Oriented Strand Board (OSB) Manufacturing Operation
PSD Air Permit Application

KRONOSPAN, LLC
1 Kronospan Way
Eastaboga, Alabama 36260

April 2026

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ADEM AIR DIVISION

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I.

Project Summary

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A.

Process Description

Process Description

Kronospan plans to install the following new operations at their Eastaboga, Alabama facility:

1. OSB (Oriented Strand Board) Plant having a capacity of 141.842 MSF (3/8" basis) per hour;
2. Two (2) 204.73 MMBtu/hr wood-fired thermal oil heaters and four (4) 56.70 MMBtu/hr natural gas-fired thermal oil heaters, and;
3. Three (3) 910 KW diesel-fired emergency generators.

In addition, the facility plans to move permitted natural gas-fired co-gen engines NGE-7, NGE-8, MGE-9, and NGE-10 to a new location for logistic purposes. The exhaust from NGE-7, NGE-8, NGE-9, and NGE-10 will be ducted to one exhaust stack.

A. OSB Plant

1. Log Handling and Processing

Incoming logs will be truck off-loaded, stored, and transferred to one of four (4) loading decks. From the decks the logs will be conveyed to four (4) individual debarkers (DB1, DB2, DB3, DB4). Debarked wood from three of the debarkers will be conveyed to one of three (3) stranders. Debarked wood from the fourth debarker will be conveyed to a chipper (CH1) and then screened and conveyed to the existing stacker/reclaimer. Emissions from the operations are fugitive. Stored chips will be conveyed to the flakers to produce flakes to be used at the OSB plant. The chipper will be located inside the strander building.

2. Stranding

The debarked logs will be conveyed to three stranders (ST21, ST2, and ST3) where the logs are cut into strands 100 to 150 mm long by 10 to 15 mm wide by 0.6 to 0.8 mm thick. The geometry of the strands plays a major role in the properties of the board. In order to achieve high quality, the strands should have only slight variations in thickness, length, width, and fines content. The strands will be conveyed to the strand storage bins awaiting processing through the dryers. Emissions from the stranders

will be ducted to individual cyclones (CYST1, CYST2, CYST3) that discharge into the individual dust collectors (DCST1, DCST2, DCST3) that discharges inside the strander building. Collected wood waste from the cyclones is recycled back to the process.

3. Flaking

Wood chips from the on-site stacker/reclaimer will be conveyed to one of four flakers (FL1, FL2, FL3, and FL4) where the chips will be reduced to size prior to being stored and conveyed to OSB operations. Emissions from the flakers will be vented to individual cyclone/dust collector systems CYFL1/CFFL1, CYFL2/CFFL2, CYFL3/CFFL3, and CYFL4/CFFL4) that discharges inside the strander building. Flakers throughput is limited to 596,600 ODT/yr.

4. Drying

Green wood strands and flakes are fed from the storage bins to one of three (3) conveyer strand dryers (D1, D2, and D3), operating in parallel. The dryers will be indirectly heated using thermal oil generated by the two 204.73 MMBtu/hr (input) wood-fired thermal oil heaters and four (4) 56.20 MMBtu/hr natural gas-fired thermal oil heaters.

Each of the three dryers will have sixteen (16) drying zones operating in series. The exhaust from zones #1, #2, #3, and #16 of each dryer will be ducted to a dust collector (D1C1, D2C1, and D3C1) and then to the two (2) biomass wood-fired thermal oil heaters. During times when the heaters are not in operation, exhaust from the dryers will be vented to the MDF Dryer. Exhaust from zones #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14, and #15 from each dryer will be routed to six (6) dust collectors (D1C2-D1C7, D2C2-D2C7, AND D3C2-D3C7). At each dryer the exhaust from the six dust collectors will be vented to the atmosphere through a common stack.

To ensure compliance with Part 64 Subpart DDDD, emissions from dryer zones 1, 2, 3, and 16 will be vented to the combustion chamber flame zones of wood-fired thermal oil heaters K7 and K8. The heaters will act as the control device. When vented to the MDF dryer, RTO-1 will act as the control device.

The Arkansas Division of Environmental Quality (ADEQ) recently permitted a new Weyerhaeuser OSB Plant in Monticello, Arkansas. Strand drying is provided by a wood-fired conveyor strander dryer similar to the one to be installed at Kronospan. The dryer has eighteen zones compared to sixteen. Only zones 1 – 5 of the dryer are vented to a control device. In a recent conversation, Jesse Smith, ADEQ, stated the Division received no comments from EPA

5. Sifting/Screening

The dried strands/flakes will be conveyed to a sifter/screen (SI/SS) to remove fines and to separate the strands by surface area and weighed before being stored in bins. Emissions from the sifter will be ducted to a dust collector (DCSS) that discharges to the atmosphere. Screening emissions (dust) will be ducted to a cyclofilter (CF19.2) and dropped into the OSB Dust Silo (ODS). Screening emissions (granulate) from oversized material (CL and SL) will be ducted to cyclofilter (CF19.1) and dropped into the OSB Granulate Silo (OGS).

6. Blending (Gluing)

The three (3) storage bins are designated as either surface, core, or fine core layer bins. From the bins the strands and flakes will be conveyed to six (6) blenders (BL1, BL2, BL3, BL4, BL5, and BL6) via weigh belts which control MDI/PMDI resin and wax distribution into the blenders by measuring the weight of the strand material flow across the belts. The resin and wax are metered into the blenders by feeders. The MDI/PMDI resin will be stored inside in eight (8) liquid resin tanks. Wax will be stored inside in seven (7) heated tanks.

Incoming MDI/PMDI Resin and Wax will be delivered to the site by semi-truck or railcar. The resin/wax will be pumped directly from the truck/railcar, via hose, into the storage tanks (top filling).

Emissions from the blending operation are ducted to a dust collector (DCB) that discharges to the atmosphere.

Blending operations are considered an affected source under Part 63, Subpart DDDD. No emission limits apply.

7. Mat Forming

The blended strands and flakes will be transported to two (2) core layers and four (4) surface layer stations with core or surface layer forming heads, which are equipped with orientation devices. Orientation of the surface layer in the direction of the production will be carried out with the aid of disc orienteers, while the core layer is oriented in the transverse direction by means of fan-type rollers. The discharge from the forming heads onto the moving mat screen will be controlled in accordance with the required surface/core layer weight/volume proportion. Electromagnets after each spreading machine ensure that any metallic foreign objects contained in the mat are removed to protect the press plates.

Emissions from the mat forming line will be ducted to a cyclone (CYMF) that is ducted to dust collector (DCMF) which discharges inside the press hall.

Mat forming operations are considered an affected source under Part 63, Subpart DDDD. No emission limits apply.

8. Mat Trimming

The continuous formed mat will be cut into desired lengths by a side-trim saw. Waste from the trimming operation will be conveyed back to the bins for product reuse. A mat reject system will convey off-specification mat back to the OSB Granular Dust Silo (OSBGS) from where the material will be used as fuel for the thermal oil heaters.

Emissions from the mat trimming operation will be ducted to a cyclone (CYMT) that is ducted to a dust collector (DCMT) that is vented to the press hall. Collected wood waste from the cyclone is recycled back to the process.

9. Pressing

The formed mats will be fed into a mat pre-heater where the mat is steamed. Steaming has a positive affect on the pressing process. The pressing time is reduced, so that the feed speed can be set higher. Additives may be added to achieve special properties of the board such as resistance to fungi or a reduction in flammability. A release agent will be

applied to the press plate which prevents the glue from sticking to the press plate. After steaming, the mat will enter a continuous press where heat and pressure cures the resin and convert the mat to the desired thickness.

Emissions from the press hall will be vented to a cyclone (PCY)/wet scrubber (WS) system that discharges from the cyclone. Emissions from the system (E.P. #PCY-4.1) will be ducted to the dryer #3 (D3) emission stack (D-20.3). Provisions will be made so emissions from PCY-4.1 and D-20.3 can be tested individually.

To ensure compliance with Part 63, Subpart DDDD, the scrubber will act as the control device.

10. Finishing

The board exiting the press will be cut to size using diagonal and cut-to-size saws, (DS, CTS).

Emissions from the diagonal saw cutting operations will be ducted to cyclone (CYDS) which is ducted to a dust collector (DCDS) which is vented to the press hall. Emissions from the cut-to-size operation will be ducted to a cyclone (CYCTS) that is ducted to a dust collector (DCCTS) which is vented to the press hall. Off-specification board will be sent to the reject bin for further use.

Cut board will be transported to the sanding line (SA) and then to three (3) tongue and groove lines (TG1, TG2, and TG3) as customer needs dictate. Emissions from the sanding operation will be ducted to a dust collector (DCSA) which discharges inside the press hall, via finishing hall. Emissions from the tongue and groove lines will be ducted to the individual cyclone (CYTG1, CYTG2, CYTG3) / dust collector (DCTG1, DCTG2, DCTG3) systems which discharge inside the press hall. Finally, the board will be conveyed to the sealing, stenciling, and strapping areas. Non-HAP, water-based paints will be used in the edge sealing operations. The edge sealing will occur in three (3) booths with particulate filters (FES1, FES2, FES3) that vent inside the building.

The miscellaneous finishing operations (sanding, sawing, edge sealing, etc.) are subject to Part 63, Subpart DDDD. Edge sealing operations are subject to the Work Practices Requirements in Tables 3(5), 6(5), and 8(5).

11. Wood Waste Handling

a. Granulate

Bark from the log handling and processing operation will be conveyed to the OSB Boiler Granulate Silo (OSBGS) and used as fuel for the thermal oil heaters.

Collected wood granulate from the forming operation cyclone (CYMF) will be conveyed to a cyclofilter (CF11.1) and dropped into the OSB Granulate Silo (OSG).

Collected wood granulate waste from the diagonal saw cyclone (CYDS), cut-to-size saw cyclone (CYCTS), and tongue and groove cyclones (CYTG1, CYTG2, and CYTG3) will be conveyed to a cyclofilter (CF18.1) and dropped into the OSB Granulate Silo (OGS).

Some of the collected wood granulate in the OSB Granulate Silo (OGS) will be conveyed to a cyclofilter (CF16.2) and dropped into the Particleboard Flaker Silo (PBFS).

Some granulate from the MDF Granulate Silo (MGS) will be conveyed to a cyclofilter (CF15.1) and dropped into the OSB Boiler Granulate Silo (OBGS).

Some granulate from the Particleboard Core Layer Dry Silo (PCLS) will be conveyed to a cyclofilter (CF16.1) and dropped into the OSB Core Layer Silo (OCLS)

Collected wood granulate from granulate screening operations (SS) will be conveyed to cyclofilter (CF19.1) and dropped into the OSB Granulate Silo (OGS).

b. Dust

Collected wood dust from the strander dust collectors (DCST1, DCST2, and DCST3 will be conveyed to a cyclofilter (CF14.1) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the flaker cyclofilters (CFF1, CFF2, CFF3, and CFF4) will be conveyed to a cyclofilter (CF14.1) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the dryer dust collectors will be conveyed to cyclofilter (CF8.1) and dropped into the OSB Dust silo (ODS).

Collected wood dust from the sifter dust collector (DCSS), gluing/blending dust collector (DCCB), forming line dust collector (DCMF), and mat trimming dust collector (DCMT) will be conveyed to a cyclofilter (CF9.1) and dropped into the OSB Dust silo (OBS).

Collected wood dust from the diagonal saw dust collector (DCDS), cut-to-size dust collector (DCCTS), and tongue and groove dust collectors (DCTG1, DCTG2, and DCTG3) will be conveyed to a cyclofilter (CF18.2) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the sanding dust collector (DCSA) will be conveyed to a cyclofilter (CF10.1) and dropped into the OSB Dust Silo (ODS).

Collected wood waste at the OSB Dust Silo (ODS) is conveyed from cyclofilter (CF12.1) and dropped into the OSB Boiler Dust Silo (OBDS).

Some of the collected wood dust in the OSB Boiler Dust (OBDS) is conveyed to a cyclofilter (CF12.2) and dropped into MDF Dust Silo (MDS).

Some of the wood dust from the MDF Dust Silo (MDS) is conveyed to a cyclofilter (CF13.1) and dropped into the OSB Boiler Dust Silo (OBDS).

Collected wood dust from granulate screening operations (SS) will be conveyed to a cyclofilter (CF19.2) and dropped into the OSB Dust Silo (ODS).

B. Thermal Oil Heaters

Kronospan plans to install two (2) 204.73 MMBtu/hr Wood Waste Fired Thermal Oil Heaters (K7 & K8) to supply heat to the new OSB Plant. Incoming combustion air will be supplied by the exhaust from zones #1, 2, 3, and 16 at each of the three (3) new conveyor strand dryers. PM emissions from the heaters will be conveyed to individual multi-clones (MC1 and MC2) and then to individual hybrid filter systems (EF-1 and EF-2) that will discharge to the atmosphere through a common stack (TOH-1 or to the MDF Dryer). NO_x emissions will be controlled by SNCR. HCl emissions will be controlled by lime injection.

The facility also plans to install four (4) new 56.20 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters (K9, K10, K11, K12) that will discharge to the atmosphere through the same stack (TOH-1) as Thermal Oil Heaters K7 and K8, or to the MDF Dryer. Thermal oil heaters can also supply heat to the OSB plant.

1. Normal Operation – Venting to Atmosphere

   During normal operations, emissions from the wood-fired thermal oil heaters and two (2) of the four (4) natural gas-fired thermal oil heaters will either discharge to the atmosphere through a common stack (TOH-1). Only two of the four natural gas-fired thermal heaters will operate at any given time.

2. Alternative Operation - NG Scenarios for Venting to MDF Dryer (See Table I.4.1)

   a. Scenario #1 – Current Operation

      Under current operations, existing Thermal Oil Heaters K2, K4, K5, and K6 along with four (4) of the six Co-Generator Engines (NGE-1, NGE-2, NGE-3, NGE-4, NGE-5, and NGE-6) can be vented to the MDF Dryer.

b. Scenario #2

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with existing Thermal Oil Heater K4 and proposed Thermal Oil Heaters K9, K10, K11, and K12 will be vented to the MDF Dryer. Proposed Thermal Oil Heaters K7 and K8 will not be in operation.

c. Scenario #3

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with the Thermal Oil Heater K7 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K8 will not be in operation.

d. Scenario #4

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heater K8 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K7 will not be in operation.

Table I.4.1

	Current Operating Scenario for MDF Dryer	Operating Scenario for MDF Dryer with OSB – Option 1	Operating Scenario for MDF Dryer with OSB – Option 2	Operating Scenario for MDF with OSB – Option 3
K2	X			
K4	X	X		
K5	X			
K6	X			
K7			X	
K8				X
K9		X	2 of 4 heaters	2 of 4 heaters
K10		X		
K11		X		
K12		X		
OSB Dryer 1		X**	X**	X**
OSB Dryer 2		X**	X**	X**
OSB Dryer 3		X**	X**	X**
Gas Engine 1	X*			
Gas Engine 2	X*			
Gas Engine 3	X*			
Gas Engine 4	X*			
Gas Engine 5	X*			
Gas Engine 6	X*			

*Currently 4 of the 6 Co-Generation Engines can exhaust to MDF Dryer at any given time.
** OSB Dryer Exhaust form Zones 1, 2, 3, and 16

C. Emergency Generators

Kronospan plans to install three (3) new 910 kw emergency generators to support the new OSB plant operations.

D. Natural Gas Co-Gen Engines

Co-Gen Engines NGE-7, NGE-8, NGE-9, and NGE-10 were recently permitted as part of the particleboard plant expansion (Unit #X062). Due to logistics issues at the facility, Kronospan proposed to relocate the engines to a new location within the site. The exhaust from NGE-7, NGE-8, NGE-9, and NGE-10 will be ducted to one exhaust stack. Provisions will be made so that each of the engines can be tested individually.

An equipment summary is provided in Table 1.1.

Table 1.1

I. OSB Operations

Source	Equipment Name	Equipment ID	Control Device	Control Device ID	Emission Point
A. Debarking	Debarker #1	DB1	N/A	N/A	F-DB
	Debarker #2	DB2	N/A	N/A	F-DB
	Debarker #3	DB3	N/A	N/A	F-DB
	Debarker #4	DB4	N/A	N/A	F-DB
B. Chipping/Screening	Chipper #1	CH1	Building Enclosure	BE	Strander Building
C. Stranding	Strander #1	ST1	Cyclone/Dust Collector/ Building Enclosure	CYST1/DCST1/BE	Strander Building
	Strander #2	ST2	Cyclone/Dust Collector/ Building Enclosure	CYST2/DCST2/BE	Strander Building
	Strander #3	ST3	Cyclone/Dust Collector/ Building Enclosure	CYST3/DCST3/BE	Strander Building
D. Flaking	Flaker #1	FL1	Cyclone/Dust Collector/ Building Enclosure	CYFL1, CFFL1/BE	Strander Building
	Flaker #2	FL2	Cyclone/Dust Collector/ Building Enclosure	CYFL2, CFFL2/BE	Strander Building
	Flaker #3	FL3	Cyclone/Dust Collector/ Building Enclosure	CYFL3, CFFL3/BE	Strander Building
	Flaker #4	FL4	Cyclone/Dust Collector/ Building Enclosure	CYFL4, CFFL4/BE	Strander Building
E. Drying	Dryer #1	D1	Dust Collector	D1C1	D-20.1
	Dryer #2		Dust Collectors	D1C2-D1C7	D-20.1
	Dryer #3	D2	Dust Collector	D2C1	D-20.2
			Dust Collectors	D2C2-D2C7	D-20.2
		D3	Dust Collector	D3C1	D-20.3
			Dust Collectors	D3C2-D3C7	D-20.3
F. Sifting/Screening	Sifter	S1	Dust Collector	DCSS	SS-2.2
	Screen	SS	Cyclofilter	CF19.1	CF-19.1
		SS	Cyclofilter	CF19.2	CF-19.2
G. Blending	Blenders (3)	BL1, BL2, BL3	Dust Collector	DCB	BG-2.1
H. Mat Forming	Mat Forms	MF	Cyclone / Dust Collector Cyclone/Wet Scrubber	CYMF, DCMF PCY/WS	D-20.3, via PCY-4.1
I. Mat Trimming	Trim Saw	MT	Cyclone / Dust Collector Cyclone / Wet Scrubber	CYMT, DCMT PCY/WS	D-20.3, via PCY-4.1
J. Pressing	Press	CP	Cyclone / Wet Scrubber	PCY/WS	D-20.3, via PCY-4.1
K. Diagonal Saws	Diagonal Saws	DS	Cyclone / Dust Collector	CYDS, DCDS, PCY/WS	D-20.3, via PCY 4.1
L. Cut-To-Size Sawing	Cut-To-Size Saws	CTS	Cyclone / Dust Collector Cyclone / Wet Scrubber	CYCTS, DCCTS PCY/WS	D-20.3, via PCY-4.1
M. Sanding	Sander	SA	Dust Collector Cyclone / Wet Scrubber	DCSA PCY/WS	D-20.3, via PCY-4.1
N. Tongue and Groove	Station #1 Station #2 Station #3	TG1	Cyclone / Dust Collector Cyclone / Wet Scrubber	CYTG1, DCTG1 PCY/WS	D-20.3, via PCY-4.1
		TG2	Cyclone / Dust Collector Cyclone / Wet Scrubber	CYTG2, DCTG2 PCY/WS	D-20.3, via PCY-4.1
		TG3	Cyclone / Dust Collector Cyclone / Wet Scrubber	CYTG3, DCTG3 PCY/WS	D-20.3, via PCY-4.1
O. Edge Sealing	Booth #1	ESB1	Particulate Filter	FES1	Inside Building
	Booth #2	ESB2	Particulate Filter	FES2	Inside Building
	Booth #3	ESB3	Particulate Filter	FES3	Inside Building
P. Stenciling	Stenciling Machine	STM	N/A	N/A	STE-1

Source	Equipment Name | Equipment ID	Control Device	Control Device ID	Emission Point
Q. Wood Granulate Handling	1. Granulate from CYMF to OSB Granulate Silo (OGS)	Cyclofilter	CF11.1	CF-11.1
	2. Granulate from CYDS, CYCTS, CYTG1, and CYTG2 to OSB Granulate Silo (OGS)	Cyclofilter	CF18.1	CF-18.1
	3. Granulate from OSB Granulate Silo (OGS) to PB Flaker silo (PBFS)	Cyclofilter	CF16.2	CF-16.2
	4. Granulate from MDF Granulate Silo (MGS) to OSB Boiler Granulate Silo (OBGS)	Cyclofilter	CF15.1	CF-15.1
	5. Granulate from PB Core Layer Silo (PCLS) to OSB Core Layer Silo (OCLS)	Cyclofilter	CF16.1	CF16.1
R. Wood Dust Handling	1. Dust from DCST-1, DCST-2, and DCST-3 to OSB Dust Silo (ODS)	Cyclofilter	CF14.1	CF-14.1
	2. Dust from Dryer Dust Collector to OSB Dust Silo (ODS)	Cyclofilter	CF8.1	CF-8.1
	3. Dust from DCSS, DCB, DCMF, and DCMT to OSB Dust Silo (ODS)	Cyclofilter	CF9.1	CF-9.1
	4. Dust from DCDS, DCCTS, DCTG1, DCGT2, and DCTG3 to OSB Dust Silo (ODS)	Cyclofilter	CF18.2	CF-18.2
	5. Dust from DCSA to OSB Dust Silo (ODS)	Cyclofilter	CF10.1	CF-10.1
	6. Dust from OSB Dust Silo (ODS) to OSB Boiler Dust Silo (OBDS)	Cyclofilter	CF12.1	CF-12.1
	7. Dust from OSB Boiler Dust Silo (OBDS) to MDF Dust Silo (MDS)	Cyclofilter	CF12.2	CF-12.2
	8. Dust from MDF Dust Silo (MDS) to Boiler Dust Silo (OBDS)	Cyclofilter	CF13.1	CF-13.1
	9. Dust from Granulate Screening (SS) to OSB Dust Silo (ODS)	Cyclofilter	CF19.2	CF-19.2

NOTE: E.P. # PCY-4.1 Discharges to the atmosphere through D-20.3

II. Thermal Oil Heater

Source	Equipment Name	Equipment ID	Control Device	Control Device ID	Emission Point
A. Thermal Oil Heater	Thermal Oil Heater (Wood Fired)	K7	Multi-Clone Hybrid Filter	MC1 EF1	TOH-1 or MDF Dryer
B. Thermal Oil Heater	Thermal Oil Heater (Wood Fired)	K8	Multi-Clone Hybrid Filter	MC2 EF2	TOH-1 or MDF Dryer
C. Thermal Oil Heater	Thermal Oil Heater (Natural Gas)	K9	N/A	N/A	TOH-1 or MDF Dryer
D. Thermal Oil Heater	Thermal Oil Heater (Natural Gas)	K10	N/A	N/A	TOH-1 or MDF Dryer
E. Thermal Oil Heater	Thermal Oil Heater (Natural Gas)	K11	N/A	N/A	TOH-1 or MDF Dryer
F. Thermal Oil Heater	Thermal Oil Heater (Natural Gas)	K12	N/A	N/A	TOH-1 or MDF Dryer

III. Emergency Generators

Source	Equipment Name	Equipment ID	Control Device	Control Device ID	Emission Point
A. Emergency Generator	Emergency Generator #6	EG6	N/A	N/A	EG-6
B. Emergency Generator	Emergency Generator #7	EG7	N/A	N/A	EG-7
C. Emergency Generator	Emergency Generator #8	EG8	N/A	N/A	EG-8

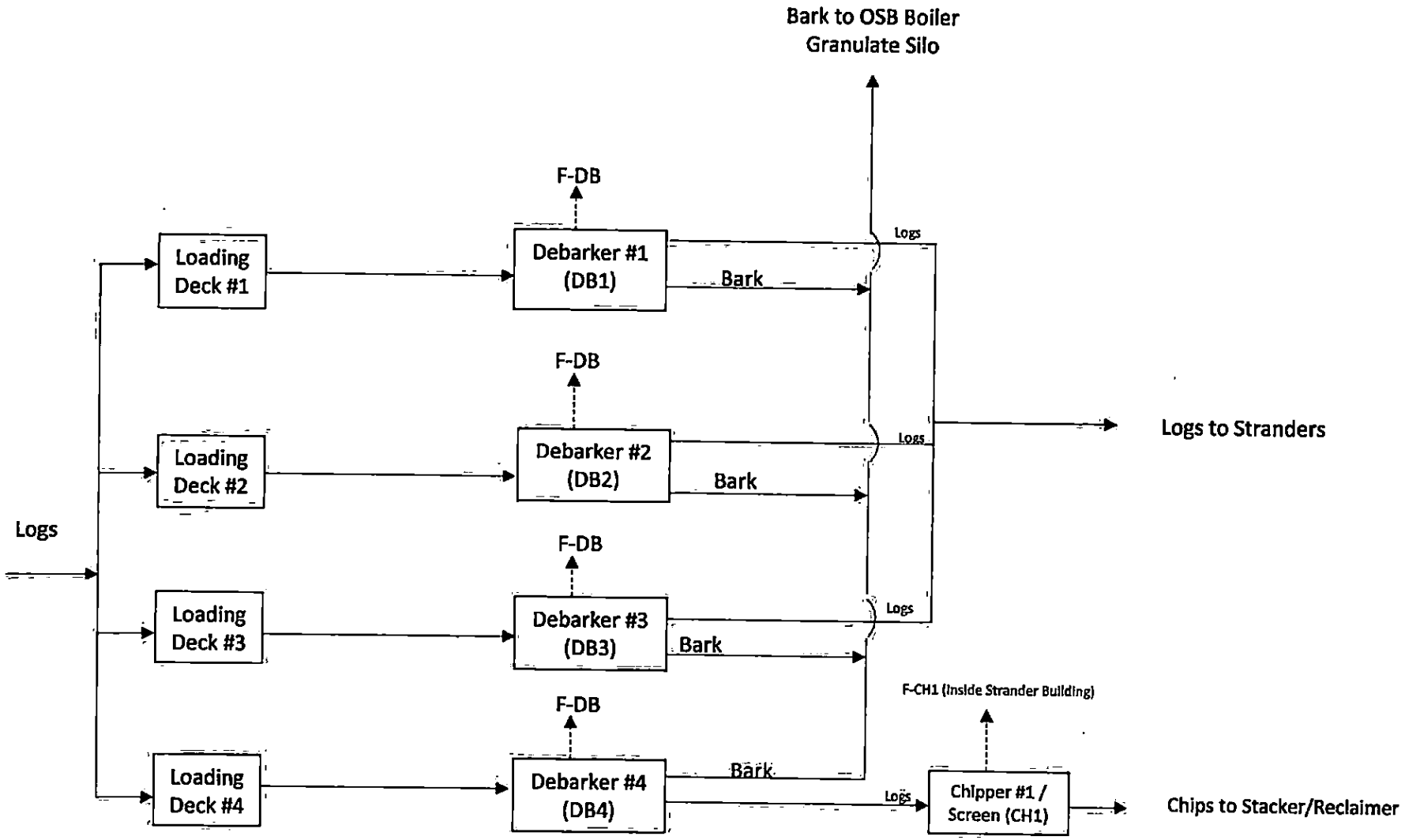
B.

Flow Diagrams

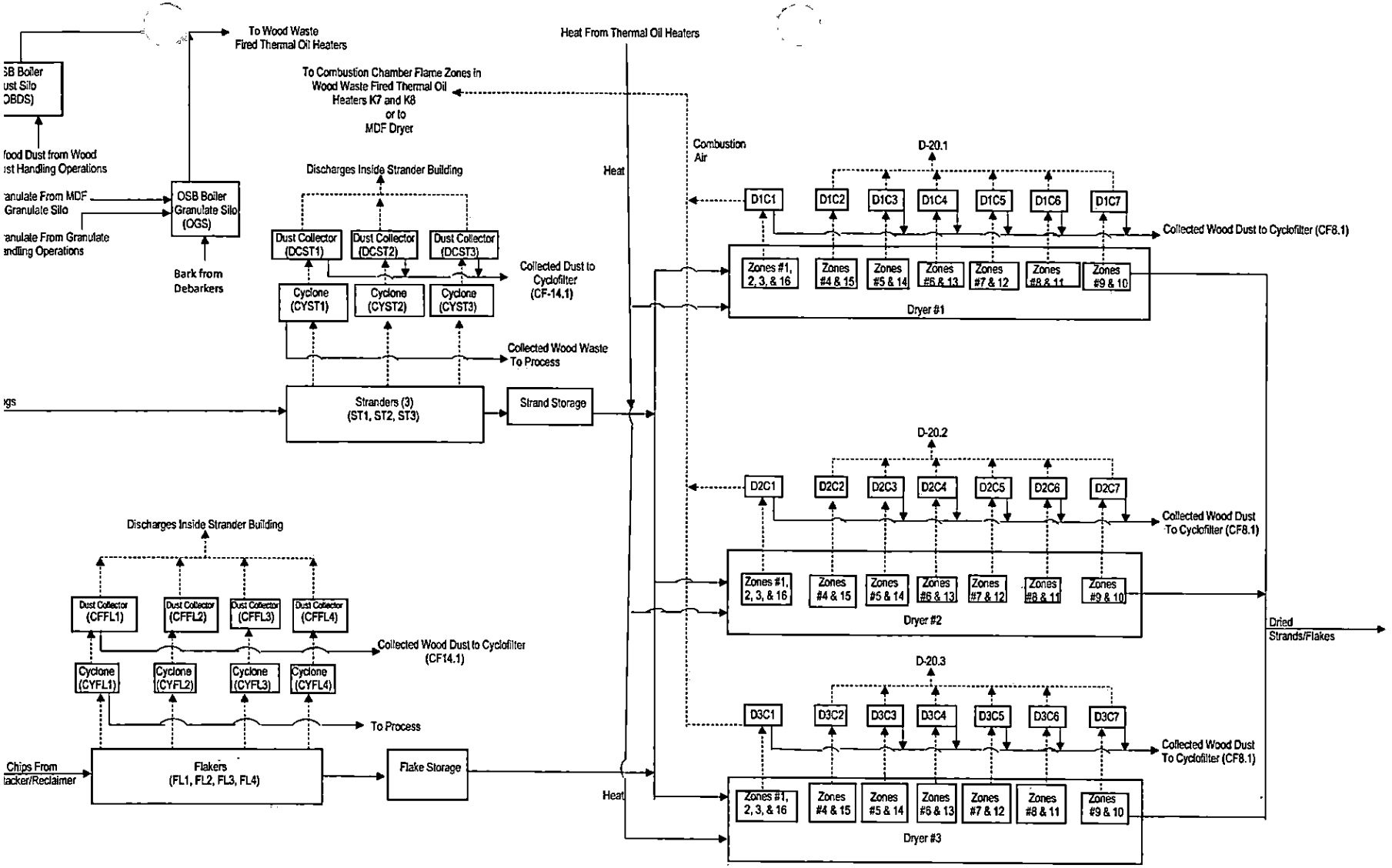
1. OSB Process
2. Thermal Oil Heaters
3. Emergency Generators

1.

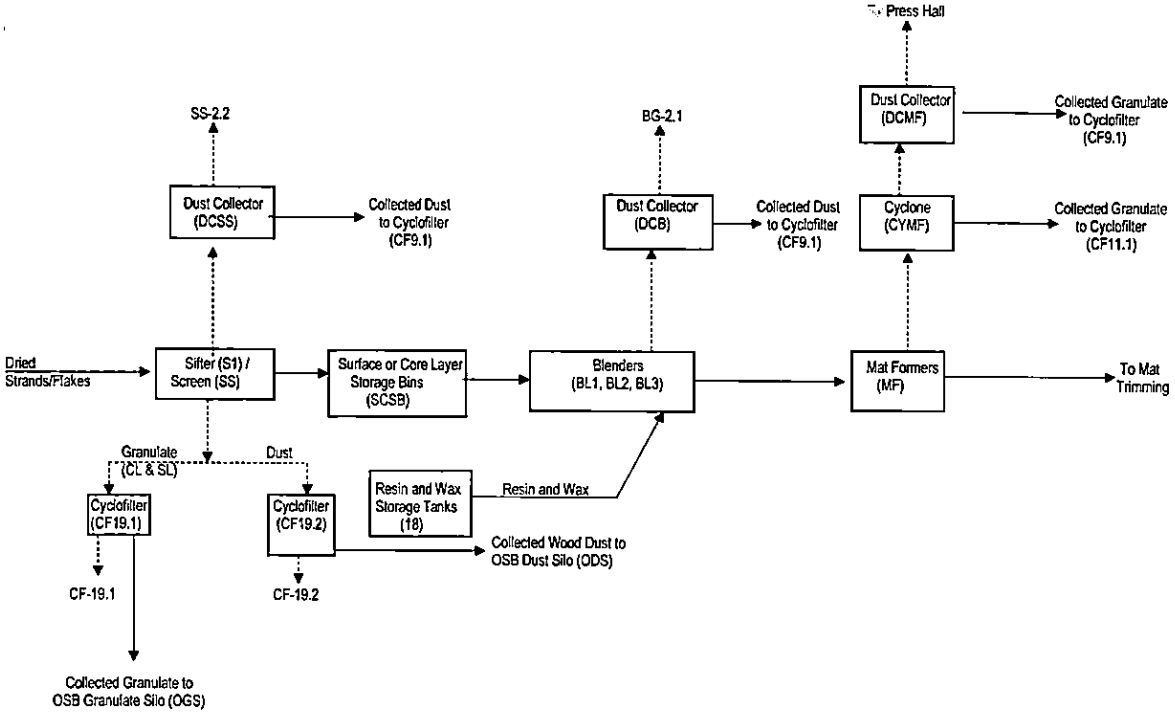
OSB Process



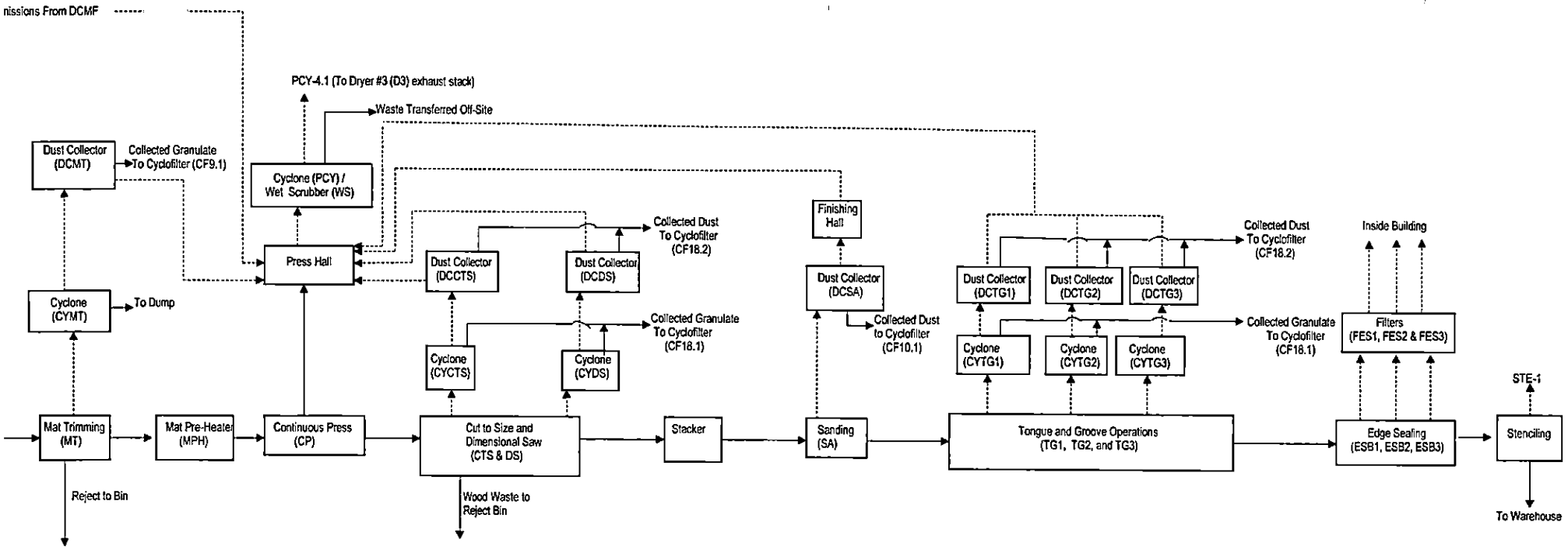
Log Handling and Processing



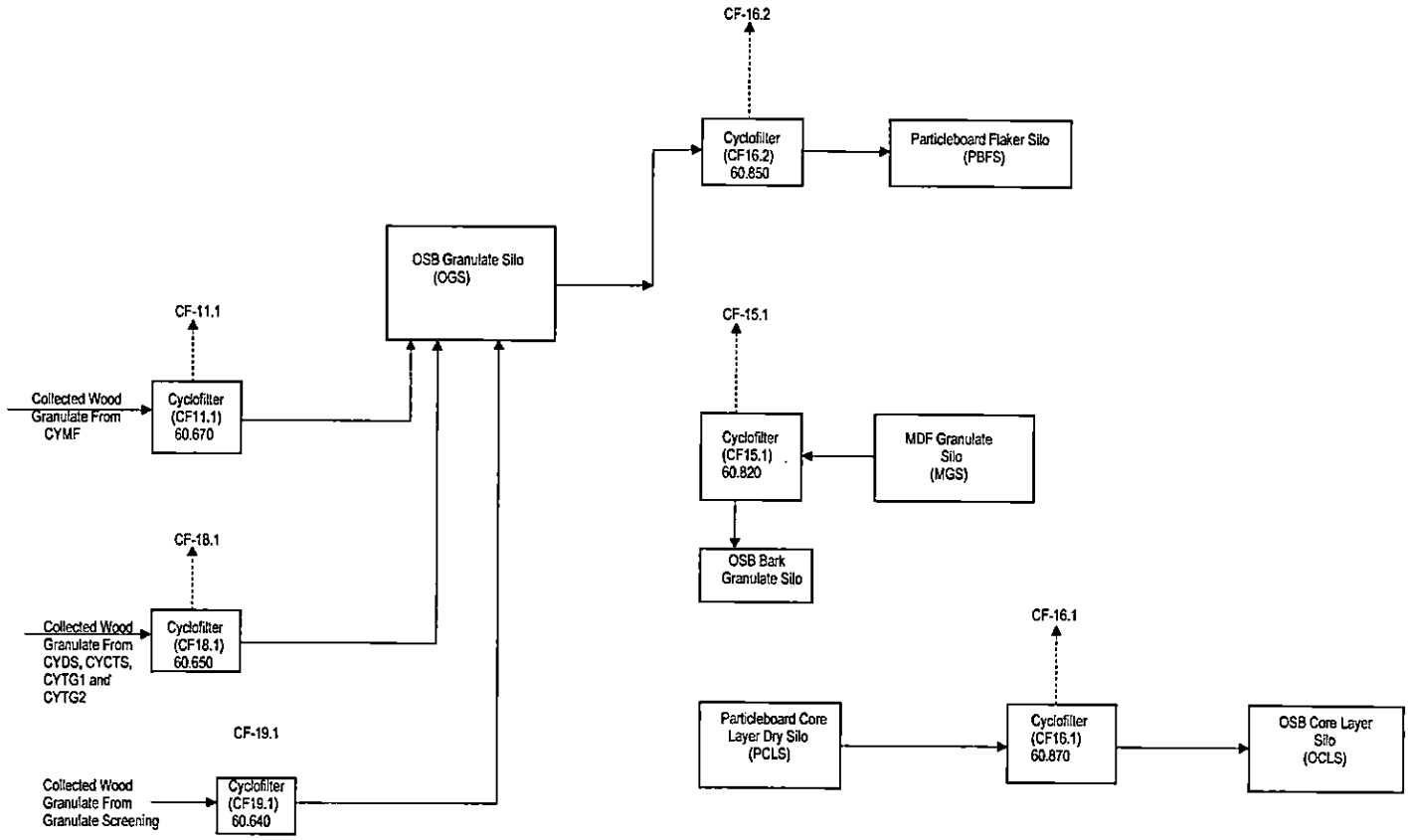
STRANDING / FLAKING / DRYING



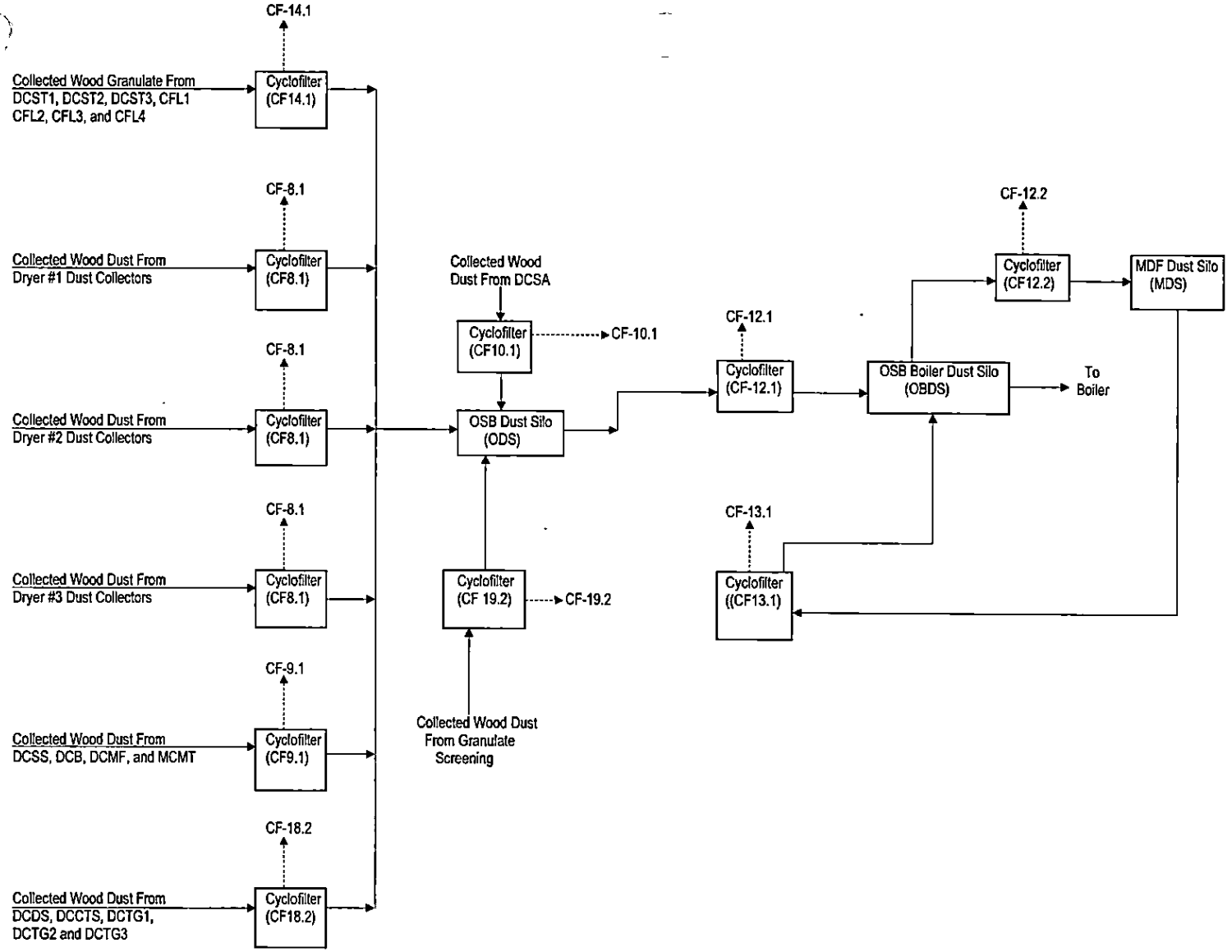
SIFTING / SCREENING / BLENDING (GLUING) / FORMING



MAT TRIMMING / PRESSING / FINISHING / EDGE SEALING



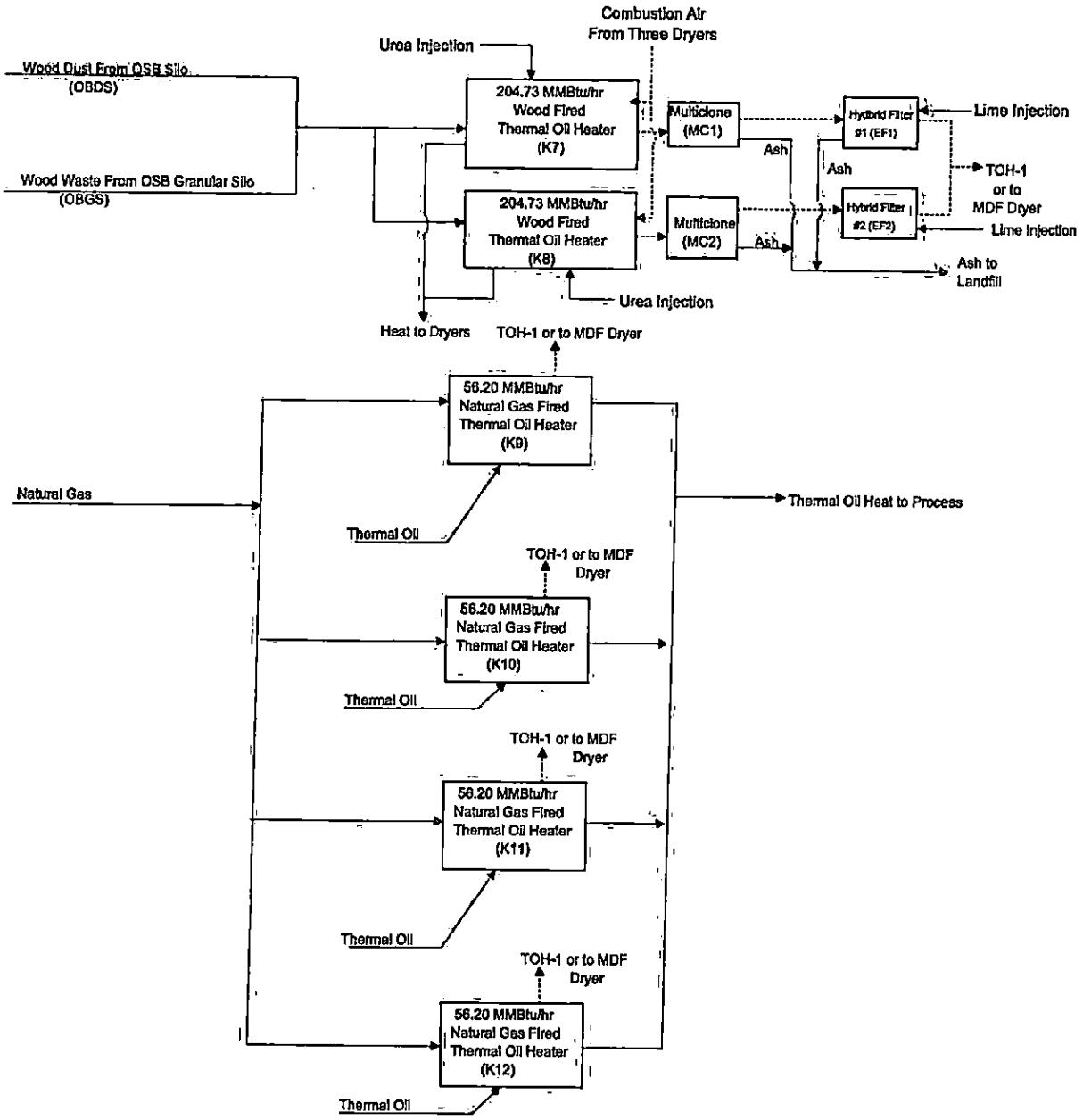
Wood Granulate Handling



Wood Dust Handling

2.

Thermal Oil Heaters



Thermal Oil Heaters

Alternative Operating / NG Scenarios for Venting to MDF Dryer

a. **Option #1**

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with existing Thermal Oil Heater K4 and proposed Thermal Oil Heater K9, K10, K11, and K12 will be vented to the MDF Dryer. Proposed Thermal Oil Heaters K7 and K8 will not be in operation.

b. **Option #2**

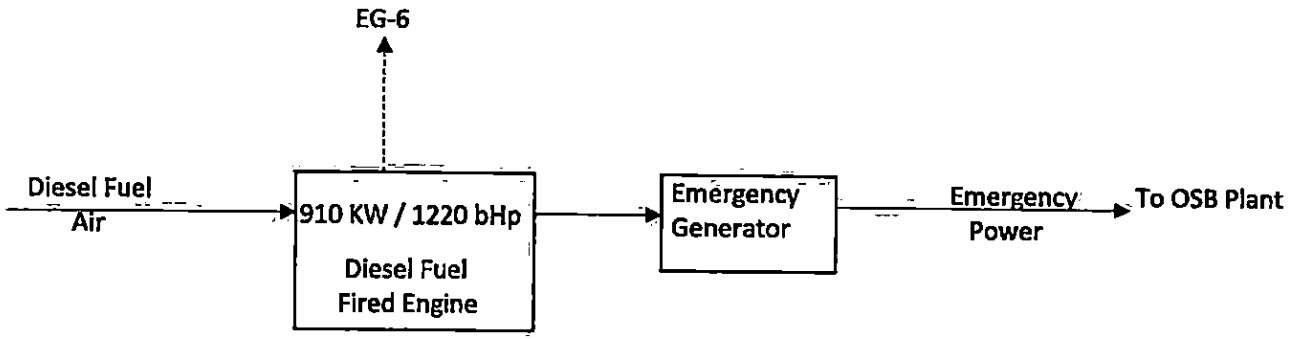
Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heater K7 and two (2) of the four(4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K8 will not be in operation.

c. **Option #3**

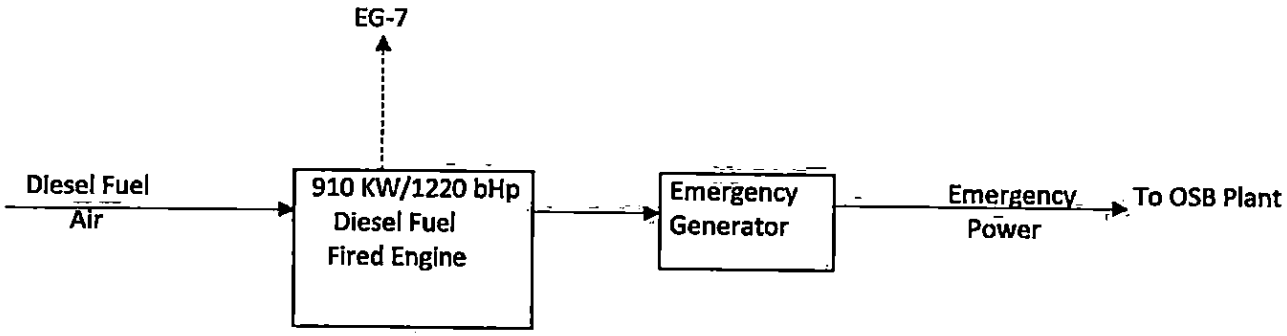
Zones #1, #2, #3, an d#16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heater K8 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K7 will not be in operation.

3.

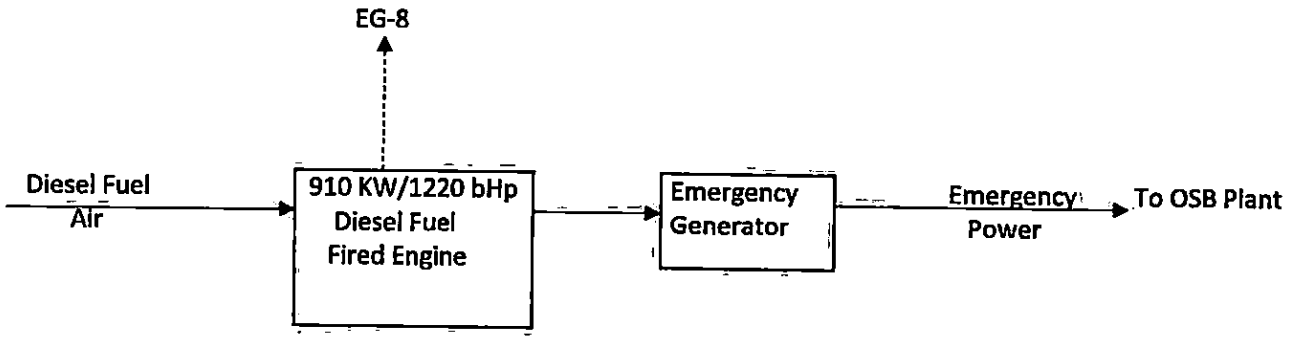
Emergency Generators



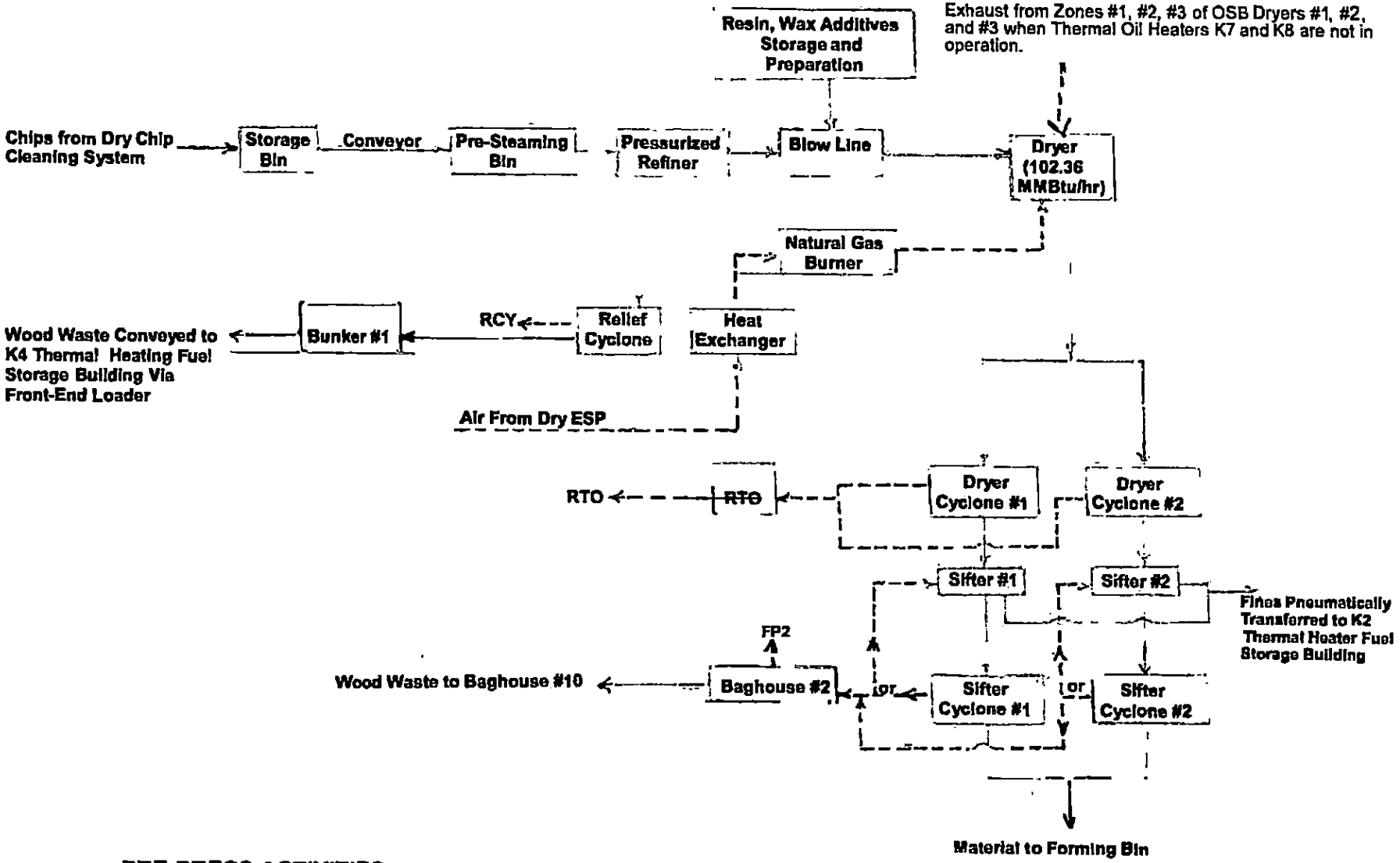
Emergency Generator #6 Flow Diagram



Emergency Generator #7 Flow Diagram



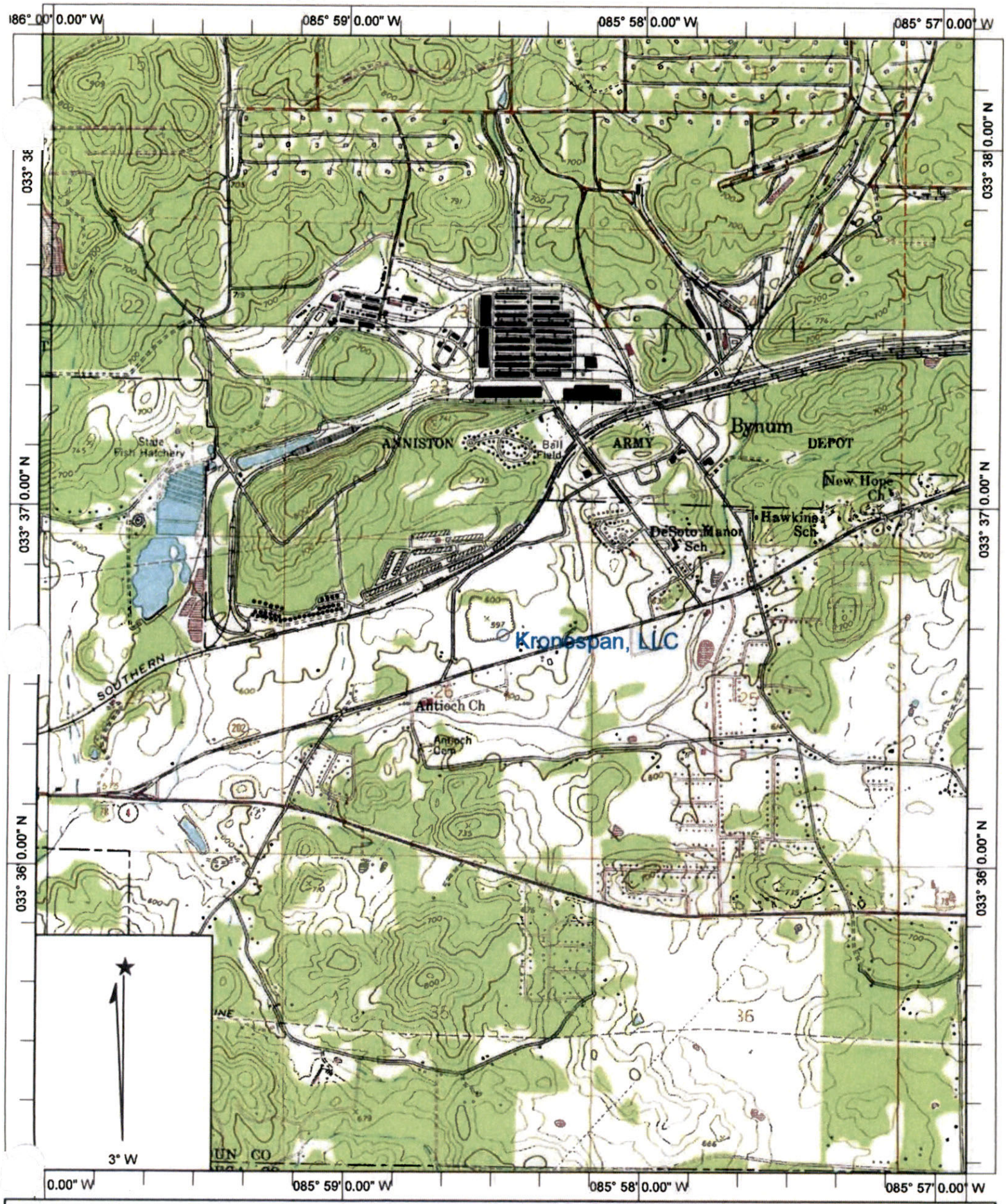
Emergency Generator #8 Flow Diagram



PRE-PRESS ACTIVITIES

C.

Facility Location



Name: MUNFORD
Date: 9/24/2020
Scale: 1 inch equals 2000 feet

Location: 033° 36' 43.29" N 085° 58' 28.2" W
Caption: Site Location and Topographic Map

II.

PSD Applicability Analysis

A. General
B. Facility Permitting History
C. Units Subject to PSD Applicability Analysis
D. Impact on Existing Sources
E. Significant Emission Increase
F. Summary of Sources Subject to Applicability Analysis
G. Potential Emissions (PTE)
H. Significant Net Emissions Increase

A. General

Kronospan is in Calhoun County which is currently classified as an attainment area for all criteria pollutants. Therefore, consideration for New Source Review (NSR) pollutants are evaluated for Prevention of Significant Deterioration (PSD) in lieu of Nonattainment NSR.

Kronospan is a PSD major source due to facility-wide potential emissions and thus the emissions increases from the proposed project must be evaluated and compared to the major modification thresholds of regulated pollutants for NSR permitting applicability under the PSD program. PSD major source thresholds are shown in Table II.A.I

Table II.A.1 – PSD Thresholds (TPY)

Pollutant	TPY
PM- Particulate Matter	25
PM_{10} – PM less than 10 microns	15
$PM_{2.5}$ – PM less than 2.5 microns	10
VOC – Volatile Organic Compounds	40
SO2 – Sulfur Dioxide	40
NOx – Oxide of Nitrogen	40
CO- Carbon Monoxide	100
Lead – Lead and Lead Compounds	7
CO2e – Greenhouse Gas Carbon Dioxide Equivalent	75,000

B. Facility Permitting History

Date	Description	Permit Number
January 23, 2008	Fiberboard Mfg. Process w/ RTO	X007
January 23, 2008 May 23, 2019 (Reissue)	Material Handling System to Sanding Dust Silo	X013
January 23, 2008 May 23, 2019 (Reissue)	Wood Chip Cleaning	X025
January 23, 2008	122.84 MMBtu/hr Thermal Oil Heater	X026
January 23, 2008	61.42 MMBtu/hr Thermal Oil Heater	X027
January 23, 2008	55.00 MMBtu/hr Natural Gas Heater	X028

Date	Description	Permit Number
January 23, 2008 May 23, 2019 (Reissue)	Material Transfer System to Granulate Silo	X029
January 23, 2008 May 23, 2019 (Reissue)	Material Transfer System to Granulate Silo	X031
August 17, 2013	1,490 Hp Emergency Generator #1	X032
August 17, 2013	755 Hp Emergency Generator #2	X033
April 24, 2014	Formalin Production Unit	X021
April 24, 2014	Two (2) 146,000 Gallon Methanol Storage Tanks vented to a Catalytic Oxidizer (RP1)	X022
May 28, 2015	Three (3) 89,000 Gallon Formalin Storage Tanks vented to a Catalytic Oxidizer (RP1 and RP3)	X023
September 14, 2015	755 Hp Emergency Generator #3	X034
October 25, 2016	Resin Production Unit	X024
December 6, 2016	Web Coating Operation which includes: - Paper Treating - Board Laminate (w/ 3 Baghouses); and - Flooring/Milling (w/4 Baghouses)	X035
May 12, 2017	55 MMBtu/hr Natural Gas Fired Backup Thermal Oil Heater	X037
June 20, 2017	Four (4) 10.113 MW (13,562 Hp/9,970 kWm) General Electric 4 Stroke Lean Burn Natural Gas Fired Reciprocating Engines (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ)	X036
March 8, 2018	Two (2) 460 bHp Clarke Fire Protection Products Compression Ignition Diesel Fired Fire Pump Engine – Emergency Fire Pump (NSRS, Subpart IIII)	X038
May 23, 2019	755 Hp (563 KWm) Cummins Compression Ignition Diesel Fired Reciprocating Internal Combustion Engine (Emergency Generator No. 3)(NSPS)	X034
May 23, 2019 (Reissue)	Web Coating Operation which includes: - Paper Treating - Board Lamination (w/ 3 Baghouses); and - Flooring/Milling (w/ 4 Baghouses)	X035

Date	Description	Permit Number
May 23, 2019	Four (4) 10.113 MW (13,562 Hp/9,970 kWm) General Electric 4-Stork Lean Burn Natural Gas Fired Reciprocating Engines (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ)	X036
May 23, 2019 (Reissue)	Two (2) 460 bHp Clarke Fire Protection Products Compression Ignition Diesel Fired Pump Engine – Emergency Fire Pump (NSPS, Subpart IIII)	X038
May 23, 2019	Wood Chip Sorting exhausting to Selective Non-Catalytic Reduction Wet Scrubber, Wet Electrostatic Precipitator (WESP) and Regenerative Thermal Oxidizer (RTO) including: - Macro/Micro Chips Dos Silos - Flakers (6) - Wet Flakers Silos (2) - Dos Bin A - Cyclone Bank (9) - Rotary Dryer with 236.22 MMBtu/hr Wood Fired Burner	X040
May 23, 2019	Pre-Press Activities exhausting to Selective Non-Catalytic Reduction (SNCR), Wet Scrubber, Wet Electrostatic Precipitator (WESP), and Regenerative Thermal Oxidizer (RTO) including: - Firelock - Screens (6) - Surface Layer and Core Layer Processes exhausting to Filter #4 - Hammermills #1, #2, and #3 exhausting to Filter #5 - Heavy Particle Sifter exhausting to Filter #6	X041
May 23, 2019	Press Activities exhausting to Selective non-Catalytic Reduction (SNCR), Wet Scrubber, Wet Electrostatic Precipitator (WESP), and Regenerative Thermal Oxidizer (RTO) including: - Surface Layer (SL) Process - Core Layer (CL) Process - SL Wind Former (2) - CL Rake Spreader (2) - Press Hall - Press - Edge Trim Saw exhausting to Filter #9 - Board Cooler (5)	X042

Date	Description	Permit Number
May 23, 2019	Post-Press Activities exhausting to Selective non-Catalytic Reduction (SNCR), Wet Scrubber, Wet Electrostatic Precipitator (WESP), and Regenerative Thermal Oxidizer (RTO) including: - Sanding machine - Final Cutting exhausting to Filter #11 - Strapping and Packaging	X043
May 23, 2019	One (1) 10.113 MW (6,127 bHp/4,569 kWm) General Electric 4-Stroke Lean Burn Natural Gas Fired Reciprocating Engine (CG-05) (NSPS, Subpart JJJJ & MACT, Subpart ZZZZ)	X044
May 23, 2019	Web Coating Operation for Particle Board Operation which includes: - Paper Treating Lines (Nos. 5 & 6); and - Board Lamination (Line Nos. 4, 5, and 6) w/ 3 Baghouses (BH-8, BH-9 and BH-10)	X045
May 23, 2019	Resin Production Unit Controlled by two Catalytic Oxidizers (RP1 and RP3). The processes include: - One (1) 77.16 ton reactor (existing) - Two (2) 27.56 ton reactors (existing) - One (1) 77.16 ton reactor (new)	X046
May 23, 2019	Formalin Production Unit	X021
May 23, 2019	Two (2) 146,140 Gallon Methanol Storage Tanks Vented to a Catalytic Oxidizer (RP1) – Tank Nos. E225-A, E225-B	X022
May 23, 2019	Three (3) 89,600 Gallon Formalin Storage Tanks Vented to a Catalytic Oxidizer (RP1 or RP3) – Tanks Nos. E330A-E330C	X023
May 23, 2019	Resin Production Unit	X024
May 23, 2019	122.84 MMBtu/hr Wood fired Thermal Oil Heater (Unit K4) Equipped with Selective Non Catalytic Reduction (SNCR) and controlled by a common Dry Electrostatic Precipitator	X026
May 23, 2019	61.42 MMBtu/hr Wood Fired Thermal Oil Heater (Unit K2) controlled by a common Electrostatic Precipitator (ESP) and exhausting to a Regenerative Thermal Oxidizer (RTO) (NSPS, Dc, MACT, DDDDD)	X047

Date	Description	Permit Number
May 23, 2019	55.00 MMBtu/hr Wood Fired Thermal Oil Heater (Unit K1), (NSPS Dc; MACT DDDDD)	X048
May 23, 2019	Two 56.20 MMBtu/hr Natural Gas Fired Backup Thermal Oil heater (Units K5 and K6), (NSPS, Dc, MACT DDDDD)	X049
May 23, 2019	1,490 Hp (1,112 kWm) Cummins Compression Ignition Diesel Fired Reciprocating Internal Combustion Engine (Emergency Generator No. 2)(NSPS)	X032
May 23, 2019	755 Hp (563 kWm) Cummins Compression Ignition Diesel Fired Reciprocating Internal Combustion Engine (Emergency Generator No. 2)(NSPS)	X033
May 23, 2019	1,220 bHp (910 kWm) Cummins Compression Ignition Diesel Fired Reciprocating Internal Combustion Engine [(Emergency Generator No. 4 (ENG-04)][(NSPS, Subpart IIII)(MACT, Subpart ZZZZ)] 1,257 bHp (938 kWm) Caterpillar Compression Ignition Diesel Fired Reciprocating Internal Combustion Engine [Emergency Generator No. 5 (ENG-05)][(NSPS Subpart IIII)(MACT, Subpart ZZZZ)]	X050
September 19, 2019 (Reissue)	6,127 bHp (4,569 kWm) General Electric 4-Stroke Lean Burn Natural Gas Fired Reciprocating Engine (Engine No. 1) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,127 bHp (4,569 kWm) General Electric 4-Stroke Lean Burn Natural Gas Fired Reciprocating Engine (Engine No. 2) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,022.53 bHp (4,491 kWm) General Electric 4-Stroke Lean Burn Natural Gas Fired Reciprocating Engine (Engine No. 3) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,127 bHp (4,569 kWm) General Electric 4-Stroke Lean Burn Natural Gas Fired Reciprocating Engine (Engine No. 4) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ)	X036

Date	Description	Permit Number
April 16, 2020 (modification)	Pre-Press Activities exhausting to Selective Non-Catalytic Reduction (SNCR), Wet Scrubber, Wet Electrostatic Precipitator (WES), and Regenerative Thermal Oxidizer (RTO) including: - Firelock - Screens (6) - Surface Layer and Core Layer Process exhausting to Filter #4 - Hammermills #1, #2, and #3 exhausting to Filter #5 - Heavy Particle Sifter exhausting to Filter #6	X041
June 23, 2020 (Reissue)	One (1) 510 bHp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine – Emergency Fire Pump No.1 (EFP-01)[NSPS, Subpart IIII)]. One (1) 460 bHp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine – Emergency Fire Pump No. 2 (EFP-02)[NSPS, Subpart III)	X038
July 22, 2020	6,127 bHp (4,569 kWm) General Electric 4-Sroke Lean Burn Natural Gas fired Reciprocating Engine (Engine No.1) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,127 bHp (4,569 kWm) General Electric 4-Sroke Lean Burn Natural Gas fired Reciprocating Engine (Engine No.2) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,022.53 bHp (4,491 kWm) General Electric 4-Sroke Lean Burn Natural Gas fired Reciprocating Engine (Engine No.3) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ), and 6,023 bHp (4,491 kWm) General Electric 4-Sroke Lean Burn Natural Gas fired Reciprocating Engine (Engine No.4) (NSPS, Subpart JJJJ and MACT, Subpart ZZZZ),	X036

Date	Description	Permit Number
September 22, 2022	122.84 MMBtu/hr Thermal Oil Heater (K4) equipped with a Selective Non-Catalytic Reduction (SNCR) and controlled by a common/shared Dry Electrostatic Precipitator (ESP) 61.42 MMBtu/hr Sander Dust-Fired Thermal Oil Heater with Natural Gas-Fired Startup (K2) with Selective Non-Catalytic Reduction (SNCR) and controlled by a Common Dry Electrostatic Precipitator (ESP)	X051
September 22, 2022	Medium Density Fiberboard – Pre-Press Activities	X052
September 21, 2022 RE: February 1, 2023	Medium Density Fiberboard – Press Activities	X053
September 22, 2022	Medium Density Fiberboard – Post Press Activities	X054
	Medium Density Fiberboard – Finishing and Packaging	X055
	Medium Density Fiberboard – Granulate Collection and Transfer System	X056
	Medium Density Fiberboard – Sawdust Collection and Transfer System	X057
	1490 Hp Engine Exhaust (Emergency Generator No. 1) (Located at MDF Plant)	X058
	755 Hp Engine Exhaust (Emergency Generator No. 2) (Located at MDF Plant)	X059
	755 Hp Engine Exhaust (Emergency Generator No. 3) (Located at Resin Plant)	X060
September 22, 2022	Web Coating Operation (MDF Plant) which includes: • Paper Treating Line Nos. 1, 2, 3, and 4 • Board Lamination Line No. 1, 2, and 3 (with 3 Baghouses) • Flooring/Milling Line Nos. 1 and 2 (with 2 Baghouses)	X061
September 21, 2022 MOD: February 1, 2023	Cogeneration Process – Natural Gas-Fired Spark Ignition Internal Combustion Engine Nos. 1-10	X062

Date	Description	Permit Number
September 22, 2022	Formalin Production Unit	X063
	Methanol Storage Tanks	X064
	Formalin Storage Tanks	X065
	Resin Production Unit controlled by two catalytic oxidizers (RP-1 and RP-3). The process includes: • Two (2) 77.16 ton reactors (RR-1 and RR-4) • Two (2) 27.56 ton reactors (RR-2 and RR-3)	X066
	Sawdust and Chips Handling (Particleboard Plant) includes: • Sawdust handling and storage exhausting to Reject Filters #1 and #2 • Wood chips screening • Wood Waste Handling System and Storage exhausting to Dust Handling Filters #1, #2, #3, #4, #5, and #6	X067
September 21, 2022 MOD: February 1, 2023	Wood Chip Sorting exhausting to Selective Non-Catalytic Reduction, Wet Scrubber, Wet Electrostatic Precipitator (WESP), and Regenerative Thermal Oxidizer (RTO) includes: • Macro/Micro Chip Dos Silos • Flakers (6) • Wet Flakers Silos (2) • Dos Bins (Furface Layer and Core Layer) • Cyclone Bank (8) • Rotary Dryer with 236.22 MMBtu/hr wood-fired burner	X068
September 22, 2021	Particleboard – Pre-Press Activities includes: • Firelock • Screens (6) • Surface Layer and Coore Layer processes exhausting to Filter $3 • Hammermills #1, #2, #3,and #4 exhausting to Filter #5 • Heavy Particle Sifter existing to Filter #6	X069

Date	Description	Permit Number
September 22, 2022	Particleboard Plant Press Activities	X070

	Press Activities exhausting to Selective Non-Catalytic (SNCR), Wet Scrubber, Wet Electrostatic Precipitator (WESP), and Regenerative Thermal Oxidizer (RTO) includes:
	• Surface Layer (SL) process
	• Core Layer (CL) process
	• SL Wind Former (2)
	• CL Rake Spreader (2)
	• Press Hall
	  o Press
	  o Edge Trim Saw exhausting to Filter #9
	  o Board Cooler (5)
	• Sanding Machine
	• Final Cutting exhausting to Filter #11 (exhausting to Press Hall)
	• Strapping and Packaging	

	Web Coating Operation for Particleboard Operation includes: • Paper Treatment Line Nos. 5 and 6 • Board Lamination (Line Nos. 4, 5, and 6) with Baghouse (BH-6)	X071
	Two (2) 56.20 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters (K5 and K6)	X072
	1,220 bHp (910 kW_m) Cummins Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine [Emergency Generator No. 4 (ENG-04)]	X073
	1,257 bHp (938 kW_m) Caterpillar Compression Ignition Diesel-Fired Reciprocating Internal Combustion Engine [Emergency Generator No. 5 (ENG-05)	
	510 bHp Clark Fire Protection Products Compression Ignition Diesel-Fired Fire Pump Engine – Emergency Fire Pump No.1	X074
	460 bHp Clark Fire Protection Products Compression Ignition Diesel-Fired Pump Engine – Emergency Fire Pump No. 2	
September 8, 2023	Storage Silos with Conveyance and Baghouse at Particleboard Process	X075
April 8, 2024 (Modification)	122.84 MMBtu/hr Thermal Oil Heater (K4) equipped with a Selective Non-Catalytic Reduction (SNCR) and controlled by a common/shared Dry electrostatic Precipitator (ESP)	X051

	61.42 MMBtu/hr Sander Dust-Fired Thermal Oil Heater with Natural Gas-Fired Startup (K2) with Selective Non-Catalytic Reduction (SNCR) and controlled by a Common Dry Electrostatic Precipitator (ESP)	

C. Sources Subject to PSD Applicability Analysis

The following new sources will be installed a part of this project:

1. OSB Plant (121.53 odt/hr capacity / 141.842 MSF/hr – 3/8" basis)
2. Two (2) 204.73 MMBtu/hr wood waste fired thermal oil heaters
3. Four (4) 56.20 MMBtu/hr natural gas fired thermal oil heaters
4. Three (3) 910 KW/1220 bHp Emergency Generator to support the new OSB plant

All of the above sources are subject to PSD Applicability Analysis. Kronospan does not plant to modify or remove any of the existing permitted sources at the facility.

Table II.C.1

Unit	PSD Applicability Analysis	BACT Determination	Applications Required
A. OSB Plant	Y	Y	Y
B. Thermal Oil Heaters (6)	Y	Y	Y
C. Emergency Generators (3)	Y	Y	Y

D. Impact on Existing Sources.

The above sources will be installed as standalone units and will not have a direct impact on existing sources. As part of this application, exhaust from Thermal Oil Heaters (K7, K8, K9, K10, K11, and K12) will be allowed to vent to the existing MDF Dryer or directly to the atmosphere.

Exhaust heat from the new heaters (K7, K8, K9, K10, K11 and K12) will not impact the MDF Dryer production or emission rate. Under normal operation emissions from Thermal Oil Heaters K7 and K8 and two (2) of the four (4)Natural Gas Fired Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the atmosphere or to the MDF Dryer. K9, K10, K11, and K12 also have the option of venting to the atmosphere.

Under alternative operation when the Thermal Oil Heaters K7 and K8 are not in operation exhaust from Zones #1, 2, 3, and 16 from each of the three (3) strand dryers, along with the exhaust from K9, K10, K11, and K12 will be vented to the MDF Dryer.

The debarker/chipper line will support the OSB line and the MDF or Particleboard lines but will not impact MDF or Particleboard production or emission limits. The facility will now be using chips generated on-site instead of using chips generated off-site.

E. Significant Emission Increase

ADEM Admin Code 335-3-14-.04(1)(d), states that a project is a major modification for a regulated NSR pollutant only if it causes both:

- A significant emission increase, as defined in subparagraph (2)(mm) of ADEM Admin Code 335-3-14-.04; and
- A significant net emissions increase, as defined in subparagraph (2)(c) and (2)(w) of ADEM Admin Code 335-3-14-.04.

As outlined in ADEM Admin Code R335-3-14-.04(1)(e) – (i), if the project involves new emissions units, the ATP (Actual-to-Potential) Test is the relevant method for calculating the emission increases associated with the project.

F. Summary of Sources Subject to Applicability Analysis

1. New Sources (See Table II.F.1)

G. Potential Emissions (PTE)

1. New Sources

Potential emissions from the units are based upon 8760 hours of operation per year, with the following exception:

- Emergency Generators #6, #7, and #8 are each based upon 500 hour of operation per year

Potential emission for new sources is shown in Table II.F.2. PM emissions include PM filterable. PM_{10} and $PM_{2.5}$ emissions include filterables and condensables. Detailed calculations are shown in the Emission Calculation Section (Section V).

2. Existing Sources

N/A

3. Decommissioned Sources

N/A

Table II.F.1

Source	Emission Point
A. OSB Plant	
1. Log Processing	
a. Debarking	F-DB (Fugitive)
b. Chipping / Screening	F-CH1 (Discharges Inside Strander Building)
2. Stranding	
a. Strander #1	Discharges Inside Strander Building
b. Strander #2	Discharges Inside Strander Building
c. Strander #3	Discharges Inside Strander Building
3. Flaking	
a. Flaker #1	Discharges Inside Strander Building
b. Flaker #2	Discharges Inside Strander Building
c. Flaker #3	Discharges Inside Strander Building
d. Flaker #4	Discharges Inside Strander Building
4. Drying (Zones #1, 2, 3, and 16)	
a. Dryer #1	TOH-1 or MDF Dryer (RTO-1)
b. Dryer #2	TOH-1 or MDF Dryer (RTO-1)
c. Dryer #3	TOH-1 or MDF Dryer (RTO-1)
5. Drying (Zones #4-15)	
a. Dryer #1	D-20.1
b. Dryer #2	D-20.2
c. Dryer #3	D-20.3
6. Sifting/Screening	
a. Sifter	SS-2.2
b. Screening (Dust)	CF-19.2
c. Screening (Granulate)	CF-19.1
7. Blending (Gluing)	BG-2.1
8. Mat Forming	D-20.3, via PCY-4.1
9. Mat Trimming	D-20.3, via PCY-4.1
10. Pressing/Press Room	D-20.3, via PCY-4.1
11. Finishing	
a. Cut-To-Size Saw	D-20.3, via PCY-4.1
b. Diagonal Saw	D-20.3, via PCY-4.1
c. Sanding	D-20.3, via PCY-4.1
d. Tongue and Groove #1	D-20.3, via PCY-4.1
e. Tongue and Groove #2	D-20.3, via PCY-4.1
f. Tongue and Groove #3	D-20.3, via PCY-4.1
g. Edge Sealing	Discharges Inside Building
12. Wood Waste Handling	
a. Granulate Transfer	
1. Granulate From Mat Forming Cyclones to OSB Granulate Silo (OGS)	CF-11.1

2. Granulate From Diagonal Saw, Cut-To-Size Saw, and Tongue and Groove Cyclones to OSB Granulate Silo (OGS)	CF-18.1
3. Granulate From OSB Granulate Silo (OGS) to PB Flakers silo (PBFS)	CF-16.2
4. Granulate From MDF Granulate Silo (MGS) to OSB Boiler Granulate Silo (OBGS)	CF-15.1
5. Granulate From PB Core Layer silo (PCLS) to OSB Core Layer silo (DCLS)	CF-16.1
b. Wood Dust Handling	
1. Dust From Strander Dust Collectors and Flaker Cyclofilters to OSB Dust Silo (ODS)	CF-14.1
2. Dust From Dryer Dust Collectors to OSB Dust Silo (ODS)	CF-8.1
3. Dust From Sifter/Screener, Blending/Gluing, Mat Forming, and Mat Trimming Dust Collectors to OSB Dust Collector (ODS)	CF-9.1
4. Dust From Diagonal Saw, Cut-To-Size Saw, and Tongue and Groove Dust Collectors to OSB Dust Silo (ODS)	CF-18.2
5. Dust From Sanding Dust Collector to OSB Dust Silo (ODS)	CF-10.1
6. Dust From OSB Dust Silo (ODS) to OSB Boiler Dust Silo (OBDS)	CT-12.1
7. Dust from OSB Boiler Dust Silo (OBDS) to MDF Dust Silo (MDS)	CF-12.2
8. Dust from MDF Dust Silo (MDS) to Boiler Dust Silo (BDS)	CF-13.1
B. Thermal Heaters	
1. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (K7)	TOH-1 or to MDF Dryer (RTO-1)
2. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (K8)	TOH-1 or to MDF Dryer (RTO-1)
3. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K9)	TOH-1 or to MDF Dryer (RTO-1)
4. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K10)	TOH-1 or to MDF Dryer (RTO-1)
5. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K11)	TOH-1 or to MDF Dryer (RTO-1)
6. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K12)	TOH-1 or to MDF Dryer (RTO-1)
C. Emergency Generators	
1. Emergency Generator #6	EG-6
2. Emergency Generator #7	EG-7
3. Emergency Generator #8	EG-8

NOTE: PCY-4.1 Discharges to the Atmosphere Through D-20.3

Table II.F.2 Summary of Potential Em (PTS) From New Sources

Emission Unit	Emission Point	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	NOx (tpy)	CO (tpy)	SO_2 (tpy)	CO_2e (tpy)	PMcond
I. OSB Plant										
A. Log Handling and Processing										
1. Debarking	F-DB (Fugitive)	2.65	1.32	0.27	0.00	0.00	0.00	0.00	0.00	
2. Chipping	F-CH1 (Fugitive)	0.47	0.24	0.12	28.47	0.00	0.00	0.00	0.00	
Total		3.12	1.56	0.39	28.47	0.00	0.00	0.00	0.00	
B. Stranding										
1. Strander #1	Strander Building	0.22	0.158	0.03	3.904	0.00	0.00	0.00	0.00	
2. Strander #2	Strander Building	0.22	0.158	0.03	3.904	0.00	0.00	0.00	0.00	
3. Strander #3	Strander Building	0.22	0.158	0.03	3.904	0.00	0.00	0.00	0.00	
Total		0.66	0.474	0.09	11.71	0.00	0.00	0.00	0.00	
C. Flakers										
1. Flaker #1	Strander Building	0.066	0.048	0.009	8.923	0.00	0.00	0.00	0.00	
2. Flaker #2	Strander Building	0.066	0.048	0.009	8.923	0.00	0.00	0.00	0.00	
3. Flaker #3	Strander Building	0.066	0.048	0.009	8.923	0.00	0.00	0.00	0.00	
4. Flaker #4	Strander Building	0.066	0.048	0.009	8.923	0.00	0.00	0.00	0.00	
Total		0.26	0.192	0.035	36.69	0.00	0.00	0.00	0.00	
D. Dryers (Total) - Includes emissions vented to D-20.1, D-20.2, D20.3, and TOH-1										
1. Dryer #1	D-20.1 / TOH-1	56.05	38.24	3.64	146.38	1.37	16.82	0.00	0.00	4.07
2. Dryer #2	D-20.2 / TOH-1	56.05	38.24	3.64	146.38	1.37	16.82	0.00	0.00	4.07
3. Dryer #3	D-20.3 / TOH-1	56.05	38.24	3.64	146.38	1.37	16.82	0.00	0.00	4.07
Total		168.15	114.72	10.92	439.14	4.11	50.45	0.00	0.00	12.21
E. Sifting / Screening										
1. Sifter	SS-2.2	3.50	2.68	0.48	77.18	0.00	0.00	0.00	0.00	
2. Screen (Dust)	CF-19.2	0.15	0.13	0.02	2.80	0.00	0.00	0.00	0.00	
3. Screen (Granulate)	CF-19.1	0.30	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
Total		3.95	3.02	0.54	82.78	0.00	0.00	0.00	0.00	
F. Blending (Gluing)	BG-2.1	2.68	1.97	0.35	87.83	0.00	0.00	0.00	0.00	
G. Mat Forming	PCY-4.1	1.33	0.33	0.26	5.69	0.00	0.00	0.00	0.00	
H. Mat Trimming	PCY-4.1	0.50	0.13	0.11	2.42	0.00	0.00	0.00	0.00	
I. Pressing	PCY-4.1	8.08	4.03	3.77	24.09	27.34	55.91	0.00	0.00	17.78
J. Finishing										
1. DIA Saw	PCY-4.1	0.50	0.12	0.10	3.63	0.00	0.00	0.00	0.00	
2. CTS Saw	PCY-4.1	0.25	0.07	0.06	2.41	0.00	0.00	0.00	0.00	
3. Sanding	PCY-4.1	1.16	0.31	0.25	6.35	0.00	0.00	0.00	0.00	
4. Tongue and Groove										
a. Unit #1	PCY-4.1	0.33	0.09	0.07	0.20	0.00	0.00	0.00	0.00	
b. Unit #2	PCY-4.1	0.33	0.09	0.07	0.20	0.00	0.00	0.00	0.00	
c. Unit #3	PCY-4.1	0.33	0.09	0.07	0.20	0.00	0.00	0.00	0.00	
Total		2.90	0.77	0.62	12.99	0.00	0.00	0.00	0.00	
K. Wood Dust Transfer										
1. Strander Dust Collectors and Flaker Cyclofilters to OSB Dust Silo	CF-14.1	0.15	0.10	0.02	2.80	0.00	0.00	0.00	0.00	
2. Dryer Dust Collectors to OSB Dust Silo	CF-8.1	0.11	0.07	0.01	2.80	0.00	0.00	0.00	0.00	
3. Sifter, Screen, Blending, Gluing, Mat Forming, and Mat Trimming Dust Collectors to OSB Dust Silo	CF-9.1	0.15	0.10	0.02	2.80	0.00	0.00	0.00	0.00	
4. Diagonal Saw, Cut-To-Size Saw, and Tongue and Groove Dust Collectors to OSB Dust Silo	CF-18.2	0.24	0.16	0.04	2.80	0.00	0.00	0.00	0.00	
5. Sanding Dust Collector to OSB Dust silo	CF-10.1	0.15	0.13	0.02	2.80	0.00	0.00	0.00	0.00	
6. Dust From OSB Dust Silo to OSB Boiler Dust Silo	CF-12.1	0.3	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
7. Dust From OSB Boiler Dust Silo to MDF Dust Silo	CF-12.2	0.3	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
8. Dust From MDF Dust Silo to OSB Boiler Dust Silo	CF-13.1	0.24	0.16	0.04	2.80	0.00	0.00	0.00	0.00	
Total		1.64	1.14	0.23	22.40	0.00	0.00	0.00	0.00	

Table II.F.2 Summary of Potential Em[illegible]PTS) From New Sources

Emission Unit	Em[illegible]int	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	NOx (tpy)	CO (tpy)	SO_2 (tpy)	CO_2e (tpy)	PMcond
L. Wood Granulate Transfer										
1. Mat Forming Cyclone to OSB Granulate Silo	CF-11.1	0.15	0.13	0.02	2.80	0.00	0.00	0.00	0.00	
2. Diagonal Saw, Cut-To-Size Saw, and Tongue and Groove Cyclones to OSB Granulate Silo	CF-18.1	0.24	0.16	0.04	2.80	0.00	0.00	0.00	0.00	
3. OSB Granulate Silo to PB Flaker Silo	CF-16.2	0.30	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
4. MDF Granulate Silo to OSB Boiler Granulate Silo	CF-15.1	0.30	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
5. PB Core Layer Silo to OSB Core Layer Silo	CF-16.1	0.30	0.21	0.04	2.80	0.00	0.00	0.00	0.00	
Total		1.29	0.92	0.18	14.00	0.00	0.00	0.00	0.00	
M. Edge Sealers		0.44	0.22	0.22	0.14	0.00	0.00	0.00	0.00	
II. Thermal Oil Heater										
A. 204.73 MMBtu/hr (K7)	TOH-1	11.66	11.66	10.45	12.09	160.53	160.53	9.86	201,280	15.24
B. 204.73 MMBtu/hr (K8)	TOH-1	11.66	11.66	10.45	12.09	160.53	160.53	9.86	201,280	15.24
C. 56.20 MMBtu/hr (K9)	TOH-1	0.66	0.66	0.66	0.14	10.95	1.16	0.15	29,719	1.40
D. 56.20 MMBtu/hr (K10)	TOH-1	0.66	0.66	0.66	0.14	10.95	1.16	0.15	29,719	1.40
E. 56.20 MMBtu/hr (K11)	TOH-1	0.66	0.66	0.66	0.14	10.95	1.16	0.15	29,719	1.40
F. 56.20 MMBtu/hr (K12)	TOH-1	0.66	0.66	0.66	0.14	10.95	1.16	0.15	29,719	1.40
Total		25.96	25.96	23.54	24.74	364.86	325.70	20.32	521,436	36.08
III. Emergency Generator										
1. Emergency Generator #6	EG-6	0.10	0.10	0.10	0.32	2.90	1.75	0.003	288	0.24
2. Emergency Generator #7	EG-7	0.10	0.10	0.10	0.32	2.90	1.75	0.003	288	0.24
3. Emergency Generator #8	EG-8	0.10	0.10	0.10	0.32	2.90	1.75	0.003	288	0.24
Total		0.30	0.30	0.30	0.96	8.70	5.25	0.01	864	0.72
Grand Total		218.12	155.74	41.56	794.05	405.01	437.31	20.33	522,300	66.79

H. Significant Net Emissions Increase

The significant net emissions increase is shown in Table II.H.I. PSD review is required for PM, PM_{10}, $PM_{2.5}$, NOx, VOC, CO, and $CO_{2(e)}$.

Table II.H.I
Significant Net Emission Increase

Emission Sources	Net Emissions Increase (tons/yr)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC	CO_2-e
Future Potential Emissions	215.00	220.97	107.96	20.33	405.01	437.31	765.58	522,300
Baseline Actual Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Contemporaneous Decreases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Emissions Increase	215.00	220.97	107.96	20.33	405.01	437.31	765.58	522,300
Significant Threshold	25	15	10	40	40	100	40	75,000

Note: PM includes PM filterable
PM10/PM2.5 includes PM filterable plus PM Condensibles
Does not include fugitive emissions from Log Handling and Processing,

III.

Regulatory Analysis

A. New Source Review (NSR)
B. New Source Performance Standards (NSPS)
C. National Emission Standards for Hazardous Air Pollutants (NESHAP)
D. Title V Applicability
E. ADEM Rules Applicability
F. Accidental Release Prevention Program (Section 112r)

REGULATORY ANALYSIS

Kronospan LLC is subject to federal and state air regulations. This section of the application summarizes the air permitting requirements and key air quality regulations that apply to the facility under both federal and state permitting programs. Applicability to New Source Review (NSR), Title V, New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP) and ADEM state rules are addressed.

A. New Source Review (NSR)

Since Kronospan LLC is a major PSD source, the new emissions increase from the proposed project must be compared to the major modification threshold to determine if PSD permitting is required. The net emission increase analysis was presented in Section II of this report. Table III.A.I is a summary of the analysis.

Table III.A.I
Significant Net Emission Increase

Emission Sources	Net Emissions Increase (tons/yr)							
	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC	CO_2-e
Future Potential Emissions	215.00	220.97	107.96	20.33	405.01	437.31	765.58	522,300
Baseline Actual Emissions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Contemporaneous Decreases	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Net Emissions Increase	215.00	220.97	107.96	20.33	405.01	437.31	765.58	522,300
Significant Threshold	25	15	10	40	40	100	40	75,000
Subject to PSD	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes

Note: PM includes PM filterable
PM10/PM2.5 includes filterables plus condensibles

B. New Source Performance Standards (NSPS)

Units at Kronospan LLC subject to NSPS are shown in Table III.B.I.

C. National Emission Standard for Hazardous Air Pollutants (NESHAP)

Units at Kronospan subject to NESHAP are shown in Table III.C.I.

Table III.B.I
NSPS

Emission Source	Industrial Steam Generating Units		Compression or Ignition Internal Combustion Engine
	Subpart Dc	Subpart Db	(Subpart IIII)
A. OSB Plant			
1. Log Handling and Processing			
2. Stranding			
3. Flaking			
4. Drying			
5. Sifting / Screening			
6. Blending (Gluing)			
7. Mat Forming			
8. Mat Trimming			
9. Pressing			
10. Finishing			
a. Cutting			
b. Sanding			
c. Tongue and Groove			
d. Edge Sealing / Stenciling			
11. Wood Waste Handling			
B. Thermal Oil Heaters			
1. 204.73 MMBtu/hr Wood Fired (K7)		X	
2. 204.73 MMBtu/hr Wood Fired (K8)		X	
3. 56.20 MMBtu/hr Natural Gas Fired (K9)	X		
4. 56.20 MMBtu/hr Natural Gas Fired (K10)	X		
5. 56.20 MMBtu/hr Natural Gas Fired (K11)	X		
6. 56.20 MMBtu/hr Natural Gas Fired (K12)	X		
C. Emergency Generators			
1. Generator #6			X
2. Generator #7			X
3. Generator #8			X

Table III.C.I
NESHAP

Emission Source	Plywood & Composite Wood Products (Subpart DDDD)	Industrial Boilers / Process Heaters (Subpart DDDDD)	Reciprocating Internal Combustion Engines (Subpart ZZZZ)
A. OSB Plant			
1. Log Handling and Processing			
2. Stranding			
3. Flaking			
4. Drying	X		
5. Sifting / Screening			
6. Blending (Gluing)	X		
7. Mat Forming	X		
8. Mat Trimming			
9. Pressing	X		
10. Finishing			
a. Cutting	X		
b. Sanding	X		
c. Tongue and Groove	X		
d. Edge Sealing / Stenciling	X		
11. Wood Waste Handling			
B. Thermal Oil Heater (K7)			
1. 204.73 MMBtu/hr Wood Fired (K7)		X	
2. 204.73 MMBtu/hr Wood Fired (K8)		X	
3. 56.20 MMBtu/hr Natural Gas Fired (K9)		X	
4. 56.20 MMBtu/hr Natural Gas Fired (K10)		X	
5. 56.20 MMBtu/hr Natural Gas Fired (K11)		X	
6. 56.20 MMBtu/hr Natural Gas Fired (K12)		X	
C. Emergency Generators			
1. Generator #6			X
2. Generator #7			X
3. Generator #8			X

Table III.D.I
ADEM Rules and Regulations

Emission Source	Fugitive Emissions	Visible Emissions	Process Industries	Wood Waste Boilers	Fuel Burning Equipment	Fuel Combustion	PSD	Industrial Steam Generating Units	Compression or Ignition Internal Combustion Engine	Reciprocating Internal Combustion Engines	Plywood & Composite Wood Products	Industrial Boilers / Process Heaters
	(335-3-4-.02)	(335-3-4-.01(1))	(335-3-4-.04(1))	(335-3-4-.08(2)(a))	(335-3-4-.03(1))	(335-3-5-.01(1)(b))	(335-3-14-.04)	(335-3-10-.02)	(335-3-10-.03(87))	(335-3-11-.08 (103))	(335-3-11-.06(81))	(334-3-11.06(107))
A. OSB Plant												
1. Log Handling & Processing	X		X				X					
2. Stranding	X		X				X					
3. Flaking	X		X				X					
4. Drying		X	X				X				X	
5. Sifting / Screening		X	X				X					
6. Blending (Gluing)		X	X				X				X	
7. Mat Forming	X		X				X				X	
8. Mat Trimming	X		X				X					
9. Pressing			X				X				X	
10. Finishing												
a. Cutting	X	X	X				X				X	
b. Sanding	X		X				X				X	
c. Tongue and Groove	X		X				X				X	
d. Edge Sealing / Stenciling							X				X	
11. Wood Waste Handling	X	X										
B. Thermal Oil Heaters												
1. 204.73 MMBtu/hr Wood Fired (K7)		X		X	X	X	X	X				X
2. 204.73 MMBtu/hr Wood Fired (K8)		X		X	X	X	X	X				X
3. 56.20 MMBtu/hr Natural Gas Fired (K9)		X			X	X	X	X				X
4. 56.20 MMBtu/hr Natural Gas Fired (K10)		X			X	X	X	X				X
5. 56.20 MMBtu/hr Natural Gas Fired (K11)		X			X	X	X	X				X
6. 56.20 MMBtu/hr Natural Gas Fired (K12)		X			X	X	X	X				X
C. Emergency Generators												
1. Generator #6		X					X		X	X		
2. Generator #7		X					X		X	X		
3. Generator #8		X					X		X	X		

MDI/PMDI and Cascowax Storage Tanks Regulatory Summary

The MDI/PMDI Resin and Wax are both petroleum derived products having a true vapor pressure of less than 0.015 psi, which will below the 1.5 psia threshold in 335-3-6-.810

Since both resin and wax are stored in tanks with capacities of less than 40,000 gallons and have vapor pressures of less than 1.52 psia the requirements of 335-3-6-.27 do not apply.

Program Standard	Rule	Applicable	
		Yes	No
SIP	335-3-6-.03		X
	335-3-6-.027		X
NSPS	Subpart Kb		X
NESHAP	N/A		X

D. Title V Applicability

Kronospan LLC is currently a major source under Title V (VOC, NOx, PM_{10}, CO, and HAPs). The facility will be required to submit a Title V Update Application to ADEM within 12 months of permit issuance.

E. ADEM Rules Applicability

Units at Kronospan LLC subject to the ADEM Rules are shown in Table III.D.I.

F. Accidental Release Prevention Program (CAA Section 112(r))

The Accidental Release Prevention Program is regulated under Title III of the Clean Air Act and is included as part of the NESHAP Program. The Formalin Storage tanks at the facility are subject to the program requirements.

IV.

Permit Applications

A. Facility Identification
B. OSB Plant
C. Thermal Oil Heaters
D. Emergency Generators
E. MDF Plant Modifications

A.

Facility Identification
(Form 103)

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: Kronospan, LLC

Facility Physical Location Address

Street & Number: 1 Kronospan Way

City: Eastaboga County: Calhoun Zip: 36260

Facility Mailing Address (If different from above)

Address or PO Box: 1 Kronospan Way

City: Eastaboga State: Alabama Zip: 36260

Owner's Business Mailing Address

2. Owner: Kronospan, LLC

Street & Number: 1 Kronospan Way City: Eastaboga

State: Alabama Zip: 36260 Telephone:

Responsible Official's Business Mailing Address

3. Responsible Official: John S. Connell Title: HR Director

Street & Number: 1 Kronospan Way

City: Eastaboga State: Alabama Zip: 36260

Telephone Number: 256-240-6816 E-mail Address: j.connell@kronospanusa.com

Plant Contact Information

4. Plant Contact: Michael Wilson Title: Environmental Manager

Telephone Number: 256-741-8755 E-mail Address: m.wilson@kronospanusa.com

5. Location Coordinates:

UTM 595.100 E-W 3719.200 N-S

Latitude/Longitude 33.608324 LAT -85.97490 LONG

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

☐ Existing source (initial application)

☐ Existing source (permit renewal)

☐ Modification

■ New source (to be constructed)

☐ Change of ownership

☐ Change of location

☐ Other (specify) _____

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

Kronospan, LLC

1 Kronospan Way / Eastaboga / AL / 36260

Telephone 256-741-8755

Date construction/modification to begin 02/25 to be completed 08/25

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.**

6	ADEM 104 - INDIRECT HEATING EQUIPMENT
19	ADEM 105 - MANUFACTURING OR PROCESSING OPERATION
N/A	ADEM 106 - REFUSE HANDLING, DISPOSAL, AND INCINERATION
3	ADEM 107 - STATIONARY INTERNAL COMBUSTION ENGINES
N/A	ADEM 108 - LOADING, STORAGE & DISPENSING LIQUID & GASEOUS ORGANIC COMPOUNDS
1	ADEM 109 - VOLATILE ORGANIC COMPOUND SURFACE COATING EMISSION SOURCES
74	ADEM 110 - AIR POLLUTION CONTROL DEVICE
N/A	ADEM 112 - SOLVENT METAL CLEANING
4	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)):**

MDF (Medium Density Fiberboard) and Particleboard Manufacturing/Urea-Formaldehyde Resin Manufacturing/Laminating Flooring Manufacturing

NAICS Codes #321219, #35211

SIC Codes #2493, #2821

Existing

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
I. PM		
A. MDF Plant	41.81	No
B. Particleboard Plant	52.89	No
C. Resin Plant	0.34	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	5.80	No
2. Particleboard Paper Treating/Lamination	1.49	No
E. Energy Plant		
1. Thermal Oil Heater K4	N/A*	No
2. Thermal Oil Heater K2	N/A*	No
3. Thermal Oil Heaters K5 and K6	N/A	No
4. Co-Gen Engines #1-5	7.58	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.324	No
2. Fire Pump Engines #1 and #2	0.14	No
G. Thermal Oil Heater K4 (Via By-Pass Stack)	1.15	No
Total	111.52	Yes
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
II. PM_{10}		
A. MDF Plant	35.20	No
B. Particleboard Plant	44.07	No
C. Resin Plant	0.328	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	2.96	No
2. Particleboard Paper Treating/Lamination	1.49	No
E. Energy Plant		
1. Thermal Oil Heater K4	N/A*	No
2. Thermal Oil Heater K2	N/A*	No
3. Thermal Oil Heaters K5 and K6	N/A	No
4. Co-Gen Engines #1-5	5.05	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.324	No
2. Fire Pump Engines #1 and #2	0.14	No
G. Thermal Oil Heater K4 (By-Pass Stack)	0.85	No
Total	90.29	No
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
III. $PM_{2.5}$		
A. MDF Plant	19.69	No
B. Particleboard Plant	29.62	No
C. Resin Plant	0.328	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	0.82	No
2. Particleboard Paper Treating/Lamination	1.49	No
E. Energy Plant		
1. Thermal Oil Heater K4	N/A*	No
2. Thermal Oil Heater K2	N/A*	No
3. Thermal Oil Heaters K5 and K6	N/A	No
4. Co-Gen Engines #1-5	3.70	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.324	No
2. Fire Pump Engines #1 and #2	0.14	No
G. Thermal Oil Heater K4 (By-Pass Stack)	0.75	No
Total	56.86	No
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
IV. SO_2		
A. MDF Plant	16.54	No
B. Particleboard Plant	25.95	No
C. Energy Plant		
1. Thermal Oil Heater K4	13.45	No
2. Thermal Oil Heater K2	6.73	No
3. Thermal Oil Heaters K5 and K6	N/A	No
4. Co-Gen Engines #1-5	0.44	No
D. Emergency Equipment		
1. Emergency Generators #1-5	0.15	No
2. Fire Pump Engines #1 and #2	0.47	No
E. Thermal Oil Heater K4 (By-Pass Stack)	0.94	No
Total	64.67	No
*Included in MDF Plant Emissions		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
V. NO_x		
A. MDF Plant	210.86	Yes
B. Particleboard Plant	422.64	Yes
C. Energy Plant		
1. Thermal Oil Heater K4	N/A*	N/A
2. Thermal Oil Heater K2	N/A*	N/A
3. Thermal Oil Heaters K5 and K6	21.90	No
4. Co-Gen Engines #1-5	21.40	No
D. Emergency Equipment		
1. Emergency Generators #1-5	10.90	No
2. Fire Pump Engines #1 and #2	2.26	No
E. Thermal Oil Heater K4 (By-Pass Stack)	14.28	No
Total	704.24	Yes

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VI. CO		
A. MDF Plant	148.09	Yes
B. Particleboard Plant	420.09	Yes
C. Resin Plant	2.15	No
D. Energy Plant		
1. Thermal Oil Heater K4	N/A*	N/A
2. Thermal Oil Heater K2	N/A*	N/A
3. Thermal Oil Heater K5 and K6	N/A*	N/A
4. Co-Gen Engines K#1-5	25.40	No
E. Emergency Equipment		
1. Emergency Generators #1-5	4.24	No
2. Fire Pump Engines #1 and #2	1.39	No
F. Thermal Oil Heater K4 (By-Pass Stack)	64.03	No
Total	665.39	Yes

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VII. VOC		
A. MDF Plant	138.14	Yes
B. Particleboard Plant	468.39	Yes
C. Resin Plant	7.594	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	20.29	No
2. Particleboard Paper Treating/Lamination	0.042	No
E. Energy Plant		
1. Thermal Oil Heater K4	N/A*	N/A
2. Thermal Oil Heater K2	N/A*	N/A
3. Thermal Oil Heaters K5 and K6	N/A*	N/A
4. Co-Gen Engines #1-5	41.40	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.76	No
2. Fire Pump Engines #1 and #2	0.28	No
G. Thermal Oil Heater K4 (By-Pass Stack)	1.24	No
Total	678.14	Yes
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VIII. Total HAPs		
A. MDF Plant	33.24	Yes
B. Particleboard Plant	23.90	No
C. Resin Plant	1.504	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	20.29	No
2. Particleboard Paper Treating/Lamination	0.05	No
E. Energy Plant		
1. Thermal Oil Heater K4	13.62	Yes
2. Thermal Oil Heater K2	6.81	No
3. Thermal Oil Heaters K5 and K6	0.95	No
4. Co-Gen Engines #1-5	12.70	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.036	No
2. Fire Pump Engines #1 and #2	0.023	No
G. Thermal Oil Heater K4 (By-Pass Stack)	2.230	No
Total	115.36	Yes
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
IX. Acetaldehyde		
A. MDF Plant	0.62	No
B. Particleboard Plant	1.58	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.004	No
2. Thermal Oil Heater K2 (via RTO-1)	0.002	No
D. Thermal Oil Heater K4 (By-Pass Stack)	0.073	No
Total	2.279	No
*Included in MDF Plant Emissions		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
X. Formaldehyde		
A. MDF Plant	13.18	Yes
B. Particleboard Plant	6.07	No
C. Resin Plant	0.376	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	5.34	No
2. Particleboard Paper Treating/Lamination	0.03	No
E. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.24	No
2. Thermal Oil Heater K2 (via RTO-1)	0.12	No
3. Thermal Oil Heaters K5 and K6	0.04	No
4. Co-Gen Engines #1-5	9.20	No
F. Emergency Equipment		
1. Emergency Generators #1-5	0.002	No
2. Fire Pump Engines #1 and #2	0.0019	No
G. Thermal Oil Heater K4 (By-Pass Stack)	0.39	No
Total	36.99	Yes
***Included in MDF Plant Emissions**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XI. Acrolein		
A. MDF Plant	0.024	No
B. Particleboard Plant	0.505	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.22	No
2. Thermal Oil Heater K2 (via RTO-1)	0.11	No
D. Thermal Oil Heater K4 (By-Pass Stack)	0.034	No
Total	0.893	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XII. Methanol		
A. MDF Plant	18.66	Yes
B. Particleboard Plant	11.57	Yes
C. Resin Plant	1.128	No
D. Web Coating		
1. MDF Paper Treating/Lamination/Flooring	14.95	Yes
2. Particleboard Paper Treating/Lamination	0.013	No
E. Thermal Oil Heater K4 (By-Pass Stack)	0.065	No
Total	46.385	Yes
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIII. MIBK		
A. MDF Plant	0.28	No
B. Particleboard Plant	0.32	No
Total	0.60	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIV. Phenol		
A. MDF Plant	0.47	No
B. Particleboard Plant	0.76	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.003	No
2. Thermal Oil Heater K2 (via RTO-1)	0.0015	No
D. Thermal Oil Heater K4 (By-Pass Stack)	0.005	No
Total	1.240	No
*Included in MDF Plant Emissions		

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XV. Propionaldehyde		
A. MDF Plant	0.01	No
B. Particleboard Plant	0.24	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.004	No
2. Thermal Oil Heater K2 (via RTO-1)	0.002	No
D. Thermal Oil Heater K4 (By-Pass Stack)	0.005	No
Total	0.261	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVI. Mercury		
A. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.003	No
2. Thermal Oil Heater K2 (via RTO-1)	0.0015	No
B. Thermal Oil Heater K4 (By-Pass Stack)	0.0003	No
Total	0.0048	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVII. HCl		
A. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	11.84	Yes
2. Thermal Oil Heater K2 (via RTO-1)	5.92	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.39	No
Total	18.15	Yes
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVIII. Styrene		
A. Particleboard Plant	0.007	No
B. Web Coating		
1. MDF Paper Treating/Laminating/Floor	0.00004	No
2. Particleboard Paper Treating/Laminating	0.00002	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.10	No
2. Thermal Oil Heater K2 (via RTO-1)	0.05	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.168	No
Total	0.325	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIX. Benzene		
A. Particleboard Plant	0.18	No
B. Web Coating		
1. MDF Paper Treating/Laminating/Floor	0.00005	No
2. Particleboard Paper Treating/Laminating	0.00002	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.22	No
2. Thermal Oil Heater K2 (via RTO-1)	0.11	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.354	No
Total	0.86	No
*Included in MDF Plant Emissions		

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XX. Chloroform		
A. Particleboard Plant	0.002	No
B. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.002	No
2. Thermal Oil Heater K2 (via RTO-1)	0.008	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.002	No
Total	0.005	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXI. Cumene		
A. Particleboard Plant	0.04	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXII. Methylene Chloride		
A. Particleboard Plant	0.03	No
B. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.016	No
2. Thermal Oil Heater K2 (via RTO-1)	0.008	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.026	No
Total	0.080	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXIII. Toluene		
A. Particleboard Plant	0.24	No
B. Web Coating		
1. MDF Paper Treating/Laminating/Floor	0.0015	No
2. Particleboard Paper Treating/Laminating	0.0007	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.05	No
2. Thermal Oil Heater K2 (via RTO-1)	0.025	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.081	No
Total	0.398	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXIV. Xylene		
A. Particleboard Plant	0.10	No
B. Web Coating		
1. MDF Paper Treating/Laminating/Floor	0.001	No
2. Particleboard Paper Treating/Laminating	0.0005	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.0014	No
2. Thermal Oil Heater K2 (via RTO-1)	0.0007	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.002	No
Total	0.106	No
*Included in MDF Plant Emissions		

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXV. Ethylbenzene		
A. Particleboard Plant	0.10	No
B. Web Coating		
1. MDF Paper Treating/Laminating/Floor	0.0002	No
2. Particleboard Paper Treating/Laminating	0.0001	No
C. Thermal Oil Heater K4	0.003	No
Total	0.103	No
*Included in MDF Plant Emissions		

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVI. Miscellaneous HAPs		
A. MDF Plant	0.11	No
B. Particleboard Plant	2.26	No
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	0.88	No
2. Thermal Oil Heater K2 (via RTO-1)	0.44	No
3. Thermal Oil Heater K4 (By-Pass Stack)	0.44	No
4. Thermal Oil Heaters K5 and K6	0.91	No
5. Co-Gen Engines #1-5	3.50	No
D. Emergency Equipment		
1. Emergency Generators #1-3	0.0335	No
2. Fire Pump Engines #1 and #2	0.0211	No
Total	8.60	No
*Included in MDF Plant Emissions		

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVII. GHG		
A. MDF Plant	15,864	No
B. Particleboard Plant	247,651 (15,788)	No
C. Resin Plant	5,471	No
D. Energy Plant		
1. Thermal Oil Heater K4	120,770 (9,428)	No
2. Thermal Oil Heater K2	60,352 (4,713)	No
3. Thermal Oil Heaters K5 and K6	29,719	No
4. Co-Gen Engines #1-5	90,053	No
E. Emergency Equipment		
1. Emergency Generators #1-5	1,445	No
2. Fire Pump Engines #1 and #2	261	No
Total	819,235 (143,023)	Yes
***Note: Value in parenthesis include CO_2 Wood Waste Fired Exclusion**		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVIII. PM_{cond}		
A. MDF Plant	0.75	N/A
B. Particleboard Plant	18.34	N/A
C. Energy Plant		
1. Thermal Oil Heater K4 (via RTO-1)	9.15	N/A
2. Thermal Oil Heater K2 (via RTO-1)	4.57	N/A
3. Thermal Oil Heater K4 (By-Pass Stack)	0.79	
4. Thermal Oil Heaters K5 and K6	2.81	N/A
5. Co-Gen Engines #1-#5	7.50	N/A
D. Emergency Equipment		
1. Emergency Generators #1-5	0.07	N/A
2. Fire Pump Engines #1 and #2	0.013	N/A
Total	43.99	N/A
***Note: Value in parenthesis include CO_2 Wood Waste Fired Exclusion**		

*** 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.**

New

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
I. PM		
A. Log Handling and Processing	3.12	No
B. OSB Plant Operations	191.86	Yes
C. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	25.83	No
D. Emergency Generators (EG-6, EG-7, EG-8)	0.30	No
Total	221.21	Yes

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
II. PM_{10}		
A. Log Handling and Processing	1.56	No
B. OSB Plant Operations	127.92	Yes
C. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	26.32	No
D. Emergency Generators (EG-6, EG-7, EG-8)	0.30	No
Total	168.38	Yes

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
III. $PM_{2.5}$		
A. Log Handling and Processing	0.39	No
B. OSB Plant Operations	17.33	No
C. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	23.57	No
D. Emergency Generators (EG-6, EG-7, EG-8)	0.30	No
Total	41.59	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
IV. SO_2		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	20.32	No
B. Emergency Generators (EG-6, EG-7, EG-8)	0.01	No
Total	20.33	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
V. NO_x		
A. OSB Plant Operations	31.45	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	364.86	Yes
C. Emergency Generators (EG-6, EG-7, EG-8)	8.70	No
Total	405.01	Yes

* **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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VI. CO		
A. OSB Plant Operations	106.36	Yes
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	325.70	Yes
C. Emergency Generators (EG-6, EG-7, EG-8)	5.25	No
Total	437.31	Yes

* **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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VII. VOC		
A. Log Handling and Processing	28.47	No
B. OSB Plant Operations	699.84	Yes
C. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	64.68	No
D. Emergency Generators (EG-6, EG-7, EG-8)	0.96	No
Total	793.95	Yes

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
VIII. Total HAPs		
A. OSB Plant Operations	99.39	Yes
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	35.56	Yes
C. Emergency Generators (EG-6, EG-7, EG-8)	0.009	No
Total	134.95	Yes

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
IX. Acetaldehyde		
A. OSB Plant Operations	1.93	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	1.49	No
Total	3.42	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
X. Formaldehyde		
A. OSB Plant Operations	8.25	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11 K-12)	7.97	No
D. Emergency Generators (EG-6, EG-7, EG-8)	0.0006	No
Total	16.22	Yes

* 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.

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XI. Acrolein		
A. OSB Plant Operations	0.17	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11 K12)	0.68	No
Total	0.85	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XII. Methanol		
A. OSB Plant Operations	73.18	Yes
B. Thermal Oil Heaters (K7, K8, K9, K10, K11 K12)	1.31	No
Total	74.49	Yes

* **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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIII. MIBK		
A. OSB Plant Operations	1.82	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIV. Phenol		
A. OSB Plant Operations	3.76	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.09	No
Total	3.85	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XV. Propionaldehyde		
A. OSB Plant Operations	6.09	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, and K12)	0.11	No
Total	6.20	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVI. Mercury		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.0014	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVII. HCl		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.38	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XVIII. Styrene		
A. OSB Plant Operations	0.74	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	3.40	No
Total	4.14	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XIX. Benzene		
A. OSB Plant Operations	0.21	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	7.17	No
Total	7.38	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XX. Chloroform		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.05	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXI. Methylene Chloride		
A. OSB Plant Operations	0.60	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.52	No
Total	1.12	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXII. Toluene		
A. OSB Plant Operations	0.72	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	1.65	No
Total	2.37	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXIII. Ethylbenzene		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.56	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXIV. Xylene		
A. OSB Plant Operations	0.76	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.04	No
Total	0.80	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXV. Naphthalene		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.17	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVI. Chloroethane		
A. OSB Plant Operations	0.45	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVII. Bromoethane		
A. OSB Plant Operations	0.67	No
B. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.0008	No
Total	0.67	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXVIII. 1,2-Dichloroethane		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.05	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXIX. MDI		
A. OSB Plant Operations	0.035	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXX. Hexane		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	0.91	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXXI. Miscellaneous HAPs		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	9.01	No
B. Emergency Generators (EG-6, EG-7, EG-8)	0.0084	No
Total	9.02	No

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

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXXII. GHG		
A. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	461,998 (402,560)	Yes
B. Emergency Generators (EG-6, EG-7, EG-8)	864	No
Total	462,862 (402,560)	No
NOTE: Values in parenthesis are GHG emissions from Biomass Units.		

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
XXXIII. PM_{cond}		
A. Log Handling and Processing		
B. OSB Plant Operations	29.99	
C. Thermal Oil Heaters (K7, K8, K9, K10, K11, K12)	31.12	N/A
D. Emergency Generators (EG-6, EG-7, EG-8)	0.72	N/A
Total	61.83	N/A

*** 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.**

Total
Facility-Wide

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
I. PM	329.64	Yes
II. PM_{10}	246.03	Yes
III. $PM_{2.5}$	98.42	Yes
IV. PM_{cond}	110.78	No
V. SO_2	85.00	No
VI. NO_x	1109.25	Yes
VII. CO	1102.70	Yes
VIII. VOC	1472.05	Yes
IX. GHG	1,282,232 (545,583)	Yes
X. Total HAPs	250.03	Yes
A. Acetaldehyde	5.70	No
B. Formaldehyde	53.21	Yes
C. Acrolein	1.74	No
D. Methanol	120.88	Yes
E. MIBK	2.42	No
F. Phenol	5.09	Yes
G. Propionaldehyde	6.46	No
H. Mercury	0.0062	No
I. HCl	18.53	Yes

*** 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.**

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

Regulated pollutant	Potential Emissions* (tons/year)	Major source? yes/no
J. Styrene	4.47	No
K. Benzene	8.24	No
L. Chloroform	0.055	No
M. Cumene	0.04	No
N. Methylene Chloride	1.20	No
O. Toluene	2.77	No
P. Xylene	0.91	No
Q. Ethylbenzene	0.66	No
R. Naphthalene	0.17	No
S. Chloroethane	0.45	No
T. Bromoethane	0.67	No
U. 1,2-Dichloroethane	0.05	No
V. MDI/PMDI	0.035	No
W. Hexane	0.91	No
X. Miscellaneous HAPs	17.62	No

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

11. 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 requirements.

Emission unit or source: I. OSB Plant
A. Debarking/Chipper (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
F-DB	Opacity	Visible Fugitive Emissions	SIP (335-3-14-.04) SIP (335-3-4-.02)	Good Design and Operations Good Operating Practices	X	
	PM	0.60 lbs/hr / 2.65 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
	PM_{10}	0.31 lbs/hr / 1.32 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
	PM2.5	0.08 lbs/hr / 0.27 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
F-CH1	Opacity	Visible Fugitive Emissions	SIP (335-3-14-.04) SIP (335-3-4-.02)	Good Design and Operations Good Operating Practices	X	
	PM	0.11 lbs/hr / 0.47 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
	PM_{10}	0.05 lbs/hr / 0.24 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
	PM2.5	0.03 lbs/hr / 0.12 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	
	VOC	6.50 lbs/hr / 28.47 tpy	SIP (335-3-14-04)	Good Design and Operations Good Operating Practices	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
B. Stranding/Flaking (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
Inside Strander Building (Stranding)	PM	0.15 lbs/hr / (0.002185 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	PM_{10}	0.108 lbs/hr / (0.0016 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	$PM_{2.5}$	0.021 lbs/hr / (0.0003 gr/dscf)	SIP (335-3-14-.04)	Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	VOC	2.67 lbs/hr / (0.015 lbs/wet tons @ 55% moisture)	SIP (335-3-14-.04)	Good Design and Operation / Daily Throughput Daily Pressure Differential Monitoring and Recording	X	
	Opacity	5%	SIP (335-3-4-.02)	Daily Visual Observations Daily Pressure Differential Monitoring and Recording	X	
Inside Strander Building (Flaking)	PM	0.06 lbs/hr / (0.002185 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	PM_{10}	0.044 lbs/hr / (0.0016 gr/dscf)	SIP (335-3-14-.04)	Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	$PM_{2.5}$	0.008 lbs/hr / (0.0003 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	VOC	22.78 lbs/hr / 36.69 tpy / (0.082 lbs/wet tons @ 55% moisture)	SIP (335-3-14-.04)	Good Design and Operation / Daily Throughput Daily Pressure Differential Monitoring and Recording	X	
	Opacity	5%	SIP (335-3-4-.02)	Daily Visual Observations	X	
		Annual flaker production is limited to 896,900 wet tons @ 55% moisture per year.				
NOTE: gr/dscf values are from the dust collector exhaust and does not include building enclosure emission reduction factor. Daily monitoring and recording of Strander and Flaker throughputs.						

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
C. Drying (Dryers #1, #2, and #3) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
D-20.1	PM	12.80 lbs/hr/ (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operations Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operations Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR Part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	
D-20.2	PM	12.80 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63 CFR, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
C. Drying (Dryers #1, #2, and #3) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
D-20.3 (Dryers Only)	PM	12.80 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63 CFR, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	

Note: Daily monitoring and recording of dryer throughput shall be performed.

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

*Kronospan will comply with one of the following options identified in Part 63, Subpart DDDD, Table 1b at the time of testing:

(1) Reduce emissions of total HAP, measured as THC (as carbon)[a], by 90 percent; or

(2) Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd; or

(3) Reduce methanol emissions by 90 percent; or

(4) Limit methanol emission to less than or equal to 1 ppmvd if uncontrolled methanol emissions entering the control device are greater than or equal to 10 ppmvd; or

(5) Reduce formaldehyde emissions by 90 percent; or

(6) Limit formaldehyde emissions to less than or equal to 1 ppmvd if uncontrolled formaldehyde emission entering the control device are greater than or equal to 10 ppmvd.

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 requirements.

Emission unit or source: I. OSB Plant
D. Strand/Flaker Preparation (description)
(Sifting/Screening and Blending/Gluing)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
SS-2.2	PM	0.80 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	PM_{10}	0.60 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	$PM_{2.5}$	0.11 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	Opacity	5%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	17.62 lbs/hr (0.145 lbs/ODT)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
BG-2.1	PM	0.60 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	PM_{10}	0.45 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	$PM_{2.5}$	0.08 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
	Opacity	5%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	20.05 lbs/hr (0.165 lbs/ODT)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
CF-19.1	- See Wood Granulate Transfer and Storage					
CF-19.2	- See Wood Dust Transfer and Storage					
		NOTE: Sifting/Screening and Blending/Gluing throughputs shall be monitored and recorded daily.				

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant

E. Units Vented to Cyclone/Wet Scrubber System, Via Press Hall (Mat Forming, Mat Trimming, Press, Diagonal Saw, Cut-to-Size Saws, Sanding, and Tongue and Groove) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
PCY-4.1 (Discharges To D-20.3)	PM	2.92 lbs/ hr (0.0206 lbs/MSF(3/8"))	SIP (335-3-14-.04)	Annual Testing Daily Visual Observation at Dryer #3 Exhaust Stack	X	
			SIP (335-3-14-.04)			
	VOC	10.33 lbs/hr (0.073 lbs/MSF (3/8"))	SIP (335-3-14-.04)	Annual Testing	X	
			SIP (335-3-14-.04)			
	NO_x	6.24 lbs/hr (0.044 lbs/MSF (3/8"))	SIP (335-3-14-.04)	Annual Testing Good Design and Operation	X	
			SIP (335-3-14-.04)			
	CO	12.77 lbs/hr (0.09 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
			SIP (335-3-14-.04)			
	Opacity	15%	SIP (335-3-14-.04)	Installation of COMs unit in outlet duct prior to venting into Dryer #3 stack.	X	
	HAPs	Limit Emissions of Total HAPs, Measured as THC (as Carbon) to 20 ppmvd.	NESHAP (40 CFR Part 63, Subpart DDDD)	Annual Testing / Continuous Pressure Drop Recordings Across Scrubber / Continuous Monitoring of Liquid Flow Rate to the Scrubber	X	
	PM_{10} / PM_{cond}	5.26 lbs/hr (0.037 lbs/MSF (3/8"))	SIP (335-3-14-.04)	Annual Testing	X	
			SIP (335-3-14-.04)			
	$PM_{2.5}$ / PM_{cond}	5.15 lbs/hr (0.0363 lbs/MSF (3/8"))	SIP (335-3-14-.04)	Annual Testing	X	
			SIP (335-3-14-.04)			

NOTE: A plan to address how organic HAPs captured in the wastewater from the scrubber are contained and destroyed to minimize release to the atmosphere, such that desired emission reductions are obtained will be submitted with the Notice of Compliance Status.

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
F. Wood Granulate Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CF-18.1	PM	0.05 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-19.1	PM	0.07 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-11.1	PM	0.03 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-18.1	PM_{10}	0.04 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.008 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-19.1	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-11.1	PM_{10}	0.03 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.005 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
F. Wood Granulate Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN [2]	OUT [3]
CF-16.1	PM	0.07 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-16.2	PM	0.07 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr 0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-15.1	PM	0.07 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-16.1	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-16.2	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-15.1	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
G. Wood Dust Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CF-14.1	PM	0.03 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-14.1	PM_{10}	0.02 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.005 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
G. Wood Dust Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CF-8.1	PM	0.02 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr 0.0045 lbs/MSF (3/8")	SIP (335-3-14-.04)	N/A	X	
CF-9.1	PM	0.03 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-18.2	PM	0.05 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF(3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-8.1	PM_{10}	0.02 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.003 lbs/h (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-9.1	PM_{10}	0.02 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.005 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-18.2	PM_{10}	0.04 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.0083 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
G. Wood Dust Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CF-19.2	PM	0.03 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr 0.0045 lbs/MSF(3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-10.1	PM	0.03 lbs/hr / 0.13 tpy (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr 0.0045 lbs/MSF (3/8")	SIP (335-3-14-.04)	N/A	X	
CF-12.1	PM	0.07 lbs/hr 0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr 0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-19.2	PM_{10}	0.03 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.005 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-10.1	PM_{10}	0.03 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.005 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-12.1	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
G. Wood Dust Transfer and Storage (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
CF-12.2	PM	0.07 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-13.1	PM	0.05 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	Opacity	0%	SIP (335-3-14-.04)	Daily Visual Observation	X	
	VOC	0.64 lbs/hr (0.0045 lbs/MSF (3/8"))	SIP (335-3-14-.04)	N/A	X	
CF-12.2	PM_{10}	0.05 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.01 lbs/hr (0.0003 lbs/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
CF-13.1	PM_{10}	0.04 lbs/hr (0.0015 gr/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	
	$PM_{2.5}$	0.008 lbs/hr (0.0003) lbs/dscf)	SIP (335-3-14-.04)	Daily Visual Observation	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
H. Edge Sealing / Stenciling (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
Inside Building	PM	0.10 lbs/hr / 0.44 tpy	ADEM Code 335-3-14-.04	N/A	X	
	PM_{10} / $PM_{2.5}$	0.05 lbs/hr / 0.22 tpy	ADEM Code 335-3-14-.04	N/A	X	
	VOC	0.03 lbs/hr / 0.14 tpy	ADEM Code 335-3-14-.04	N/A	X	
	HAPs	0.00 lbs/gallon	Part 63, Subpart DDDD, Table 6(5)	Purchase Non – HAP Coatings Only	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
A. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (K7) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or	PM	0.030 lbs/MMBtu input	SIP (335-3-10-.02 (2)(b)) NSPS (40 CFR Part 60, Subpart Db)	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs and Secondary Electrical Power Input System	X	
MDF Dryer		0.013 lbs/MMBtu input	SIP (335-3-11-.06 (107) NESHAP (Part 63, Subpart DDDDD)/BACT	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs and Secondary Electrical Power Input System	X	
		0.17 gr / dscf @ 50% excess air	SIP (335-3-4-.08(2)(a)	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs and Secondary Electrical Power Input System	X	
		2.66 lbs/hr	PSD	Annual Testing / Daily Visual Observations	X	
	SO_2	4.0 lbs/MMBtu input	SIP (335-3-5-.01(b)	Combust Wood Waste Only	X	
	NO_x	36.65 lbs/hr (0.18 lb/MMBtu)	SIP (335-3-14-.04)	Maintain equipment to monitor SNCR system performance and record urea injection rate / Annual Testing	X	
	CO	390 ppm volume dry basis corrected to 3% oxygen (30 day rolling avg)	NESHAP (40 CFR Part 63, Subpart DDDDD) and SIP (335-3-11-.06(107)	Install, operate, and maintain CO/O^2 CEMs and reduce CO CEMs data to 30-day rolling avg. and annual testing	X	
		36.65 lb/hr (0.18 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	HCl	0.00021 lbs/MMBtu input	NESHAP (40 CFR Part 63, Subpart DDDDD) and SIP (335-3-11-.06(107)	Maintain equipment to monitor lime injection system performance and record lime injection rate / Annual Testing	X	
	Hg	0.0000008 lbs/MMBtu input	NESHAP (40 CFR Part 63, Subpart DDDDD)	Annual Testing	X	
	All	N/A	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform tune-up annually	X	
	PM_{10} / PM_{cond}	6.14 lbs/hr (0.03 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	$PM_{2.5}$ / PM_{cond}	5.87 lbs/hr (0.0287 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	Opacity	10%	NSPS (Part 60, Subpart Db) NESHAP (Part 63, Subpart DDDDD)	Daily Visual Observations Install, Operate, and Maintain COM System	X	
	VOC	7.32 lbs/hr (0.036 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	GHG	45,903 lbs/hr (224,464 lbs/MMBtu)				

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

Note: The biomass heater will be tested under the following two scenarios: (1) fresh air used as combustion air, and (2) dryer air used as combustion air. The difference will be considered to be the dryers contribution, and used to determine MACT compliance.

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 requirements.

Emission unit or source: II. Thermal Oil Heaters
A. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	HAPs	One of the Options in Part 63, Subpart DDDD, Table 1b	40 CFR Part 63, Subpart DDDD	install, operate, and maintain firebox temperature monitoring system		

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
B. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (K8) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or	PM	0.030 lbs/MMBtu input	SIP (335-3-10-.02 (2)(b)) NSPS (40 CFR Part 60, Subpart Db)	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs, and Secondary Electrical Power Input System	X	
MDF Dryer		0.013 lbs/MMBtu input	SIP (335-3-11-.06 (107) NESHAP (Part 63, Subpart DDDDD)/BACT	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs and Secondary Electrical Power Input System	X	
		0.17 gr / dscf @ 50% excess air	SIP (335-3-4-.08(2)(a)	Annual testing, records of amount of fuel combusted monthly and install, operate, and maintain COMs and Secondary Electrical Power Input System	X	
		2.66 lbs/hr /	PSD	Annual Testing / Daily Visual Observations	X	
	SO_2	4.0 lbs/MMBtu input	SIP (335-3-5-.01(b)	Combust Wood Waste Only	X	
	NO_x	36.65 lbs/hr (0.18 lb/MMBtu)	SIP (335-3-14-.04)	Maintain equipment to monitor SNCR system performance and record urea injection rate / Annual Testing	X	
	CO	390 ppm volume dry basis corrected to 3% oxygen (30 day rolling avg)	NESHAP (40 CFR Part 63, Subpart DDDDD) and SIP (335-3-11-.06(107)	Install, operate, and maintain CO/O^2 CEMs and reduce CO CEMs data to 30-day rolling avg. and annual testing	X	
		36.65 lb/hr (0.18 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	HCl	0.00021 lbs/MMBtu input	NESHAP (40 CFR Part 63, Subpart DDDDD) and SIP (335-3-11-.06(107)	Maintain equipment to monitor lime injection system performance and record lime injection rate / Annual Testing	X	
	Hg	0.0000008 lbs/MMBtu input	NESHAP (40 CFR Part 63, Subpart DDDDD)	Annual Testing	X	
	All	N/A	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform tune-up annually	X	
	PM_{10} / PM_{cond}	6.14 lbs/hr (0.0302 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	$PM_{2.5}$ / PM_{cond}	5.87 lbs/hr (0.0287 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	Opacity	10%	NSPS (Part 60, Subpart Db) NESHAP (Part 63, Subpart DDDDD)	Daily Visual Observations Install, Operate, and Maintain COM System	X	
	VOC	7.32 lbs/hr (0.036 lbs/MMBtu)	SIP (335-3-14-.04)	Annual Testing	X	
	GHG	45,903 lbs/hr (224.464 lbs/MMBtu)				

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

Note: The biomass heater will be tested under the following two scenarios: (1) fresh air used as combustion air, and (2) dryer air used as combustion air. The difference will be considered to be the dryers contribution, and used to determine MACT compliance.

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 requirements.

Emission unit or source: II. Thermal Oil Heaters
B. 204.73 MMBtu/hr Wood Fired Thermal Oil Heater (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	HAPs	One of the Options in Part 63, Subpart DDDD, Table 1b	40 CFR Part 63, Subpart DDDD	install, operate, and maintain firebox temperature monitoring system		

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
C. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K9) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	PM	0.15 lbs/hr (0.00267 lbs/ MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
		Part 60 Subpart Dc	NSPS	Record Natural Gas Consumption Monthly	X	
	Opacity	0%	SIP – BACT	Combust Natural Gas Only Install COMs Unit in Common Exhaust Duct for K9, K10, K11, and K12	X	
	SO_2	4.0 lb/MMBtu input	SIP (335-3-5-.01(b)	Combust Natural Gas Only Initial and Triennial Testing	X	
	HAPs	Work Practices	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform Annual Tune-Up	X	
	NO_x	2.50 lbs/hr (0.0445 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	CO	0.265 lbs/hr (0.00472 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	VOC	0.031 lbs/hr (0.00095 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	GHG	6,785 lbs/hr (120.734 lbs/MMBtu)	SIP (335-3-14-.04)	N/A	X	
	PM_{10} / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	$PM_{2.5}$ / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
		Note: The COMs unit will be installed in the common duct from all four (4) natural gas thermal fired thermal oil heaters.				
ALL				Daily Monitoring and Recording of Quantity of Natural Gas Combusted	x	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
D. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K10) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	PM	0.15 lbs/hr (0.00267 lbs/ MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
		Part 60 Subpart Dc	NSPS	Record Natural Gas Consumption Monthly	X	
	Opacity	0%	SIP – BACT	Combust Natural Gas Only Install COMs Unit in Common Exhaust Duct for K9, K10, K11, and K12	X	
	SO_2	4.0 lb/MMBtu input	SIP (335-3-5-.01(b)	Combust Natural Gas Only Initial and Triennial Testing	X	
	HAPs	Work Practices	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform Annual Tune-Up	X	
	NO_x	2.50 lbs/hr (0.0445 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	CO	0.265 lbs/hr (0.00472 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	VOC	0.031 lbs/hr (0.00095 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	GHG	6,785 lbs/hr (120.734 lbs/MMBtu)	SIP (335-3-14-.04)	N/A	X	
	PM_{10} / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	$PM_{2.5}$ / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
		Note: The COMs unit will be installed in the common duct from all four (4) natural gas thermal fired thermal oil heaters.				
ALL				Daily Monitoring and Recording of Quantity of Natural Gas Combusted	x	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
E. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K11) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	PM	0.15 lbs/hr (0.00267 lbs/ MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
		Part 60 Subpart Dc	NSPS	Record Natural Gas Consumption Monthly	X	
	Opacity	0%	SIP – BACT	Combust Natural Gas Only Install COMs Unit in Common Exhaust Duct for K9, K10, K11, and K12	X	
	SO_2	4.0 lb/MMBtu input	SIP (335-3-5-.01(b)	Combust Natural Gas Only Initial and Triennial Testing	X	
	HAPs	Work Practices	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform Annual Tune-Up	X	
	NO_x	2.50 lbs/hr (0.0445 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	CO	0.265 lbs/hr (0.00472 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	VOC	0.031 lbs/hr (0.00095 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	GHG	6,785 lbs/hr (120.734 lbs/MMBtu)	SIP (335-3-14-.04)	N/A	X	
	PM_{10} / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	$PM_{2.5}$ / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
		Note: The COMs unit will be installed in the common duct from all four (4) natural gas thermal fired thermal oil heaters.				
ALL				Daily Monitoring and Recording of Quantity of Natural Gas Combusted		

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: II. Thermal Oil Heaters
F. 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heater (K12) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
TOH-1 or MDF Dryer	PM	0.15 lbs/hr (0.00267 lbs/ MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing / Daily Visual Observations	X	
		Part 60 Subpart Dc	NSPS	Record Natural Gas Consumption Monthly	X	
	Opacity	0%	SIP – BACT	Combust Natural Gas Only Install COMs Unit in Common Exhaust Duct for K9, K10, K11, and K12	X	
	SO_2	4.0 lb/MMBtu input	SIP (335-3-5-.01(b)	Combust Natural Gas Only Initial and Triennial Testing	X	
	HAPs	Work Practices	NESHAP (40 CFR Part 63, Subpart DDDDD)	Perform Annual Tune-Up	X	
	NO_x	2.50 lbs/hr (0.0445 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	CO	0.265 lbs/hr (0.00472 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	VOC	0.031 lbs/hr (0.00095 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	GHG	6,785 lbs/hr (120.734 lbs/MMBtu)	SIP (335-3-14-.04)	N/A	X	
	PM_{10} / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
	$PM_{2.5}$ / PM_{cond}	0.47 lbs/hr (0.00837 lbs/MMBtu)	SIP (335-3-14-.04)	Initial and Triennial Testing	X	
		Note: The COMs unit will be installed in the common duct from all four (4) natural gas thermal fired thermal oil heaters.				
ALL				Daily Monitoring and Recording of Quantity of Natural Gas Combined		

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: III. Emergency Equipment
A. 910 KW Emergency Generator #6 (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
EG-6	$NMHC/NO_x$	12.9 / lbs/hr 4.8 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	CO	6.99 lbs/hr 2.6 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	ALL	Sulfur content not to exceed 15 ppm	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of sulfur content	X	
		Cetane index shall be a minimum of 40 or the aromatic content shall not exceed 35 volume percent	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of either the cetane index or aromatic content of diesel fuel	X	
		Install and operate a non-resettable hour meter	40 CFR 60.4209	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Operate only in emergency operations and limited maintenance checks and readiness testing to 100 hours per year	40 CFR 60.4211(e)	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Hours of operation limited to 500 hours/year	SIP	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
	Opacity	0%	SIP (335-3-14-.04)	Periodic Visual Observation	X	
	PM_{cond}	0.06 lbs/hr / 0.015 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	GHG	1,150 lbs/hr / 287.50 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM_{10} / $PM_{2.5}$	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP	Good Combustion Practices / Maintenance	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: IV. Emergency Equipment
B. 910 KW Emergency Generator #7 (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
EG-7	$NMHC/NO_x$	12.9 / lbs/hr 4.8 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	CO	6.99 lbs/hr 2.6 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	ALL	Sulfur content not to exceed 15 ppm	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of sulfur content	X	
		Cetane index shall be a minimum of 40 or the aromatic content shall not exceed 35 volume percent	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of either the cetane index or aromatic content of diesel fuel	X	
		Install and operate a non-resettable hour meter	40 CFR 60.4209	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Operate only in emergency operations and limited maintenance checks and readiness testing to 100 hours per year	40 CFR 60.4211(e)	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Hours of operation limited to 500 hours/year	SIP	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
	Opacity	0%	SIP (335-3-14-.04)	Periodic Visual Observation	X	
	PM_{cond}	0.06 lbs/hr / 0.015 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	GHG	1,150 lbs/hr / 287.50 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM_{10} / $PM_{2.5}$	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP	Good Combustion Practices / Maintenance	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: IV. Emergency Equipment
C. 910 KW Emergency Generator #8 (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
EG-8	NMHC/NO_x	12.9 / lbs/hr 4.8 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	CO	6.99 lbs/hr 2.6 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP (335-3-14-.04) and 40 CFR 60, Subpart IIII	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	ALL	Sulfur content not to exceed 15 ppm	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of sulfur content	X	
		Cetane index shall be a minimum of 40 or the aromatic content shall not exceed 35 volume percent	40 CFR 60.4207 40 CFR 80.510(b)	Maintain records of either the cetane index or aromatic content of diesel fuel	X	
		Install and operate a non-resettable hour meter	40 CFR 60.4209	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Operate only in emergency operations and limited maintenance checks and readiness testing to 100 hours per year	40 CFR 60.4211(e)	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
		Hours of operation limited to 500 hours/year	SIP	Maintain records of date, time duration, and purpose of operation each time unit is operated	X	
	Opacity	0%	SIP (335-3-14-.04)	Periodic Visual Observation	X	
	PM_{cond}	0.06 lbs/hr / 0.015 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	GHG	1,150 lbs/hr / 287.50 tpy	SIP (335-3-14-.04)	Good Combustion Practices / Maintenance EPA Compliance Certification	X	
	PM_{10} / $PM_{2.5}$	0.40 lbs/hr / 0.10 tpy 0.15 g/HP-hr	SIP	Good Combustion Practices / Maintenance	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Insignificant Activity	Basis
PMDI Storage Tanks	Deminimus
Wax Storage Tanks	Deminimus
Hardener Storage Tanks	Deminimus
Release Agent Storage Tanks	Deminimus
Shuttle Wagon	Deminimus
Bucket Wheel Loader	Deminimus
Forklifts	Deminimus
Stenciling	Deminimus
Wood Granulate and Dust Handling	Deminimus

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

a. N/A

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. Section I - Project Summary

b. Section II - PSD Applicability Analysis

c. Section III - Regulatory Analysis

d. Section IV - Permit Applications

e. Section V - Emission Calculations

f. Section VI - Monitoring/Regulatory Summary

g. Section VII - Appendix A

h. Section VIII - Air Modeling

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 OF RESPONSIBLE OFFICIAL **TITLE** **DATE**

B.

OSB Plant

1. Process (105 Form)
2. Surface Coating (109) Form
3. Continuous Emissions Monitoring (438 Form)
4. Air Pollution Control Device (110 Form)
5. Loading and Storage of Organic Compounds (108 Form)

1.

Process (105 Form)

a. Log Handling and Processing
b. Stranding / Flaking
c. Drying
d. Sifting / Screening
e. Strand Blending (Gluing)
f. Mat Forming
g. Mat Trimming
h. Pressing
i. Finishing (Diagonal and Cut-to-Size Saws)
j. Finishing (Sanding)
k. Finishing (Tongue and Groove)
l. Wood Dust Transfer and Storage
m. Wood Granulate Transfer and Storage

a.

Log Handling and Processing

i. To Stranders
ii. To Flakers or Stackers/Reclaimers

i.

To Stranders

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___

   Log Handling and Processing

   Incoming logs will be truck off-loaded, stored, and transferred to one of three (3) loading decks.

   From the decks, the logs will be conveyed to four individual debarkers (DB1, DB2, and DB3).

   Debarked wood from three debarkers will be conveyed to one of three (3) stranders.

   Emissions from the operation are fugitive.

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

   Make: Xylo **Model:** Custom

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 121.53 odtph

   Manufactured date: 2023 **Proposed installation date:** 06/25

   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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Logs	121.53 odt	130 odt	1,064,603 odt

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Debarked Logs	1,064,603	tons (oven dry)
Bark	190,939	tons (oven dry)

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

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

○ Yes ◉ No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
F-DB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* 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)
F-DB	A. PM	0.29	1.28	See Calculation Section	N/A	N/A
	B. PM_{10}	0.15	0.64	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.03	0.13	See Calculation Section	N/A	N/A

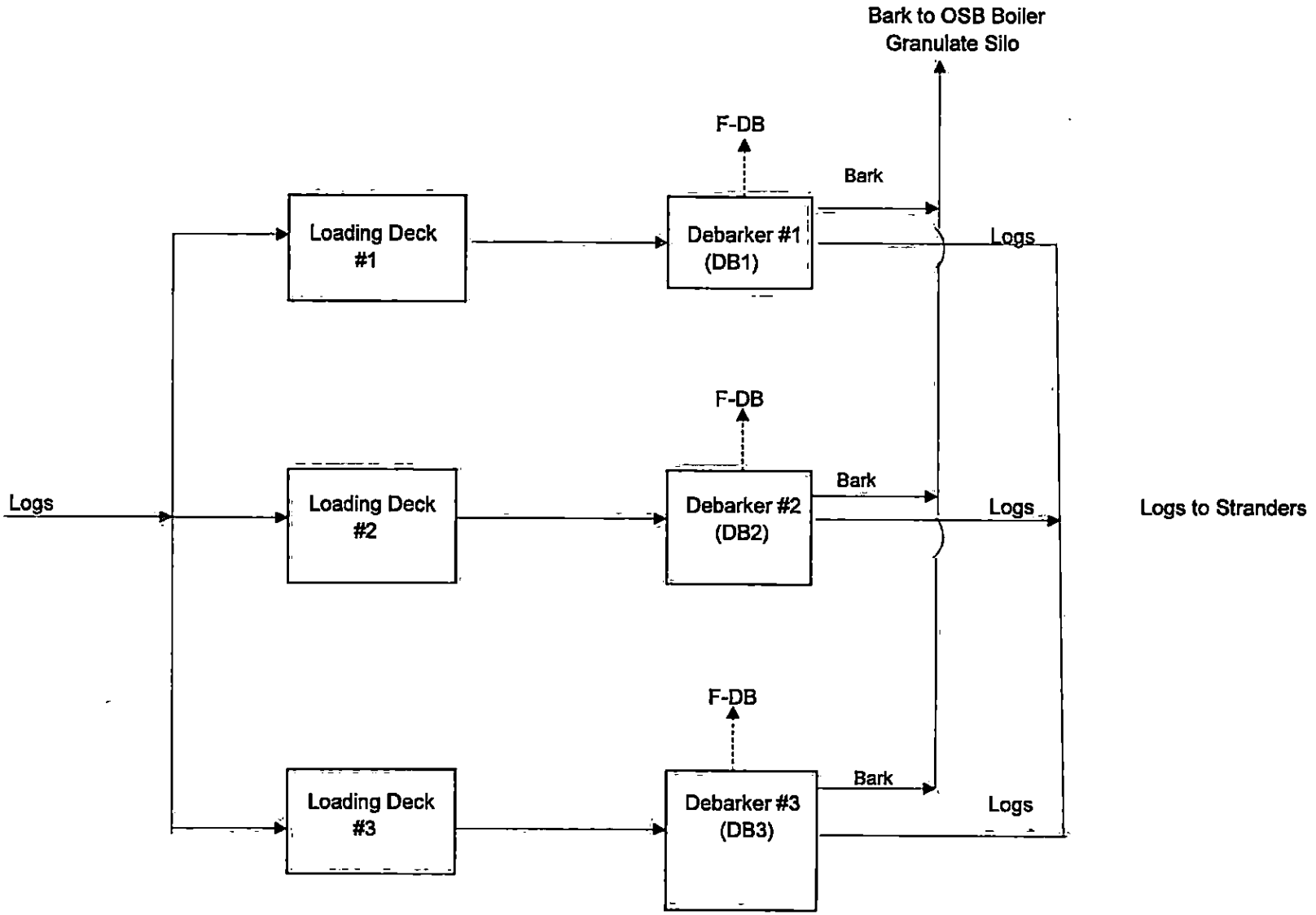
12. Using a flow diagram:

(1) Illustrate input of raw materials,

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

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

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


Bark to OSB Boiler
Granulate Silo
F-DB
Bark
Loading Deck
#1
Debarker #1
(DB1)
Logs
F-DB
Logs
Loading Deck
#2
Debarker #2
(DB2)
Bark
Logs
Logs to Stranders
F-DB
Loading Deck
#3
Debarker #3
(DB3)
Bark
Logs

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

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/28/2024

ii.

To Flakers or Stacker/Reclaimer

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ___

Log Handling and Processing

Incoming logs will be truck off-loaded, stored, and transferred to a loading deck.

From the deck, the logs will be conveyed to a debarker (DB4).

Debarked wood from the debarker will be conveyed to a chipper. Chips will be conveyed to the stacker/reclaimer. The chipper is located in the strander building. Emissions from the operation are fugitive.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Debarkers / Chipper

Make: Xylo **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 130 odtph

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Logs	130.00 odt	130.00 odt	1,138,800 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Debarked Logs	1,138,800	tons (oven dry)
Bark	204,246	tons (oven dry)

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

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

○ Yes ◉ No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
F-DB	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
F-CH1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* 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)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
F-DB	A. PM	0.31	1.37	See Calculation Section	N/A	N/A
	B. PM_{10}	0.16	0.68	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.03	0.14	See Calculation Section	N/A	N/A
F-CH1	A. PM	0.11	0.47	See Calculation Section	N/A	N/A
	B. PM_{10}	0.05	0.24	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.03	0.12	See Calculation Section	N/A	N/A
	D. VOC	6.50	28.47	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,

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

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

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

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)	Basis of Calculation	Regulatory Emission Limit (lb/hr)	Regulatory Emission Limit (units of standard)
Totals	A. PM	0.42	1.84	See Calculation Section	N/A	N/A
	B. PM_{10}	0.21	0.92	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.06	0.26	See Calculation Section	N/A	N/A
	D. VOC	6.50	28.47	See Calculation Section	N/A	N/A

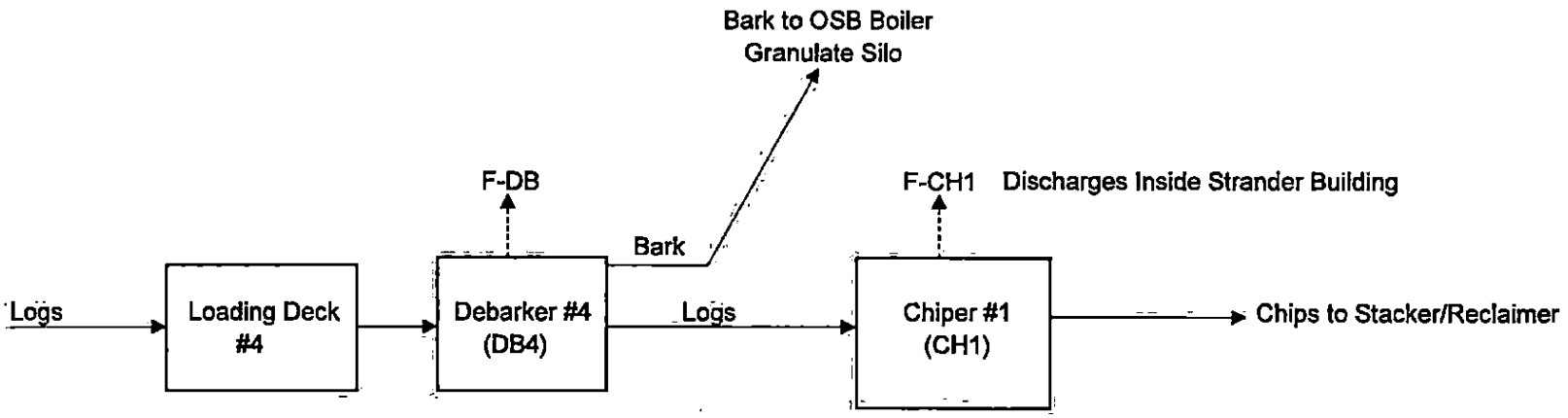
12. **Using a flow diagram:**

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

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

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

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


Bark to OSB Boiler
Granulate Silo
F-DB
F-CH1
Discharges Inside Strander Building
Bark
Logs
Loading Deck
#4
Debarker #4
(DB4)
Logs
Chiper #1
(CH1)
Chips to Stacker/Reclaimer

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

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/28/2024

(b).

Stranding / Flaking

(i) Stranding
(ii) Flaking

(i).

Stranding

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ___

Stranding Operations

The debarked logs will be conveyed to three stranders (ST1, ST2, and ST3) where the logs are cut into strands 100 to150 mm long by 10 to 15 mm wide by 0.6 to 0.8 mm thick. The symmetry of the strands plays a major role in the properties of the board. In order to achieve high quality, the strands should have only slight variations in thickness, length, width, and fines content. The strands will be conveyed to the strand storage bins to await processing through the dryers. Emissions from the stranders will be ducted to individual cyclones (CYST1, CYST2, CYST3) venting into individual dust collectors (DCST1, DCST2, DCST3) that discharge inside the strander building. Collected dust from the collectors is conveyed to the OSB Dust Silo (ODS) via cyclofilter (CF14.1).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Stranders #1, #2, and #3

Make: Xylo **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 121.53 odt/hr

Manufactured date: 2023 **Proposed installation date:** 0

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Debarked Logs	121.53 tph odt/hr	121.53 odt/hr	1,064,603 odt/hr

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Wood Strands	1,064,603	oven dried 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):
N/A

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

(●) Yes ( ) No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
Strander	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Building												

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

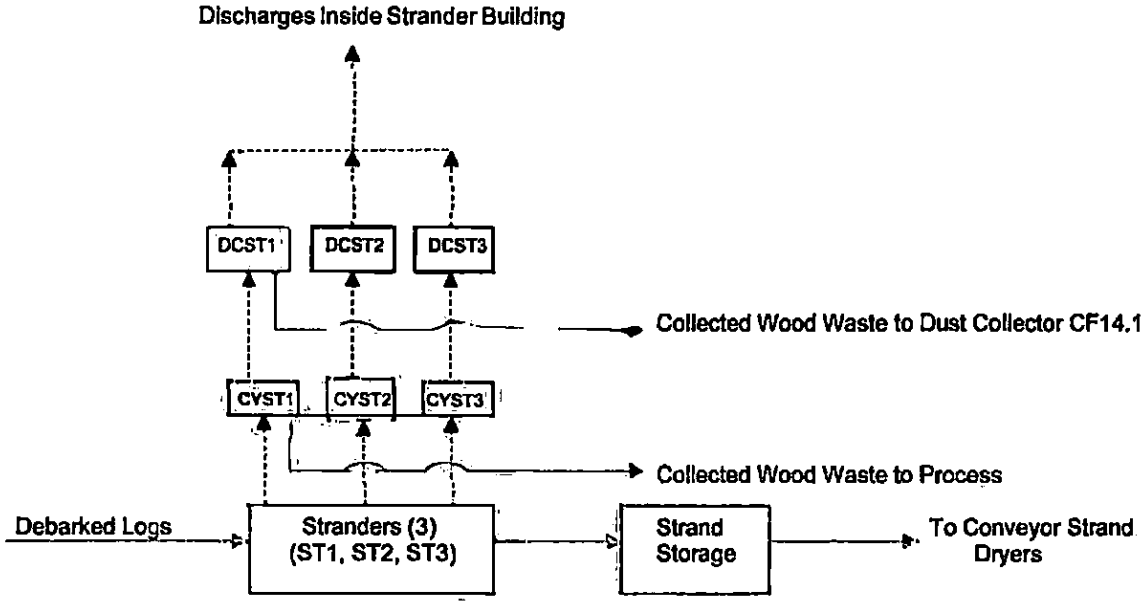
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Strander Building	A. PM	0.150	0.66	See Calculation Section	N/A	N/A
	B. PM_{10}	0.108	0.47	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.021	0.09	See Calculation Section	N/A	N/A
	D. VOC	2.57	11.71	See Calculation Section	N/A	N/A
	E. HAPs (Total)	1.44	6.29	See Calculation Section	N/A	N/A
	1. Methanol	0.69	3.89	See Calculation Section	N/A	N/A
	2. Phenol	0.55	2.40	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒ 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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/28/24

(ii).

Flaking

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ____

Flaking Operations

Incoming chips will be conveyed to one of four (4) knifing flakers (FL-1, FL-2, FL-3, and FL-4). The flakes will be conveyed to the flaker storage bins awaiting transfer to the dryers. Emissions from the flakers will be ducted to individual cyclones (CYFL1, CYFL2, CYFL3, and CYFL4) and then to individual dust collectors (CFFL1.1, CFFL1.2, CFFL1.3, and CFFL1.4) that discharge inside the Strander Building. Collected material from the cyclones are conveyed back to process. Wood dust from the dust collectors is conveyed to OSB Dust Silo via cyclofilter (CF14.1).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Chip Flaking Operations (Flakers)

Make: Xylo **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 185.20 odt/hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Chips	185.20 odt/hr	185.20 odt/hr	1,622,352 odt

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Wood Flakes	1,622,352	Oven Dried 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):
Annual production limit of 596,600 ODT/yr.

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

(●) Yes ( ) No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
Strander Building	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

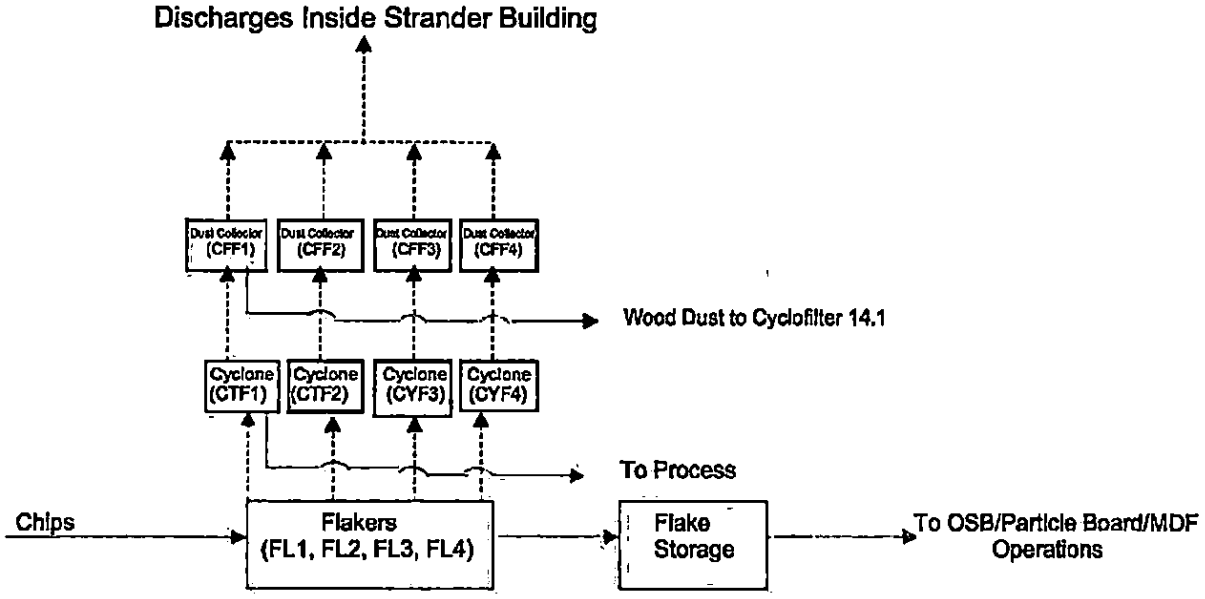
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Strander Building	A. PM	0.060	0.26	See Calculation Section	N/A	N/A
	B. PM_{10}	0.044	0.192	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.008	0.035	See Calculation Section	N/A	N/A
	D. VOC	22.78	36.69	See Calculation Section	N/A	N/A
	E. HAPs (Total)	2.19	9.56	See Calculation Section	N/A	N/A
	1. Methanol	1.35	5.92	See Calculation Section	N/A	N/A
	2. Phenol	0.84	3.64	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 03/26/24

c.

Drying

(i) Dryer #1
(ii) Dryer #2
(iii) Dryer #3

(i).

Dryer #1

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. **Name of facility or organization:** Kronospan LLC

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 ____ Drying Operations (Conveyor Strand Dryers) - Dryer #1

Green wood strands are fed from the storage bins to one of three (3) conveyor strand dryers (D1, D2, and D3) operating in parallel. The dryers will be indirectly heated using hot water generated by two (2) 204.73 MMBtu/hr (input) thermal oil heaters.

~~Dryer #1 will have sixteen (16) drying zones operating in series. The exhaust from zones #1, #2, #3, and #16 of the dryer will be ducted to a dust collector (D1C1) and then to the thermal oil heaters or to the MDF Dryer. Exhaust from zones #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14, and #15 from the dryer will be routed to six (6) dust collectors (D1C2 - D1C7). The exhaust from the six dust collectors will be vented to the atmosphere through a common stack. Wood dust from the collectors is conveyed to the OSB Dust Silo (ODS), via cyclofilter (CF8.1).~~

~~To ensure compliance with Part 63 Subpart DDDD, emissions from dryers zones 1, 2, 3, and 16 will be vented to the combustion chamber flame zones of wood-fired thermal oil heaters K7 and K8 or to the MDF Dryer. The heaters, will act as the control device. When the zones are vented to the MDF Dryer, RTO-1 acts as the control device.~~

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Conveyor Strand Dryer #1

Make: CEATEC **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 40.51 odt/hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Strands/Flakes	40.51 odt/hr	40.51 odt/hr	354,868 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Dried Strands/Flakers	354,868	Oven Dried 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):**

Exhaust from the Dryer 1, Zones 1, 2, 3, ad 16 dust collectors is vented to Thermal Oil Heaters K7 and K8 or to the MDF Dryer. Exhaust from these zones are subject to Part 63, Subpart DDDD, Table 1B and 2.

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
D-20.1	594.629	3719.559	33.611600	-85.979940	230.00	337.50	603	13.78	N/A	102.03	912,950	131
(Zones 4 - 15)												
TOH-1	594.864	3719.468	33.610763	-85.977420	230.00	N/A	603	8.50	N/A	36.01	122,602	338
(Zones 1, 2, 3, and 16												

* 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)
D-20.1	A. PM	12.80	56.05	See Calculation Section	12.80	N/A
Zones 4-15)	B. PM_{10}	9.66	42.31	See Calculation Section	9.66	N/A
	C. $PM_{2.5}$	1.76	7.71	See Calculation Section	1.76	N/A
	D. VOC	30.383	133.08	See Calculation Section	30.383	133.08 tpy
	E. NO_x	0.31	1.37	See Calculation Section	N/A	N/A
	F. CO	3.84	16.82	See Calculation Section	N/A	N/A
	G. HAPs (Total)	1.131	4.953	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.048	0.210	See Calculation Section	N/A	N/A
	2. Methanol	1.000	4.380	See Calculation Section	N/A	N/A
	3. Acetaldehyde	0.003	0.013	See Calculation Section	N/A	N/A
	4. Phenol	0.08	0.350	See Calculation Section	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.

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

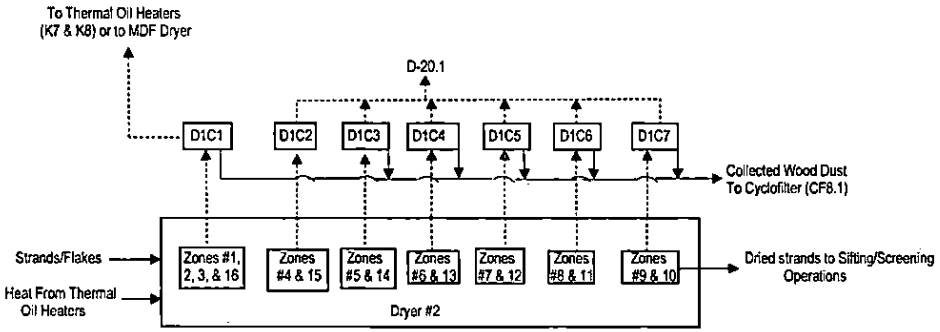
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
TOH-1 (Zones 1, 2, 3, and 16)	A. VOC	3.037	13.30	See Calculation Section	N/A	20 ppmdv THC
	B. HAPs (Total)	0.1133	0.496	See Calculation Section	N/A	N/A
	1. Acrolein	0.0003	0.001	See Calculation Section	N/A	N/A
	2. Formaldehyde	0.005	0.022	See Calculation Section	N/A	N/A
	3. Methanol	0.10	0.438	See Calculation Section	N/A	N/A
	4. Phenol	0.008	0.035	See Calculation Section	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.

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


To Thermal Oil Heaters
(K7 & K8) or to MDF Dryer
D-20.1
D1C1
D1C2
D1C3
D1C4
D1C5
D1C6
D1C7
Collected Wood Dust
To Cyclofilter (CF8.1)
Strands/Flakes
Heat From Thermal
Oil Heaters
Zones #1,
2, 3, & 16
Zones
#4 & 15
Zones
#5 & 14
Zones
#6 & 13
Zones
#7 & 12
Zones
#8 & 11
Zones
#9 & 10
Dried strands to Sifting/Screening
Operations
Dryer #2

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

(ii).

Dryer #2

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___ **Drying Operations (Conveyor Strand Dryers) - Dryer #1**

Green wood strands are fed from the storage bins to one of three (3) conveyor strand dryers (D1, D2, and D3) operating in parallel. The dryers will be indirectly heated using hot water generated by two (2) 204.73 MMBtu/hr (input) thermal oil heaters.

~~Dryer #2 will have sixteen (16) drying zones operating in series. The exhaust from zones #1,~~ #2, #3, and #16 of the dryer will be ducted to a dust collector (D2C1) and then to the thermal oil heaters or to the MDF Dryer. Exhaust from zones #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14, and #15 from the dryer will be routed to six (6) dust collectors (D2C2 - D2C7). ~~The exhaust from the six dust collectors will be vented to the atmosphere through a common stack.~~ Wood dust from the collectors is conveyed to the OSB Dust Silo (ODS), via cyclofilter (CF8.1).

To ensure compliance with Part 63 Subpart DDDD, emissions from dryers zones 1, 2, 3, and 15 will be ~~vented to the combustion chamber flame zones of wood-fired thermal oil heaters K7 and K8 or to the MDF~~ Dryer. The heaters, will act as the control device. When the zones are vented to the MDF Dryer, RTO-1 ~~acts as the control device.~~

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Conveyor Strand Dryer #2

Make: CEATEC **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 40.51 odt/hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Strands/Flakes	40.51 odt/hr	40.51 odt/hr	354,868 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Dried Strands/Flakes	354,868	Oven Dried 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):**

Exhaust from the Dryer 3, Zones 1, 2, 3, and 16 dust collectors is vented to Thermal Oil Heaters K7 and K8 or to the MDF Dryer. Exhaust from these zones are subject to Part 63, Subpart DDDD, Tables 1B and 2.

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
D-20.2	594.601	3719.540	33.611432	-85.980243	230	337.50	603	13.78	N/A	102.03	912,950	131
(Zones 4-15)												
TOH-1	594.864	3719.468	33.610763	-85.977420	230.00	N/A	603	8.50	N/A	36.01	122,602	338
(Zones 1, 2, 3, and 16)												

* 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)
D-20.2	A. PM	12.80	56.05	See Calculation Section	12.80	56.05 tpy
(Zones 4-15)	B. PM_{10}	9.66	42.31	See Calculation Section	9.66	42.31 tpy
	C. $PM_{2.5}$	1.76	7.71	See Calculation Section	1.76	7.71 tpy
	D. VOC	30.383	133.08	See Calculation Section	30.383	133.08 tpy
	E. NO_x	0.31	1.37	See Calculation Section	N/A	N/A
	F. CO	3.84	16.82	See Calculation Section	N/A	N/A
	G. HAPs (Total)	1.131	4.953	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.048	0.210	See Calculation Section	N/A	N/A
	2. Methanol	1.000	4.380	See Calculation Section	N/A	N/A
	3. Acetaldehyde	0.003	0.013	See Calculation Section	N/A	N/A
	4. Phenol	0.108	0.350	See Calculation Section	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.

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

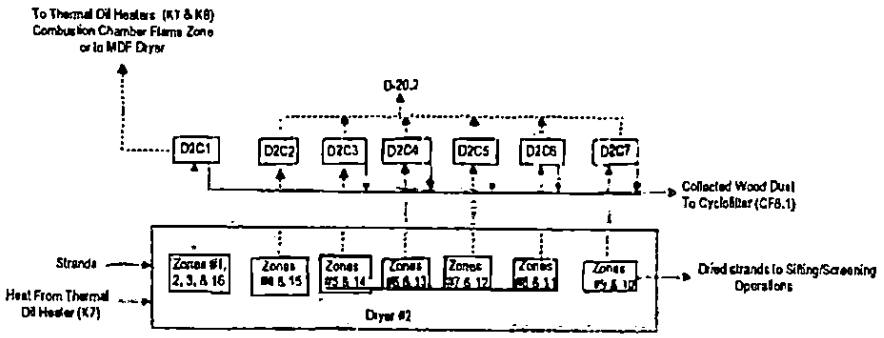
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
TOH-1	A. VOC	3.037	13.30	See Calculation Section	N/A	20 ppmdv THC
(Zones 1, 2, 3, And 16)	B. HAPs	0.1133	0.496	See Calculation Section	N/A	N/A
	1. Acrolein	0.0003	0.001	See Calculation Section	N/A	N/A
	2. Formaldehyde	0.005	0.022	See Calculation Section	N/A	N/A
	3. Methanol	0.10	0.438	See Calculation Section	N/A	N/A
	4. Phenol	0.008	0.035	See Calculation Section	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.

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


To Thermal Oil Heaters (K7 & K8)
Combustion Chamber Flame Zone
or to MDF Dryer
D-20.2
D2C1
D2C2
D2C3
D2C4
D2C5
D2C6
D2C7
Collected Wood Dust
To Cyclofilter (CF8.1)
Strands
Heat From Thermal
Oil Heater (K7)
Zones #1,
2, 3, & 16
Zones
#4 & 15
Zones
#5 & 14
Zones
#6 & 13
Zones
#7 & 12
Zones
#8 & 11
Zones
#9 & 10
Dried strands to Sifting/Screening
Operations
Dryer #2

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 08/29/24

(iii).

Dryer #3

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Kronospan LLC

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 ___

Green wood strands are fed from the storage bins to one of three (3) conveyor strand dryers (D1, D2, and D3) operating in parallel. The dryers will be indirectly heated using thermal oil generated by two (2) 204.73 MMBtu/hr (input) thermal oil heaters and four (4) 56.20 MMBtu/hr (input) natural gas thermal oil heaters.
Dryer #3 will have sixteen (16) drying zones operating in series. The exhaust from zones #1, #2, #3, and #16 of the dryer will be ducted to a dust collector (D3C1) and then to the thermal oil heaters or to the MDF Dryer. Exhaust from zones #4, #5, #6, #7, #8, #9, #10, #11, #12, #13, #14, and #15 from the dryer will be routed to six (6) dust collectors (D3C2 - D2C7). The exhaust from the six dust collectors will be vented to the atmosphere through a common stack. Wood dust from the collectors is conveyed to the OSB Dust Silo (ODS), via cyclofilter (CF8:1).
To ensure compliance with Part 63, Subpart DDDD, emissions from dryer Zones 1, 2, 3, and 16 will be vented to the combustion chamber flame zones of wood-fired thermal oil heaters K7 and K8 or to the MDF Dryer. The heaters will act as the control device. When the zones are vented to the MDF Dryer, RTO-1 will act as the control device.

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Conveyor Strand Dryer #3

Make: CEATEC Model: Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 40.51 odt/hr

Manufactured date: 2023 Proposed installation date: 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Strands/Flakes	40.51 odt/hr	40.51 odt/hr	354,868 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Dried Strands/Flakes	354,868	Oven Dried 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):**

Exhaust from the Dryer 3, Zones 1, 2, 3, and 16 dust collectors is vented to Thermal Oil Heaters K7 and K8 or to the MDF Dryer. Exhaust from these zones are subject to Part 63, Subpart DDDD, Tables 1B and 2).

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
D-20.3	594.557	3719.516	33.611223	-85.980724	230.00	276.64	603	13.78	N/A	102.03	912,950	131
D-20.3*	594.557	3719.516	33.611223	-85.980724	230.00	276.64	603	1378	N/A	115.19	1,030,752	125
Zones 4-15)												
* Includes discharge from PCY-4.1												
TOH-1	594.864	3719.468	33.610763	-85.977420	230.00	N/A	603	8.50	N/A	36.01	122,602	338
Zones 1, 2, 3, and 16)												

* 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)
D-20.3	A. PM	12.80	56.05	See Calculation Section	12.80	56.05 tpy
	B. PM_{10}	9.66	42.31	See Calculation Section	9.66	42.31 tpy
	C. $PM_{2.5}$	1.76	7.71	See Calculation Section	1.76	7.71 tpy
	D. VOC	30.383	133.08	See Calculation Section	30.383	133.08 tpy
	E. NO_x	0.31	1.37	See Calculation Section	N/A	N/A
	F. CO	3.84	16.82	See Calculation Section	N/A	N/A
	G. HAPs (Total)	1.131	4.953	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.048	0.210	See Calculation Section	N/A	N/A
	2. Methanol	1.000	4.380	See Calculation Section	N/A	N/A
	3. Acetaldehyde	0.003	0.013	See Calculation Section	N/A	N/A
	4. Phenol	0.08	0.350	See Calculation Section	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.

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

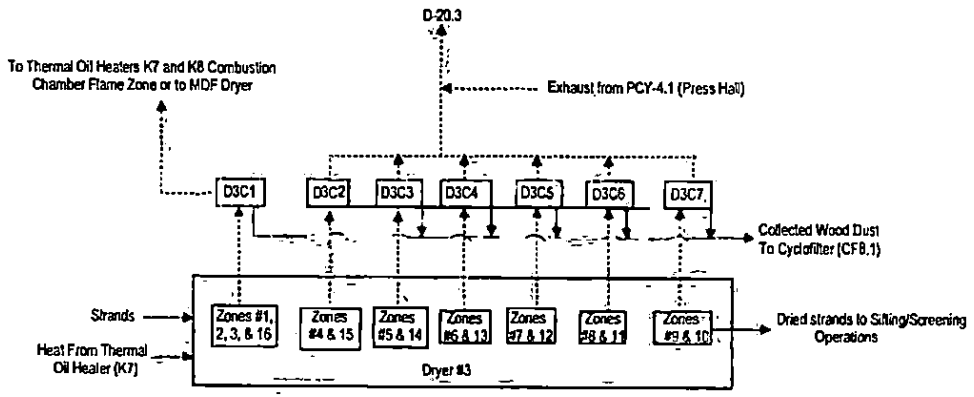
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
TOH-1	A. VOC	3.037	13.30	See Calculation Section	N/A	20 ppmdv (THC
(Zones 1, 2, 3, and 16)	B. HAPs (Total)	0.1133	0.496	See Calculation Section	N/A	N/A
	1. Acrolein	0.0003	0.001	See Calculation Section	N/A	N/A
	2. Formaldehyde	0.005	0.022	See Calculation Section	N/A	N/A
	3. Methanol	0.10	0.438	See Calculation Section	N/A	N/A
	4. Phenol	0.008	0.035	See Calculation Section	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.

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


D-20.3
To Thermal Oil Heaters K7 and K8 Combustion Chamber Flame Zone or to MDF Dryer
Exhaust from PCY-4.1 (Press Hall)
D3C1
D3C2
D3C3
D3C4
D3C5
D3C6
D3C7
Collected Wood Dust To Cyclofilter (CF8.1)
Strands
Heat From Thermal Oil Heater (K7)
Zones #1, 2, 3, & 16
Zones #4 & 15
Zones #5 & 14
Zones #6 & 13
Zones #7 & 12
Zones #8 & 11
Zones #9 & 10
Dried strands to Sifting/Screening Operations
Dryer #3

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: _____ Date: 08/29/24

d.

Sifting/Screening

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___

   Sifting / Screening Operations

   The dried strands will be conveyed to a sifter/screen (SI/SS) to remove fines and to separate the strands by surface area and weighted before being stored in one of three bins. Emissions from the sifter and screen will be ducted to a dust collector (DGSS) that discharges to the atmosphere.

   Screener dust will be conveyed to the OSB Dust Silo (ODS) via cyclofilter (CF19.2). Granulate from the screeners will be conveyed to the OSB Granulate Silo (OGS) via cyclofilter (CF19.1). Dust from the collector will be conveyed to the OSB Dust Silo (ODS) via cyclofilter (CF9.1,)

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sifter and Screen

   Make: CEATEC **Model:** Custom

   Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 121.53 odt/hr

   Manufactured date:

   Proposed installation date: 06/25

   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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Dried Strands/Flakes	121.53 odt/hr	121.53 odt/hr	1,064,603 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Classified Strands/Flakes	1,064,603	oven dried 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):**
N/A

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
SS-2.2	594.521	3719.479	33.610892	-85.981106	100.00	276.74	603	3.28	N/A	92.88	47,120	86

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

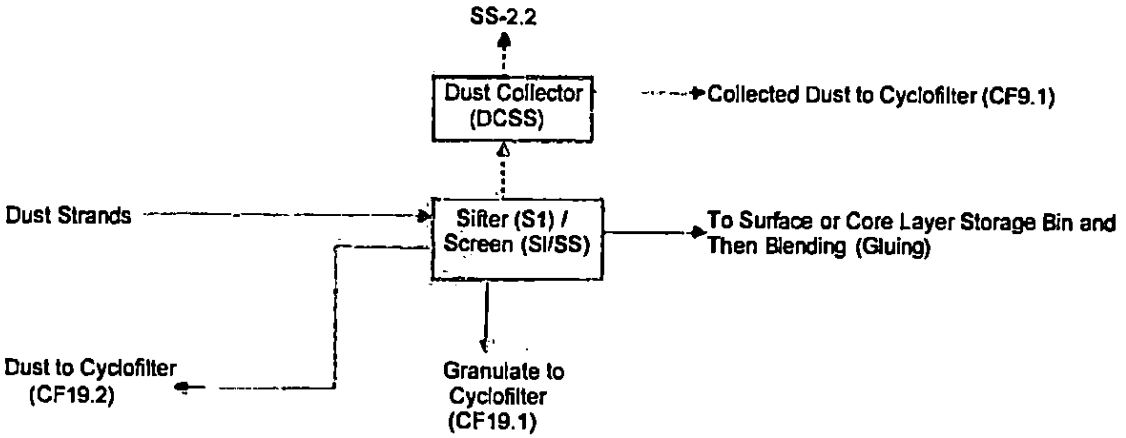
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
SS-2.2	A. PM	0.80	3.50	See Calculation Section	0.80	3.50 tpy
	B. PM_{10}	0.60	2.63	See Calculation Section	0.60	2.63 tpy
	C. $PM_{2.5}$	0.11	0.48	See Calculation Section	0.11	0.48 tpy
	D. VOC	21.33	93.42	See Calculation Section	28.60	125.27 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒ 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

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

e.

Strand Blending (Gluing)

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ___

Strand Blending Operations (Gluing)

The storage bins are designated as either surface, core, or fine core layer bins. From the bins ~~the strands will be conveyed to three blenders (BL1, BL2, BL3) via weigh belts which control~~ MDI resin and wax distribution into the blenders by measuring the weight of the strand material ~~flow across the belts. The resin and wax are metered into the blenders by feeders. The MDI~~ resin will be stored inside sixteen (16) liquid resin tanks. Wax will be stored inside two (2) ~~heated tanks.~~

~~Emissions from the blending operation are ducted to a dust collector (DCB) that discharges to~~ the atmosphere. Dust from the collector will be conveyed to the Boiler dust Silo (ODS) via ~~cyclofilter (CF-9.1).~~

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Blenders (4)

Make: Instalmec **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 121.53odt/hr

Manufactured date: 2023

Proposed installation date: 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Strands/Flakes	121.53 odt/hr	121.53 odt/hr	1,064,603 odt
MDI Resin	9,000	9,000	39,420
Wax	1,500	1,500	6,570

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Blended Strands, Resin, and Wax	1,064,603	oven dried 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):**
N/A

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
BG-2.1	594.425	3719.458	33.610710	-85.982142	100.00	276.74	603	2.95	N/A	86.11	35,340	86

* 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)
BG-2.1	A. PM	0.60	2.68	See Calculation Section	0.60	2.68 tpy
	B. PM10	0.45	1.97	See Calculation Section	0.45	N/A
	C. $PM_{2.5}$	0.08	0.35	See Calculation Section	0.08	N/A
	D. VOC	21.875	95.81	See Calculation Section	20.05	87.83 tpy
	E. HAPs (Total)	11.72	51.38	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.44	1.92	See Calculation Section	N/A	N/A
	2. Methanol	7.66	33.53	See Calculation Section	N/A	N/A
	3. Acetaldehyde	0.119	0.522	See Calculation Section	N/A	N/A
	4. Phenol	0.20	0.88	See Calculation Section	N/A	N/A
	5. MDI	0.013	0.058	See Calculation Section	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.

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

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions 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)
	5. Propionaldehyde	1.30	5.69	See Calculation Section	N/A	N/A
	6. MIBK	0.13	0.59	See Calculation Section	N/A	N/A
	7. Benzene	0.02	0.11	See Calculation Section	N/A	N/A
	8. Xylene	0.06	0.27	See Calculation Section	N/A	N/A
	9. Cumene	1.38	6.06	See Calculation Section	N/A	N/A
	10. Toluene	0.05	0.23	See Calculation Section	N/A	N/A
	11. Styrene	0.06	0.26	See Calculation Section	N/A	N/A
	12. Methylene Chloride	0.05	0.21	See Calculation Section	N/A	N/A
	13. Chloroethane	0.04	0.16	See Calculation Section	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.

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

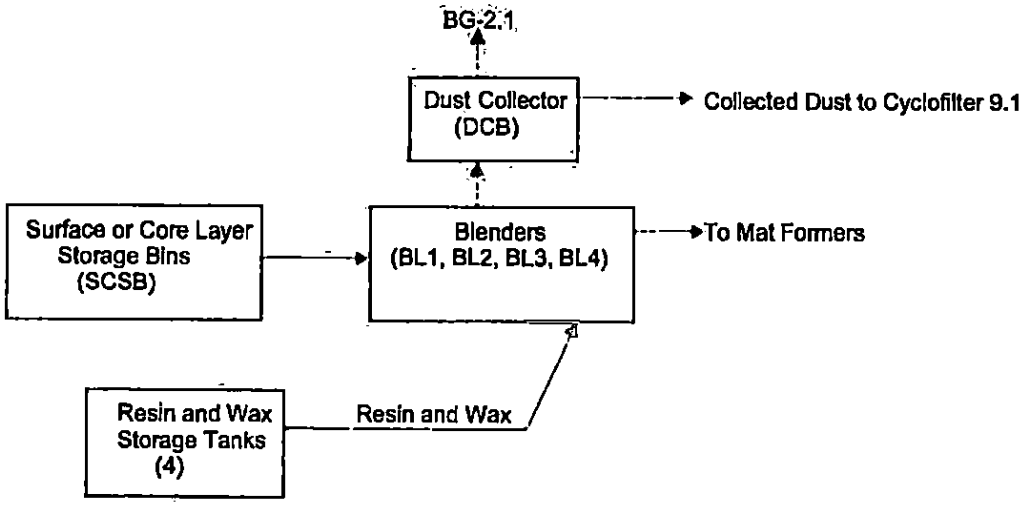
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
	14. Bromoethane	0.05	0.24	See Calculation Section	N/A	N/A
	15. 1,2-Dichloroethane	0.06	0.25	See Calculation Section	N/A	N/A
	16. 1,2,4-Trimethyl-benzene	0.10	0.46	See Calculation Section	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.

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



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

☒Yes ☐No

(if "no", a compliance schedule, 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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 08/29/24

f.

Mat Forming

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___ **Mat Forming Operations**

The blended strands will be transported via rollers to the core or surface layer - formring heads, which are equipped with orientation devices. Orientation of the surface layer in the direction of production will be carried out with the aid of disc orienters, while the core layer is oriented in the transverse direction by means of fan-type rollers.
~~The moving mat screen will be controlled in accordance with the required surface/core layer~~ weight/volume proportion.
Electromagnets after each spreading machine ensure that any metallic foreign objects contained in the mat are removed to protect the press plates.
Emissions from the mat forming line will be ducted to a cyclone (CYMF) that is ducted to dust ~~collector (DCMF) which discharges to the atmosphere via press hall, cyclone (CYP) and~~ wet scrubber (WS) system.
~~Granulate from the cyclone is conveyed to the OSB Granulate Silo (OGS), via cyclofilter~~ (CF-11.1). Dust from the collector is conveyed to the OSB Dust Silo (ODS) via cyclofilter CF-9.1).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Mat Formers (6 Stations - 2 Surface and 4 Core)

Make: Siempelkamp **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 121.53 adt/hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Blended Strands/Flakes	121.53 odt/hr	121.53 odt/hr	1,064,603 odt

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Formed OSB Mat	1,242,536	msf (3/8")

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

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
N/A - Discharges Inside Press Hall												

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

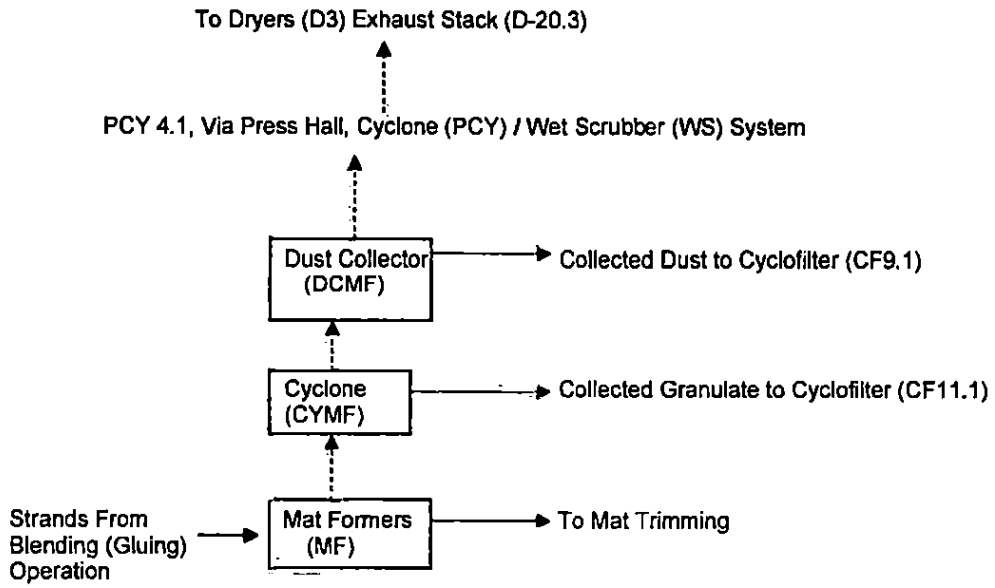
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
	5. Phenol	0.52	2.278	See Calculation Section	N/A	N/A
	6. Propionaldehyde	0.0016	0.007	See Calculation Section	N/A	N/A
	7. Benzene	0.114	0.499	See Calculation Section	N/A	N/A
	8. Xylene	0.0014	0.006	See Calculation Section	N/A	N/A
	9. Toluene	0.10	0.438	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒ 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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

g.

Mat Trimming

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ____ **Mat Trimming Operation**

The continuous formed mat will be cut into desired lengths by a side-trim saw. Waste from the trimming operation will be reused in the process.

Mat-reject will be used as fuel for the thermal oil heaters.

Emissions from the mat trimming operation will be ducted to a cyclone (CYMT) that is ducted to a dust collector (DCMT) that discharges to the atmosphere, via press hall cyclone (CYF) / wet scrubber (WS) system.

Dust from the collector is conveyed to the OSB Duct Silo (ODS), via cyclofilter (CF-9.1).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Mat Trimming (Saws) Operation

Make: Siempelkamp **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 141.842 msf (3/8") / hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Formed OSB Mat	141.842 msf (3/8")/hr	141.842 msf (3/8")/hr	1,242,536

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Trimmed OSB Mat	1,242,536	msf (3/8")

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

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
N/A - Discharges Inside Press Hall												

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

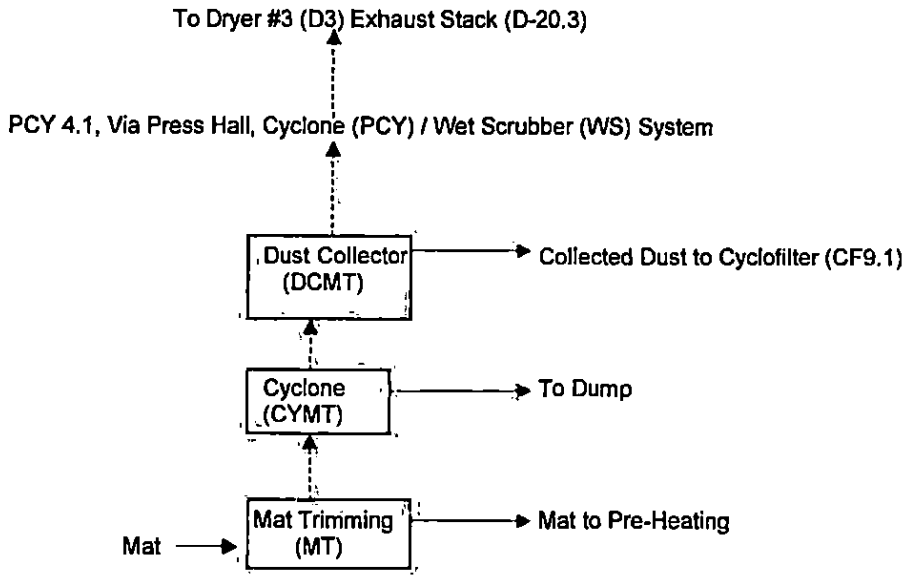
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Discharges	A. PM	0.60	2.63	See Calculation Section	N/A	N/A
Inside Press	B. PM_{10}	0.45	1.97	See Calculation Section	N/A	N/A
Hall	C. $PM_{2.5}$	0.08	0.35	See Calculation Section	N/A	N/A
	D. VOC	3.67	16.07	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒ 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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

h.

Pressing

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ____ **Pressing Operations**

The formed mats will be fed into a mat pre-heater where the mat is steamed. Steaming has a positive affect on the pressing process. The pressing time is reduced, so that the feed speed can be set higher. Additives may be added to achieve special properties of the board such as resistance to fungi or a reduction in flammability. A release agent will be applied to the press plate. This prevents the glue from sticking to the press plate.

After steaming, the mat will enter a continuous press where heat and pressure to cure the resin and convert the mat to the desired thickness.

Emissions from the press hall will be vented to a cyclone (PCY) / wet scrubber (WS) system that discharges to the atmosphere, via Dryer #3 (D3) Exhaust Stack D-20.3.

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** OSB Press

Make: Siempelkamp **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 141,842 mst/a/8760/hr

Manufactured date: 2023

Proposed installation date: 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Trimmed OSB Mat	141.842 msf (3/8")/hr	141.842 msf (3/8")/hr	1,242,536 msf (3/8")

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Pressed OSB Mat	1,242,536	msf (3/8")

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

Press is subject to Part 63, Subpart DDDD. The wet scrubber will be used to comply with Tables 1B and 2(4).

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
PCY-4.1	594.463	3719.334	33.609587	-85.981749	100.00	N/A	603	5.25	N/A	90.65	117,800	113
D-20.3	594.557	3719.516	33.611223	-85.980724	230.00	276.74	603	13.78	N/A	115.19	1,030,752	125
NOTE: PCY-4.1 discharges to the atmosphere at D-20.3. Stack conditions for PCY-4.1 are prior to being vented to the dryer #3 (D3) stack (D-20.3).												

*** 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)
PCY-4.1*	A. PM	0.92	4.03	See Calculation Section	1.20	N/A
	B. PM10	0.92	4.03	See Calculation Section	1.20	N/A
	C. $PM_{2.5}$	0.86	3.77	See Calculation Section	1.09	N/A
	D. VOC	5.50	24.09	See Calculation Section	10.33	20 ppmvd (MACT) 45.25 tpy
	E. NOx	6.24	27.34	See Calculation Section	6.24	27.34 tpy
	F. CO	12.77	55.91	See Calculation Section	12.77	55.91 tpy
	G. PM_{cond}	4.06	17.78	See Calculation Section	4.06	17.78 tpy
	G. HAPs (Total)	5.13	22.46	See Calculation Section	N/A	20 ppmvd as THC (Carbon)
	1. Methanol (MACT)	2.55	11.18	See Calculation Section	N/A	N/A
	2. Formaldehyde (MACT)	1.02	4.47	See Calculation Section	N/A	N/A

*** - From Press Operations**
**** - PCY-4.1 Totals**

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

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)
	3. Phenol (MACT)	0.32	1.40	See Calculation Section	N/A	N/A
	4. Acetaldehyde (MACT)	0.21	0.93	See Calculation Section	N/A	N/A
	5. Propionaldehyde (MACT)	0.06	0.25	See Calculation Section	N/A	N/A
	6. MIBK	0.28	1.23	See Calculation Section	N/A	N/A
	7. Benzene	0.006	0.028	See Calculation Section	N/A	N/A
	8. Xylene	0.11	0.49	See Calculation Section	N/A	N/A
	9. Toluene	0.10	0.42	See Calculation Section	N/A	N/A
	10. Styrene	0.11	0.48	See Calculation Section	N/A	N/A
	11. Methylene Chloride	0.09	0.39	See Calculation Section	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.

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

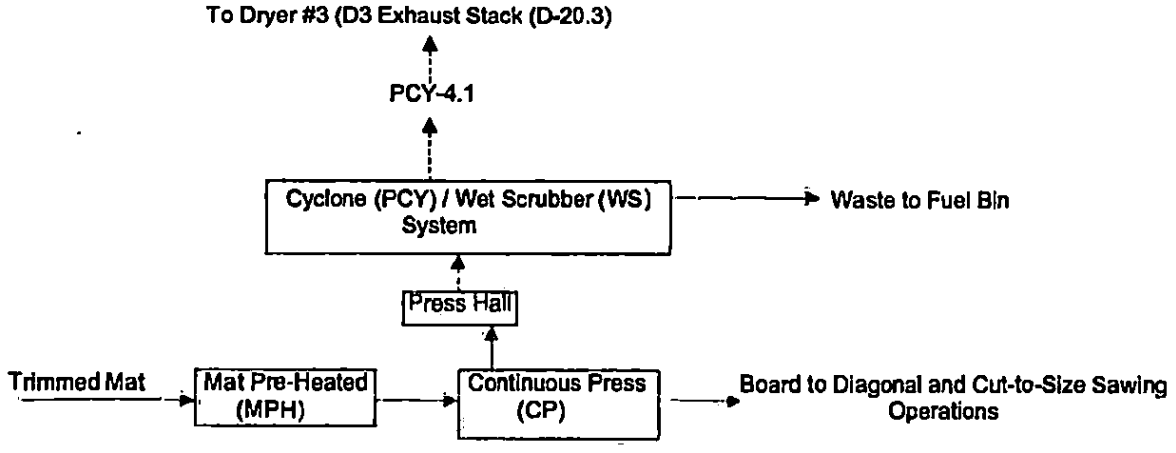
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
	12. Chloroethane	0.065	0.29	See Calculation Section	N/A	N/A
	13. Bromomethane	0.10	0.43	See Calculation Section	N/A	N/A
	14. 1,2-Dichloroethane	0.10	0.44	See Calculation Section	N/A	N/A
	15. MDI	0.008	0.035	See Calculation Section	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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



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

☒ 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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

(i).

Finishing
(Diagonal and Cut-To-Size Sawing)

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ____

Finishing Operations (Diagonal and Cut-To-Size Sawing)

The board exiting the press will be cut to size using diagonal and cut-to-size saws (DS, CTS). Emissions from the diagonal saw cutting operation will be ducted to cyclone (CYDS) which is ~~ducted to a dust collector (DCDS) which discharges to the atmosphere via Press Hall, Cyclone (PCY)/Wet Scrubber (WS) System and Dryer #3 (D3) exhaust stack D-20.3. Emissions from the~~ cut-to-size sawing operation will be ducted to a cyclone (CYCTS) that is ducted to a dust collector (DCCTS) which discharges to the atmosphere via press hall, cyclone ((PCY)/W et Scrubber (WS) system and dryer #3 (D3) exhaust stack D-20.3. Off-specification board will be sent to the reject bin for further reuse. Cut board will be transported to the sanding line. Granulate from the cyclones will be conveyed to the OSB Granulate Silo (OGS) via cyclofilter ~~(CF-18.1). Dust from the collectors will be conveyed to the OSB Dust Silo (ODS) via cyclofilter~~ **(CF-18.2).**

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Diagonal and Cut-To-Size Saws

Make: Diagonal Saws - Kontra Cut-To-Size Saws Xylo **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 141.842 msf (3/8")/hr

Manufactured date:

Proposed installation date: 6/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Pressed OSB Board	141.842 msf (3/8")/hr	141.842 msf (3/8") / hr	1,242,536 msf (3/8")

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Cut OSB Board	1,242,536	msf (3/8")

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

N/A

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

(●) Yes ( ) No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
N/A - Discharges to Press Hall												

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

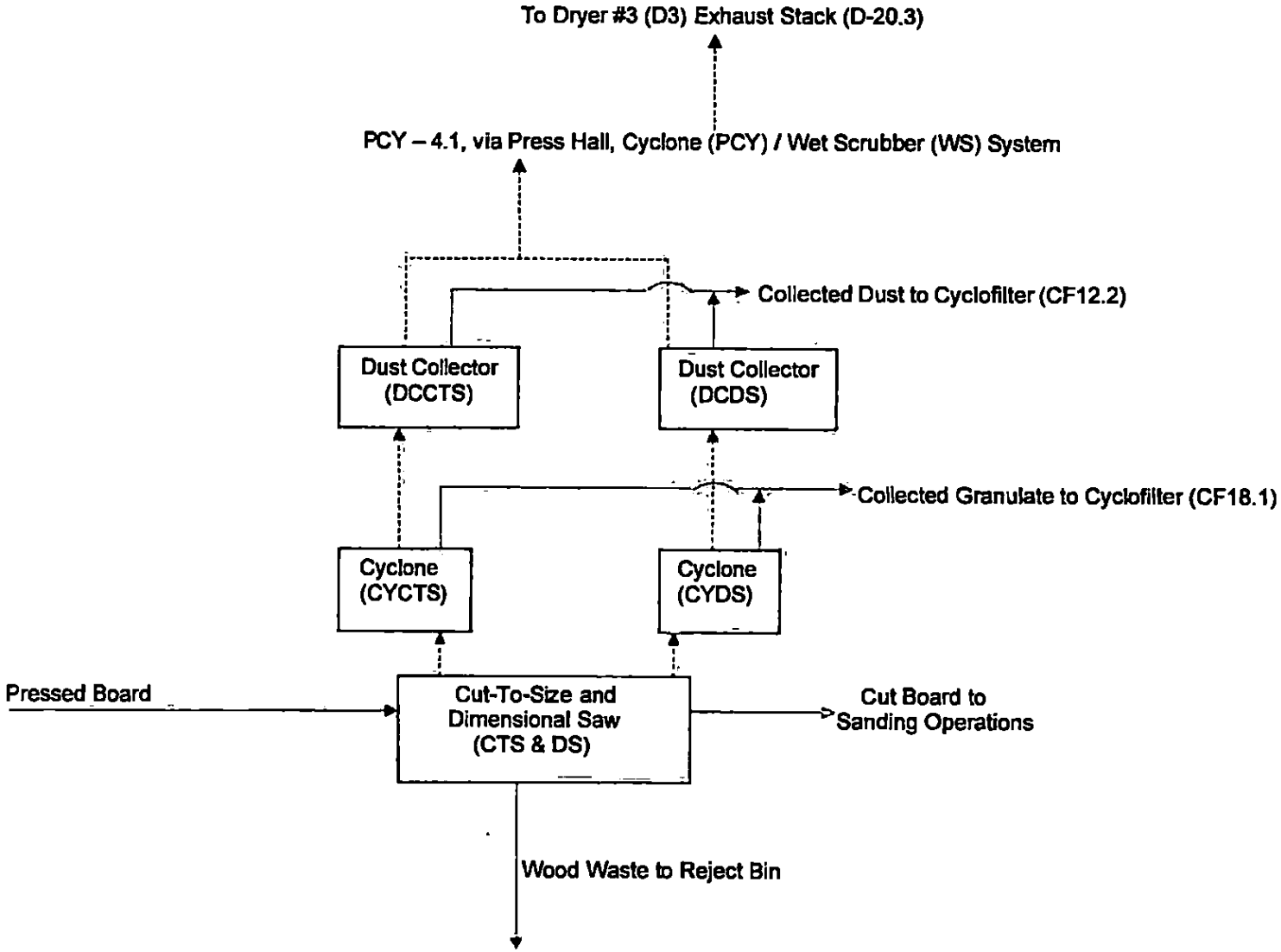
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Discharges Inside Press Hall	A. PM	0.86	3.77	See Calculation Section	N/A	N/A
	B. PM_{10}	0.65	2.85	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.12	0.53	See Calculation Section	N/A	N/A
	D. VOC	12.04	63.33	See Calculation Section	N/A	N/A
	E. HAPs	8.04	35.23	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.194	0.85	See Calculation Section	N/A	N/A
	2. Methanol	7.85	34.38	See Calculation Section	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.

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


To Dryer #3 (D3) Exhaust Stack (D-20.3)
PCY – 4.1, via Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Collected Dust to Cyclofilter (CF12.2)
Dust Collector (DCCTS)
Dust Collector (DCDS)
Collected Granulate to Cyclofilter (CF18.1)
Cyclone (CYCTS)
Cyclone (CYDS)
Pressed Board
Cut-To-Size and Dimensional Saw (CTS & DS)
Cut Board to Sanding Operations
Wood Waste to Reject Bin

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

(j).

Finishing
(Sanding)

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

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 ___

Finishing Operations (Sanding)

Cut board will be transported to the sanding line. Emissions from the sanding line will be ducted to a dust collector (DCSA) which discharges to the atmosphere via finishing hall, press hall, cyclone (PCY) / wet scrubber (WS) system and Dryer #3 (D3) exhaust stack D-20.3.

Dust from the collectors will be conveyed to the OSB Dust Silo (ODS) via cyclofilter (CF-10.1).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Sanding Operations

Make: Steinemann **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 141.842 msf (3/8") / hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Cut OSB Board	141.842 msf (3/8")/hr	141.842 msf (3/8") / hr	1,242,536 msf (3/8")

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Sanded OSB Board	1,242,536	msf (3/8")

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

N/A

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

(●) Yes ( ) No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
N/A - Discharges to Press Hall												

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

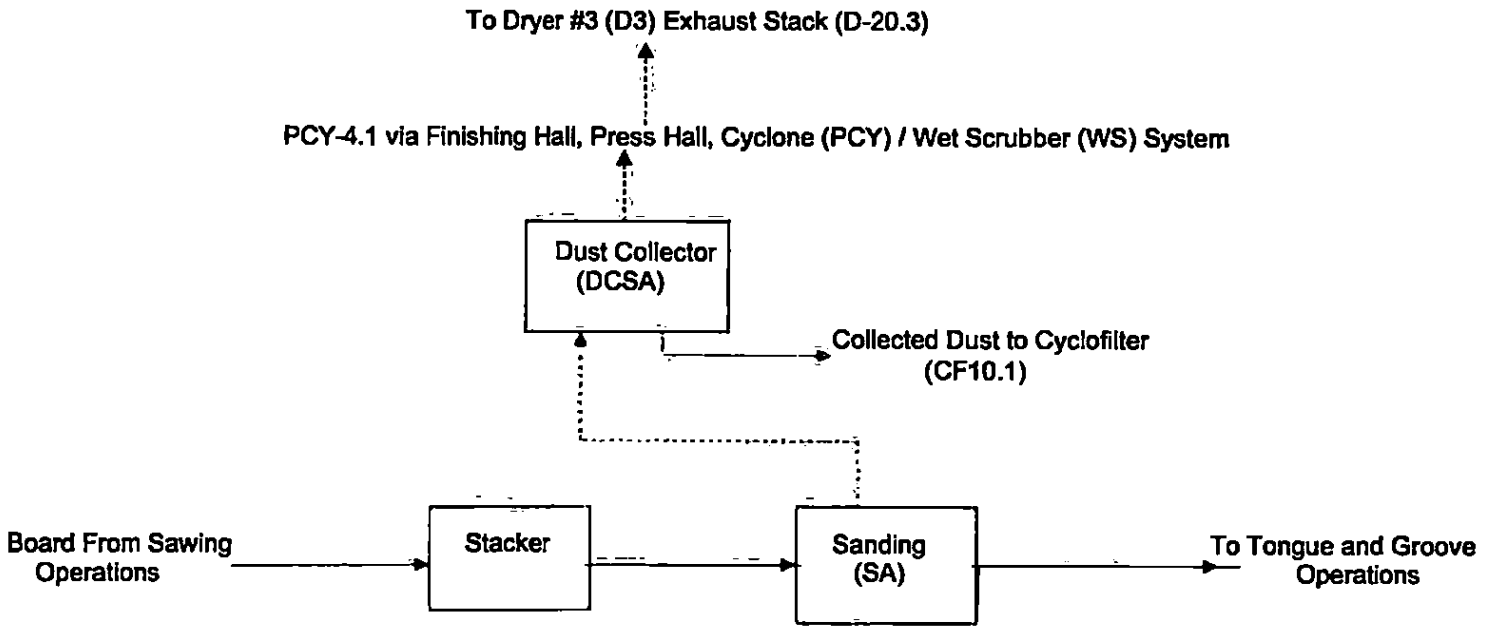
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Discharges Inside Press Hall	A. PM	1.39	6.09	See Calculation Section	N/A	N/A
	B. PM_{10}	1.05	4.60	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.19	0.88	See Calculation Section	N/A	N/A
	D. VOC	9.67	42.35	See Calculation Section	10.33	45.25 tpy
	E. HAPs	0.426	1.86	See Calculation Section	N/A	N/A
	1. Formaldehyde	0.142	0.62	See Calculation Section	N/A	N/A
	2. Methanol	0.284	1.24	See Calculation Section	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.

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


To Dryer #3 (D3) Exhaust Stack (D-20.3)
PCY-4.1 via Finishing Hall, Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector (DCSA)
Collected Dust to Cyclofilter (CF10.1)
Board From Sawing Operations
Stacker
Sanding (SA)
To Tongue and Groove Operations

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

(k).

Finishing
(Tongue and Groove)

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___

Finishing Operations (Tongue and Groove)

Sanded board will be conveyed to one of three tongue and groove lines as customer dictates. Emissions from the three tongue and groove operations will be ducted to individual cyclones ~~(GYTG1, GYTG2, GYTG3) which are ducted to individual dust collectors (DCTG1, DCTG2,~~ DCTG3) which discharge to the atmosphere via press hall, cyclone (PCY) / wet scrubber (WS) system. ~~Lines #1 and #2 will be installed immediately. Line #3 will be installed at a later date.~~

Granulate from the cyclones will be conveyed to the OSB Granulate Silo (OGS) via cyclofilter ~~(CF-18.1). Dust from the collectors will be conveyed to the OSB Dust Silo (ODS) via cyclofilter~~ (CF-18.2).

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Tongue and Groove Machines #1, #2 and #3

Make: Xylo **Model:** Custom

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 141.842 msf (3/8") / hr

Manufactured date: 2023 **Proposed installation date:** 06/25

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

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Sanded OSB Board	141.842 msf (3/8")/hr	141.842 msf (3/8") / hr	1,242,536 msf (3/8")

6. Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

7. Products of process or unit:

Products	Quantity/year	Units of production
Finished OSB Board	1,242,536	msf (3/8")

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

N/A

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

(●) Yes ( ) No (Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
N/A - Discharges to Press Hall												

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

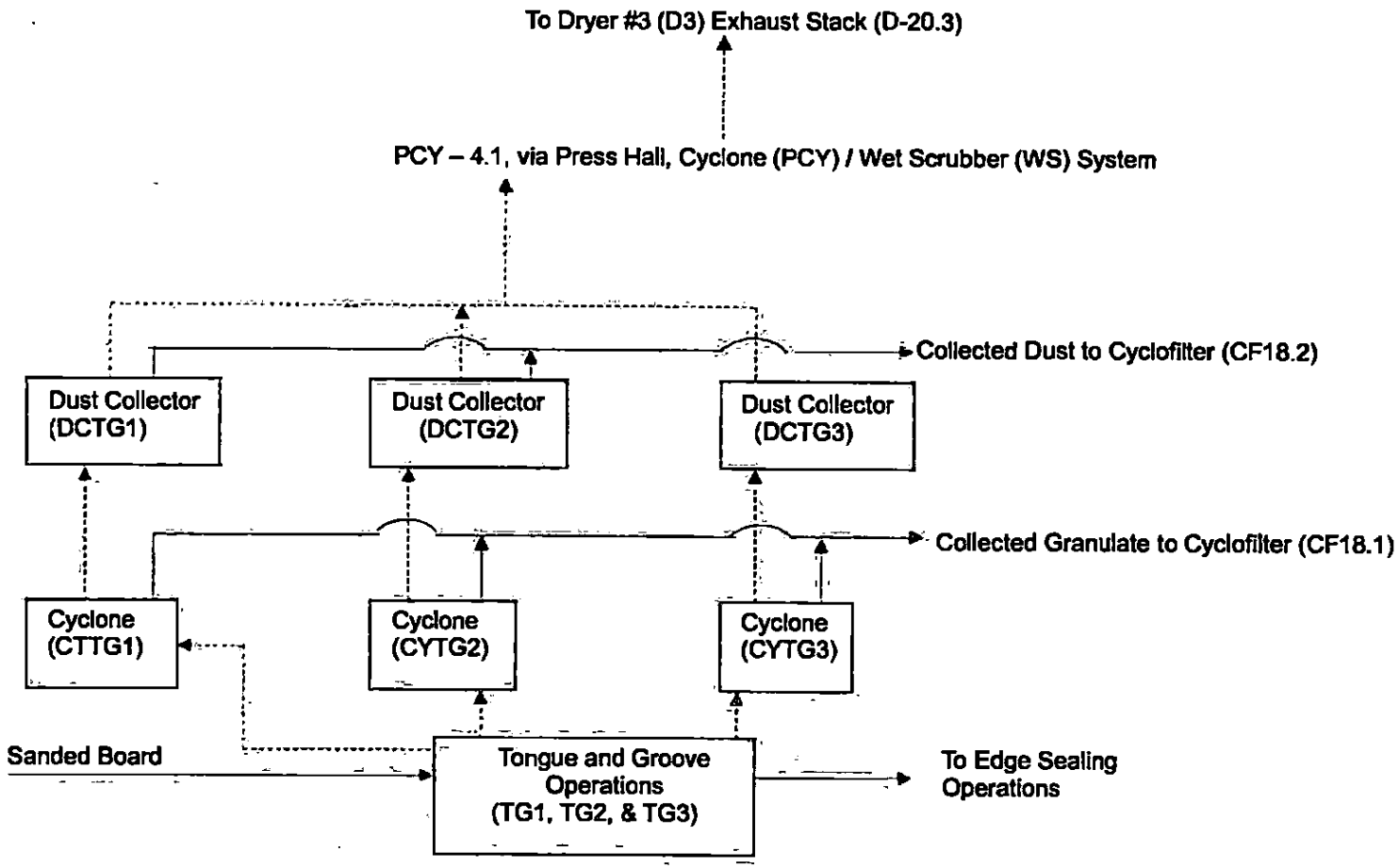
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Discharges Inside Press Hall	A. PM	1.20	5.26	See Calculation Section	N/A	N/A
	B. PM10	0.90	3.94	See Calculation Section	N/A	N/A
	C. $PM_{2.5}$	0.15	0.66	See Calculation Section	N/A	N/A
	D. VOC	1.00	4.38	See Calculation Section	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.

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


To Dryer #3 (D3) Exhaust Stack (D-20.3)
PCY – 4.1, via Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Collected Dust to Cyclofilter (CF18.2)
Dust Collector (DCTG1)
Dust Collector (DCTG2)
Dust Collector (DCTG3)
Collected Granulate to Cyclofilter (CF18.1)
Cyclone (CTTG1)
Cyclone (CYTG2)
Cyclone (CYTG3)
Sanded Board
Tongue and Groove Operations (TG1, TG2, & TG3)
To Edge Sealing Operations

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

I.

Wood Dust Transfer and Storage

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

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1. **Name of facility or organization:** Kronospan LLC

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 ___

   Wood Dust Transfer and Storage

   See Attached

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Wood Waste Handling Operations

   Make: N/A **Model:** N/A

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

   Manufactured date: 2023 **Proposed installation date:** 06/25

   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

Wood Dust Transfer and Storage

Collected wood dust from strander dust collectors (DCST1, DCST2, AND DCST3) will be conveyed to a cyclofilter (CF14.1) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the dryer dust collectors will be conveyed to cyclofilter (CF8.1) and dropped into the OSB Dust Sio (ODS).

Collected wood dust from the sifter / screening dust collector (DCSS), gluing / blending dust collector (DCGB), forming line dust collector (DCMF) and mat trimming dust collector (DCMT) will be conveyed to a cyclofilter (CF9.1) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the screeners will be conveyed to a cyclofilter (CY19.2) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the diagonal saw dust collector (DCDS), cut-to-size dust collector (DCCTS) and tongue and groove dust collectors (DCTG1, DCTG2, and DCTG3) will be conveyed to a cyclofilter (CF18.2) and dropped into the OSB Dust Silo (ODS).

Collected wood dust from the sanding dust collector (DCSA) will be conveyed to a cyclofilter (CF10.1) and dropped into the OSB Dust Silo (ODS).

Collected wood waste at the OSB Dust Silo (ODS) is conveyed to a cyclofilter (CF12.1) and dropped into the OSB Boiler Dust Silo (OBDS).

Some of the collected wood dust in the OSB Boiler Dust Silo (OBDST) is conveyed to a cyclofilter (CF12.2) and dropped into MDF Dust Silo (MDS)

Some of the wood dust from the MDF Dust Silo (MDS) is conveyed to a cyclofilter (CF13.1) and dropped into the OSB Boiler dust Silo (OBDS).

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Dust	Unknown	Unknown	Unknown

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Wood Dust	Unknown	Unknown

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

N/A

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
CF-8.1	594.671	3719.482	33.610903	-85.979491	98.43	337.50	603	0.66	N/A	98.43	1,473	86
CF-9.1	594.669	3719.481	33.610898	-85.979512	98.43	337.50	603	0.66	N/A	100.35	2,062	86
CF-10.1	594.667	3719.481	33.610892	-85.979534	98.43	337.50	603	0.66	N/A	100.35	2,062	86
CF-12.1	594.770	3719.462	33.610717	-85.978432	98.43	337.50	603	0.98	N/A	91.03	4,123	86
CF-12.2	594.944	3719.473	33.610799	-85.976551	98.43	337.50	603	0.98	N/A	91.03	4,123	86
CF-13.1	594.772	3719.463	33.610724	-85.978403	98.43	337.50	603	0.98	N/A	71.52	3,240	86
CF-14.1	594.672	3719.479	33.610878	-85.979482	98.43	337.50	603	0.66	N/A	100.35	2,062	86
CF-18.2	594.670	3719.478	33.610873	-85.979503	98.43	337.50	603	0.98	N/A	71.52	3,240	86
CF19.2	594.668	3719.478	33.610868	-85.979525	98.43	337.50	603	0.66	N/A	100.35	2,062	86

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

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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)
CF-8.1	A. PM	0.02	0.11	See Calculation Section	0.02	0.11 tpy
	B. PM10	0.02	0.07	See Calculation Section	0.02	0.07 tpy
	C. $PM_{2.5}$	0.003	0.01	See Calculation Section	0.003	0.01 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-9.1	A. PM	0.03	0.15	See Calculation Section	0.03	0.15 tpy
	B. PM10	0.02	0.10	See Calculation Section	0.02	0.10 tpy
	C. $PM_{2.5}$	0.005	0.02	See Calculation Section	0.005	0.02 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-10.1	A. PM	0.03	0.15	See Calculation Section	0.03	0.15 tpy
	B. PM10	0.03	0.13	See Calculation Section	0.03	0.13 tpy
	C. $PM_{2.5}$	0.005	0.02	See Calculation Section	0.005	0.02 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions 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)
CF-12.1	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-12.2	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-13.1	A. PM	0.05	0.24	See Calculation Section	0.05	0.24 tpy
	B. PM10	0.04	0.16	See Calculation Section	0.04	0.16 tpy
	C. $PM_{2.5}$	0.008	0.04	See Calculation Section	0.008	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions 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)
CF-14.1	A. PM	0.03	0.15	See Calculation Section	0.03	0.15 tpy
	B. PM10	0.02	0.10	See Calculation Section	0.02	0.10 tpy
	C. $PM_{2.5}$	0.005	0.02	See Calculation Section	0.005	0.02 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-18.2	A. PM	0.05	0.24	See Calculation Section	0.05	0.24 tpy
	B. PM10	0.04	0.16	See Calculation Section	0.04	0.16 tpy
	C. $PM_{2.5}$	0.008	0.04	See Calculation Section	0.008	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-19.2	A. PM	0.03	0.15	See Calculation Section	0.03	0.15 tpy
	B. PM10	0.03	0.13	See Calculation Section	0.03	0.13 tpy
	C. $PM_{2.5}$	0.005	0.02	See Calculation Section	0.005	0.02 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

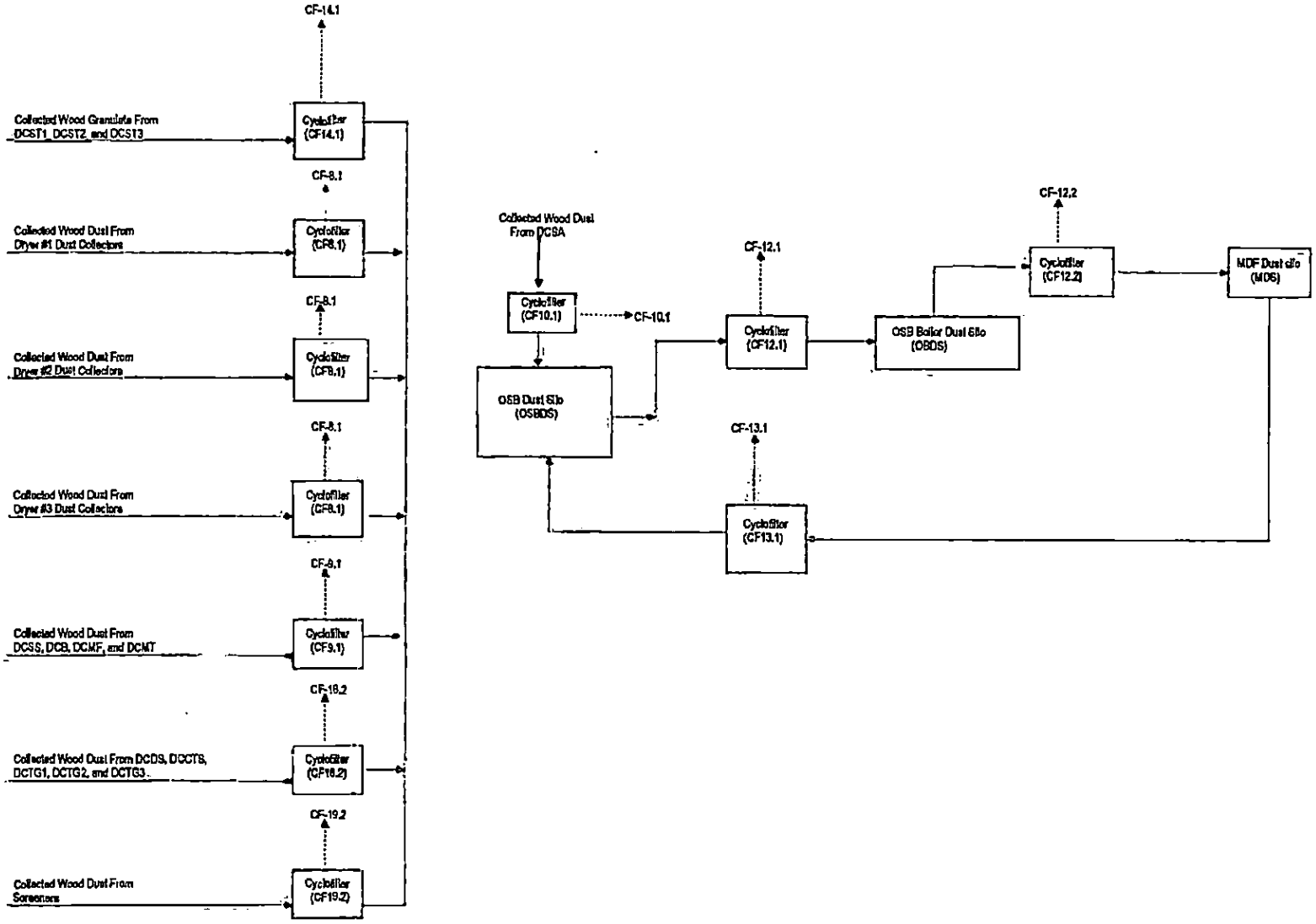
11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.**

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Total	A. PM	0.41	1.81	See Calculation Section	0.41	1.27 tpy
	B. PM10	0.32	1.27	See Calculation Section	0.30	1.27 tpy
	C. $PM_{2.5}$	0.06	0.25	See Calculation Section	0.06	0.25 tpy
	D. VOC	5.76	25.20	See Calculation Section	5.76	29.20 tpy

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



Wood Dust Handling

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24

m.

Wood Granulate Transfer and Storage

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
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1. **Name of facility or organization:** Kronospan LLC

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 ___

   Wood Granulate Transfer and Storage

   See Attached

3. **Type of unit or process (e.g., calcining kiln, cupola furnace):** Wood Waste Handling Operations

   Make: N/A **Model:** N/A

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

   Manufactured date: 2023 **Proposed installation date:** 06/25

   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

Wood Granulate Transfer and Storage

Bark from the log handling and processing operation will be conveyed to the OSB Boiler Granulate Silo (OBGS) and used as fuel for thermal oil heaters K7 and K8.

Collected wood granulate from the SL / CL Screeners will be conveyed to a cyclofilter (CF19.1) and dropped into the OSB Granulate Silo (OGS).

Collected wood granulate from the forming operation dust collector (DCMF) will be conveyed to a cyclofilter (CF11.1) and dropped into the OSB Granulate Silo (OGS).

Collected wood granulate from the diagonal saw cyclone (CYDS), cut-to-size saw cyclone (CYCTS), and tongue and groove cyclones (CYTG1, CYTG2, and CYTG3) will be conveyed to a cyclofilter (CF18.1) and dropped into the OSB Granulate Silo (OGS).

Some of the collected wood granulate in the OSB Granulate Silo (OGS) will be conveyed to a cyclofilter (CF16.2) and dropped into the Particleboard Flaker Silo (PBFS).

Some granulate from the MDF Granulate Silo (MGS) will be conveyed to a cyclofilter (CF15.1) and dropped into the OSB Boiler Granulate Silo (OBGS).

Some granulate from the Particleboard Core Layer Dry Silo (CFBCLS) will be conveyed to a cyclofilter (CF16.1) and dropped into the OSB Core Layer Silo (OCLS).

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Granulate	Unknown	Unknown	Unknown

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 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 (specify)						

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

Products	Quantity/year	Units of production
Wood Granulate	Unknown	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):**

N/A

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
CF-11.1	594.667	3719.487	33.610950	-85.979631	98.43	337.50	603	0.66	N/A	100.35	2,062	86
CF-15.1	594.779	3719.465	33.610742	-85.978334	98.43	337.50	603	0.98	N/A	91.03	4,123	86
CF-16.1	594.533	3719.509	33.611160	-85.980980	98.43	337.50	603	0.98	N/A	91.03	4,123	86
CF-16.2	594.845	3719.621	33.612145	-85.977602	98.43	337.50	603	0.98	N/A	91.03	4,123	86
CF-18.1	594.666	3719.491	33.610985	-85.979544	98.43	337.50	603	0.98	N/A	71.52	3,240	86
CF-19.1	594.667	3719.489	33.610967	-85.979538	98.43	337.50	603	0.98	N/A	91.03	4,123	86

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

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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)
CF-11.1	A. PM	0.03	0.15	See Calculation Section	0.03	0.15 tpy
	B. PM10	0.03	0.13	See Calculation Section	0.03	0.13 tpy
	C. $PM_{2.5}$	0.005	0.02	See Calculation Section	0.005	0.02 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-15.1	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-16.1	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

11. **Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions 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)
CF-16.2	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-18.1	A. PM	0.05	0.24	See Calculation Section	0.05	0.24 tpy
	B. PM10	0.04	0.16	See Calculation Section	0.04	0.16 tpy
	C. $PM_{2.5}$	0.008	0.04	See Calculation Section	0.008	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy
CF-19.1	A. PM	0.07	0.30	See Calculation Section	0.07	0.30 tpy
	B. PM10	0.05	0.21	See Calculation Section	0.05	0.21 tpy
	C. $PM_{2.5}$	0.01	0.04	See Calculation Section	0.01	0.04 tpy
	D. VOC	0.64	2.80	See Calculation Section	0.64	2.80 tpy

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

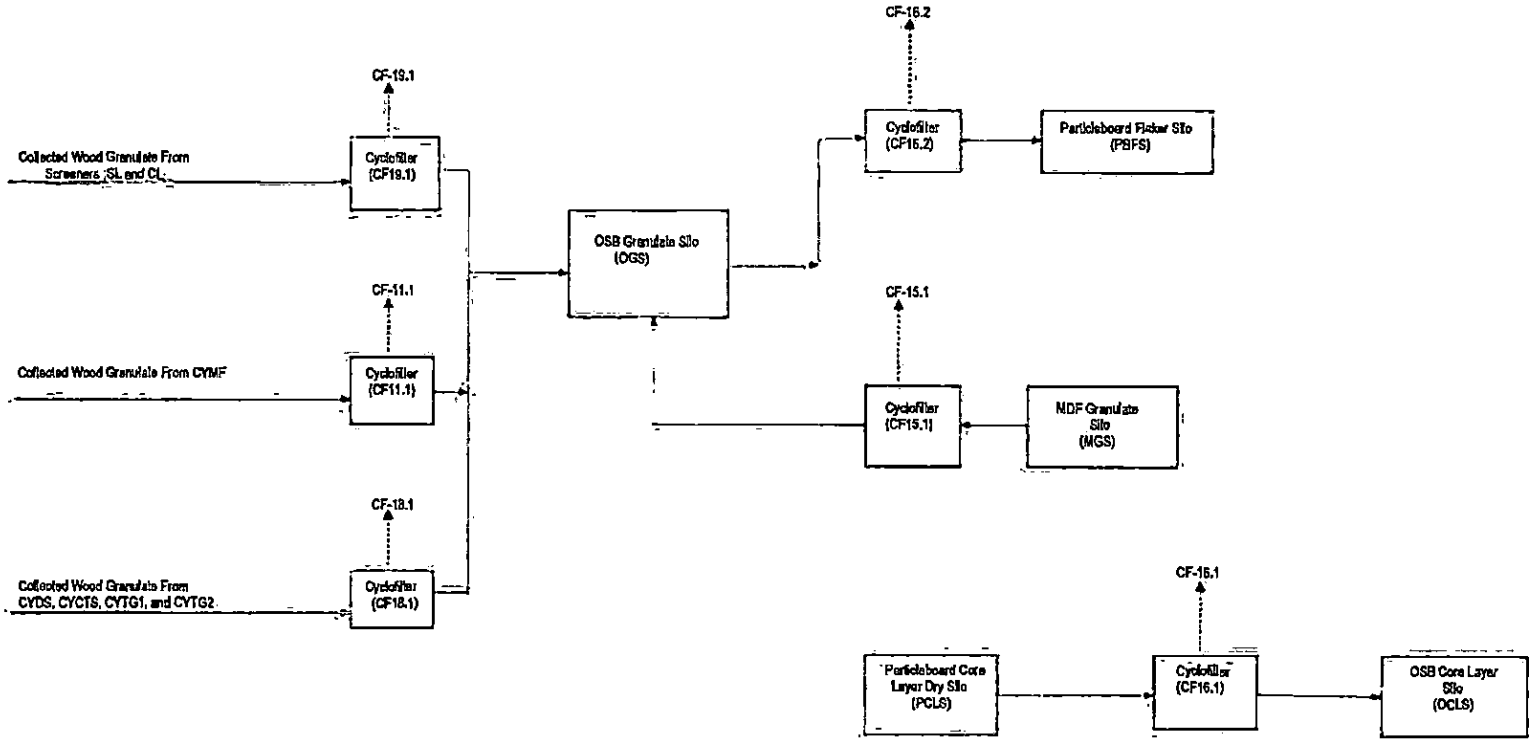
11. Air contaminants emitted: Basis of estimate (material balance, stack test, emission factor, etc.) must be clearly indicated on calculations appended to this form. Fugitive emissions must be included and calculations must be appended.

Emission Point	Pollutants	Potential Emissions			Regulatory Emission Limit	
		(lb/hr)	(tons/yr)	Basis of Calculation	(lb/hr)	(units of standard)
Total	A. PM	0.37	1.60	N/A	0.37	1.60 tpy
	B. PM10	0.27	1.13	N/A	0.27	1.13 tpy
	C. $PM_{2.5}$	0.05	0.22	N/A	0.05	0.22 tpy
	D. VOC	3.84	16.80	N/A	3.84	16.80 tpy

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



Wood Granulate Handling

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

List storage piles or other facility (if any): N/A

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: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 08/29/24

2.

Surface Coating (109 Form)

PERMIT APPLICATION
FOR
VOLATILE ORGANIC COMPOUND (VOC)
SURFACE COATING EMISSION SOURCES

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of firm or organization:** Kronospan LLC

2. **Identification Name or Number given to this process:** Edge Sealing Operation

3. **Type of surface coating process:**

- ☐ Can coating
- ☐ Coil coating
- ☐ Metal furniture coating
- ☐ Surface coating of large appliances
- ☐ Misc. metal parts & products
- ☑ Other (specify): Wood Products Edge Sealing
- ☐ Flatwood paneling coating
- ☐ Paper, fabric and vinyl coating
- ☐ Magnet wire coating
- ☐ Automobile and light duty truck manufacturing

4. **Briefly describe the operation of this surface coating process in your facility:**

Finished board will be conveyed to the sealing, stenciling, and strapping areas.

Non-HAP, water based paints will be used in the edge sealing and stenciling operations. The edge sealing will occur in one of three booths, (FES1, FES2, and FES3) that vent inside the building.

5. **Normal operating schedule:**

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

Peak production season (if any): N/A

6. **Coating material used in unit or process (as applied). Do not include diluents added to coatings (see item 7).**

Coating Material	Coating Method	Max. gal/hr.	Total gal/yr.	Density lbs/gal	% wt Solid	% wt Water	% wt VOC	VOC's applied lbs/year
Edge Sealer	Spray	38.88	340.589	8.20	35.00	64.99	0.01	279

7. **Description of organic liquid diluents (coating thinners & additives) added to the surface coatings:**

Diluents	Amt. added per gallon	Coating material	Total gal/yr.	Density lbs/gal	% wt Water	% wt VOC	VOC's lbs/year
N/A							
					Total (pounds/year)		
					Total (tons/year)		

8. **Description of all organic liquid solvents used for wash or clean up:**

Solvents	Total gal/yr.	Density lbs/gal	% wt Water	% wt VOC	VOC's lbs/year
N/A					
			Total (pounds/year)		
			Total (tons/year)		

281

9. After coating, materials are: ☐Oven dried ☑Air dried ☐Warm air tunnel dried

If oven or warm air tunnel dried, the total fuel heat input is (exclude fuels used by indirect heating equipment previously described on ADEM Form 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/ft³				
L. P. Gas		Btu/ft³				
Wood		Btu/lb				
Other (specify)						

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 - N/A (Discharges Inside Building)							
	UTM Coordinates		Height Above Grade (Ft)	Base Elevation (Ft)	Diameter (Ft)	Gas Exit Velocity (Ft/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)						

* 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)
F-ES1	A. PM	0.033	0.147	Material Balance	0.033	0.147 tpy
	B. PM10	0.017	0.074	Material Balance	0.017	0.074 tpy
	C. $PM_{2.5}$	0.017	0.074	Material Balance	0.017	0.074 tpy
	D. VOC	0.011	0.047	Material Balance	0.011	0.047 tpy
F-ES2	A. PM	0.083	0.147	Material Balance	0.033	0.147 tpy
	B. PM10	0.017	0.073	Material Balance	0.017	0.073 tpy
	C. $PM_{2.5}$	0.017	0.073	Material Balance	0.017	0.073 tpy
	D. VOC	0.011	0.047	Material Balance	0.011	0.047 tpy

12. Is there any emission control equipment on this unit or process?

[ ] yes [x] no (if "yes", complete ADEM Form 110)

13. Does this process have particulate filters?

[x] yes [ ] no

14. For each regulated pollutant, describe any limitation on source operation which affects emissions or any work practice standard (attach additional pages if necessary):

40 CFR Part 63, Subpart DDDD, Table 3(5); Use Non-HAP coatings.

15. Is this surface coating process in compliance with all applicable air pollution rules and regulations?

[x] yes [ ] no (if "no", complete ADEM Form 437)

16. For existing sources only, include a chronological history of the process, including original installation date, modification dates(s), and detailed description of the modifications(s).

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 05/01/2025

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)
F-ES3	A. PM	0.033	0.147	Material Balance	0.033	0.147 tpy
	B. PM10	0.017	0.074	Material Balance	0.017	0.073 tpy
	C. $PM_{2.5}$	0.017	0.074	Material Balance	0.017	0.073 tpy
	D. VOC	0.011	0.047	Material Balance	0.011	0.047 tpy
Total	A. PM	0.099	0.441	Material Balance	0.099	0.441 tpy
	B. PM10	0.051	0.219	Material Balance	0.051	0.219 tpy
	C. $PM_{2.5}$	0.051	0.219	Material Balance	0.051	0.219 tpy
	D. VOC	0.033	0.141	Material Balance	0.033	0.141 tpy

12. Is there any emission control equipment on this unit or process?

[ ] yes [x] no (if "yes", complete ADEM Form 110)

13. Does this process have particulate filters?

[x] yes [ ] no

14. For each regulated pollutant, describe any limitation on source operation which affects emissions or any work practice standard (attach additional pages if necessary):

N/A

15. Is this surface coating process in compliance with all applicable air pollution rules and regulations?

[x] yes [ ] no (if "no", complete ADEM Form 437)

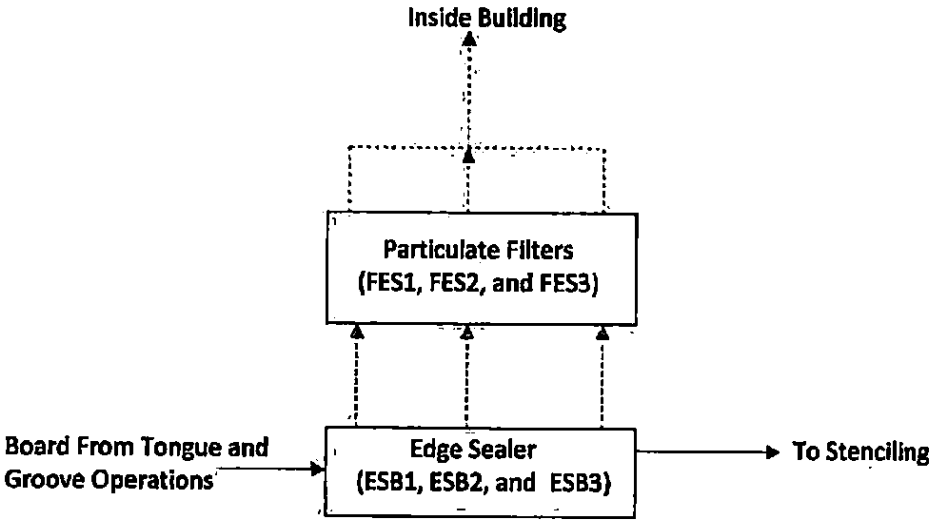
16. For existing sources only, include a chronological history of the process, including original installation date, modification dates(s), and detailed description of the modifications(s).

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 04/01/24

Using a flow diagram, illustrate locations of air contaminant releases so that emission points under item 10 can be identified:

Flow diagram



3.

CEMs (438 Form)

a. COMs (K7)
b. COMs (K8)
c. CEMs (K7)
d. CEMs (K8)
e. COMs (K9, K10, K11, and K12)
f. COMs (PCY/WS)

a.

COMs (K7)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☒ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

Name of manufacturer: Land Instruments International

Model number: Landmark III

Serial number: Unknown

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: TRACE Environmental Software

Serial number: N/A - TRACE Environmental Software talks to PLC

Model number: Allen Bradley L32E PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust Duct for K7

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Computer DAS system triggers the daily calibration check. The Landmark III raises a reflector for 180 seconds and the first 80 seconds the DAS records the zero value. An attenuator folds into the light path for 80 seconds and the DAS records the span value.

7. Indicate CEM calibration/maintenance schedule:

Every quarter the opacity blower motor filter is replaced keeping the optical lenses clean from particulate and heat damage from the source. An opacity reading is recorded before and after each lens is cleaned. the MKII is put into the filter audit mode and the reflective mirror is cleaned and the zero reading is recorded. Three certified audit filters are consecutively placed in the light path 5 times and recorded.

8. Check which program(s) apply to the unit with the monitor:

■ NSPS	☐ SIP	☐ PSD	☐ BIF
☒ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: Zero To: 100%

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications #1

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☐ YES ☑ NO

If yes, what type?

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 04/24/2024

b.

COMs (K8)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☒ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Flow Rate
- ☐ VOCs
- ☐ Other (explain): _____

3. CEMS Manufacturer's Information:

Name of manufacturer: Land Instruments International

Model number: Landmark III

Serial number: Unknown

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: TRACE Environmental Software

Serial number: N/A - TRACE Environmental Software talks to PLC

Model number: Allen Bradley L32E PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust Duct for K8

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Computer DAS system triggers the daily calibration check. The 4500 Landmark III raises a reflector for 180 seconds and the first 80 seconds the DAS records the zero value. An attenuator folds into the light path for 80 seconds and the DAS records the span value.

7. Indicate CEM calibration/maintenance schedule:

Every quarter the opacity blower motor filter is replaced keeping the optical lenses clean from particulate and heat damage from the source. An opacity reading is recorded before and after each lens is cleaned. the MKII is put into the filter audit mode and the reflective mirror is cleaned and the zero reading is recorded. Three certified audit filters are consecutively placed in the light path 5 times and recorded.

8. Check which program(s) apply to the unit with the monitor:

■ NSPS	☐ SIP	☐ PSD	☐ BIF
■ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: Zero To: 100%

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications #1

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☐ YES ☑ NO

If yes, what type?

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 04/24/2024

c.

CEMs (K7)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☒ Nitrogen oxides
- ☐ PM 10
- ☒ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☒ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain):
- ☒ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

Name of manufacturer: California Analytical Instruments (See Attachment)

Model number: Model #200

Serial number:

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: TRACE Environmental Software

Serial number: TRACE Environmental Software talks to PLC
Model number: Allen Bradley Compact Logix PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust Duct for K7

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Daily calibrations on each monitor, approximately 15 minutes are lost daily to perform calibrations.

7. Indicate CEM calibration/maintenance schedule:

Daily checks on the system are made, filters, pump repair, and pump tubing are changed every 6 months or less if needed.

8. Check which program(s) apply to the unit with the monitor:

☐ NSPS	☐ SIP	☐ PSD	☐ BIF
☒ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: 0 To: 1,000,000 PPM From: 0 To 132 fps (Flow) From: 0 To: 25% (O_2)

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications 2 and 4.B

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

If yes, what type? Non-Contact Peristaltic

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 04/24/2024

d.

CEMs (K8)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☒ Nitrogen oxides
- ☐ PM 10
- ☒ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☒ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☐ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☒ Flow Rate
- ☐ Hydrogen sulfide
- ☐ VOCs
- ☐ Other (explain): _____

3. CEMS Manufacturer's Information:

Name of manufacturer: California Analytical Instruments (See Attachment)

Model number: Model #200

Serial number: _____

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: TRACE Environmental Software

Serial number: TRACE Environmental Software talks to PLC
Model number: Allen Bradley Compact Logix PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

Exhaust Duct for K8

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Daily calibrations on each monitor, approximately 15 minutes are lost daily to perform calibrations.

7. Indicate CEM calibration/maintenance schedule:

Daily checks on the system are made, filters, pump repair, and pump tubing are changed every 6 months or less if needed.

8. Check which program(s) apply to the unit with the monitor:

☐ NSPS	☐ SIP	☐ PSD	☐ BIF
☒ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: 0 To: 1,000,000 PPM From: 0 To 132 fps (Flow) From: 0 To: 25% (O_2)

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications 2 and 4.B

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☑ YES ☐ NO

If yes, what type? Non-Contact Peristaltic

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 04/24/2024

e.

COMs
(K9, K10, K11, and K12)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ☒ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain): _____
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

Name of manufacturer: Land Instruments International

Model number: Landmark III

Serial number: Unknown

4. Data acquisition system to be used (data logger, strip chart, software, etc):

Name of manufacturer/software: TRACE Environmental Software

Serial number: N/A - TRACE Environmental Software talks to PLC

Model number: Allen Bradley L32E PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

Common exhaust duct for K9, K10, K11, and K12.

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Computer DAS system triggers the daily calibration check. The Landmārk III raises a reflector for 180 seconds and the first 80 seconds the DAS records the zero value. An attenuator folds into the light path for 80 seconds and the DAS records the span value.

7. Indicate CEM calibration/maintenance schedule:

Every quarter the opacity blower motor filter is replaced keeping the optical lenses clean from particulate and heat damage from the source. An opacity reading is recorded before and after each lens is cleaned. The MKII is put into the filter audit mode and the reflective mirror is cleaned and the zero reading is recorded. Three certified audit filters are consecutively placed in the light path 5 times and recorded.

8. Check which program(s) apply to the unit with the monitor:

☐ NSPS	☐ SIP	☐ PSD	☐ BIF
☒ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: Zero To: 100%

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications #1

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☐ YES ☑ NO

If yes, what type?

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 08/08/2025

f.

COMs
(PCY/WS)

ADEM

PERMIT APPLICATION FOR CONTINUOUS EMISSION MONITORING SYSTEMS
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: Kronospan LLC

2. List pollutant or parameter the continuous emission monitoring system is measuring:

- ☐ Sulfur dioxide
- ☐ Nitrogen oxides
- ☐ PM 10
- ☐ Oxygen
- ☐ Pressure
- ☐ Carbon dioxide
- ☐ Carbon monoxide
- ☐ Particulates
- ☐ Exhaust temperature
- ☐ Hydrogen chloride
- ■ Opacity
- ☐ Temperature
  - ☐ Exhaust gas
  - ☐ Primary Chamber
  - ☐ Secondary Chamber
- ☐ Total reduced sulfides
- ☐ Hydrogen sulfide
- ☐ Other (explain): _____
- ☐ Flow Rate
- ☐ VOCs

3. CEMS Manufacturer's Information:

   Name of manufacturer: Land Instruments International

   Model number: Landmark III

   Serial number: Unknown

4. Data acquisition system to be used (data logger, strip chart, software, etc):

   Name of manufacturer/software: TRACE Environmental Software

   Serial number: N/A - TRACE Environmental Software talks to PLC

   Model number: Allen Bradley L32E PLC

5. Indicate emission source to be monitored and the location of the specific CEM:

   Exhaust Duct from PCY/WS System prior to venting to Dryer #3 stack.

6. Briefly describe the calibration and operational procedures to be used in operating the CEM (indicate estimate of time lost in calibrating, maintaining, repairing, etc.):

Computer DAS system triggers the daily calibration check. The Landmark III raises a reflector for 180 seconds and the first 80 seconds the DAS records the zero value. An attenuator folds into the light path for 80 seconds and the DAS records the span value.

7. Indicate CEM calibration/maintenance schedule:

Every quarter the opacity blower motor filter is replaced keeping the optical lenses clean from particulate and heat damage from the source. An opacity reading is recorded before and after each lens is cleaned. The MKII is put into the filter audit mode and the reflective mirror is cleaned and the zero reading is recorded. Three certified audit filters are consecutively placed in the light path 5 times and recorded.

8. Check which program(s) apply to the unit with the monitor:

☐ NSPS	☐ SIP	☐ PSD	☐ BIF
☒ NESHAPS	☐ Acid Rain	☐ RCRA	☐ Enhanced Monitoring

9. Monitor span: From: Zero To: 100%

10. Performance protocol (from Appendix B in 40 CFR Part 60): Performance Specifications #1

11. Insitu/dilution extractive/extractive? (type): Insitu Extractive with Blow Back

12. If dilution extractive, give approximate dilution rate: N/A

13. Conditioning system? ☐ YES ☑ NO

If yes, what type?

14. Does Appendix F in 40 CFR Part 60 apply? ☑ YES ☐ NO

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 08/08/2025

4.

Air Pollution Control Devices (110 Forms)

a. Flaking
b. Stranding
c. Drying
d. Sifter / Screening
e. Blending (Gluing)
f. Mat Forming at Sawing
g. Press
h. Finishing
i. Wood Granulate Transfer
j. Wood Dust Transfer

a.

Flaking

(i). CYFL1
(ii). CFFL1 / BE
(iii). CYFL2
(iv). CFFL2 / BE
(v). CYFL3
(vi). CFFL3 / BE
(vii). CYFL4
(viii). CFFL4 / BE

(i).

CYFL1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 Cyclone (CYFL1)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Hurricione

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

Flaker #1

5. Emission parameters:
Discharges to Dust Collector (CFFL1)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	516.25	206.50	128.71
Designed	103.25	41.30	25.74
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:
N/A - Discharges to Dust Collector CFFL1

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector CFFL1

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

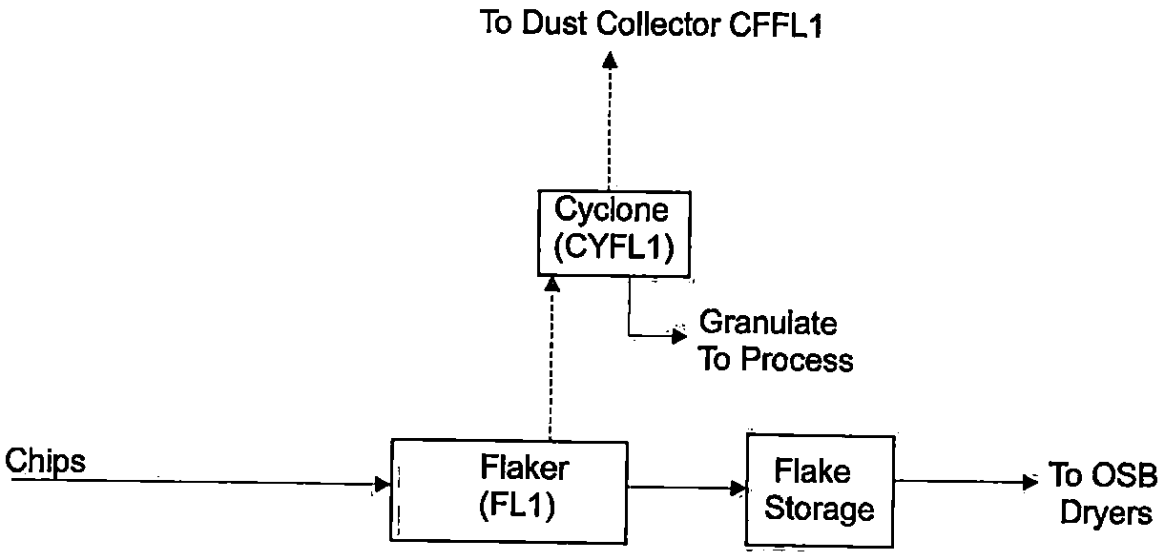
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector CFFL1
Cyclone
(CYFL1)
Granulate
To Process
Chips
Flaker
(FL1)
Flake
Storage
To OSB
Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1809 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected Granulate is conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(ii).

CFFL1 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 Dust Collector (CFFL1) / Building Enclosure
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-01

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

Flaker #1, via Cyclone (CYFL1)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	103.25	41.30	25.74
Designed	0.015	0.011	0.002
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Cyclofilter	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	7,961		7,961
(ACFM, existing conditions)	8,769		8,835
Temperature (°F)	86		86
Velocity (ft/sec)	84.95		85.54
Percent moisture	<10		<10

Pressure drop across device: 3.0 **(inches H_20)**

7. **Stack dimensions:** N/A (Discharges Inside Strander Building)

UTM Coordinate (E-W)	_____ **(km)**	**UTM Coordinate (N-S)**	_____ **(km)**
Latitude	_____ **(LAT)**	**Longitude**	_____ **(LONG)**
Height above grade	_____ **(feet)**	**Gas temperature at exit**	_____ **(°F)**
Inside diameter at exit (round)	_____ **(feet)**	**Gas Velocity**	_____ **(Ft/Sec)**
Inside area at exit (not round)	_____ **(sq. feet)**	**Volume of gas discharged**	_____ **(ACFM)**
Base Elevation	_____ **(feet)**	**GEP Stack Height**	_____ **(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.**

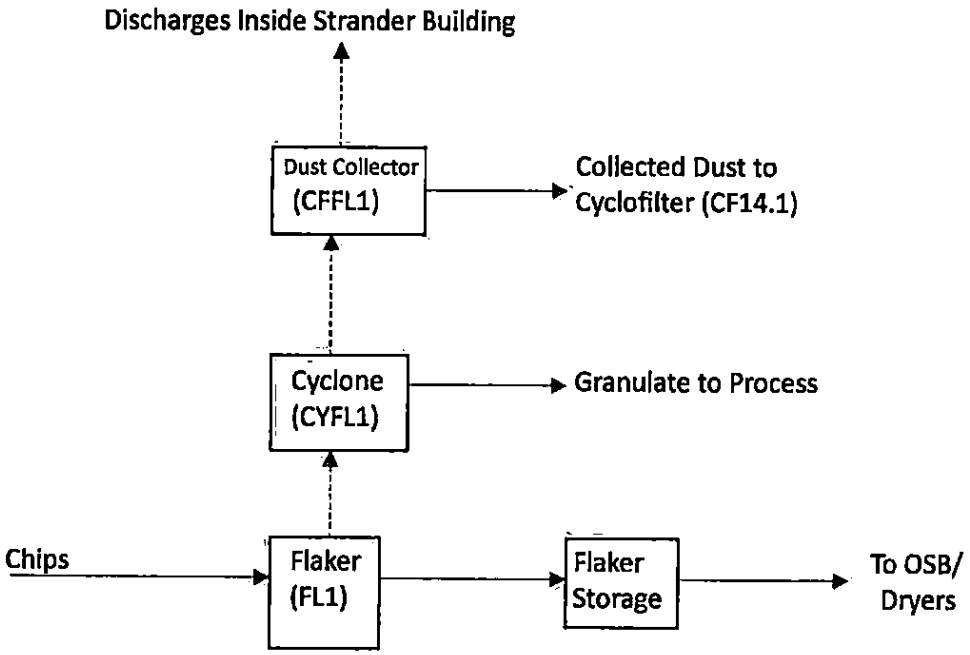
9. **Enclosed are:** N/A

- ☐ **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.)**

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0 - 8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (CFFL1)
Collected Dust to Cyclofilter (CF14.1)
Cyclone (CYFL1)
Granulate to Process
Chips
Flaker (FL1)
Flaker Storage
To OSB/ Dryers

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	452 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected wood dust is conveyed to the OSB Dust Silo and eventually used as fuel.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(iii).

CYFL2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 Cyclone (CYFL2)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Hurricione

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

Flaker #2

5. Emission parameters:
Discharges to Dust Collector (CFFL2)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM_{10}	$PM_{2.5}$
Mass emission rate (#/hr)			
Uncontrolled	516.25	206.50	128.71
Designed	103.25	41.30	25.74
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:
N/A - Discharges to Dust Collector CFFL2

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector CFFL2

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

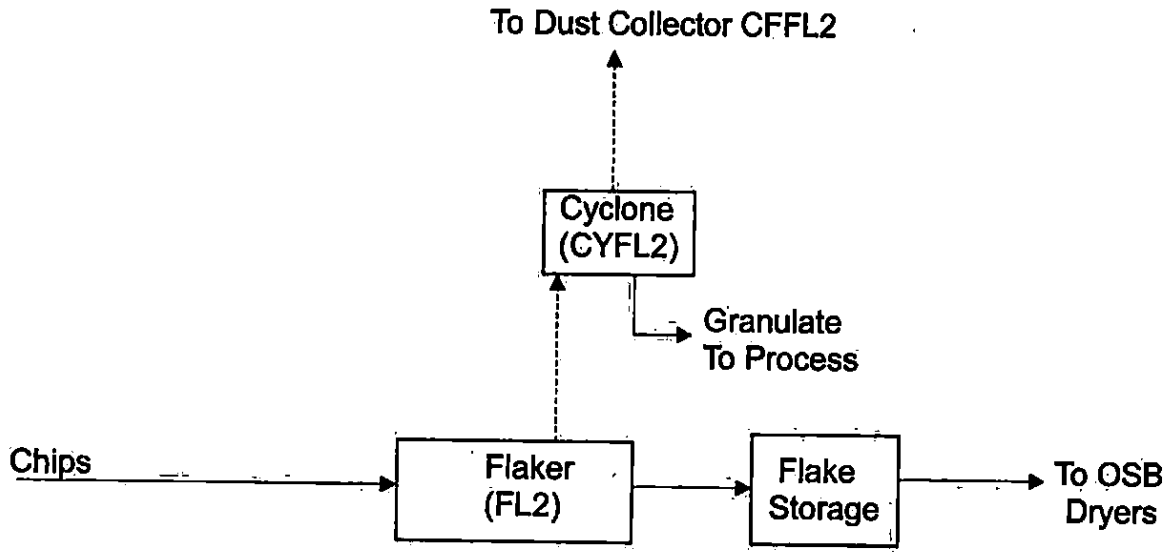
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector CFFL2
Cyclone
(CYFL2)
Granulate
To Process
Chips
Flaker
(FL2)
Flake
Storage
To OSB
Dryers

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1809 tons			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate is conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(iv).

CFFL2 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 Dust Collector (CFFL2) / Building Enclosure
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-4500-01

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

Flaker #2, via Cyclone (CYFL2)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	103.25	41.30	25.74
Designed	0.015	0.011	0.002
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Cyclofilter	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	7,961		7,961
(ACFM, existing conditions)	8,769		8,835
Temperature (°F)	86		86
Velocity (ft/sec)	84.95		85.54
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A (Discharges Inside Strander Building)

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

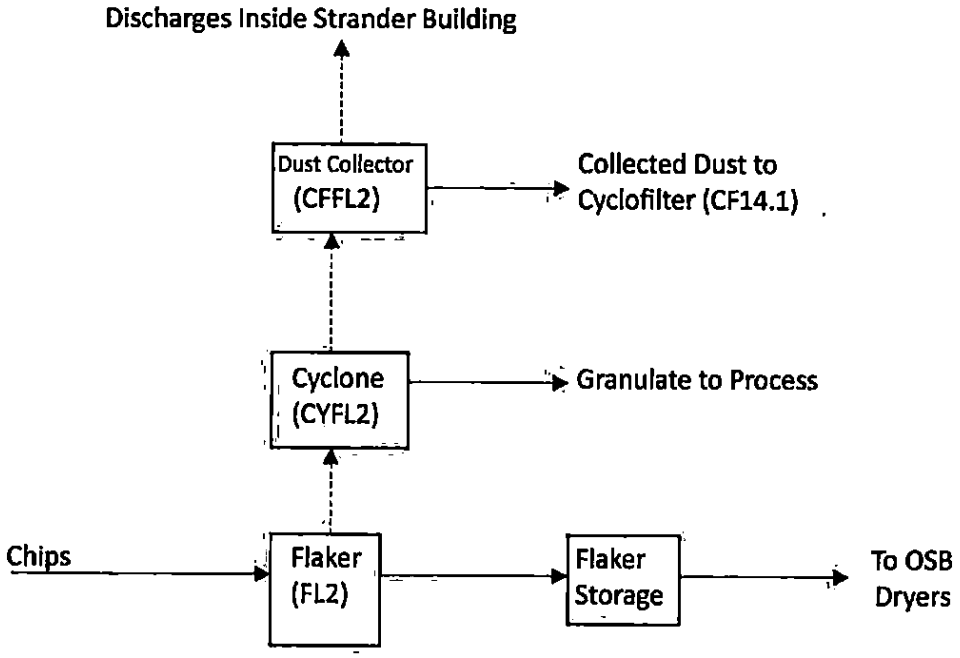
9. Enclosed are: N/A

- ☐ 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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operation range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (CFFL2)
Collected Dust to Cyclofilter (CF14.1)
Cyclone (CYFL2)
Granulate to Process
Chips
Flaker (FL2)
Flaker Storage
To OSB Dryers

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	452 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected wood dust is conveyed to the OSB Dust Silo and eventually used as fuel.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(v).

CYFL3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 Cyclone (CYFL3)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. Hurricione

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

Flaker #3

5. **Emission parameters:**
Discharges to Dust Collector (CFFL3)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM_{10}	$PM_{2.5}$
Mass emission rate (#/hr)			
Uncontrolled	516.25	206.50	128.71
Designed	103.25	41.30	25.74
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:
N/A - Discharges to Dust Collector CFFL3

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector CFFL3

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

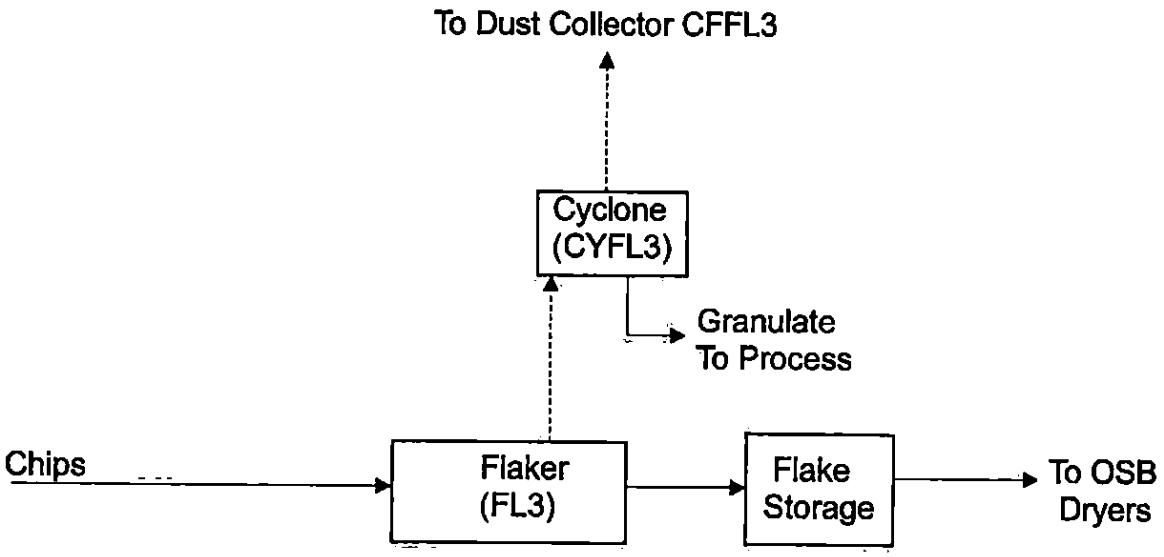
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector CFFL3
Cyclone
(CYFL3)
Granulate
To Process
Chips
Flaker
(FL3)
Flake
Storage
To OSB
Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1809 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate is conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(vi).

CFFL3 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 Dust Collector (CFFL3) / Building Enclosure

☐ Cyclone ☐ Multiclone

☐ Absorber ☐ Adsorber

☐ Condenser ☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-01

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

Flaker #3, via Cyclone (CYFL3)

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	103.25	41.30	25.74
Designed	0.015	0.011	0.002
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Cyclofilter	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	7,961		7,961
(ACFM, existing conditions)	8,769		8,835
Temperature (°F)	86		86
Velocity (ft/sec)	84.93		85.54
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A (Discharges Inside Strander Building)

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

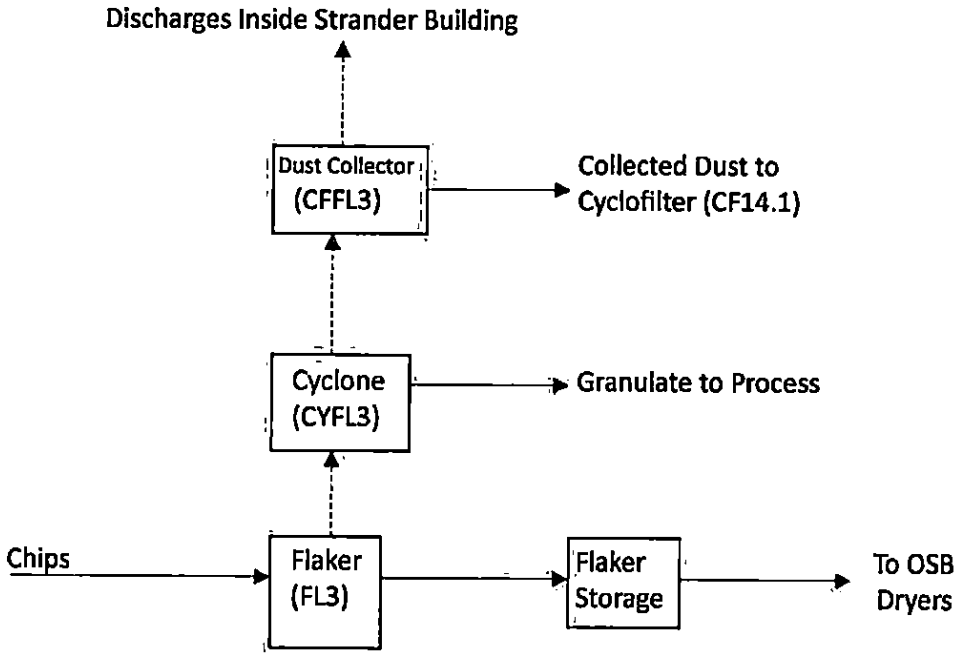
9. Enclosed are: N/A

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

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

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

Facility will install, operate and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (CFFL3)
Collected Dust to Cyclofilter (CF14.1)
Cyclone (CYFL3)
Granulate to Process
Chips
Flaker (FL3)
Flaker Storage
To OSB Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	452 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected wood dust is conveyed to the OSB Dust Silo and eventually used as fuel.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(vii).

CYFL4

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 Cyclone (CYFL4)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Hurricione

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

Flaker #4

5. Emission parameters:
Discharges to Dust Collector (CFFL4)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM_{10}	$PM_{2.5}$
Mass emission rate (#/hr)			
Uncontrolled	516.25	206.50	128.71
Designed	103.25	41.30	25.74
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:
N/A - Discharges to Dust Collector CFFL4

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector CFFL4

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

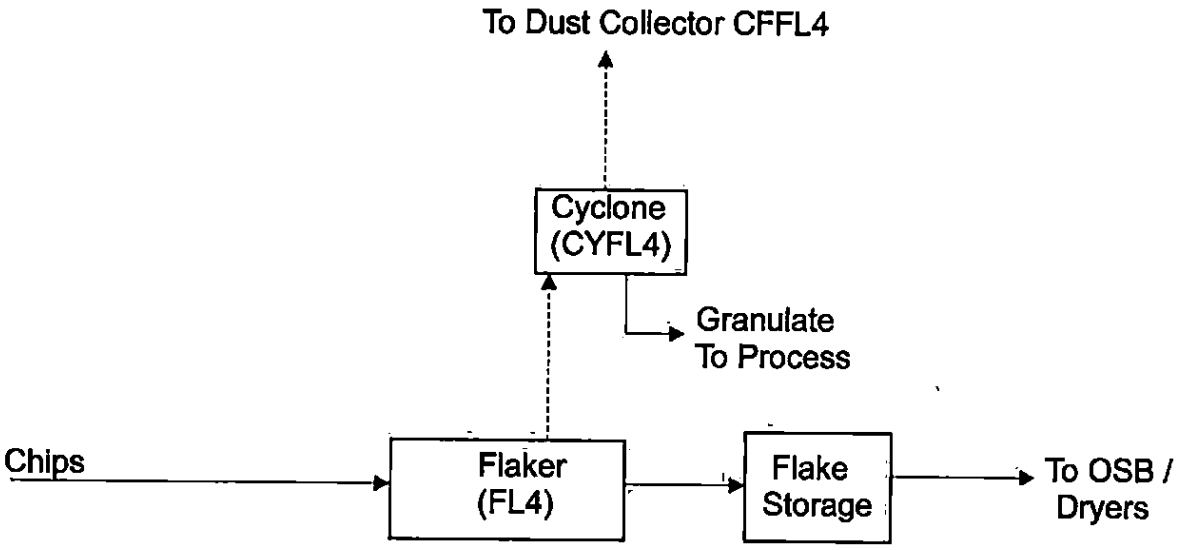
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector CFFL4
Cyclone
(CYFL4)
Granulate
To Process
Chips
Flaker
(FL4)
Flake
Storage
To OSB /
Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1809 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Process			

If collected air pollutants are recycled, describe:

Wood granulate is conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/03/24

(viii).

CFFL4 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 Dust Collector (CFFL4) / Building Enclosure
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-01

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

Flaker #4, via Cyclone (CYFL4)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	103.25	41.30	25.74
Designed	0.015	0.011	0.002
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Cyclofilter	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	7,961		7,961
(ACFM, existing conditions)	8,769		8,835
Temperature (°F)	86		86
Velocity (ft/sec)	84.93		85.54
Percent moisture	<10		<10

Pressure drop across device: 3.0 **(inches H_20)**

7. **Stack dimensions:** N/A (Discharges Inside Strander Building)

UTM Coordinate (E-W) _____ **(km)**	**UTM Coordinate (N-S)** _____ **(km)**
Latitude _____ **(LAT)**	**Longitude** _____ **(LONG)**
Height above grade _____ **(feet)**	**Gas temperature at exit** _____ **(°F)**
Inside diameter at exit (round) _____ **(feet)**	**Gas Velocity** _____ **(Ft/Sec)**
Inside area at exit (not round) _____ **(sq. feet)**	**Volume of gas discharged** _____ **(ACFM)**
Base Elevation _____ **(feet)**	**GEP Stack Height** _____ **(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.**

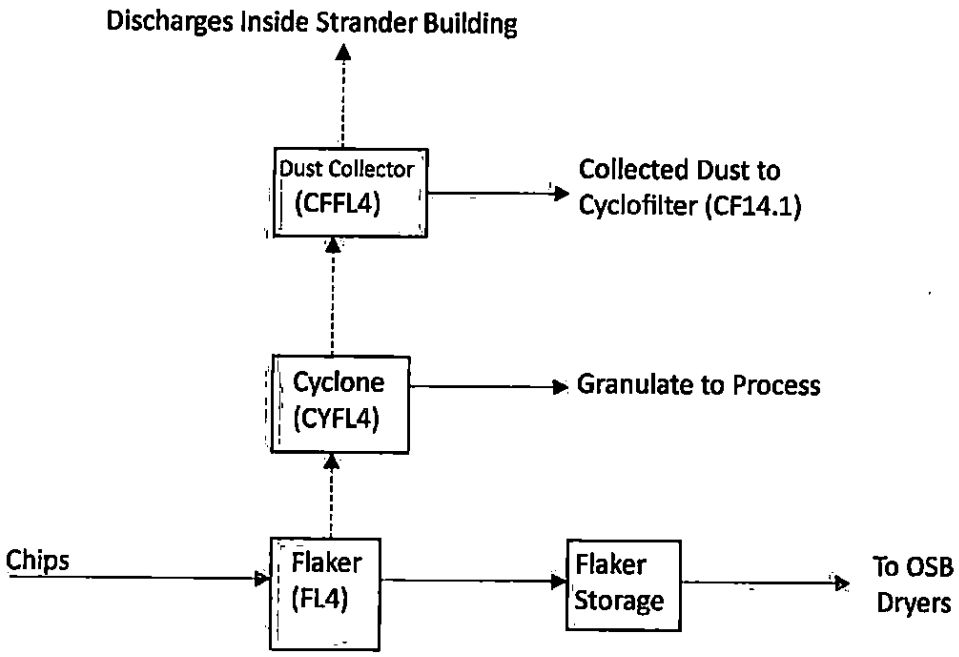
9. **Enclosed are:** N/A

- ☐ **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.)**

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector
(CFFL4)
Collected Dust to
Cyclofilter (CF14.1)
Cyclone
(CYFL4)
Granulate to Process
Chips
Flaker
(FL4)
Flaker
Storage
To OSB
Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	452 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected wood dust is conveyed to the OSB Dust Silo and eventually used as fuel.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/03/24

b.

Stranding

(i) CYST1
(ii) DCST1 / BE
(iii) CYST2
(iv) DCST2 / BE
(v) CYST3
(vi) DCST3 / BE

(i).

CYST1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYST1)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe):

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

Name of manufacturer CEATEC Model No. Custom

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

Strander #1

5. **Emission parameters:**
Discharges to Dust Collector (DCST1)

	Pollutants Removed		
	Pollutant #1 PM	Pollutant #2 PM10	Pollutant #3 PM2.5
Mass emission rate (#/hr)			
Uncontrolled	451.69	180.68	111.62
Designed	90.34	36.14	22.32
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:
N/A - Discharges to Dust Collector (DCST1)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	26,536		26,536
(ACFM, existing conditions)	29,230		29,450
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCST1)

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

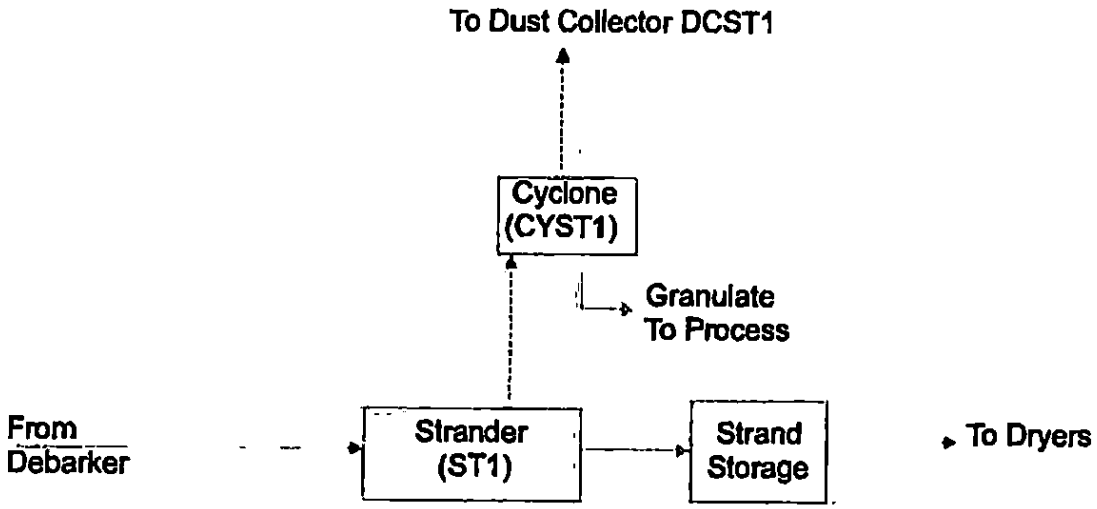
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector DCST1
Cyclone
(CYST1)
Granulate
To Process
From
Debarker
Strander
(ST1)
Strand
Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1583 tons			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Product			

If collected air pollutants are recycled, describe:

Wood granulate conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(ii).

DCST1 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (DCST1) / Building Enclosure
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Strander #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	90.34	36.14	22.32
Designed	0.050	0.036	0.007
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Dust Collector	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	26,536		26,536
(ACFM, existing conditions)	29,230		29,450
Temperature (°F)	86		86
Velocity (ft/sec)	90.36		90.98
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: N/A (Discharges inside Strander Building)

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

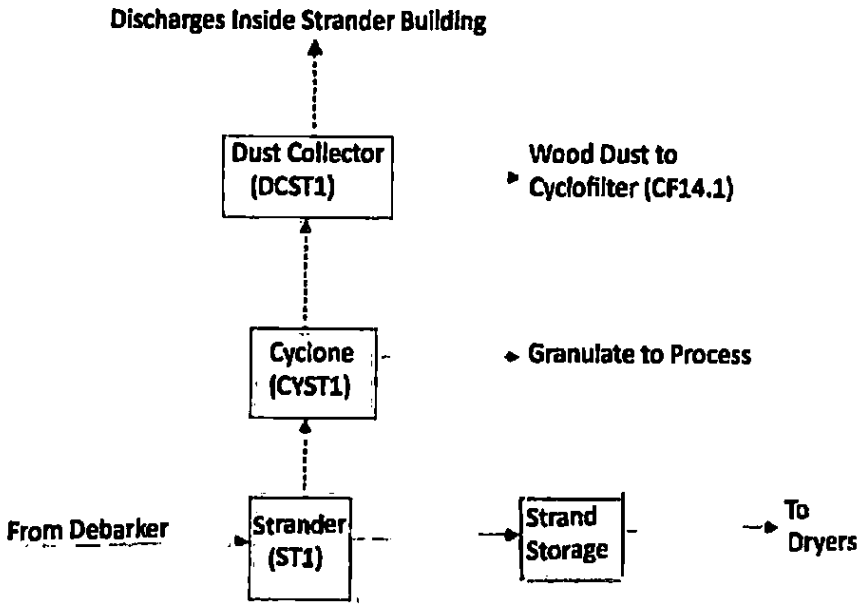
9. Enclosed are: N/A

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

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

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

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (DCST1)
Wood Dust to Cyclofilter (CF14.1)
Cyclone (CYST1)
Granulate to Process
From Debarker
Strander (ST1)
Strand Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	392 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Conveyed to OSB Dust Bin for Further Use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(iii).

CYST2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYST2)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe):

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

Name of manufacturer CEATEC Model No. Custom

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

Strander #2

5. **Emission parameters:**
Discharges to Dust Collector (DCST2)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	451.69	180.68	111.68
Designed	90.34	36.14	22.32
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to DCST2

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: (inches H_2O)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCST2)

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

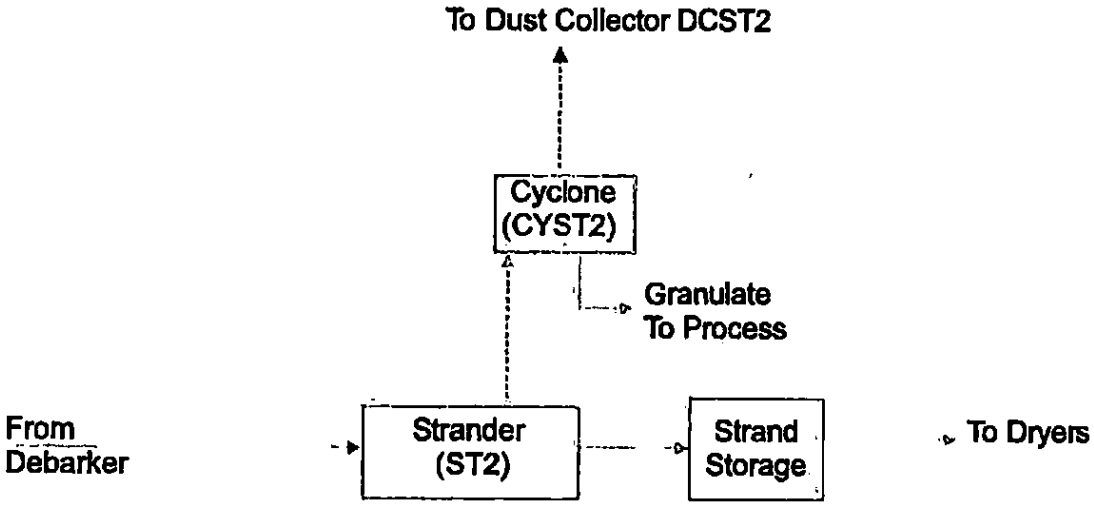
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector DCST2
Cyclone
(CYST2)
Granulate
To Process
From
Debarker
Strander
(ST2)
Strand
Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1583 tons			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Product			

If collected air pollutants are recycled, describe:

Wood granulate conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(iv).

DCST2 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (DCST2) / Building Enclosure
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Strander #2

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	90.34	36.14	22.32
Designed	0.05	0.036	0.007
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Dust Collector	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	26,536		26,536
(ACFM, existing conditions)	29,230		29,450
Temperature (°F)	86		86
Velocity (ft/sec)	90.36		90.98
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. **Stack dimensions:** N/A (Discharges inside Strander Building)

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.**

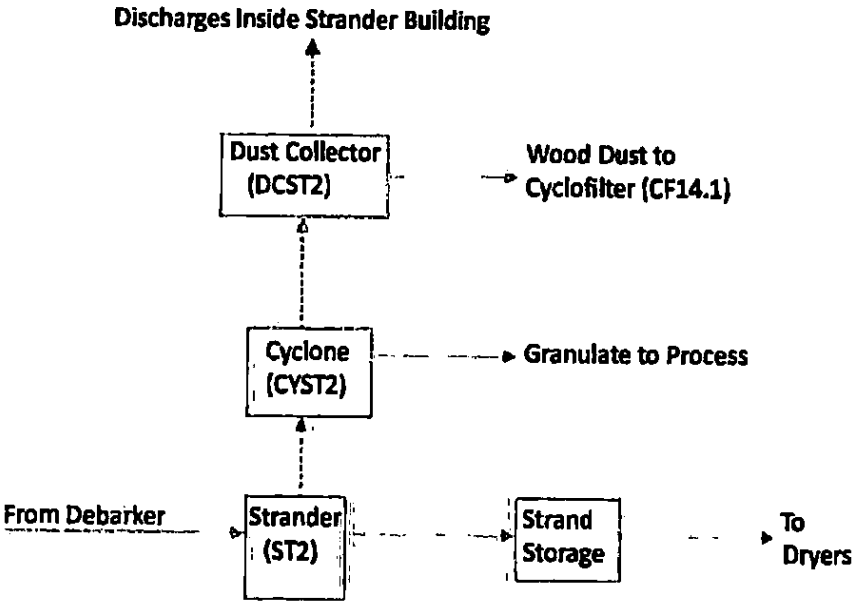
9. **Enclosed are:** N/A

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

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

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

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (DCST2)
Wood Dust to Cyclofilter (CF14.1)
Cyclone (CYST2)
Granulate to Process
From Debarker
Strander (ST2)
Strand Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	395 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Conveyed to OSB Dust Bin for Further Use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(v).

CYST3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYST3)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind):

Stage 1 - Vapor balance (type):

Other (describe):

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

Name of manufacturer CEATEC Model No. Custom

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

Strander #3

5. **Emission parameters:**
Discharges to Dust Collector (DCST3)

	Pollutants Removed		
	Pollutant #1 PM	Pollutant #2 PM10	Pollutant #3 PM2.5
Mass emission rate (#/hr)			
Uncontrolled	451.69	180.68	111.62
Designed	90.34	36.14	22.32
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	80	80	80
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

N/A - Discharges to Dust Collector (DCST3)	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_2O)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCST3)

UTM Coordinate (E-W)		(km)	UTM Coordinate (N-S)		(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade		(feet)	Gas temperature at exit		(°F)
Inside diameter at exit (round)		(feet)	Gas Velocity		(Ft/Sec)
Inside area at exit (not round)		(sq. feet)	Volume of gas discharged		(ACFM)
Base Elevation		(feet)	GEP Stack Height		(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.

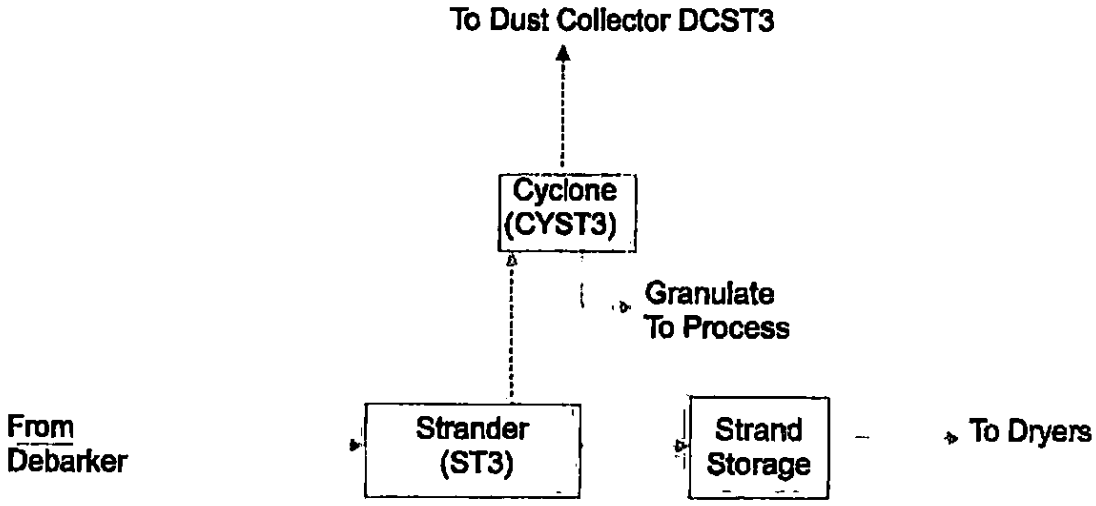
9. Enclosed are: N/A

- ☐ 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.)

N/A


To Dust Collector DCST3
Cyclone
(CYST3)
Granulate
To Process
From
Debarker
Strander
(ST3)
Strand
Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1583 tons			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Product			

If collected air pollutants are recycled, describe:

Wood granulate conveyed back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

(vi).

DCST3 / BE

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (DCST3) / Building Enclosure
- ☐ Cyclone
- ☐ Multiclone
- ☐ Absorber
- ☐ Adsorber
- ☐ Condenser
- ☐ Wet Suppression
- Wet scrubber (kind):
- Stage 1 - Vapor balance (type):
- Other (describe):

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Strander #3

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	90.34	36.14	22.32
Designed	0.05	0.036	0.007
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002815 gr/dscf - Dust Collector	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)	26,536		26,536
(ACFM, existing conditions)	29,230		29,450
Temperature (°F)	86		86
Velocity (ft/sec)	90.36		90.98
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: N/A (Discharges Inside Strander Building)

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

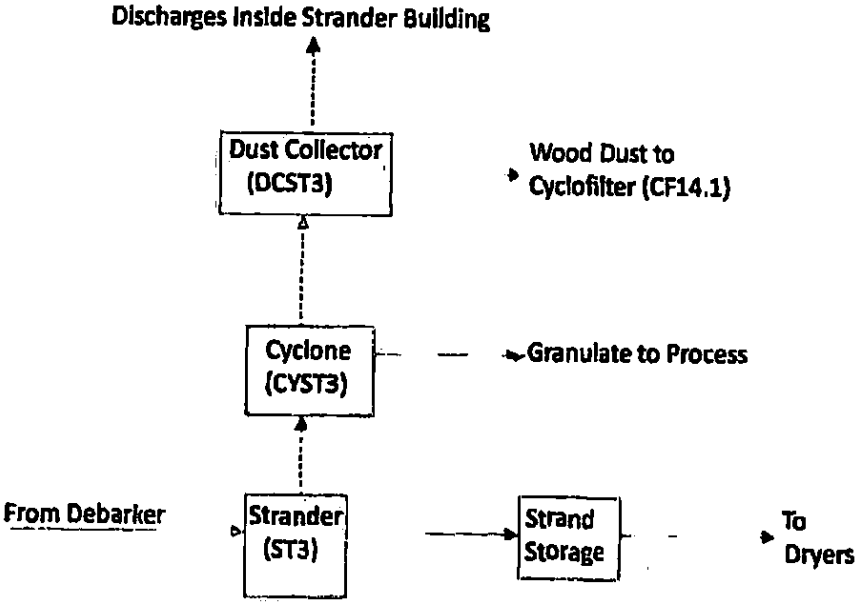
9. Enclosed are: N/A

- ☐ 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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


Discharges Inside Strander Building
Dust Collector (DCST3)
Wood Dust to Cyclofilter (CF14.1)
Cyclone (CYST3)
Granulate to Process
From Debarker
Strander (ST3)
Strand Storage
To Dryers

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	395 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Conveyed to OSB Dust Silo for Further Use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/03/24

c.

Drying (Form 110)

(i)	D1C1
(ii)	D1C2
(iii)	D1C3
(iv)	D1C4
(v)	D1C5
(vi)	D1C6
(vii)	D1C7
(viii)	D2C1
(ix)	D2C2
(x)	D2C3
(xi)	D2C4
(xii)	D2C5
(xiii)	D2C6
(xiv)	D2C7
(xv)	D3C1
(xvi)	D3C2
(xvii)	D3C3
(xviii)	D3C4
(xix)	D3C5
(xx)	D3C6
(xxi)	D3C7
(xxii)	K7
(xxiii)	K8

(i).

D1C1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**
Discharges to Thermal Oil Heaters (K7 & K8)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	10.84	6.62	1.08
Designed	0.77	0.50	0.05
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	<95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

UTM Coordinate (E-W)		(km)	UTM Coordinate (N-S)		(km)
Latitude		(LAT)	Longitude		(LONG)
Height above grade		(feet)	Gas temperature at exit		(°F)
Inside diameter at exit (round)		(feet)	Gas Velocity		(Ft/Sec)
Inside area at exit (not round)		(sq. feet)	Volume of gas discharged		(ACFM)
Base Elevation		(feet)	GEP Stack Height		(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.

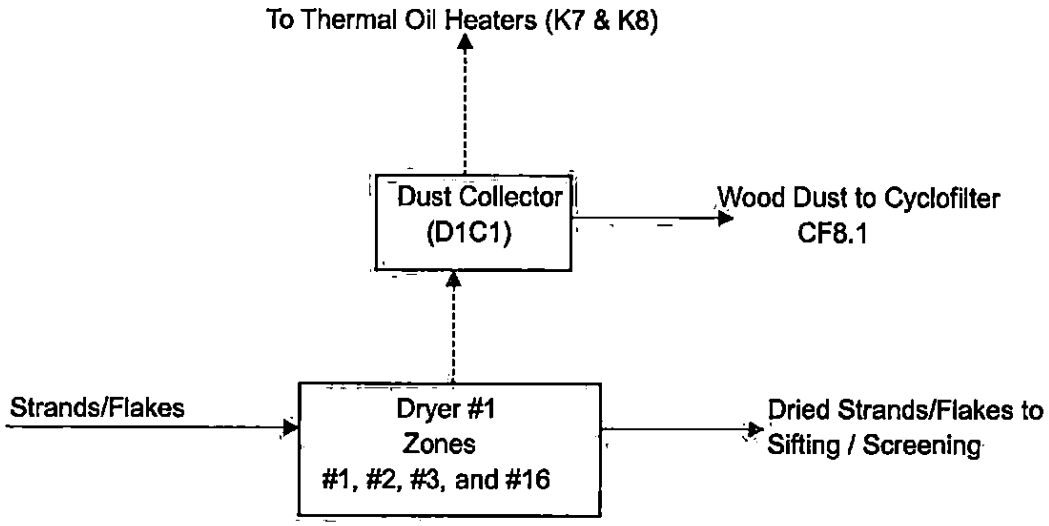
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0 - 8.0 inches H2O.


To Thermal Oil Heaters (K7 & K8)
Dust Collector
(D1C1)
Wood Dust to Cyclofilter
CF8.1
Strands/Flakes
Dryer #1
Zones
#1, #2, #3, and #16
Dried Strands/Flakes to
Sifting / Screening

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/05/24

(ii).

D1C2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: Total of all Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP # D-20.1

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

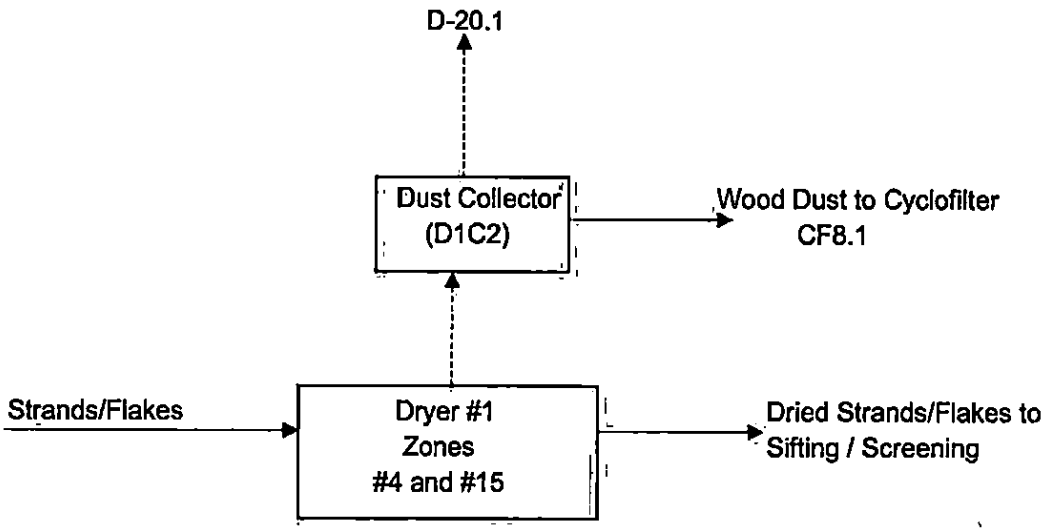
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a diferential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C3, D1C4, D1C5, D1C6, and D1C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/05/24

(iii).

D1C3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

___ - ____ - ____
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C3)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of all Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: EP#D-20.1

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

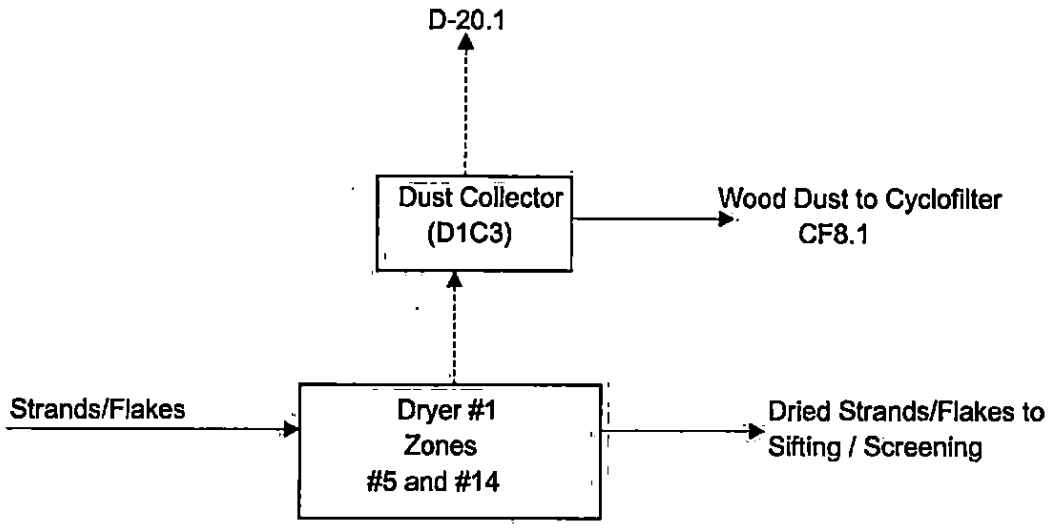
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C2, D1C4, D1C5, D1C6, and D1C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/05/24

(iv).

D1C4

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D1C4)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	2.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

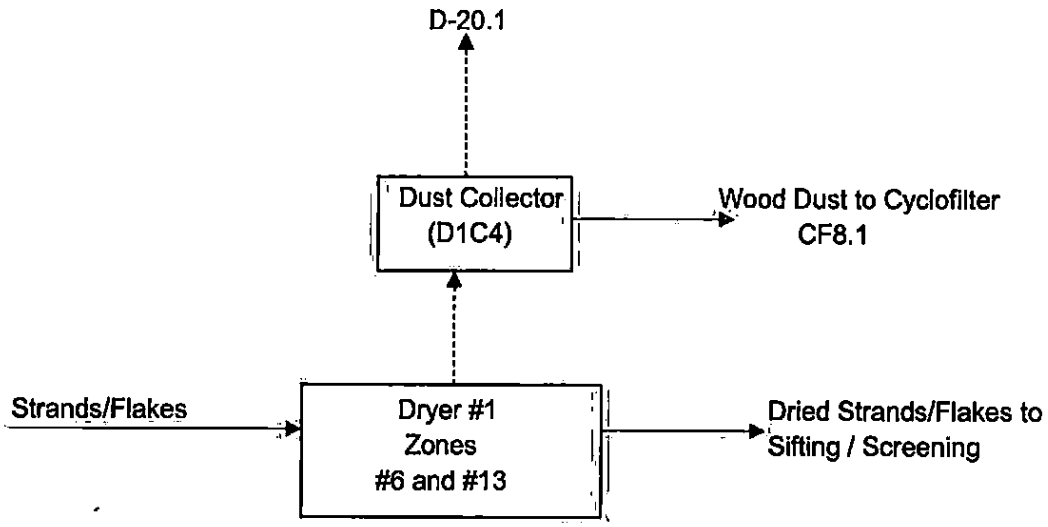
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C2, D1C3, D1C5, D1C6, and D1C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/05/24

(v).

D1C5

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C5)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

-Total of All Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM; 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.1

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

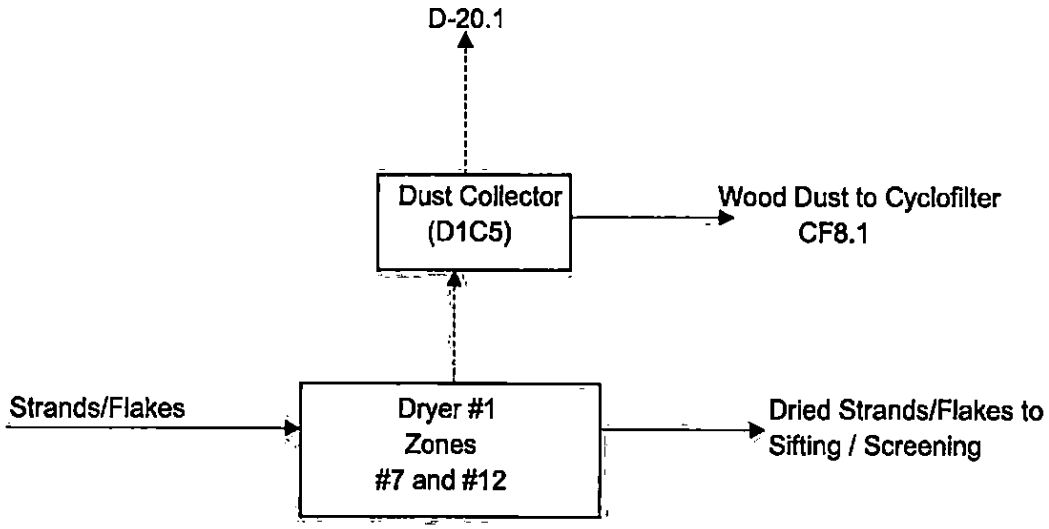
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C2, D1C3, D1C4, D1C6, and D1C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/05/24

(vi).

D1C6

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C6)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	E = 17.31P.16	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.1

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

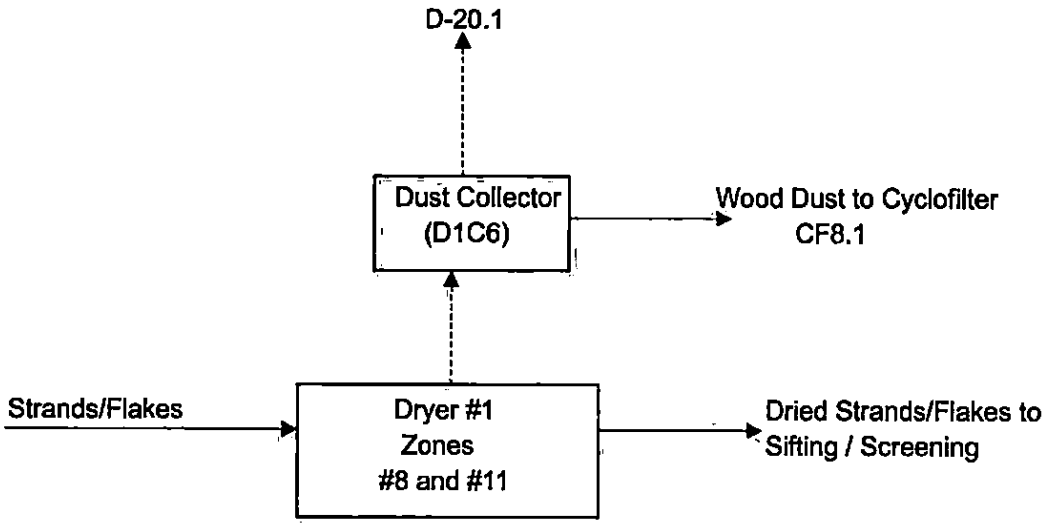
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C2, D1C3, D1C4, D1C5, and D1C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/05/24

(vii).

D1C7

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D1C7)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	E = 17.31P.16	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #1 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.1

UTM Coordinate (E-W)	594.629	(km)	UTM Coordinate (N-S)	3719.559	(km)
Latitude	33.611600	(LAT)	Longitude	-85.979940	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

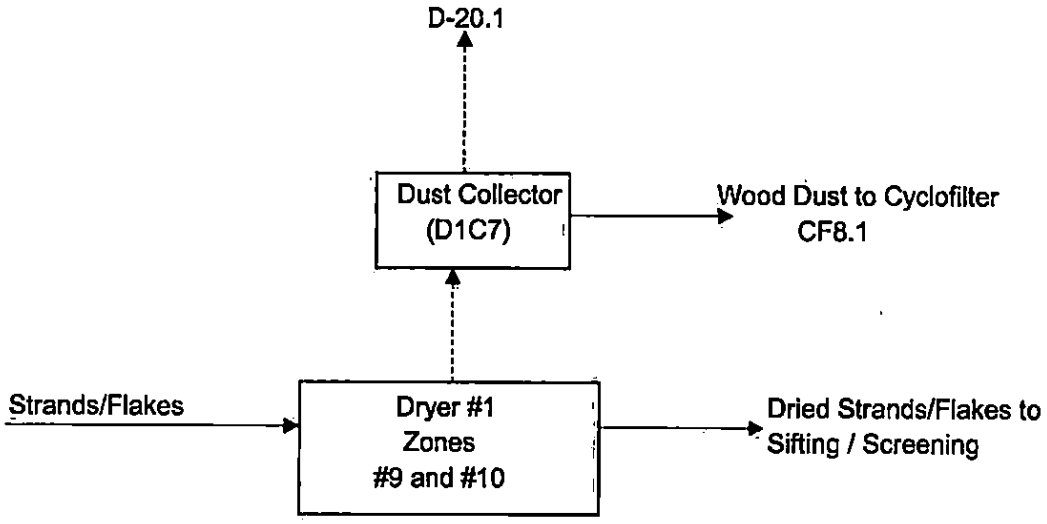
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.1. Exhaust from dust collectors D1C2, D1C3, D1C4, D1C5, and D1C6 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/05/24

(viii).

D2C1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D2C1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. Emission parameters:
Discharges to Thermal Oil Heaters (K7 & K8)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	10.84	6.62	1.08
Designed	0.77	0.50	0.05
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

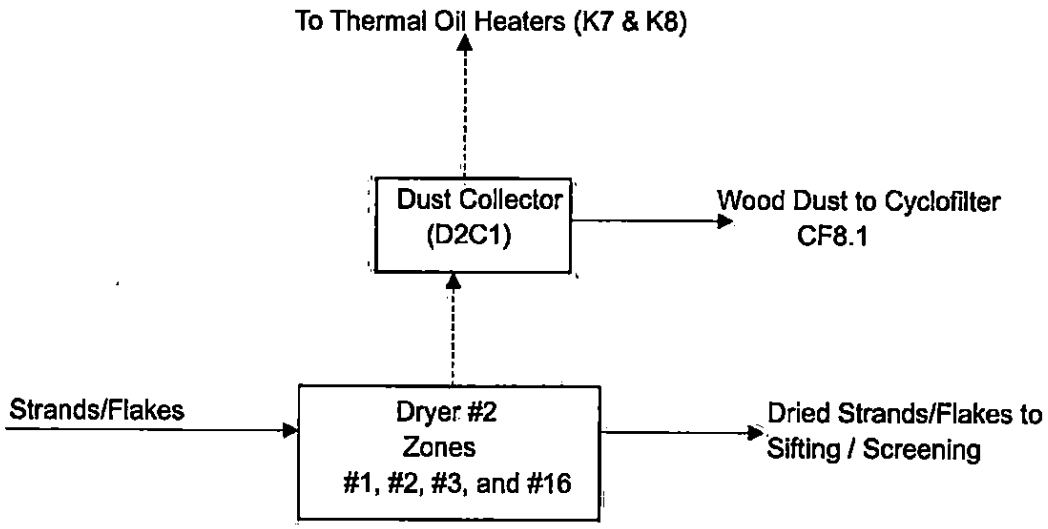
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


To Thermal Oil Heaters (K7 & K8)
Dust Collector
(D2C1)
Wood Dust to Cyclofilter
CF8.1
Strands/Flakes
Dryer #2
Zones
#1, #2, #3, and #16
Dried Strands/Flakes to
Sifting / Screening

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reused			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(ix).

D2C2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D2C2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

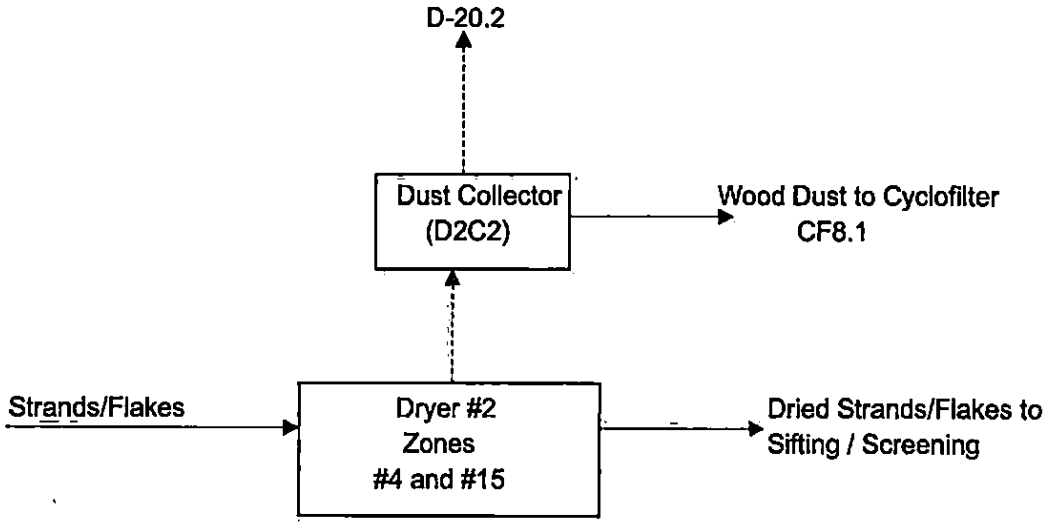
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from dust collectors D2C3, D2C4, D2C5, D2C6, and D2C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(x).

D2C3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D2C3)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{-16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

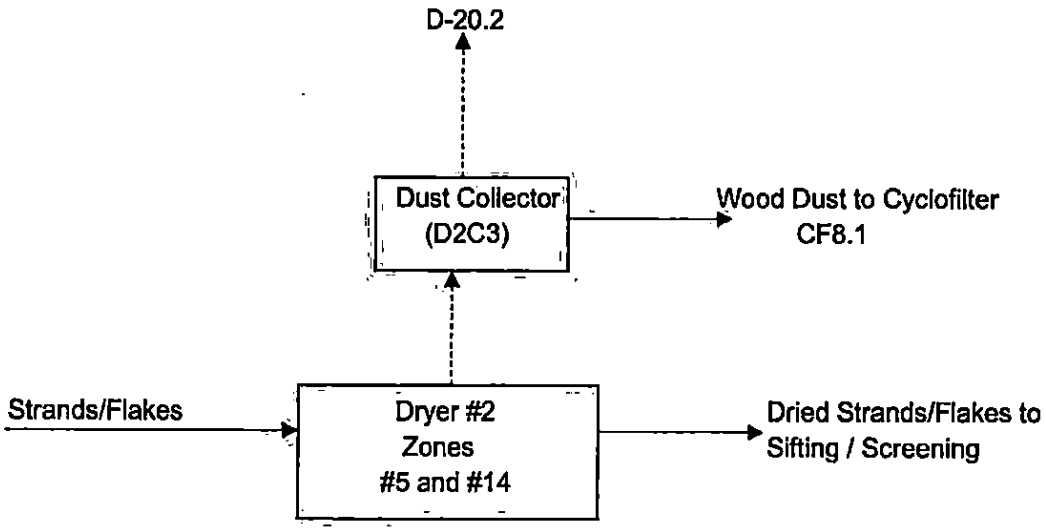
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from dust collectors D2C2, D2C4, D2C5, D2C6, and D2C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xi).

D2C4

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D2C4)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{-16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

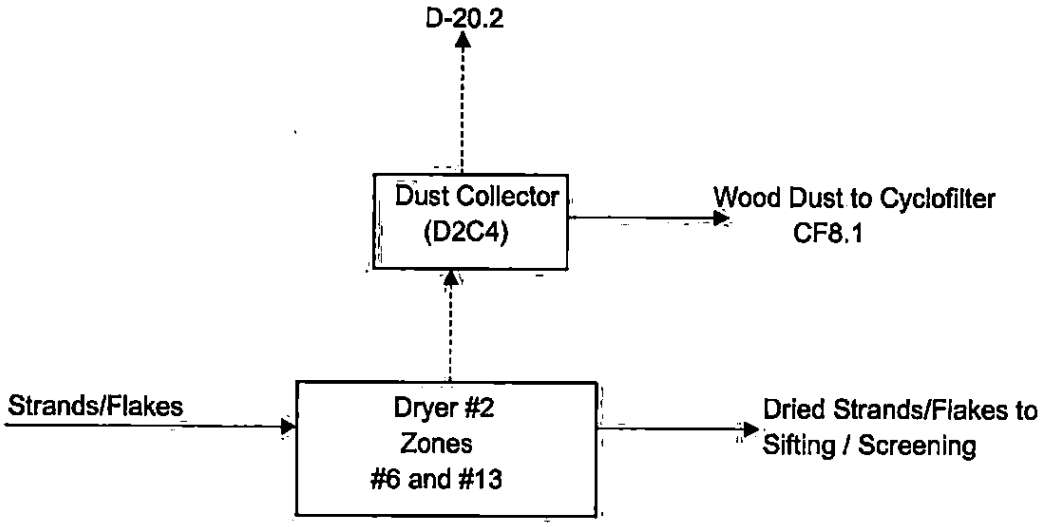
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O..



The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from dust collectors D2C2, D2C3, D2C5, D2C6, and D2C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xii).

D2C5

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D2C5)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #5

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

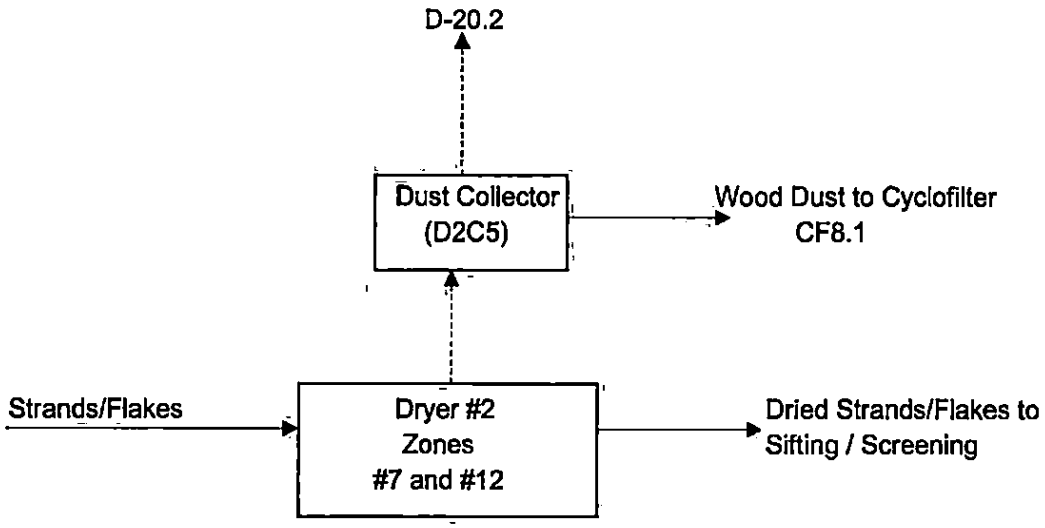
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. the operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from dust collectors D2C2, D2C3, D2C4, D2C6, and D2C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xiii).

D2C6

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D2C6)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

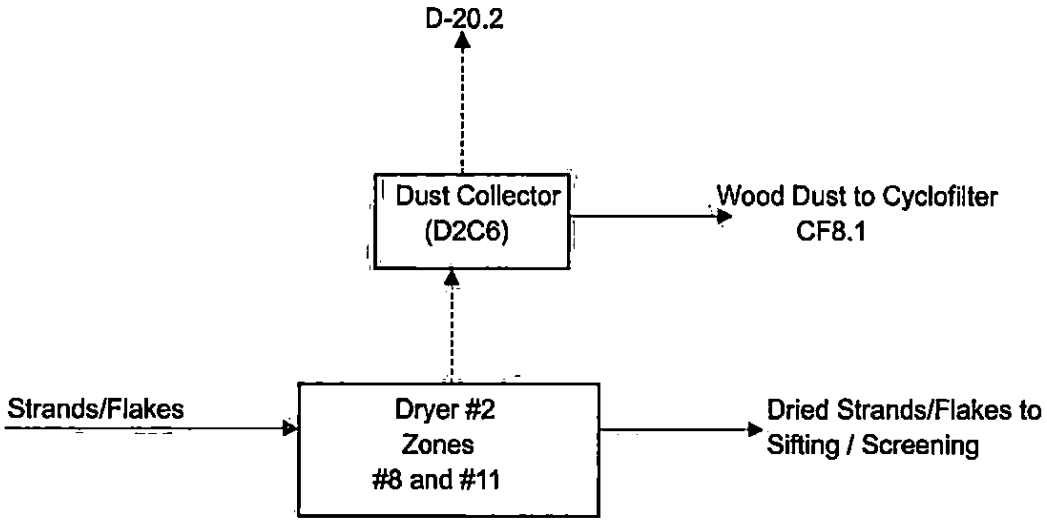
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from dust collectors D2C2, D2C3, D2C4, D2C5, and D2C7 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(xiv).

D2C7

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D2C7)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-6000-08

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

Conveyor Strand Dryer #2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: -Total of all Dryer #2 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.2

UTM Coordinate (E-W)	594.601	(km)	UTM Coordinate (N-S)	3719.540	(km)
Latitude	33.611432	(LAT)	Longitude	-85.980243	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	131	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	102.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	912,950	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

9. Enclosed are: N/A

- ☐ 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. N/A

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.)

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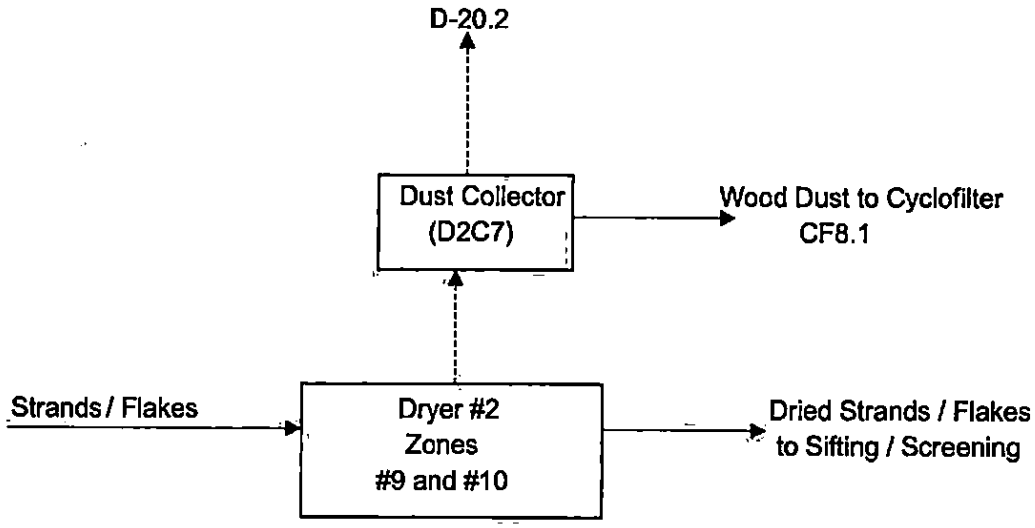


The dust collector exhaust vents to the atmosphere through common stack D-20.2. Exhaust from the dust collectors D2C2, D2C3, D2C4, D2C5, and D2C6 also vent to the atmosphere through this stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton Date: 05/01/24

(xv).

D3C1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D3C1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. Emission parameters:

Discharges to Thermal Oil Heaters (K7 & K8)

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	10.84	6.62	1.08
Designed	0.77	0.50	0.05
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Thermal Oil Heaters (K7 & K8)

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

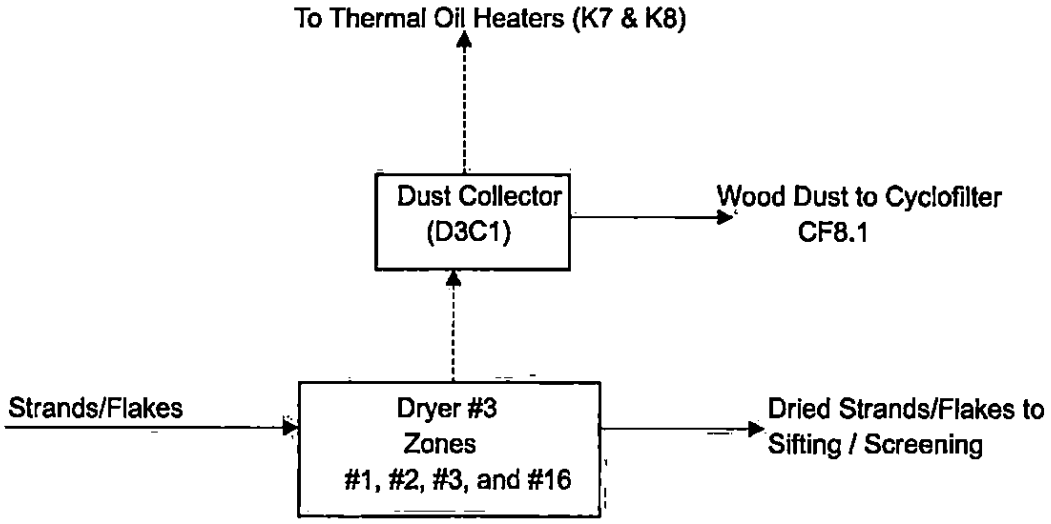
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


To Thermal Oil Heaters (K7 & K8)
Dust Collector
(D3C1)
Wood Dust to Cyclofilter
CF8.1
Strands/Flakes
Dryer #3
Zones
#1, #2, #3, and #16
Dried Strands/Flakes to
Sifting / Screening

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(xvi).

D3C2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D3C2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

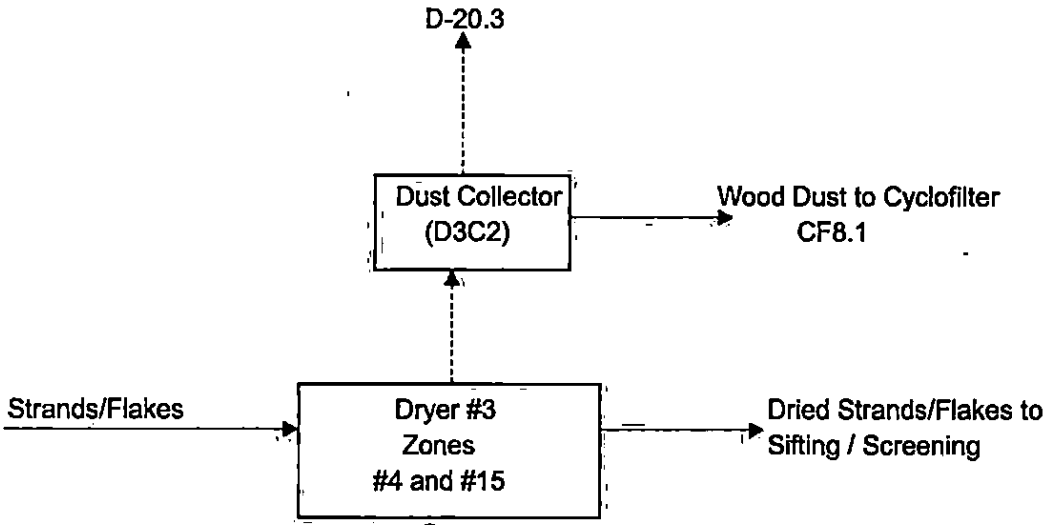
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C3, D3C4, D3C5, D3C6, and D3C7 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(xvii).

D3C3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D3C3)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

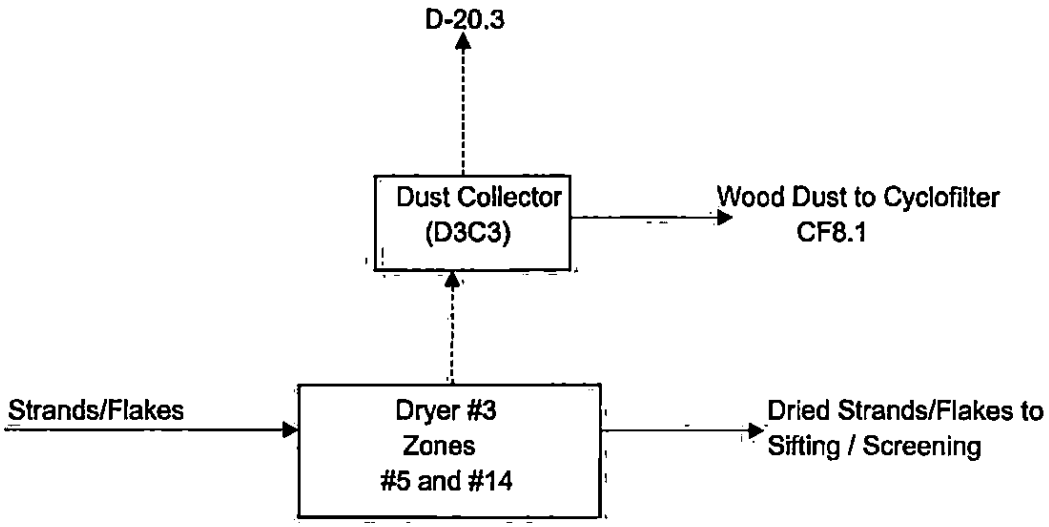
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C2, D3C4, D3C5, D3C6, and D3C7 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xviii).

D3C4

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D3C4)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

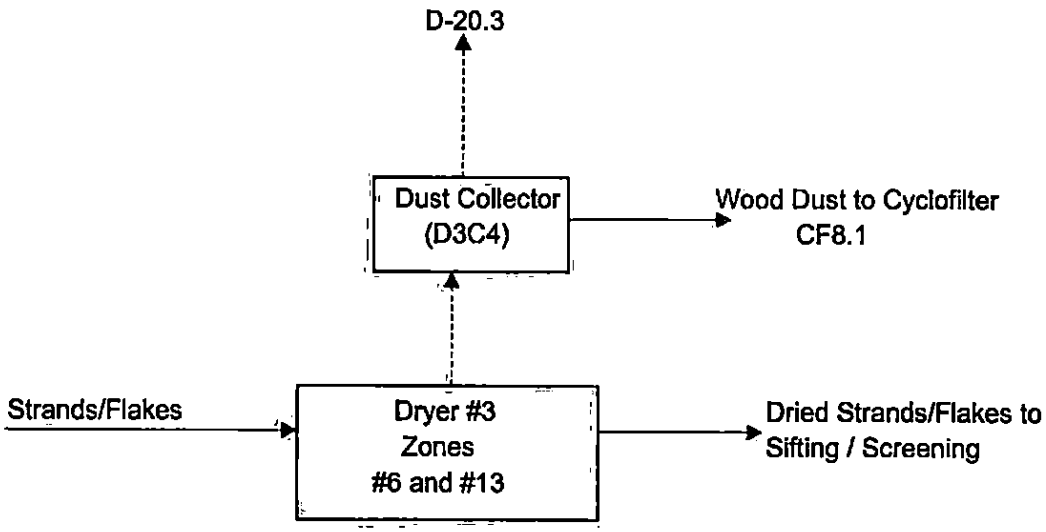
9. Enclosed are: N/A

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

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

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.)

Facility will install, opeate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C2, D3C3, D3C5, D3C6, and D3C7 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(xix).

D3C5

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D3C5)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

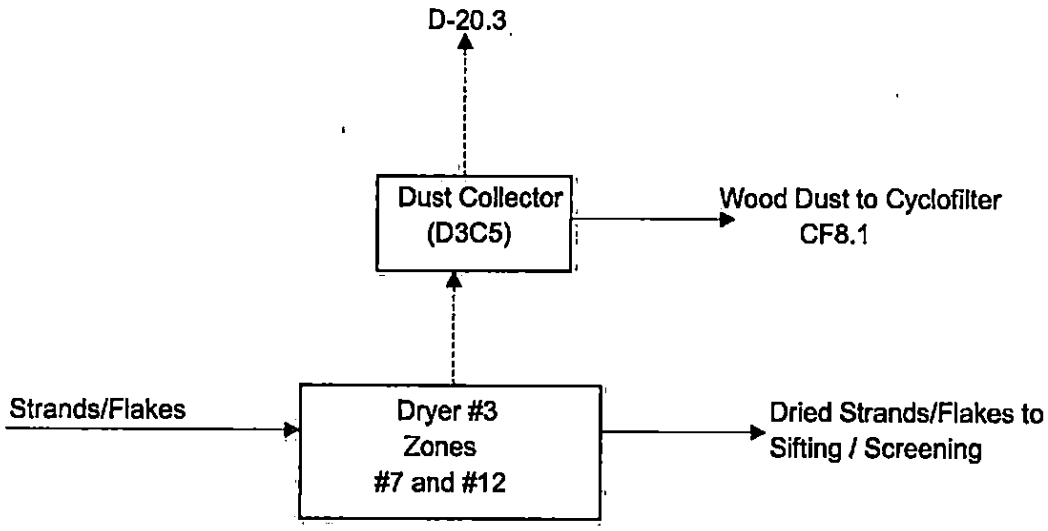
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C2, D3C3, D3C4, D3C6, and D3C7 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xx).

D3C6

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (D3C6)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

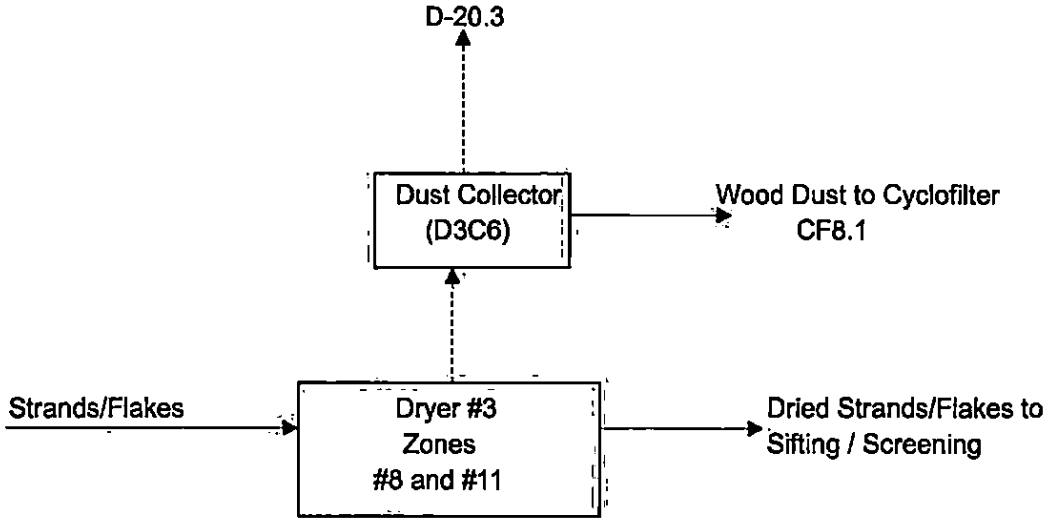
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings ~~will be taken daily. The operational range is 1.0-8.0 inches H_2O.~~



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C2, D3C3, D3C4, D3C5, and D3C7 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 05/01/24

(xxi).

D3C7

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (D3C7)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-6000-08

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

Conveyor Strand Dryer #3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	29.93	18.27	2.99
Designed	2.13	1.455	0.138
Manufacturer's guaranteed	0.002185	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>92	>92	>95
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: - Total of All Dryer #3 Dust Collectors Discharging to Atmosphere Through One Common Stack

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	683,240		683,240
(ACFM, existing conditions)	906,125		912,950
Temperature (°F)	131		131
Velocity (ft/sec)	101.26		102.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: EP #D-20.3 (Includes PCY-4.1)

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,030,750	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

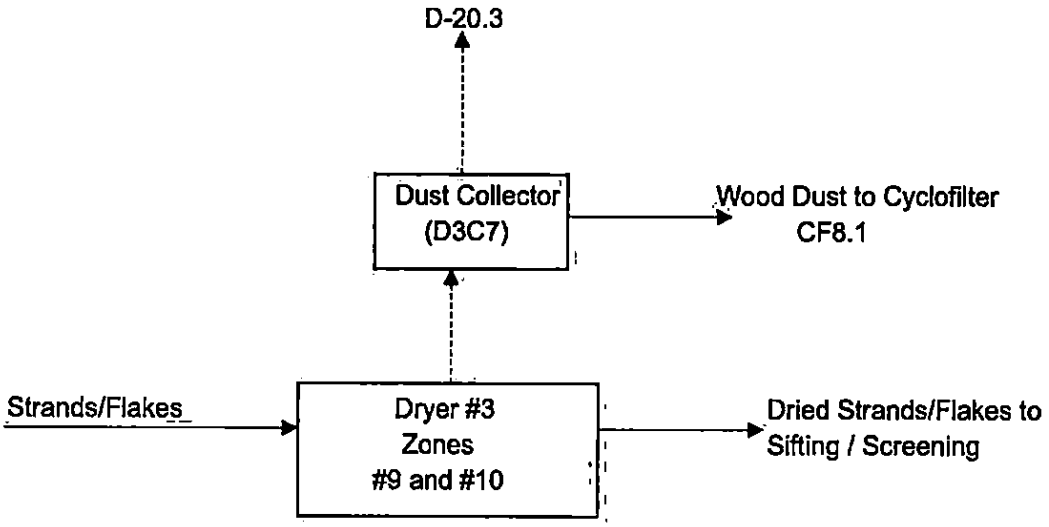
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.



The dust collector exhaust vents to the atmosphere through common stack D-20.3. Exhaust from dust collectors D3C2, D3C3, D3C4, D3C5, and D3C6 also vent to the atmosphere through the stack.

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	111.12 tons			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 05/01/24

(xxii).

K7

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

Do not write in this space

1. Name of facility or organization: Kronospann LLC

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
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind):
- ☒ Other (describe): Thermal Oil Heater K7 Combustion Chamber

3. Control device manufacturer's information:

Name of manufacturer: CEATEC Model No.: Custom

4. Emission source(s) to which device is installed or is to be installed:

Zones 1, 2, 3, and 16 from Conveyor Strand Dryers 1, 2, and 3

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC*	VHAPs*	
Mass emission rate (#/hr)			
Uncontrolled	45.57	1.85	
Designed	4.56	0.185	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation		N/A	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	>90	>90	
Manufacturer's guaranteed	N/A	N/A	

* Include Fuel Combustion

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM; 68ºf, 29.92" hg)	73,625		73,625
(ACFM, existing conditions)	122,060		122,602
Temperature (ºF)	338		338
Velocity (ft/sec)	28.27		28.39
Percent moisture	<10		<10

Pressure drop across device: 2.0 (inches H_2O)

7. Stack dimensions:

Stack No. & Description: EP #TOH-1 Stack Type: _____

Stack UTM Coordinate (E-W)	594.864 (km)	Stack UTM Coordinate (N-S)	3719.46 (km)
Latitude	33.6107 (LAT)	Longitude	-85.977 (LONG)
Height above grade	230 (ft)	Gas temperature at exit	338 (ºF)
Inside diameter at exit (round)	8.50 (ft)	Gas Velocity	36.01 (ft/Sec)
Inside area at exit (not round)	N/A (ft^2)	Volume of gas discharged	122,602 (ACFM)
Base Elevation	603 (ft)	GEP Stack Height	N/A (ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☐Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☐Yes ☐No

If yes, provide units:

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

9. Enclosed are: N/A

☐Blueprints ☐Particle size distribution report

☐Manufacturer's literature ☐Size efficiency- curves

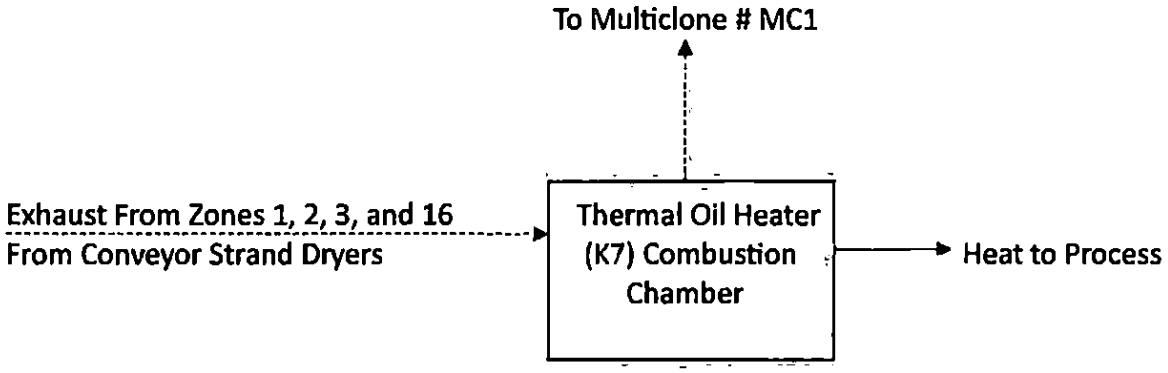
☐Emissions test of existing installation ☐Fan curves

☒Other _____

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

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.)

Comply with one of the following options identified in Part 63, Subpart DDDD, Table 1B at the time of testing:
(1) Reduce emission of total HAP, measured as THC (as carbon), by 90 percent; or
(2) Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd; or
(3) Reduce methanol emissions by 90 percent; or
(4) Limit methanol emission to less than or equal to 1 ppmvd if uncontrolled methanol emissions entering the control device are greater than or equal to 10 ppmvd; or
(5) Reduce formaldehyde emissions by 90 percent; or
(6) Limit formaldehyde emissions to less than or equal to 1 ppmvd if uncontrolled formaldehyde emissions entering the control device are greater than or equal to 10 ppmvd.


To Multiclone # MC1
Exhaust From Zones 1, 2, 3, and 16
From Conveyor Strand Dryers
Thermal Oil Heater
(K7) Combustion
Chamber
Heat to Process

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 07/11/2025

(xxiii).

K8

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

☐☐☐ - ☐☐☐☐ - ☐☐☐☐

Do not write in this space

1. Name of facility or organization: Kronospann LLC

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
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): _____
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression
- ■ Other (describe): Thermal Oil Heater K8 Combustion Chamber

3. Control device manufacturer's information:

Name of manufacturer: CEATEC Model No.: Custom

4. Emission source(s) to which device is installed or is to be installed:

Zones 1, 2, 3, and 16 from Conveyor Strand Dryers 1, 2, and 3

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	VOC	VHAPs	
Mass emission rate (#/hr)			
Uncontrolled	45.57	1.85	
Designed	4.56	0.185	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation		N/A	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	>90	>90	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)	73,625		73,625
(ACFM, existing conditions)	122,060		122,602
Temperature (ºF)	338		338
Velocity (ft/sec)	28.27		28.39
Percent moisture	<10		<10

Pressure drop across device: 2.0 (inches H_2O)

7. Stack dimensions:

Stack No. & Description: EP #TOH-1 Stack Type: _____

Stack UTM Coordinate (E-W)	594.864	(km)	Stack UTM Coordinate (N-S)	3719.46	(km)
Latitude	33.6107	(LAT)	Longitude	-85.977	(LONG)
Height above grade	230	(ft)	Gas temperature at exit	338	(ºF)
Inside diameter at exit (round)	8.50	(ft)	Gas Velocity	36.01	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	122,602	(ACFM)
Base Elevation	603	(ft)	GEP Stack Height	N/A	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☐Yes ☐No :

Is this a merged stack (do multiple units use this release point)? ☐Yes ☐No

If yes, provide units:

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

9. Enclosed are: N/A

☐Blueprints ☐Particle size distribution report

☐Manufacturer's literature ☐Size efficiency- curves

☐Emissions test of existing installation ☐Fan curves

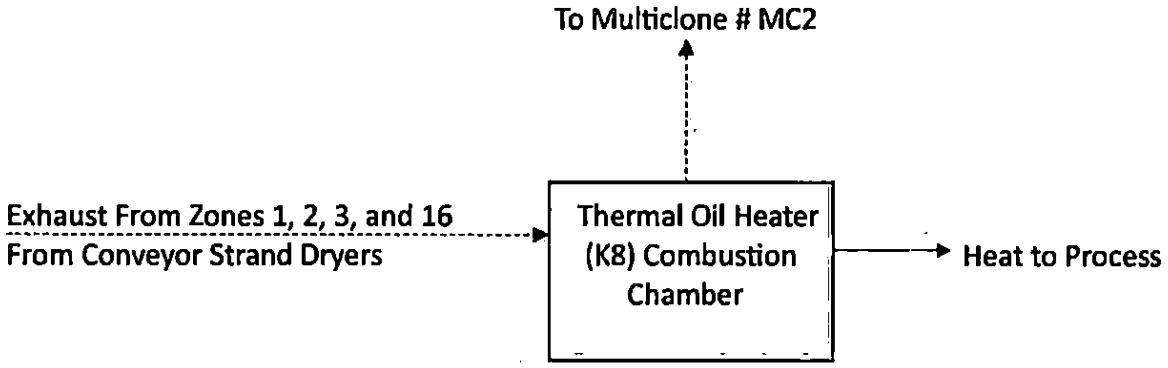
☒Other _____

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

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.)

Comply with one of the following options identified in Part 63, Subpart DDDD, Table 1B at the time of testing:

(1) Reduce emission of total HAP, measured as THC (as carbon), by 90 percent; or
(2) Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd; or
(3) Reduce methanol emissions by 90 percent; or
(4) Limit methanol emission to less than or equal to 1 ppmvd if uncontrolled methanol emissions entering the control device are greater than or equal to 10 ppmvd; or
(5) Reduce formaldehyde emissions by 90 percent; or
(6) Limit formaldehyde emissions to less than or equal to 1 ppmvd if uncontrolled formaldehyde emissions entering the control device are greater than or equal to 10 ppmvd.


To Multiclone # MC2
Exhaust From Zones 1, 2, 3, and 16
From Conveyor Strand Dryers
Thermal Oil Heater
(K8) Combustion
Chamber
Heat to Process

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 07/11/2025

d.

Sifting / Screening

(i) Sifting
(ii) Screening (Granulate)
(iii) Screening (Dust)

(i).

Sifting

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCSS)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-08

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

Sifting Operations

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	950	450	95
Designed	0.80	0.60	0.11
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	42,457		42,457
(ACFM, existing conditions)	46,418		47,120
Temperature (°F)	96		86
Velocity (ft/sec)	91.56		92.88
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.521	(km)	UTM Coordinate (N-S)	3719.479	(km)
Latitude	33.6108916	(LAT)	Longitude	-85.9811057	(LONG)
Height above grade	100.00	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	3.28	(feet)	Gas Velocity	92.88	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	47,120	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

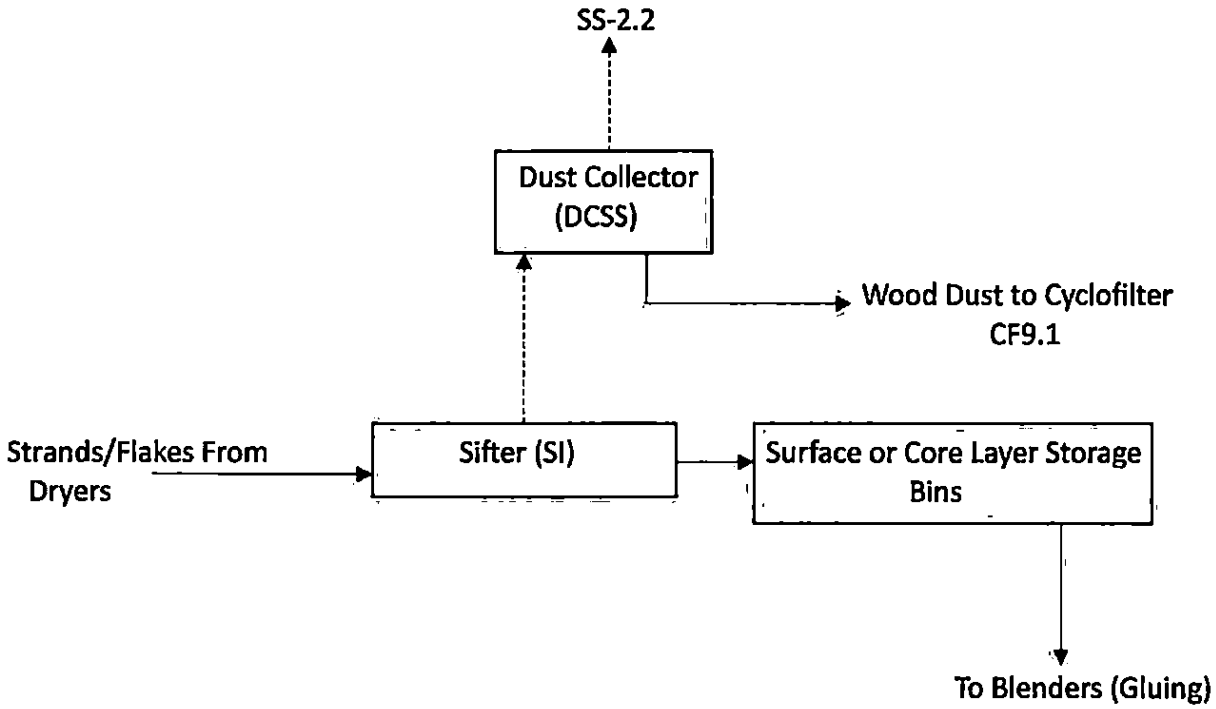
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


SS-2.2
Dust Collector
(DCSS)
Wood Dust to Cyclofilter
CF9.1
Strands/Flakes From
Dryers
Sifter (SI)
Surface or Core Layer Storage
Bins
To Blenders (Gluing)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	4,157 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Dust to OSB Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/05/24

(ii).

Screening (Granulate)

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF19.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CRU-1600-34-3375

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

Wood Granulate Transfer From Screeners to OSB Granulate Silo (OSBGS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	599.17	300	60
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	<99.9	>99.9	>99.9
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.42		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.667	(km)	UTM Coordinate (N-S)	3719.489	(km)
Latitude	33.610967	(LAT)	Longitude	-85.979539	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

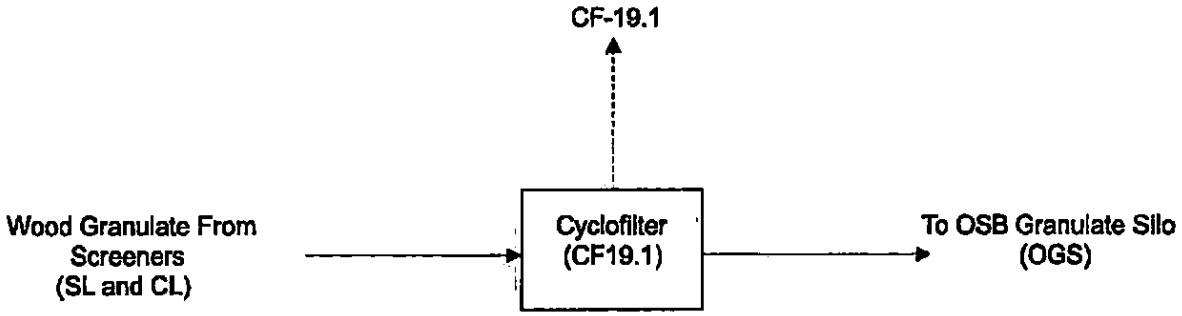
9. Enclosed are: N/A

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

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

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-19.1
Wood Granulate From Screeners (SL and CL)
Cyclofilter (CF19.1)
To OSB Granulate Silo (OGS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2624 tpy			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(iii).

Screening (Dust)

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF19.2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust From Screeners to OSB Dust Silo (ODS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	800	400	80
Designed	0.03	0.03	0.005
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.03 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99.9	>99.9	>99.9
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	1857		1857
(ACFM, existing conditions)	2046		2062
Temperature (°F)	86		86
Velocity (ft/sec)	99.67		100.35
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.668	(km)	UTM Coordinate (N-S)	3719.478	(km)
Latitude	33.610868	(LAT)	Longitude	-85.979525	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	100.35	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	2062	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

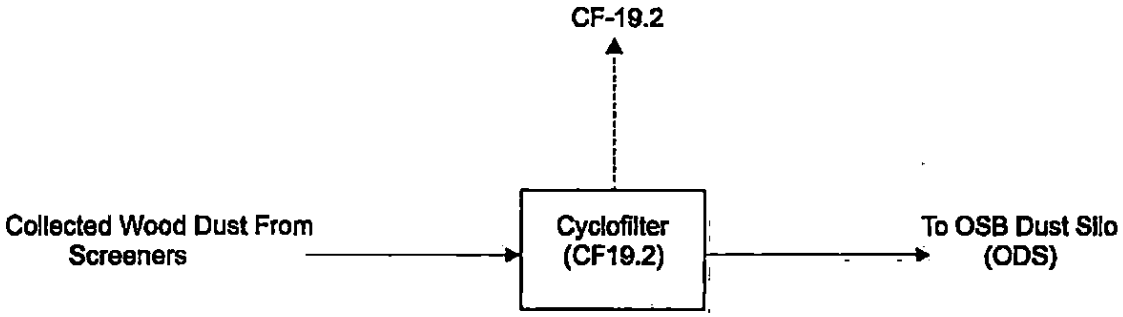
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-19.2
Collected Wood Dust From Screeners
Cyclofilter (CF19.2)
To OSB Dust Silo (ODS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	3,504 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

e.

Blending / Gluing (DCB)

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCB)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-04

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

Blending Operations

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	466.68	233.34	46.18
Designed	0.60	0.45	0.08
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	31,843		31,843
(ACFM, existing conditions)	35,076		35,340
Temperature (°F)	86		86
Velocity (ft/sec)			86.11
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.425	(km)	UTM Coordinate (N-S)	3719.458	(km)
Latitude	33.610710	(LAT)	Longitude	-85.982142	(LONG)
Height above grade	100.00	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	2.95	(feet)	Gas Velocity	86.11	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	35.340	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

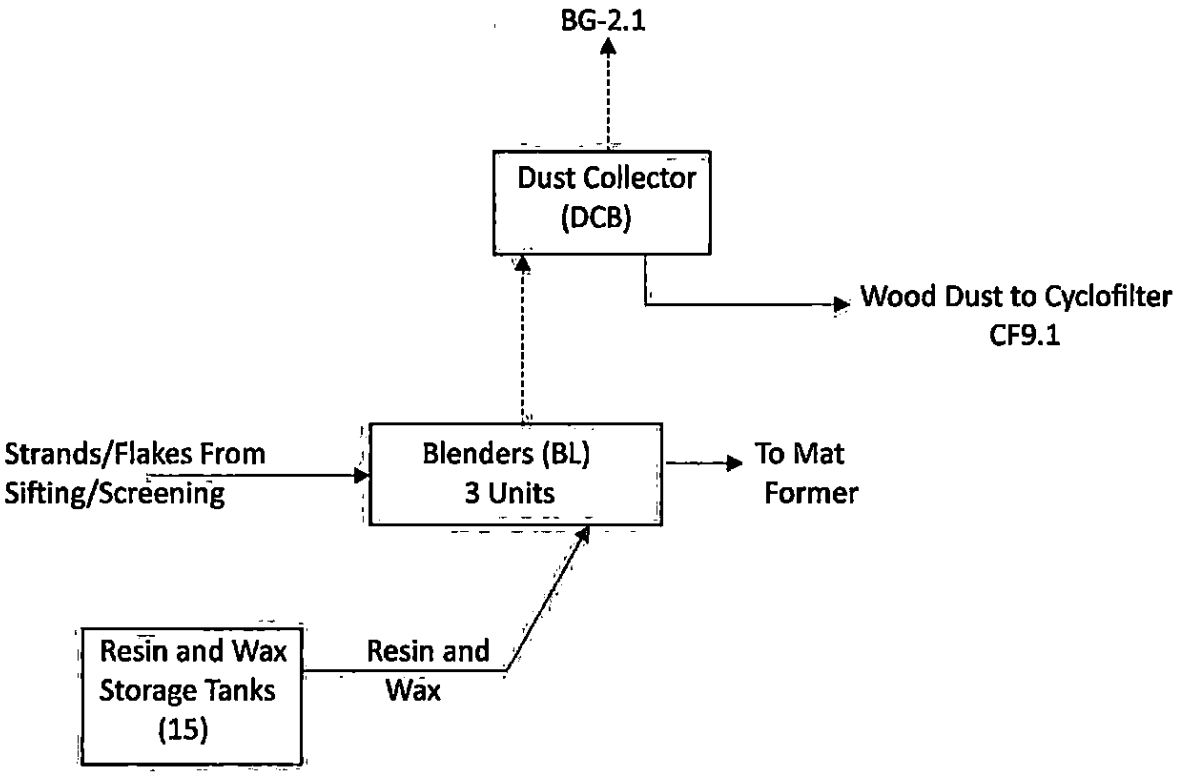
9. Enclosed are: N/A

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

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

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


BG-2.1
Dust Collector
(DCB)
Wood Dust to Cyclofilter
CF9.1
Strands/Flakes From
Sifting/Screening
Blenders (BL)
3 Units
To Mat
Former
Resin and Wax
Storage Tanks
(15)
Resin and
Wax

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2041 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Dust to OSB Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/05/24

f.

Mat Forming and Sawing

(i). CYMF
(ii). DCMF
(iii). CYMT
(iv). DCMT

(i).

CYMF

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYMF)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. Hurriclone

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

Mat Forming Operations

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	263.72	131.86	26.74
Designed	92.30	46.15	9.36
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Dust Collector (DCMF)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_2O)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCMF)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

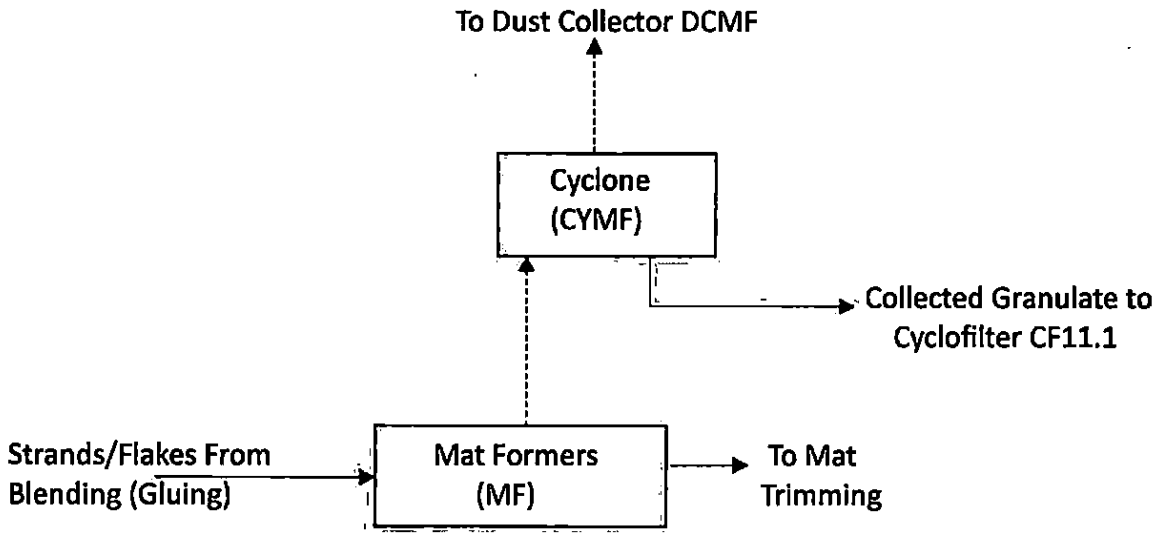
9. Enclosed are: N/A

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

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

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.)

N/A


To Dust Collector DCMF
Cyclone
(CYMF)
Collected Granulate to
Cyclofilter CF11.1
Strands/Flakes From
Blending (Gluing)
Mat Formers
(MF)
To Mat
Trimming

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	750 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

To OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/04/24

(ii).

DCMF

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCMF)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-4500-11

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

Mat Forming Operations, Via Cyclone CYMF

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	92.30	46.15	9.36
Designed	1.49	1.13	0.20
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>98	>97	>97
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	79,607		79,607
(ACFM, existing conditions)	87,690		88,350
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 **(inches H_20)**

7. **Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, Via Press Hall**

UTM Coordinate (E-W)	**(km)**	**UTM Coordinate (N-S)**	**(km)**
Latitude	**(LAT)**	**Longitude**	**(LONG)**
Height above grade	**(feet)**	**Gas temperature at exit**	**(°F)**
Inside diameter at exit (round)	**(feet)**	**Gas Velocity**	**(Ft/Sec)**
Inside area at exit (not round)	**(sq. feet)**	**Volume of gas discharged**	**(ACFM)**
Base Elevation	**(feet)**	**GEP Stack Height**	**(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.**

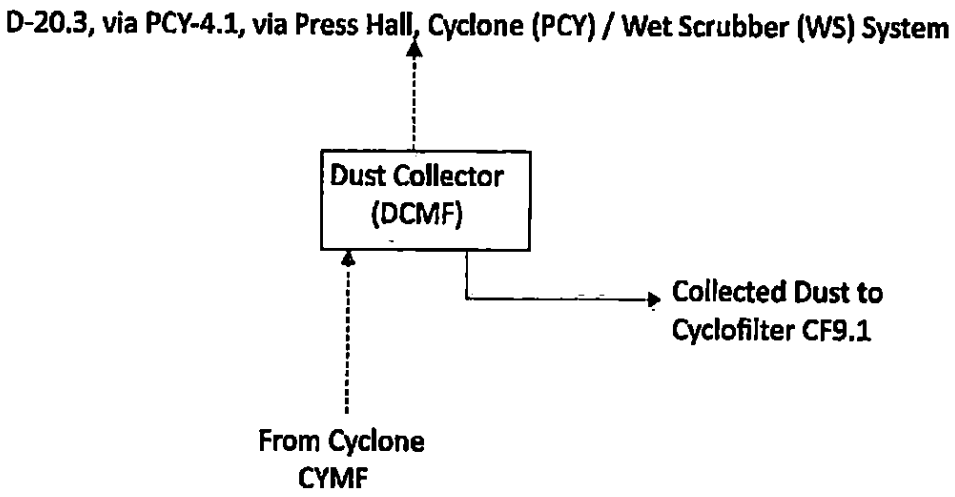
9. **Enclosed are:** **N/A**

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

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

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.)**

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 H2O.


D-20.3, via PCY-4.1, via Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCMF)
Collected Dust to
Cyclofilter CF9.1
From Cyclone
CYMF

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	398 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Conveyed to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/04/24

(iii).

CYMT

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYMT)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (desoribe): _____

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

Name of manufacturer CEATEC Model No. Custom

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

Mat Trimming Operations

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
Mass emission rate (#/hr)			
Uncontrolled	731.90	365.95	18.44
Designed.....	256.17	128.08	6.45
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed.....	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:** N/A - Discharges to Dust Collector (DCMT)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ **(inches H_2O)**

7. **Stack dimensions: N/A - Discharges to Dust Collector (DCMT)**

UTM Coordinate (E-W)	_____	**(km)**	**UTM Coordinate (N-S)**	_____	**(km)**
Latitude	_____	**(LAT)**	**Longitude**	_____	**(LONG)**
Height above grade	_____	**(feet)**	**Gas temperature at exit**	_____	**(°F)**
Inside diameter at exit (round)	_____	**(feet)**	**Gas Velocity**	_____	**(Ft/Sec)**
Inside area at exit (not round)	_____	**(sq. feet)**	**Volume of gas discharged**	_____	**(ACFM)**
Base Elevation	_____	**(feet)**	**GEP Stack Height**	_____	**(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.**

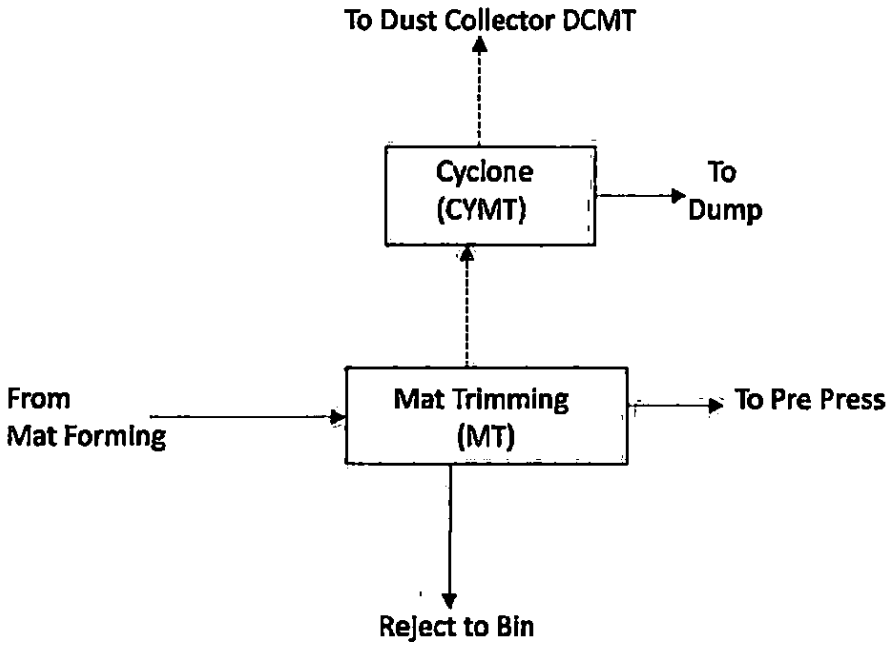
9. **Enclosed are:** N/A

- ☐ **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.** N/A

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.)**

N/A


To Dust Collector DCMT
Cyclone
(CYMT)
To
Dump
From
Mat Forming
Mat Trimming
(MT)
To Pre Press
Reject to Bin

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2084 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

Recycled back to process.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/04/24

(iv).

DCMT

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (DCMT)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-04

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

Mat Trimming Operations, Via Cyclone CYMT

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	256.17	128.08	6.45
Designed	0.60	0.45	0.08
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E = 17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>99.7	>99.6	>98
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	31,843		31,843
(ACFM, existing conditions)	35,076		35,340
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, Via Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

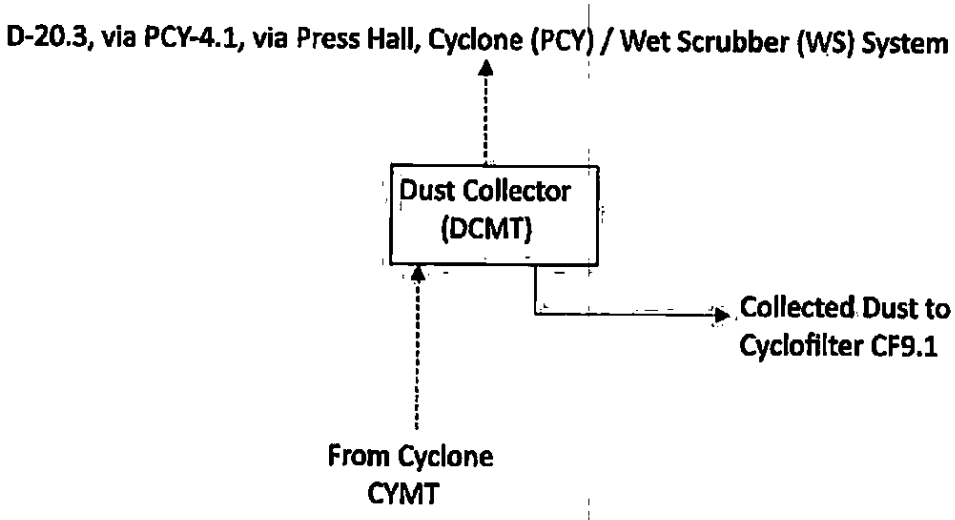
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 H_2O.


D-20.3, via PCY-4.1, via Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCMT)
Collected Dust to
Cyclofilter CF9.1
From Cyclone
CYMT

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1119 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Conveyed to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/04/24

g.

Press PCY/WS System

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Combined Cyclone / Wet Scrubber System

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

Name of manufacturer CEATEC **Model No.** Custom

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

Press Hall

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	23.98	7.56	2.40
Designed	2.92	0.92	0.86
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>87	>87	>64
Manufacturer's guaranteed	N/A	N/A	N/A

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Combined Cyclone / Wet Scrubber System

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

Name of manufacturer CEATEC **Model No.** Custom

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

Press Hall

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	VOC	Methanol	Formaldehyde
Mass emission rate (#/hr)			
Uncontrolled	68.88	29.98	7.38
Designed	10.33	4.49	1.10
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation		N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	85	85	85
Manufacturer's guaranteed	N/A	N/A	N/A

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Combined Cyclone / Wet Scrubber System

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

Name of manufacturer CEATEC **Model No.** Custom

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

Press Hall

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Phenol	Acetaldehyde	Acrolein
Mass emission rate (#/hr)			
Uncontrolled	2.67	1.41	0.0013
Designed	0.40	0.211	0.0002
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation		N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	85	85	85
Manufacturer's guaranteed	N/A	N/A	N/A

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Combined Cyclone / Wet Scrubber System

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

Name of manufacturer CEATEC Model No. Custom

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

Press Hall

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Propionaldehyde	Misc HAPs	
Mass emission rate (#/hr)			
Uncontrolled	0.40	6.62	
Designed	0.06	0.99	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation		N/A	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	85	85	
Manufacturer's guaranteed	N/A	N/A	

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	101,138		101,138
(ACFM, existing conditions)	116,919		117,800
Temperature (°F)	113		113
Velocity (ft/sec)	90.02		90.65
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions: D-20.3

UTM Coordinate (E-W)	594.557	(km)	UTM Coordinate (N-S)	3719.516	(km)
Latitude	33.611223	(LAT)	Longitude	-85.980724	(LONG)
Height above grade	230.00	(feet)	Gas temperature at exit	125	(°F)
Inside diameter at exit (round)	13.78	(feet)	Gas Velocity	115.19	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1,038,752	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	276.74	(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.

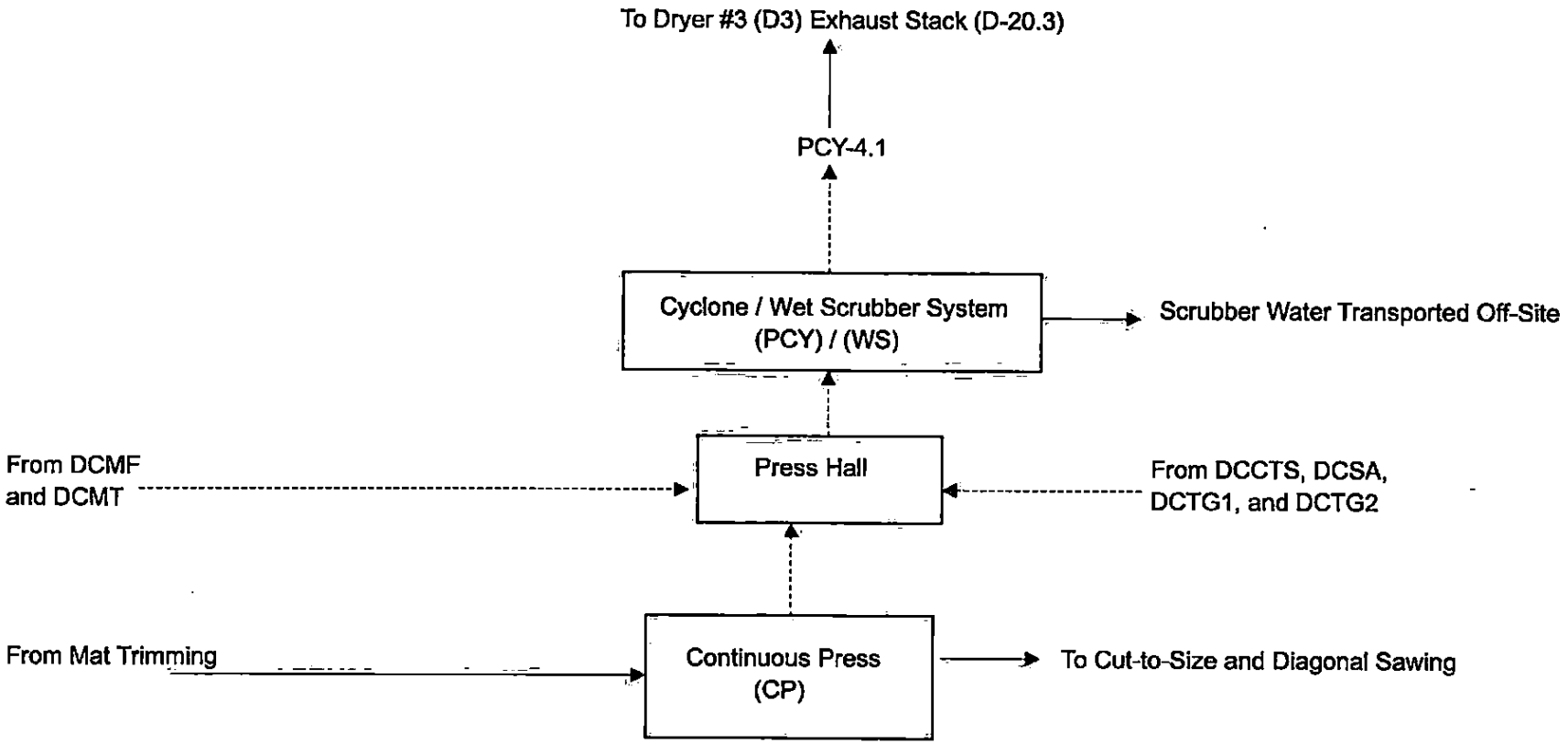
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Compliance with Part 63, Subpart DDDD, Tables 1B and 2(4) obtained by continuously monitoring the pressure drop across the scrubber and the liquid flow rate to the scrubber. The operational range(s) will be established during the performance test.


To Dryer #3 (D3) Exhaust Stack (D-20.3)
PCY-4.1
Cyclone / Wet Scrubber System
(PCY) / (WS)
Scrubber Water Transported Off-Site
From DCMF
and DCMT
Press Hall
From DCCTS, DCSA,
DCTG1, and DCTG2
From Mat Trimming
Continuous Press
(CP)
To Cut-to-Size and Diagonal Sawing

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume			400 gph	
Composition			Liquid Containing Wood Dust	
Is waste hazardous?			No	
Method of disposal			Sanitary Sewer via existing pre-treatment system at MDF Plant	
Final destination			Sanitary Sewer	

If collected air pollutants are recycled, describe:

Recovered wood product from the wastewater pretreatment system will be as fuel feed stock for the thermal oil heater.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/04/24

h.

Finishing

(i).	CYDS
(ii).	DCDS
(iii).	CYCTS
(iv).	DCCTS
(v).	DCSA
(vi).	CYTG1
(vii).	DCTG1
(viii).	CYTG2
(ix).	DCTG2
(x).	CYTG3
(xi).	DCTG3

(i).

CYDS

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYDS)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. Custom

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

Finishing Operations (Diagonal Sawing)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	731.90	365.95	73.19
Designed	256.17	128.08	25.61
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Dust Collector DCDS)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCDS)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

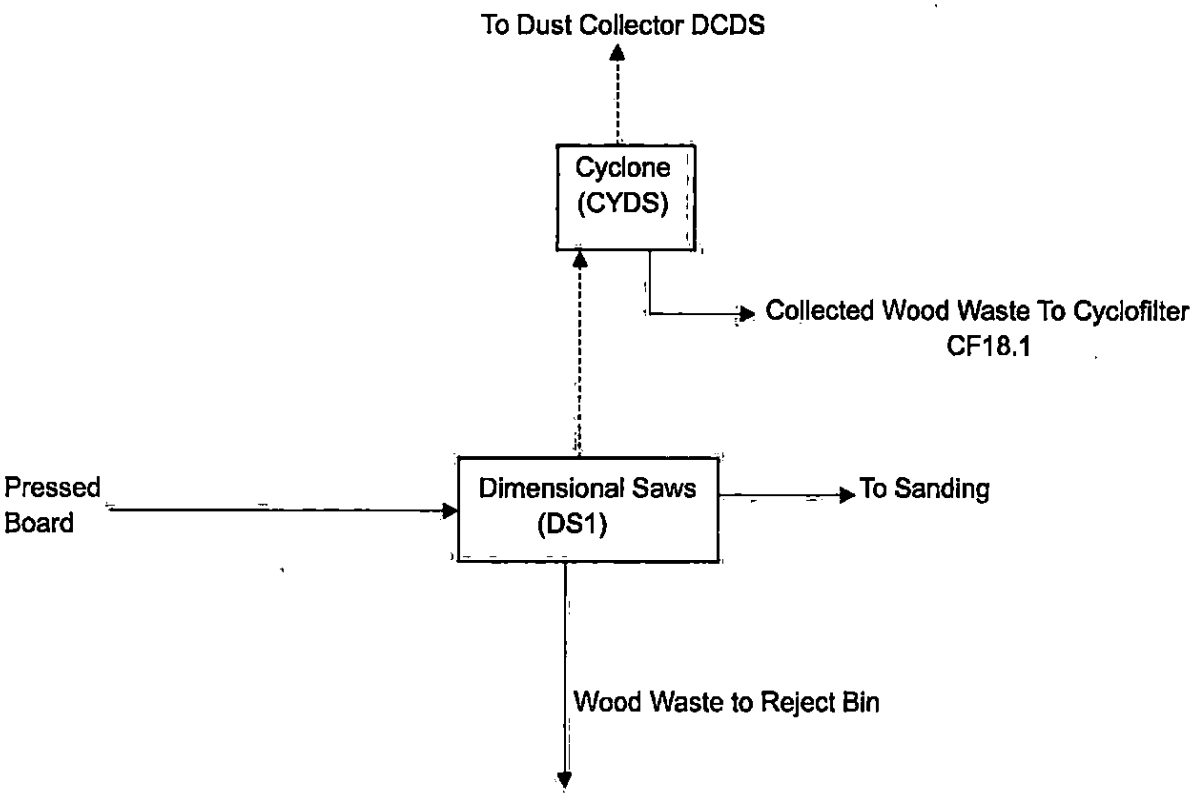
9. Enclosed are: N/A

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

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

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.)

N/A


To Dust Collector DCDS
Cyclone
(CYDS)
Collected Wood Waste To Cyclofilter
CF18.1
Pressed
Board
Dimensional Saws
(DS1)
To Sanding
Wood Waste to Reject Bin

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2084 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

To OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/04/24

(ii).

DCDS

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCDS)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-4500-04

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

Finishing Operations (Diagonal Sawing), via CYDS

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	256.17	128.08	25.61
Designed	0.56	0.42	0.08
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	<99.7	>99.6	>99.6
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	29,702		29,720
(ACFM, existing conditions)	32,737		32,984
Temperature (°F)	86		86
Velocity (ft/sec)	79.77		80.37
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber System, via Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

9. Enclosed are: N/A

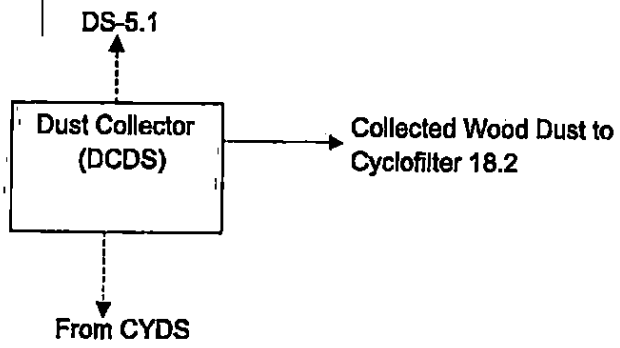
- ☐ Blueprints
- ☐ Manufacturer's literature
- ☐ Emissions test of existing installation
- ☐ Other
- ☐ Particle size distribution report
- ☐ Size-efficiency curves
- ☐ Fan curves

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0 - 8.0 inches H2O.

(Periodic Monitoring)


DS-5.1
Dust Collector
(DCDS)
Collected Wood Dust to
Cyclofilter 18.2
From CYDS

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1120 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M Layton **Date** 04/04/24

(iii).

CYCTS

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYCTS)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** Custom

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

Finishing Operations (Cut-To-Size Saw)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	731.90	365.95	73.19
Designed	256.17	128.08	25.62
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharges to Dust Collector DCCTS)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM; existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCCTS)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

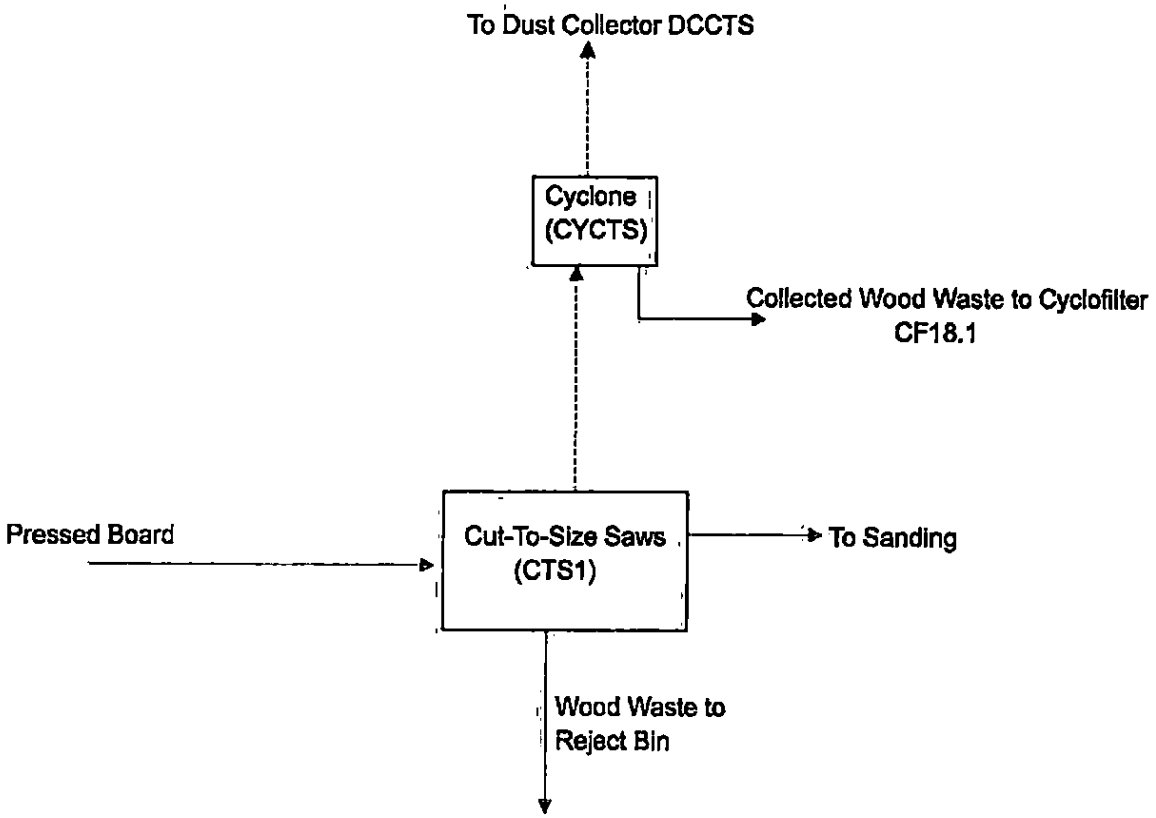
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

N/A


To Dust Collector DCCTS
Cyclone
(CYCTS)
Collected Wood Waste to Cyclofilter
CF18.1
Pressed Board
Cut-To-Size Saws
(CTS1)
To Sanding
Wood Waste to
Reject Bin

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2084 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/08/24

(iv).

DCCTS

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCCTS)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CDRW 12-05-4500-02

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

Finishing Operations (Cut-To-Size Sawing), via Cyclone CYCTS

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	256.17	128.08	25.62
Designed	0.30	0.23	0.04
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	15,921		15,921
(ACFM, existing conditions)	17,538		17,670
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

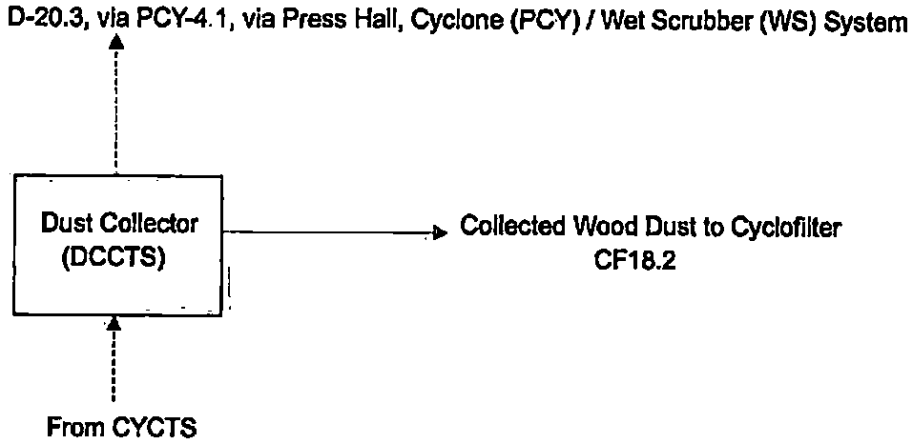
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


D-20.3, via PCY-4.1, via Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCCTS)
Collected Wood Dust to Cyclofilter
CF18.2
From CYCTS

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1121 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/08/24

(v).

DCSA

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 · (DCSA)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-10

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

Finishing (Sanding)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	2,196	878.29	219.57
Designed	1.39	1.05	0.19
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.16}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	74,300		74,300
(ACFM, existing conditions)	81,844		82,460
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Finishing Hall / Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

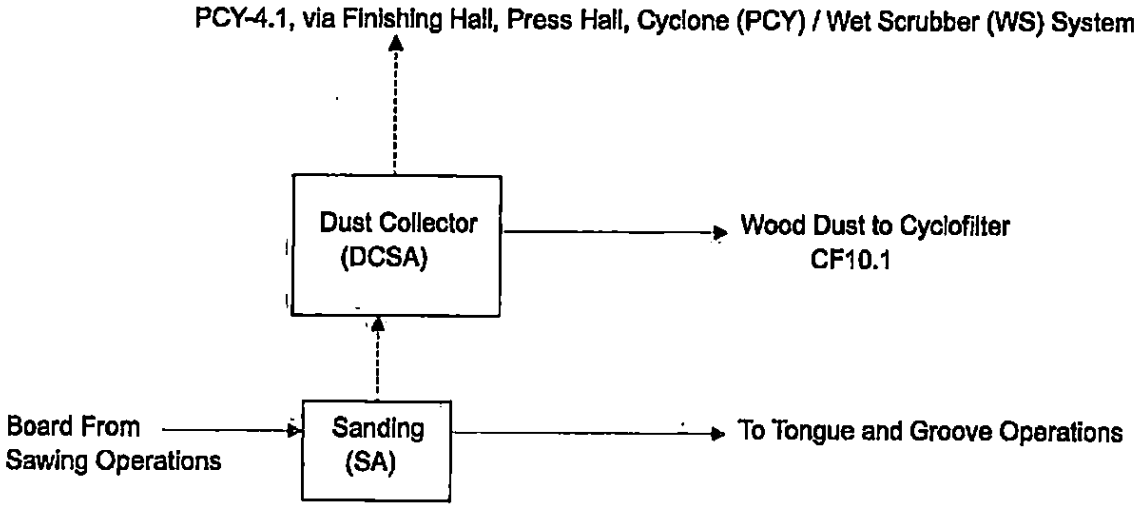
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


PCY-4.1, via Finishing Hall, Press Hall, Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCSA)
Wood Dust to Cyclofilter
CF10.1
Board From
Sawing Operations
Sanding
(SA)
To Tongue and Groove Operations

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	9,612 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/08/24

(vi).

CYTG1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYTG1)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** Custom

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

Finishing (Tongue and Groove) Station #1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	243.96	121.98	24.40
Designed	85.39	42.69	8.54
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A- Discharges to Dust Collector (DCTG1)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCTG1)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

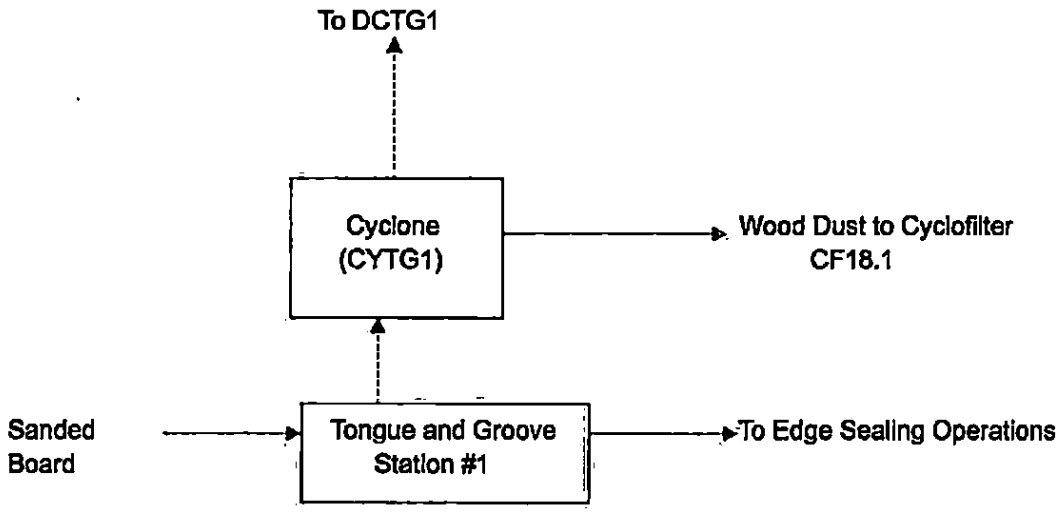
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

N/A


To DCTG1
Cyclone
(CYTG1)
Wood Dust to Cyclofilter
CF18.1
Sanded
Board
Tongue and Groove
Station #1
To Edge Sealing Operations

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	695 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/08/24

(vii).

DCTG1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCTG1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Finishing (Tongue and Groove) Station #1, via CYTG1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	85.39	42.69	8.54
Designed	0.40	0.30	0.05
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.62}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dcsf	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	21,228		21,228
(ACFM, existing conditions)	23,384		23,560
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Press Hall

UTM Coordinate (E-W) _____ (km)		UTM Coordinate (N-S) _____ (km)	
Latitude _____ (LAT)		Longitude _____ (LONG)	
Height above grade _____ (feet)		Gas temperature at exit _____ (°F)	
Inside diameter at exit (round) _____ (feet)		Gas Velocity _____ (Ft/Sec)	
Inside area at exit (not round) _____ (sq. feet)		Volume of gas discharged _____ (ACFM)	
Base Elevation _____ (feet)		GEP Stack Height _____ (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.

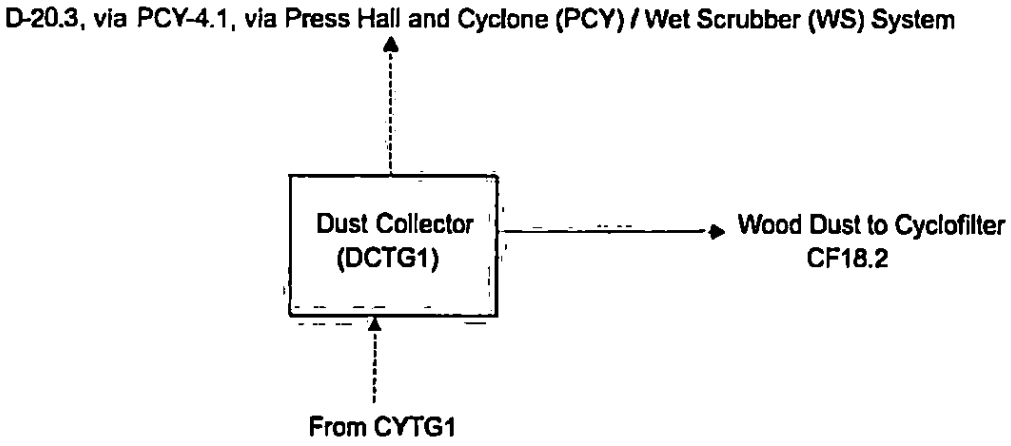
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


D-20.3, via PCY-4.1, via Press Hall and Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCTG1)
Wood Dust to Cyclofilter
CF18.2
From CYTG1

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	372 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/08/24

(viii).

CYTG2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CYTG2)	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** Custom

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

Finishing (Tongue and Groove) Station #2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	243.96	121.98	24.40
Designed.....	85.39	42.69	8.54
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed.....	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions: N/A - Discharge to Dust Collector (DCTG2)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_2O)

7. Stack dimensions: N/A - Discharges to Dust Collector (DCTG2)

UTM Coordinate (E-W)	_____ (km)	UTM Coordinate (N-S)	_____ (km)
Latitude	_____ (LAT)	Longitude	_____ (LONG)
Height above grade	_____ (feet)	Gas temperature at exit	_____ (°F)
Inside diameter at exit (round)	_____ (feet)	Gas Velocity	_____ (Ft/Sec)
Inside area at exit (not round)	_____ (sq. feet)	Volume of gas discharged	_____ (ACFM)
Base Elevation	_____ (feet)	GEP Stack Height	_____ (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.

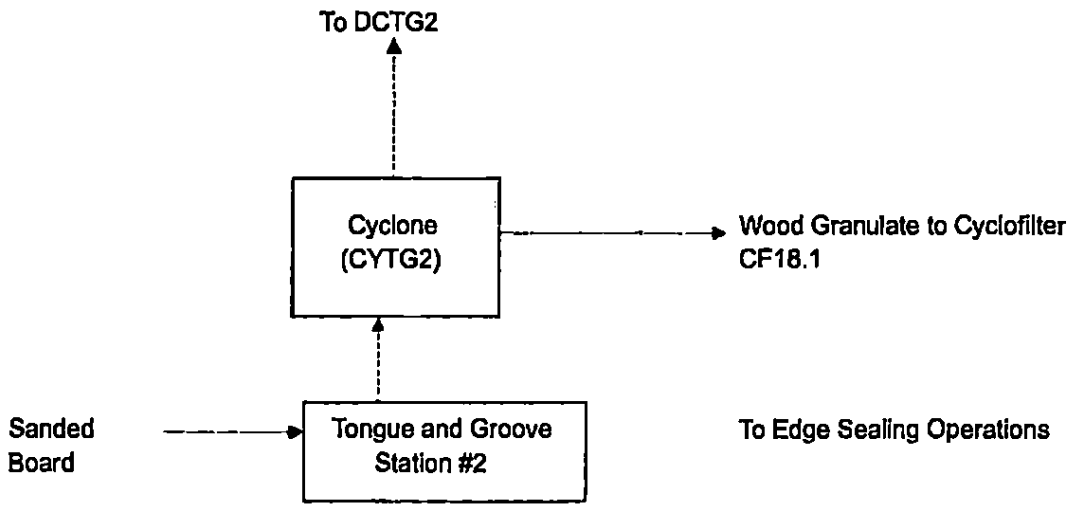
9. Enclosed are: N/A

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

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

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.)

N/A


To DCTG2
Cyclone
(CYTG2)
Wood Granulate to Cyclofilter
CF18.1
Sanded
Board
Tongue and Groove
Station #2
To Edge Sealing Operations

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	695 tons/yr			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/08/24

(ix).

DCTG2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCTG2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Finishing (Tongue and Groove) Station #2, via CYTG2

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	85.39	42.69	8.54
Designed	0.40	0.30	0.05
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.62}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	0.002 gr/dscf	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	21,228		21,228
(ACFM, existing conditions)	23,384		23,560
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

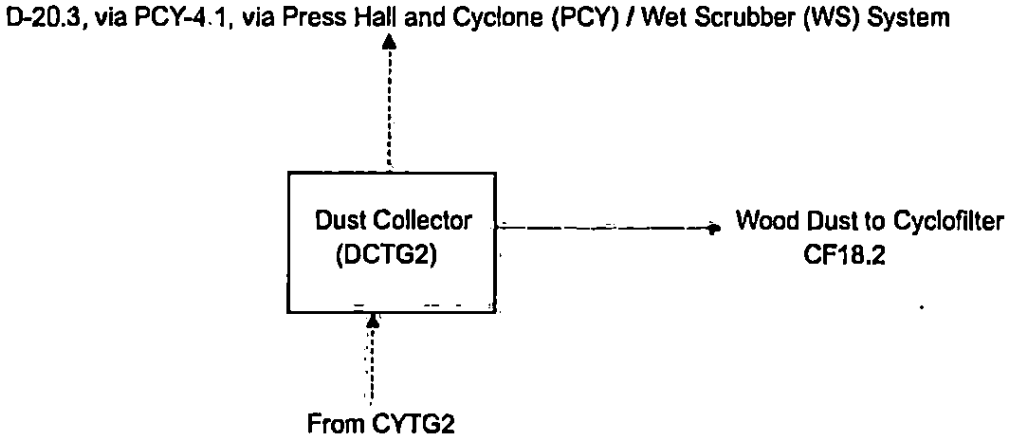
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


D-20.3, via PCY-4.1, via Press Hall and Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCTG2)
Wood Dust to Cyclofilter
CF18.2
From CYTG2

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	372 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/08/24

(x).

CYTG3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 CYTG3	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** Custom

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

Finishing (Tongue and Groove) Station #3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	243.96	121.98	24.40
Designed	85.39	42.69	8.54
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	65	65	65
Manufacturer's guaranteed	N/A	N/A	N/A

6. **Gas conditions:** N/A - Discharges to Dust Collector (DCTG3)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ **(inches H_2O)**

7. **Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Press Hall**

UTM Coordinate (E-W) _____ **(km)**	**UTM Coordinate (N-S)** _____ **(km)**
Latitude _____ **(LAT)**	**Longitude** _____ **(LONG)**
Height above grade _____ **(feet)**	**Gas temperature at exit** _____ **(°F)**
Inside diameter at exit (round) _____ **(feet)**	**Gas Velocity** _____ **(Ft/Sec)**
Inside area at exit (not round) _____ **(sq. feet)**	**Volume of gas discharged** _____ **(ACFM)**
Base Elevation _____ **(feet)**	**GEP Stack Height** _____ **(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.**

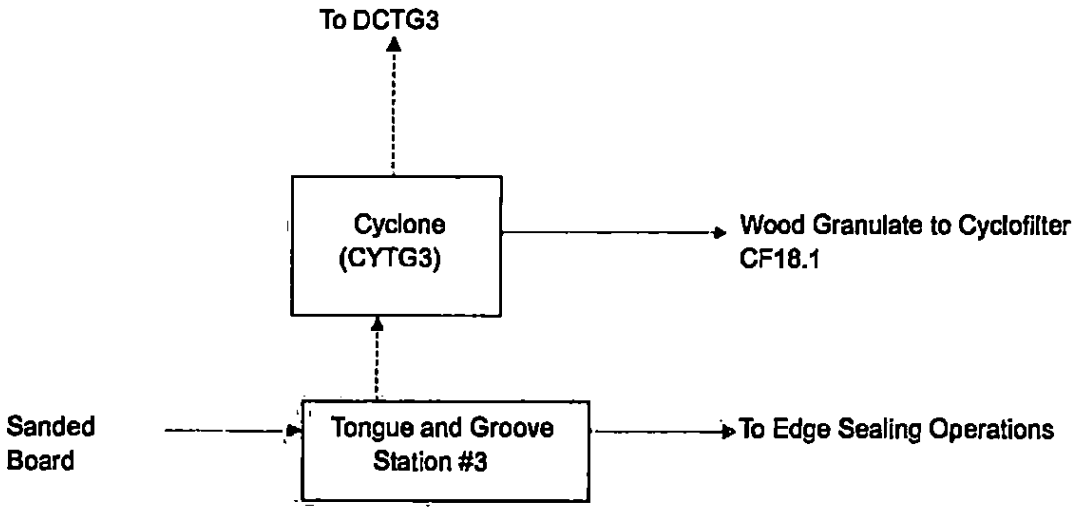
9. **Enclosed are:** N/A

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

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

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.)**

N/A


To DCTG3
Cyclone
(CYTG3)
Wood Granulate to Cyclofilter
CF18.1
Sanded
Board
Tongue and Groove
Station #3
To Edge Sealing Operations

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	695			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Process			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M Layton **Date** 04/08/24

(xi).

DCTG3

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (DCTG3)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CDRW 12-05-4500-03

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

Finishing (Tongue and Groove) Station #3, via CYTG3

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	85.39	42.69	8.54
Designed	0.40	0.30	0.05
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	$E=17.31P^{0.62}$	N/A	N/A
Manufacturer's guaranteed	0.002185 gr/dscf	N/A	N/A
Removal efficiency (%)			
Designed	>99	99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	21,228		21,228
(ACFM, existing conditions)	23,384		23,560
Temperature (°F)	86		86
Velocity (ft/sec)	Unknown		Unknown
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions: N/A - Discharges to Cyclone (PCY)/Wet Scrubber (WS) System, via Press Hall

UTM Coordinate (E-W)	(km)	UTM Coordinate (N-S)	(km)
Latitude	(LAT)	Longitude	(LONG)
Height above grade	(feet)	Gas temperature at exit	(°F)
Inside diameter at exit (round)	(feet)	Gas Velocity	(Ft/Sec)
Inside area at exit (not round)	(sq. feet)	Volume of gas discharged	(ACFM)
Base Elevation	(feet)	GEP Stack Height	(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.

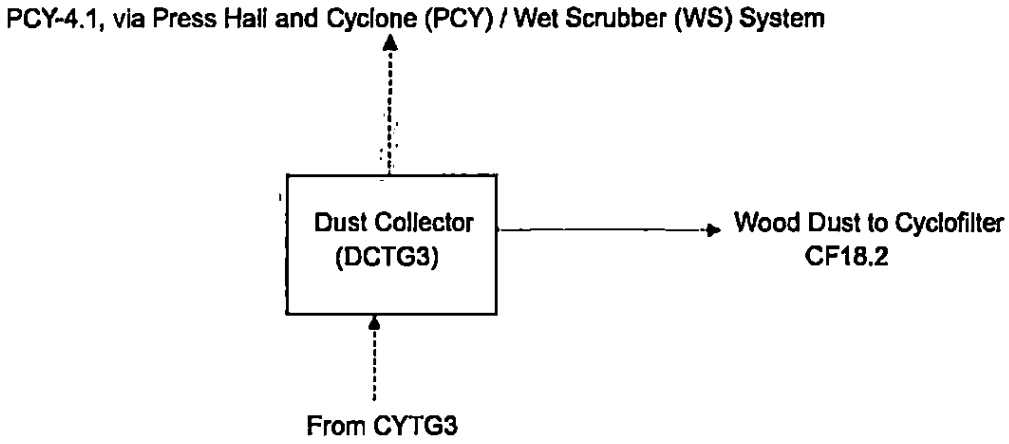
9. Enclosed are: N/A

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

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

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.)

Facility will install, operate, and maintain a differential pressure gauge on the dust collector. Readings will be taken daily. The operational range is 1.0-8.0 inches H_2O.


PCY-4.1, via Press Hall and Cyclone (PCY) / Wet Scrubber (WS) System
Dust Collector
(DCTG3)
Wood Dust to Cyclofilter
CF18.2
From CYTG3

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	372 tons/yr			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/08/24

i.

Wood Granulate Transfer

(i) CF11.1
(ii) CF15.1
(iii) CF16.1
(iv) CF16.2
(v) CF18.1

(i)

CF11.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF11.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Granulate Transfer From Mat Forming Cyclone (CYMF)(MFDC) to OSB Granulate Silo (OGS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	171	86	17
Designed	0.03	0.03	0.005
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.03 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	1,857		1,857
(ACFM, existing conditions)	2,046		2,062
Temperature (°F)	86		86
Velocity (ft/sec)	97.69		100.35
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.667	(km)	UTM Coordinate (N-S)	3719.487	(km)
Latitude	33.610950	(LAT)	Longitude	-85.979531	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	100.35	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	2,062	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

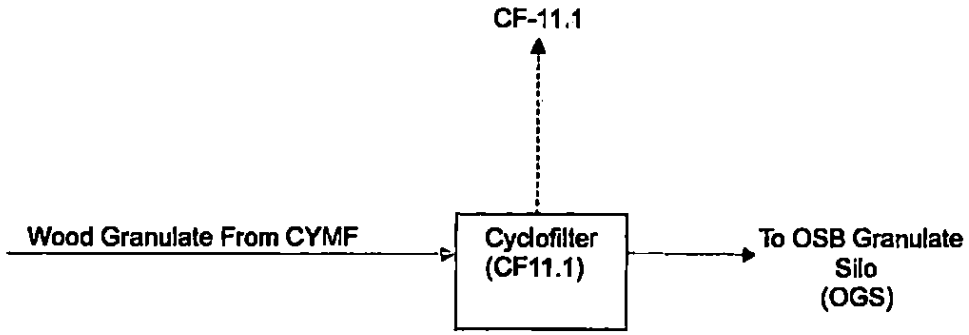
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-11.1
Wood Granulate From CYMF
Cyclofilter
(CF11.1)
To OSB Granulate
Silo
(OGS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	749 tpy			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(ii)

CF15.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF15.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CRU-1600-34-3375

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

Wood Granulate Transfer From MDF Granulate Silo (MDFGS) to OSB Boiler Granulate Silo (OBGS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	Unknown	Unknown	Unknown
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.50		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.779	(km)	UTM Coordinate (N-S)	3719.465	(km)
Latitude	33.610742	(LAT)	Longitude	-85.978334	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

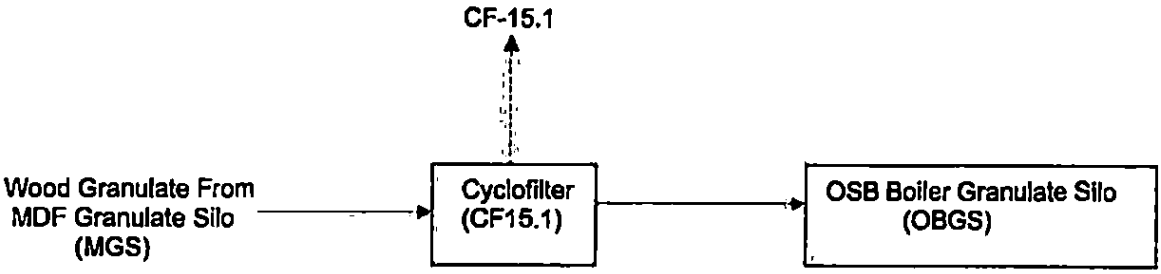
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-15.1
Wood Granulate From MDF Granulate Silo (MGS)
Cyclofilter (CF15.1)
OSB Boiler Granulate Silo (OBGS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	Unknown			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(iii)

CF16.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF16.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Granulate Transfer From Particleboard Core Layer Dry Silo (PCLS) to OSB Core Layer Silo (OCLS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	Unknown	Unknown	Unknown
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.50		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.533	(km)	UTM Coordinate (N-S)	3719.509	(km)
Latitude	33.611160	(LAT)	Longitude	-85.980980	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

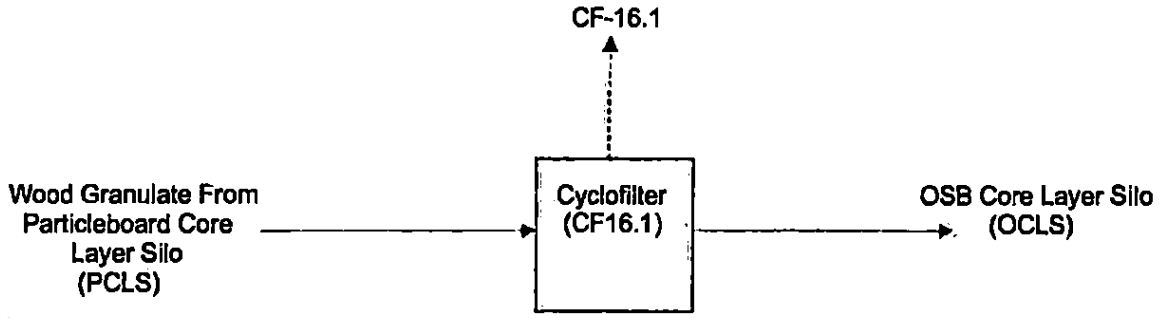
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-16.1
Wood Granulate From Particleboard Core Layer Silo (PCLS)
Cyclofilter (CF16.1)
OSB Core Layer Silo (OCLS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	Unknown			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(iv)

CF16.2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF16.2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Granulate Transfer From OSB Granulate Silo (OSBGS) to Particleboard Flaker Silo (PBFS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	Varies	Varies	Varies
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.50		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.845	(km)	UTM Coordinate (N-S)	3719.621	(km)
Latitude	33.612145	(LAT)	Longitude	-85.977602	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

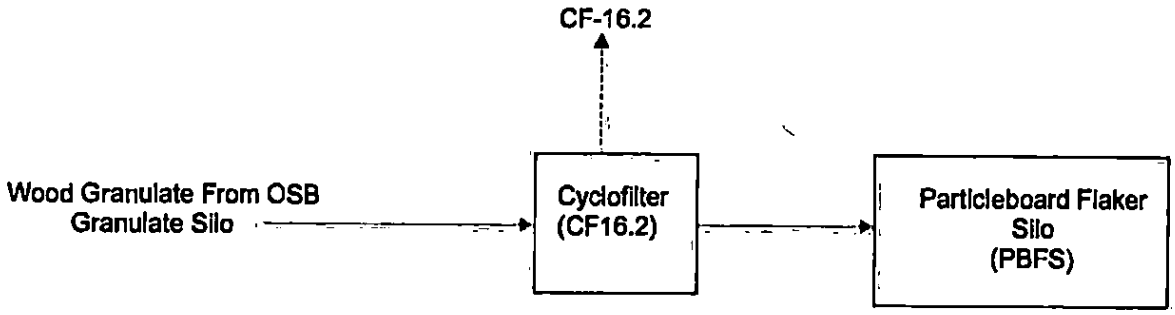
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-16.2
Wood Granulate From OSB Granulate Silo
Cyclofilter (CF16.2)
Particleboard Flaker Silo (PBFS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	Unknown			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	PB Process			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(v)

CF18.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF18.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Granulate Transfer From Diagonal Saw Cyclone (CYDS), Cut-to-Size Saw Cyclone (CYCTS), and Tongue and Groove Cyclones (CYTG1 AND CYTG2) to OSB Granulate Silo (OSBGS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	1427	714	143
Designed	0.05	0.04	0.08
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.05 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	2919		2919
(ACFM, existing conditions)	3215		3240
Temperature (°F)	86		86
Velocity (ft/sec)	71.04		71.52
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.666	(km)	UTM Coordinate (N-S)	3719.491	(km)
Latitude	33.610985	(LAT)	Longitude	-85.979544	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	71.52	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	3240	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

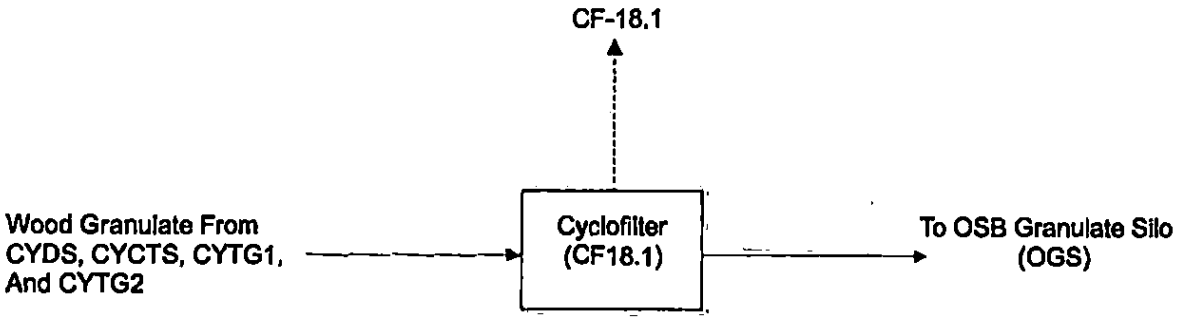
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine is visible emissions are present.


CF-18.1
Wood Granulate From
CYDS, CYCTS, CYTG1,
And CYTG2
Cyclofilter
(CF18.1)
To OSB Granulate Silo
(OGS)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	6,250 tpy			
Composition	Wood Granulate			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected granulate to OSB Granulate Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

j.

Wood Dust Transfer

(i) CF8.1
(ii) CF9.1
(iii) CF10.1
(iv) CF12.1
(v) CF12.2
(vi) CF13.1
(vii) CF14.1
(viii) CF18.2

(i)

CF8.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF8.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust Transfer From Dryers #1, #2, and #3 Dust Collectors to OSB Dust Silo (ODS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	571	349	349
Designed	0.02	0.02	0.003
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.02 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	1327		1327
(ACFM, existing conditions)	1462		1473
Temperature (°F)	86		86
Velocity (ft/sec)	71.22		71.66
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	694.671	(km)	UTM Coordinate (N-S)	3719.482	(km)
Latitude	33.610903	(LAT)	Longitude	-85.979491	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	71.66	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	1473	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

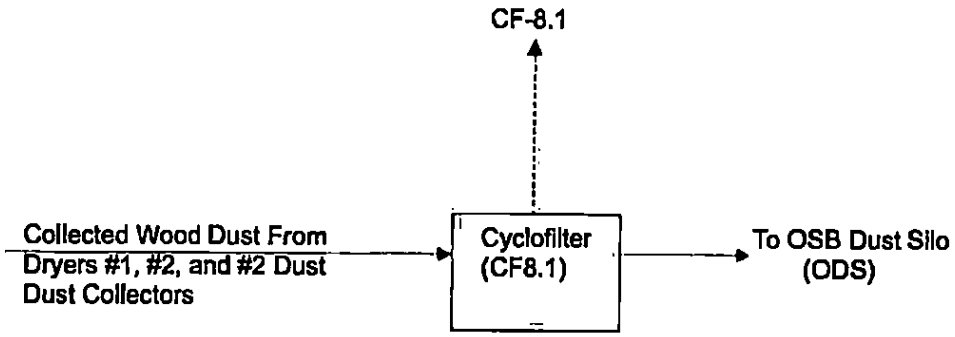
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-8.1
Collected Wood Dust From Dryers #1, #2, and #2 Dust Dust Collectors
Cyclofilter (CF8.1)
To OSB Dust Silo (ODS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	2741 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(ii)

CF9.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF9.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust Transfer From Sifting/Screening, Blending, Mat Forming, and Mat Trimming Dust Collectors to OSB Dust Silo (ODS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	1,775	857	156
Designed	0.03	0.02	0.005
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.03 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°F, 29.92" hg)	1857		1857
(ACFM, existing conditions)	2046		2062
Temperature (°F)	86		86
Velocity (ft/sec)	99.67		100.35
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.669	(km)	UTM Coordinate (N-S)	3719.481	(km)
Latitude	33.610898	(LAT)	Longitude	-85.979512	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	2062	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	100.35	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	2062	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

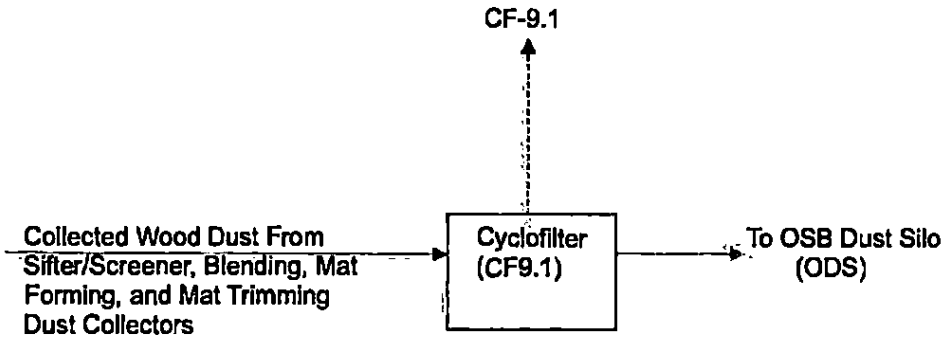
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-9.1
Collected Wood Dust From Sifter/Screener, Blending, Mat Forming, and Mat Trimming Dust Collectors
Cyclofilter (CF9.1)
To OSB Dust Silo (ODS)

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	7775 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(iii)

CF10.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF10.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust Transfer From Sanding Dust Collector (DCSA) to OSB Dust Silo (ODS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	20,118	2,752	678
Designed	0.03	0.03	0.005
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.03 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	1857		1857
(ACFM, existing conditions)	2046		2062
Temperature (°F)	86		86
Velocity (ft/sec)	99.67		100.35
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.667	(km)	UTM Coordinate (N-S)	3719.481	(km)
Latitude	33.610892	(LAT)	Longitude	-85.979534	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	100.35	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	2062	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

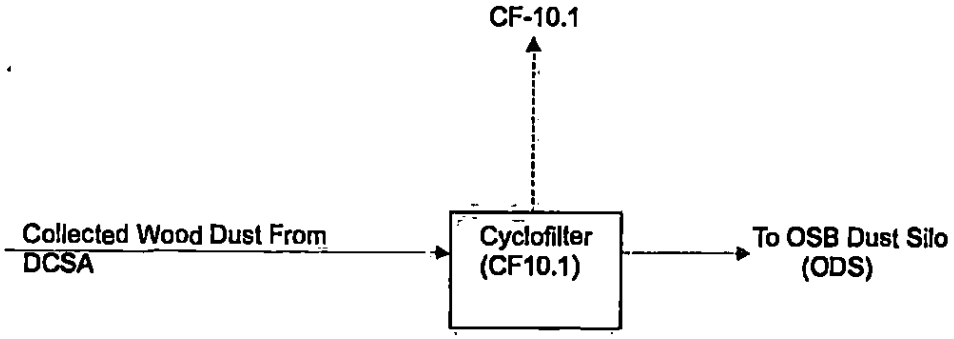
9. Enclosed are: N/A

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

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

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-10.1
Collected Wood Dust From DCSA
Cyclofilter (CF10.1)
To OSB Dust Silo (ODS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	88,116tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/12/24

(iv)

CF12.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF12.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CRU-1600-34-3375

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

Wood Dust Transfer From OSB Dust Silo (ODS) to OSB Boiler Dust Silo (OBDS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	24,488	4,960	1,442
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.41		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.770	(km)	UTM Coordinate (N-S)	3719.462	(km)
Latitude	33.610717	(LAT)	Longitude	-85.978432	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

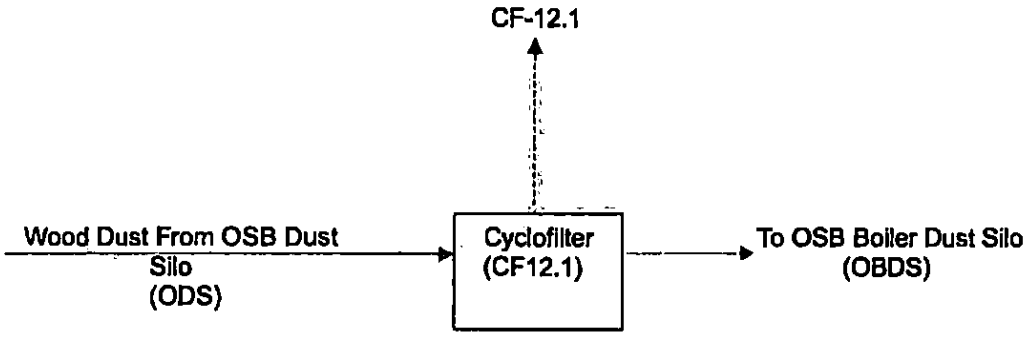
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-12.1
Wood Dust From OSB Dust Silo (ODS)
Cyclofilter (CF12.1)
To OSB Boiler Dust Silo (OBDS)

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

N/A

13. Disposal of collected air pollutants: **N/A**

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	107,257 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(v)

CF12.2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF12.2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** CRU-1600-34-3375

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

Wood Dust Transfer From OSB Boiler Dust Silo (OBDS) to MDF Dust Silo (MDS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	Varies	Varies	Varies
Designed	0.07	0.05	0.01
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.07 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	3715		3715
(ACFM, existing conditions)	4092		4123
Temperature (°F)	86		86
Velocity (ft/sec)	90.42		91.03
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.944	(km)	UTM Coordinate (N-S)	3719.473	(km)
Latitude	33.610799	(LAT)	Longitude	-85.976551	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	91.03	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	4123	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

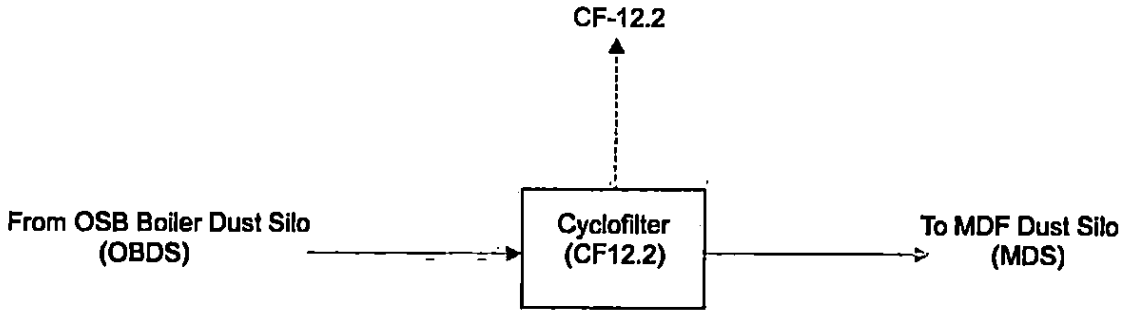
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-12.2
From OSB Boiler Dust Silo
(OBDS)
Cyclofilter
(CF12.2)
To MDF Dust Silo
(MDS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	Varies			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(vi)

CF13.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF13.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust Transfer From MDF Dust Silo (MDS) to OSB Boiler Dust Silo (OBDS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	Varies	Varies	Varies
Designed	0.05	0.04	0.008
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.05 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	2919		2919
(ACFM, existing conditions)	3215		3240
Temperature (°F)	86		86
Velocity (ft/sec)	71.03		71.52
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_20)

7. Stack dimensions:

UTM Coordinate (E-W)	594.772	(km)	UTM Coordinate (N-S)	3719.463	(km)
Latitude	33.610724	(LAT)	Longitude	-85.978403	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	71.52	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	3240	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

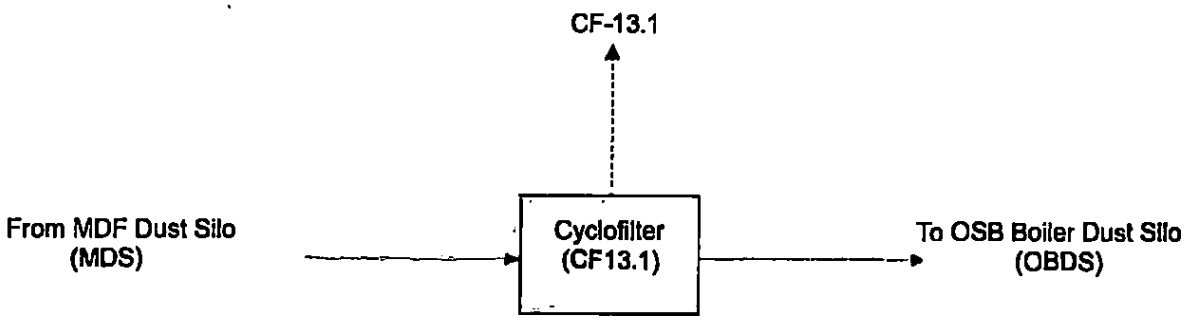
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-13.1
From MDF Dust Silo
(MDS)
Cyclofilter
(CF13.1)
To OSB Boiler Dust Silo
(OBDS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	Varies			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(vii)

CF14.1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF14.1)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. RU-1600-34-3375

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

Wood Dust Transfer From Strander Dust Colectors (DCST1, DCST2, DCST3) to OSB Dust Silo (ODS)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	398	159	99
Designed	0.03	0.02	0.005
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.03 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	1857		1857
(ACFM, existing conditions)	2046		2062
Temperature (°F)	86		86
Velocity (ft/sec)	99.67		100.35
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.672	(km)	UTM Coordinate (N-S)	3719.479	(km)
Latitude	33.610878	(LAT)	Longitude	-85.979482	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.66	(feet)	Gas Velocity	100.35	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	2062	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

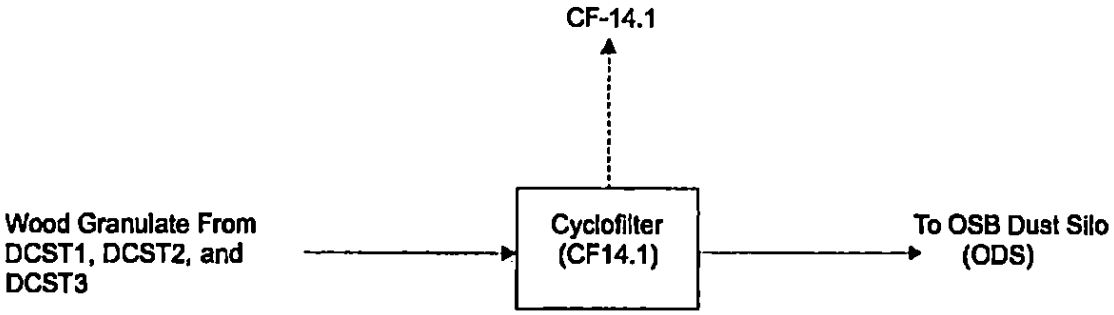
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-14.1
Wood Granulate From DCST1, DCST2, and DCST3
Cyclofilter (CF14.1)
To OSB Dust Silo (ODS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	1,743 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/12/24

(viii)

CF18.2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (CF18.2)
☐ Cyclone	☐ Multiclone
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC Model No. CRU-1600-34-3375

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

Wood Dust Transfer From Diagonal Saw Dust Collector (DCDS), Cut-to-Size Dust Collector (DCCTS), and Tongue and Groove Dust Collectors (DCTG1, DCTG2) to OSB Dust Silo (ODS).

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	766	382	75
Designed	0.05	0.04	0.008
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.05 lbs/hr	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>99	>99	>99
Manufacturer's guaranteed	N/A	N/A	N/A

6. Gas conditions:

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	2919		2919
(ACFM, existing conditions)	3215		3240
Temperature (°F)	86		86
Velocity (ft/sec)	71.04		71.52
Percent moisture	<10		<10

Pressure drop across device: 3.0 (inches H_2O)

7. Stack dimensions:

UTM Coordinate (E-W)	594.670	(km)	UTM Coordinate (N-S)	3719.478	(km)
Latitude	33.610873	(LAT)	Longitude	-85.979503	(LONG)
Height above grade	98.43	(feet)	Gas temperature at exit	86	(°F)
Inside diameter at exit (round)	0.98	(feet)	Gas Velocity	71.52	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	3240	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	337.50	(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.

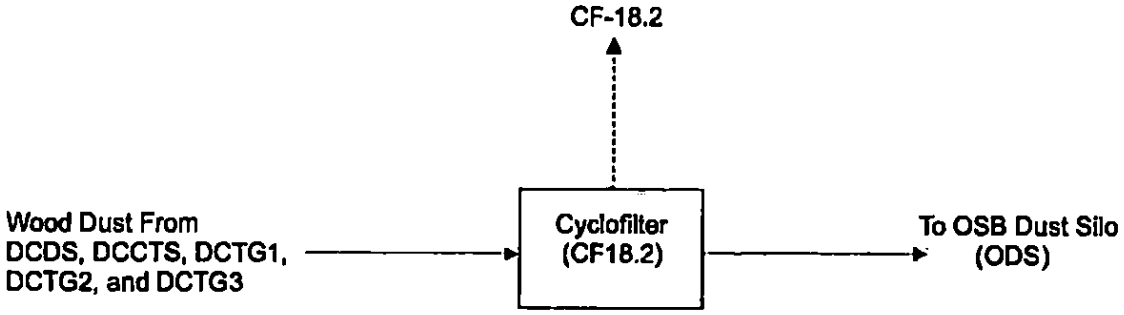
9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Daily visual observations of dust collector stack to determine if visible emissions are present.


CF-18.2
Wood Dust From
DCDS, DCCTS, DCTG1,
DCTG2, and DCTG3
Cyclofilter
(CF18.2)
To OSB Dust Silo
(ODS)

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

N/A

13. Disposal of collected air pollutants: N/A

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	3,355 tpy			
Composition	Wood Dust			
Is waste hazardous?	No			
Method of disposal	Reuse			
Final destination	Thermal Oil Heater			

If collected air pollutants are recycled, describe:

Collected dust to OSB Dust Silo for further use.

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/12/24

5.

Loading and Storage of Organic Compounds

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of Facility or Organization: Kroospan LLC

3. *Permit Application is made for:*

- ☐ Existing Equipment
- ☑ New Equipment
- ☐ Modification
- ☐ Change in Location
- ☐ Other

3. Type of unit: Resin / Wax / Release Agent Storage Tanks

Source Classification Code(s): 30700698

4. Normal Schedule of Operation:

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

Peak production season (if any): N/A

5. For each regulated pollutant, describe any limitations on source operation or any work practice standards which affect emissions:
N/A

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

7. On a separate sheet sketch a map indicating the location of each storage tank and/or loading rack for which this application is made.

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: _____ Date: 08/01/2025

If additional entries are needed, make additional copies of this form and attach to the application. Make sure to identify the additional sheets such as 2a of 8 or 2.1 of 8.

TABLE 108.1-PROPOSED STORAGE TANK(S)/LOADING RACK(S) AT FACILITY

TANK ID	TANK CAPACITY (gallons)	TANK TYPE [a] (HFRT, VFRT, EFLRT, DEFLRT, or IFLRT)	FILL METHOD [d]	DATE MANUFACTURED	DATE INSTALLED OR CONSTRUCTION COMMENCED	DATE RECONSTRUCTED, AS APPLICABLE	DATE MODIFIED, AS APPLICABLE	EQUIPPED WITH VAPOR RECOVERY SYSTEM [b] (Y or N)	APPLICABLE REGULATIONS
R-1	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-2	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-3	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-4	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-5	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-6	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-7	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
R-8	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-1	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-2	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-3	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-4	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-5	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-6	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
W-7	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None
RA-1	26,417	VFRT	Top Filling	2025	10/01/25	N/A	N/A	N	None

RACK ID	RACK TYPE (Marine, Truck, Rail, etc.)	PROPOSED PRODUCTS TO BE LOADED [c]	TYPE OF LOADING [d]	IF SUBMERGED, WHAT % IS FILL PIPE SUBMERGED?	EQUIPPED WITH VAPOR RECOVERY SYSTEM [b] (Y or N)	PROVIDE EFFICIENCY OF VAPOR COLLECTION SYSTEM	APPLICABLE REGULATIONS
N/A							

(a) HFRT-horizontal fixed roof tank; VFRT-vertical fixed roof tank; EFLRT-external floating roof tank; DEFLRT-domed external floating roof tank; IFLRT-internal floating roof tank
(b) Please attach ADEM Form 110 for the vapor recovery system.
(c) Use Product ID from Table 108.2 or list "ALL" if rack may transfer all of the products listed in Table 108.2.
(d) Type of Filling/Loading-submerged fill, splash filling, top filling, bottom filling, etc

TABLE 108.2-PROPOSED PRODUCT(S) STORED AND LOADED OUT AT FACILITY

PRODUCT CODE	PRODUCT NAME & CAS NO., IF APPLICABLE	LIQUID MOLECULAR WEIGHT (lb/lb-mole)	VAPOR MOLECULAR WEIGHT (lb/lb-mole)	MAXIMUM TRUE VAPOR PRESSURE (psia)	LIQUID DENSITY [a] (lb/gal)	TEMP. STORED AT (°F)	TOTAL PRODUCT THROUGHPUT (gal/year)	Loadout [b] Mark all that apply: Marine Vessel	Truck	Rail Car	Pipeline		Worst case VOC emissions from storing this product (TPY)	Worst case VOC emissions from loading this product (TPY)
A	MDI / PMDI Resin	150	150	6.4×10^{-8}	10.01	78	7,876,124	☐	☐	☐	☑	☐	1.2×10^{-5}	8.0×10^{-7}
B	Wax	Unknown	Unknown	61.0×10^{-5}	7.80	100	1,572,308	☐	☐	☐	☑	☐	0	0
C	Release Agent	Unknown	Unknown	61.0×10^{-5}	8.00	72	Varies	☐	☐	☐	☑	☐	0	0
D								☐	☐	☐	☐	☐		
E								☐	☐	☐	☐	☐		
F								☐	☐	☐	☐	☐		
G								☐	☐	☐	☐	☐		
H								☐	☐	☐	☐	☐		
I								☐	☐	☐	☐	☐		
J								☐	☐	☐	☐	☐		
K								☐	☐	☐	☐	☐		
L								☐	☐	☐	☐	☐		
M								☐	☐	☐	☐	☐		
N								☐	☐	☐	☐	☐		
O								☐	☐	☐	☐	☐		
P								☐	☐	☐	☐	☐		
Q								☐	☐	☐	☐	☐		
R								☐	☐	☐	☐	☐		
S								☐	☐	☐	☐	☐		
T								☐	☐	☐	☐	☐		
U								☐	☐	☐	☐	☐		
V								☐	☐	☐	☐	☐		
W								☐	☐	☐	☐	☐		
X								☐	☐	☐	☐	☐		
Y								☐	☐	☐	☐	☐		

(a) Applicable for products stored in tanks with floating roofs.
(b) Loadout is product transferred from tank through rack to marine vessel, truck or rail car, or container.

If applying for the construction/modification/reconstruction of more than six tanks, make additional copies of this form as needed and attach to the application. Make sure to identify the additional sheets such as 4a of 8 or 4.1 of 8.

TABLE 108.3- FIXED ROOF STORAGE TANK (HORIZONTAL) N/A

TANK ID →						
SHELL LENGTH (ft-in)						
SHELL DIAMETER (ft-in)						
HEATED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
PRESSURIZED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
UNDERGROUND? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
SHELL COLOR/SHADE [a]						
SHELL CONDITION [b]						
PROPOSED PRODUCTS TO BE STORED [c]						
PRODUCT TRANSFER FROM TANK TO:						
gallons per day (GPD) [d]	GPD	GPD	GPD	GPD	GPD	GPD

TABLE 108.4-FIXED ROOF STORAGE TANK (VERTICAL)

TANK ID →		R-1	R-2	R-3	R-4	R-5	R-6
SHELL HEIGHT (ft-in)		49' - 3"	49'-3"	49' - 3"	49' - 3"	49' - 3"	49' - 3"
SHELL DIAMETER (ft-in)		9'-10"	9'-10"	9'-10"	9'-10"	9'-10"	9'-10"
MAX LIQUID HEIGHT (ft-in)		47'-0"	47'-0"	47'-0"	47'-0"	47'-0"	47'-0"
AVG LIQUID HEIGHT (ft-in)		30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"
HEATED? (Y or N)		☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO
PRESSURIZED? (Y or N)		☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO
SHELL CHARACTERISTICS	SHELL COLOR/SHADE [a]	Gray	Gray	Gray	Gray	Gray	Gray
	SHELL CONDITION [b]	Good	Good	Good	Good	Good	Good
ROOF CHARACTERISTICS	ROOF COLOR/SHADE [a]	Gray	Gray	Gray	Gray	Gray	Gray
	ROOF CONDITION [b]	Good	Good	Good	Good	Good	Good
	CONE/DOME HEIGHT (ft-in)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
PROPOSED PRODUCTS TO BE STORED [c]		MDI/PMDI Resin	MDI/PMDI Resin	MDI/PMDI Resin	MDI/PMDI Resin	MDI/PMDI Resin	MDI/PMDI Resin
PRODUCT TRANSFER FROM TANK TO:		Blenders	Blenders	Blenders	Blenders	Blenders	Blenders
gallons per day (GPD) [d]		2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD

(a) Select from: White/White (W/W); Aluminum/Specular (A/S); Aluminum/Diffuse (A/D); Gray/Light (G/L); Gray/Medium (G/M); Red/Primer (R/P) If tank color unknown, list "default"

(b) Select from: Good or Poor. If tank condition unknown, list "default"

(c) Use Product ID from Table 108.2 or list "ALL" if tank may store all of the products listed in Table 108.2.

(d) Should be completed if product in tank is being transferred to a specific piece of equipment or process which is not a loading rack (e.g. boiler).

If applying for the construction/modification/reconstruction of more than six tanks, make additional copies of this form as needed and attach to the application. Make sure to identify the additional sheets such as 4a of 8 or 4.1 of 8.

TABLE 108.3- FIXED ROOF STORAGE TANK (HORIZONTAL) N/A

TANK ID →						
SHELL LENGTH (ft-in)						
SHELL DIAMETER (ft-in)						
HEATED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
PRESSURIZED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
UNDERGROUND? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
SHELL COLOR/SHADE [a]						
SHELL CONDITION [b]						
PROPOSED PRODUCTS TO BE STORED [c]						
PRODUCT TRANSFER FROM TANK TO:						
gallons per day (GPD) [d]	GPD	GPD	GPD	GPD	GPD	GPD

TABLE 108.4-FIXED ROOF STORAGE TANK (VERTICAL)

TANK ID →		R-7	R-8	W-1	W-2	W-3	W-4
SHELL HEIGHT (ft-in)		49'-3"	49'-3"	49'-3"	49'-3"	49'-3"	49'-3"
SHELL DIAMETER (ft-in)		9'-10"	9'-10"	9'-10"	9'-10"	9'-10"	9'-10"
MAX LIQUID HEIGHT (ft-in)		47'-0"	47'-0"	47'-0"	47'-0"	47'-0"	47'-0"
AVG LIQUID HEIGHT (ft-in)		30'-0"	30'-0"	30'-0"	30'-0"	30'-0"	30'-0"
HEATED? (Y or N)		☐YES ☑NO	☐YES ☑NO	☑YES ☐NO	☑YES ☐NO	☑YES ☐NO	☑YES ☐NO
PRESSURIZED? (Y or N)		☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO
SHELL CHARACTERISTICS	SHELL COLOR/SHADE [a]	Gray	Gray	Gray	Gray	Gray	Gray
	SHELL CONDITION [b]	Good	Good	Good	Good	Good	Good
ROOF CHARACTERISTICS	ROOF COLOR/SHADE [a]	Gray	Gray	Gray	Gray	Gray	Gray
	ROOF CONDITION [b]	Good	Good	Good	Good	Good	Good
	CONE/DOME HEIGHT (ft-in)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
PROPOSED PRODUCTS TO BE STORED [c]		MDI / PMDI Resin	MDI / PMDI Resin	Wax	Wax	Wax	Wax
PRODUCT TRANSFER FROM TANK TO:		Blenders	Blenders	Blenders	Blenders	Blenders	Blenders
gallons per day (GPD) [d]		2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD	2,693 GPD

(a) Select from: White/White (W/W); Aluminum/Specular (A/S); Aluminum/Diffuse (A/D); Gray/Light (G/L); Gray/Medium (G/M); Red/Primer (R/P) If tank color unknown, list "default"

(b) Select from: Good or Poor. If tank condition unknown, list "default"

(c) Use Product ID from Table 108.2 or list "ALL" if tank may store all of the products listed in Table 108.2.

(d) Should be completed if product in tank is being transferred to a specific piece of equipment or process which is not a loading rack (e.g. boiler).

If applying for the construction/modification/reconstruction of more than six tanks, make additional copies of this form as needed and attach to the application. Make sure to identify the additional sheets such as 4a of 8 or 4.1 of 8.

TABLE 108.3- FIXED ROOF STORAGE TANK (HORIZONTAL) N/A

TANK ID →						
SHELL LENGTH (ft-in)						
SHELL DIAMETER (ft-in)						
HEATED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
PRESSURIZED? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
UNDERGROUND? (Y or N)	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
SHELL COLOR/SHADE [a]						
SHELL CONDITION [b]						
PROPOSED PRODUCTS TO BE STORED [c]						
PRODUCT TRANSFER FROM TANK TO:						
gallons per day (GPD) [d]	GPD	GPD	GPD	GPD	GPD	GPD

TABLE 108.4-FIXED ROOF STORAGE TANK (VERTICAL)

TANK ID →		W-5	W-6	W-7	RA-1		
SHELL HEIGHT (ft-in)		49'-3"	49'-3"	49'-3"	49'-3"		
SHELL DIAMETER (ft-in)		9'-10"	9'-10"	9'-10"	9'-10"		
MAX LIQUID HEIGHT (ft-in)		47-0"	47-0"	47-0"	47-0"		
AVG LIQUID HEIGHT (ft-in)		30'-0"	30'-0"	30'-0"	30'-0"		
HEATED? (Y or N)		☑YES ☐NO	☑YES ☐NO	☑YES ☐NO	☑YES ☐NO	☐YES ☐NO	☐YES ☐NO
PRESSURIZED? (Y or N)		☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☑NO	☐YES ☐NO	☐YES ☐NO
SHELL CHARACTERISTICS	SHELL COLOR/SHADE [a]	Gray	Gray	Gray	Gray		
	SHELL CONDITION [b]	Good	Good	Good	Good		
ROOF CHARACTERISTICS	ROOF COLOR/SHADE [a]	Gray	Gray	Gray	Gray		
	ROOF CONDITION [b]	Good	Good	Good	Good		
	CONE/DOME HEIGHT (ft-in)	Unknown	Unknown	Unknown	Unknown		
PROPOSED PRODUCTS TO BE STORED [c]		Wax	Wax	Wax	Release Agent		
PRODUCT TRANSFER FROM TANK TO:		Blenders	Blenders	Blenders	Press		
gallons per day (GPD) [d]		615 GPD	615 GPD	615 GPD	Varies GPD	GPD	GPD

(a) Select from: White/White (W/W); Aluminum/Specular (A/S); Aluminum/Diffuse (A/D); Gray/Light (G/L); Gray/Medium (G/M); Red/Primer (R/P) If tank color unknown, list "default"

(b) Select from: Good or Poor. If tank condition unknown, list "default"

(c) Use Product ID from Table 108.2 or list "ALL" if tank may store all of the products listed in Table 108.2.

(d) Should be completed if product in tank is being transferred to a specific piece of equipment or process which is not a loading rack (e.g. boiler).

If applying for the construction/modification/reconstruction of more than six tanks, make additional copies of this form as needed and attach to the application. Make sure to identify the additional sheets such as 5a of 8 or 5.1 of 8.

TABLE 108.5-EXTERNAL FLOATING ROOF STORAGE TANK N/A

TANK ID →							
SHELL DIAMETER (ft-in)							
DOMED? (Y or N)		☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO	☐YES ☐NO
INTERNAL SHELL CONDITION [a]							
PAINT COLOR/SHADE [b]							
PAINT CONDITION [c]							
ROOF CHARACTERISTICS	PONTOON OR DOUBLE DECK	☐PONTOON ☐DOUBLE DECK	☐PONTOON ☐DOUBLE DECK	☐PONTOON ☐DOUBLE DECK	☐PONTOON ☐DOUBLE DECK	☐PONTOON ☐DOUBLE DECK	☐PONTOON ☐DOUBLE DECK
	ROOF FITTING CATEGORY [d]						
TANK CONSTRUCTION	CHOOSE ONE WELDED OR RIVETED	☐WELDED ☐RIVETED	☐WELDED ☐RIVETED	☐WELDED ☐RIVETED	☐WELDED ☐RIVETED	☐WELDED ☐RIVETED	☐WELDED ☐RIVETED
SEAL TYPE	PRIMARY [e]						
	SECONDARY [f]						
PROPOSED PRODUCTS TO BE STORED [g]							
PRODUCT TRANSFER FROM TANK TO:							
gallons per day (GPD) [h]		2,693 GPD	GPD	GPD	GPD	GPD	GPD

(a) Select from: Light Rust; Dense Rust; Gunite™ Lining. If internal shell condition unknown, list "default"
(b) Select from: White/White (W/W); Aluminum/Specular (A/S); Aluminum/Diffuse (A/D); Gray/Light (G/L); Gray/Medium (G/M); Red/Primer (R/P) If paint color unknown, list "default"
(c) Select From: Good or Poor. If tank condition unknown, list "default"
(d) Typical or Detail. If detail, list fittings and quantities for each tank on Table 108.7
(e) Select from: Mechanical Shoe (MS); Liquid Mounted (LM); or Vapor Mounted (VM)
(f) Select from: None, Shoe Mounted (SM), Rim Mounted (RM) or Weather Shield (WS)
(g) Use Product ID from Table 108.2 or list "ALL" if tank may store all of the products listed in Table 108.2.
(h) Should be completed if product in tank is being transferred to a specific piece of equipment or process which is not a loading rack (e.g. boiler).

If applying for the construction/modification/reconstruction of more than six tanks, make additional copies of this form as needed and attach to the application. Make sure to identify the additional sheets such as 6a of 8 or 6.1 of 8.

TABLE 108.6-INTERNAL FLOATING ROOF STORAGE TANK N/A

TANK ID →							
SHELL DIAMETER (ft-in)							
SELF SUPPORT. ROOF? (Y or N)		☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
NUMBER OF COLUMNS							
EFFECTIVE COLUMN DIAMETER (a)							
INTERNAL SHELL CONDITION (b)							
EXTERNAL SHELL	PAINT COLOR/SHADE (c)						
	PAINT CONDITION (d)						
ROOF CHARACTERISTICS	PAINT COLOR/SHADE (c)						
	PAINT CONDITION (d)						
DECK CHARAC.	BOLTED OR WELDED (e)	☐ BOLTED ☐ WELDED	☐ BOLTED ☐ WELDED	☐ BOLTED ☐ WELDED	☐ BOLTED ☐ WELDED	☐ BOLTED ☐ WELDED	☐ BOLTED ☐ WELDED
SEAL TYPE	PRIMARY (f)						
	SECONDARY (g)						
PROPOSED PRODUCTS TO BE STORED (h)							
PRODUCT TRANSFER FROM TANK TO:							
gallons per day (GPD) (i)		GPD	GPD	GPD	GPD	GPD	GPD

(a) Select from: 9" by 7" Built-Up Column, 8" Diameter Pipe, or Unknown
(b) Select from: Light Rust; Dense Rust; Gunite™ Lining. If internal shell condition unknown, list "default"
(c) Select from: White/White (W/W); Aluminum/Specular (A/S); Aluminum/Diffuse (A/D); Gray/Light (G/L); Gray/Medium (G/M); Red/Primer (R/P) If paint color unknown, list "default"
(d) Select From: Good or Poor. If tank condition unknown, list "default"
(e) Typical or Detail. If detail, list fittings and quantities for each tank on Table 108.7
(f) Select from: Mechanical Shoe (MS); Liquid Mounted (LM); or Vapor Mounted (VM)
(g) Select from: None, Shoe Mounted (SM), or Rim Mounted (RM)
(h) Use Product ID from Table 108.2 or list "ALL" if tank may store all of the products listed in Table 108.2.
(i) Should be completed if product in tank is being transferred to a specific piece of equipment or process which is not a loading rack (e.g. boiler).

TABLE 108.7-FLOATING ROOF FITTINGS-DETAIL
(DECK OR ROOF CHARACTERISTICS)

TANK ID. N/A

TANK CONSTRUCTION: ☐ IFRT ☐ EFRT

(fill out separate page for each IFRT or EFRT)

Specify deck fitting type(s) and indicate quantity of each fitting from the following:

A. Access Hatch Qty:_____
- ☐ Bolted cover, gasketed
- ☐ Unbolted cover, gasketed
- ☐ Unbolted cover, ungasketed

B. Automatic, Gauge Float Well Qty:_____
- ☐ Bolted cover, gasketed
- ☐ Unbolted cover, gasketed
- ☐ Unbolted cover, ungasketed

C. Column Well Qty:_____
- ☐ Built-up column-sliding cover, gasketed
- ☐ Built-up column-sliding cover, ungasketed
- ☐ Pipe column-flexible fabric sleeve seal
- ☐ Pipe column-sliding cover, gasketed
- ☐ Pipe column-sliding cover, ungasketed

D. Gauge-Hatch/Sample Well, 8 in diameter Qty:_____
- ☐ Weighted mechanical actuation, gasketed
- ☐ Weighted mechanical actuation, ungasketed

E. Ladder Well
- ☐ Sliding cover, gasketed
- ☐ Sliding cover, ungasketed

F. Rim Vent, 6 inch diameter Qty:_____
- ☐ Weighted mechanical actuation, gasketed
- ☐ Weighted mechanical actuation, ungasketed

G. Roof Drain, 3 inch diameter
- ☐ Open
- ☐ 90% Closed

H. Roof Leg, 3 inch diameter Qty:_____
- ☐ Adjustable, Pontoon Area, ungasketed
- ☐ Adjustable, Center Area, ungasketed
- ☐ Adjustable, Double Deck Roofs
- ☐ Adjustable, Double Deck Roofs
- ☐ Fixed
- ☐ Adjustable, Pontoon Area, gasketed
- ☐ Adjustable, Pontoon Area, socks
- ☐ Adjustable, Center Area, gasketed
- ☐ Adjustable, Center Area, socks

I. Roof Leg or Hanger Well Qty:_____
- ☐ Adjustable
- ☐ Fixed

J. Sample pipe or well Qty:_____
- ☐ Slotted pipe sliding cover, gasketed
- ☐ Slotted pipe sliding cover, ungasketed
- ☐ Slit fabric seal, 10% open area

K. Slotted Guide-Pole/Sample Well Qty:_____
- ☐ Ungasketed sliding cover without float
- ☐ Ungasketed sliding cover with float
- ☐ Gasketed sliding cover without float
- ☐ Gasketed sliding cover with float
- ☐ Gasketed sliding cover with pole wiper
- ☐ Gasketed sliding cover with pole sleeve
- ☐ Gasketed sliding cover with float, wiper
- ☐ Gasketed sliding cover with float, sleeve, wiper
- ☐ Gasketed sliding cover with pole sleeve, wiper

L. Stub drain, 1 inch diameter
- ☐ Yes
- ☐ No

M. Unslotted Guide-Pole Well Qty:_____
- ☐ Ungasketed sliding cover
- ☐ Gasketed sliding cover
- ☐ Ungasketed sliding cover with sleeve
- ☐ Gasketed sliding cover with sleeve
- ☐ Gasketed sliding cover with wiper

N. Vacuum breaker Qty:_____
- ☐ Weighted mechanical actuation, gasketed
- ☐ Weighted mechanical actuation, ungasketed

For an IFRT, If <u>bolted</u>, give deck construction method for the following:

A. Continuous Sheet [5 ft, 6 ft, or 7 ft wide] _____ OR B. Panel Construction [5x7.5 ft or 5x12 ft] _____

TABLE 108.8-CHEMICAL DATA INFORMATION

Use a separate form for each chemical not in the current version of EPA's TANKS Program's chemical database.

Section I:

Chemical Name: MDI / PMDI Resin

CAS Number: N/A

Category: ☐ Crude Oil ☐ Petroleum Distillates ■ Organic Liquids

Liquid Molecular Weight: 150

Vapor Molecular Weight: 150

Liquid Density (lb/gal @ 60ºF): 10.01

Section II: Vapor Pressure Information (fill in one or more of the following options completely)

Option 1 Enter Vapor Pressure (psia) for each temperature:

40F: Unknown 80F: 1.4×10^{-7}

50F: Unknown 90F: 2.5×10^{-7}

60F: Unknown 100F: 5.0×10^{-7}

70F: 6.4×10^{-8}

Option 2 Constants for Antoine's Equation (using Celsius):

A:_____ B:_____ C:_____

Option 3 Constants for Antoine's Equation (using Kelvin):

A:_____ B:_____ C:_____

Option 4 Reid Vapor Pressure (psia): (Distillates and Crude Oils only) _____

ASTM Slope: (Distillates Only) _____

RUBINATE® 1840

Version	Revision Date:	SDS Number:	Date of last issue: 11/02/2018
2.0	11/15/2022	400001002387	Date of first issue: 07/15/2015

Print Date 03/13/2023

SECTION 1. IDENTIFICATION

Product name RUBINATE® 1840

Manufacturer or supplier's details

Company name of supplier : Huntsman Polyurethanes
Address : P.O. Box 4980
The Woodlands,
TX 77387
United States of America (USA)
Telephone : Tech Info:(800) 257-5547

E-mail address Global_Product_EHS_HPU@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.
Industrial use

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Eye irritation : Category 2A

Respiratory sensitisation : Category 1

Skin sensitisation : Category 1

Specific target organ toxicity - single exposure : Category 3 (Respiratory system)

Specific target organ toxicity - repeated exposure (Inhalation) : Category 2

Short-term (acute) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.
H401 Toxic to aquatic life.

Precautionary statements : **Prevention:**
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
P285 In case of inadequate ventilation wear respiratory protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.
P362 Take off contaminated clothing and wash before reuse.
Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
Disposal:
P501 Dispose of contents/container to an approved facility in accordance with local, regional, national and international regulations.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Diphenylmethanediisocyanate, polymeric	9016-87-9	50 - 70
4,4'-methylenediphenyl diisocyanate	101-68-8	30 - 50
2,4'-methylenediphenyl diisocyanate	5873-54-1	5 - 10

The specific chemical identity and/or exact percentage (concentration) of composition may be withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Do not leave the victim unattended.
Get medical attention immediately if symptoms occur.
Show this safety data sheet to the doctor in attendance.

If inhaled : If breathed in, move person into fresh air.
Call a physician or poison control centre immediately.
Keep patient warm and at rest.
Keep respiratory tract clear.
If breathing is difficult, give oxygen.
If breathing is irregular or stopped, administer artificial respiration.
If unconscious, place in recovery position and seek medical advice.
Consult a physician immediately if symptoms such as shortness of breath or asthma are observed.
A hyper-reactive response to even minimal concentrations of diisocyanates may develop in sensitised persons.
The exposed person may need to be kept under medical surveillance for 48 hours.
LC50 (rat) : ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerodynamic diameter <5microns.
Methods used to generate the exposure concentrations in the animal studies use extreme laboratory conditions and does not represent actual exposure conditions of the material in the workplace, storage, transportation or expected use on the market due to the very low vapor pressure. Therefore, these test results cannot be used to for hazard classification of the material. Rather, an acute toxicity estimate is calculated based on weight of evidence and expert judgement and is used to justify a modified classification for acute inhalation

toxicity.

In case of skin contact	:	In case of contact, immediately flush skin with soap and plenty of water. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before reuse. Thoroughly clean shoes before reuse. Call a physician if irritation develops or persists. An MDI study has demonstrated that a polyglycol-based skin cleanser (such as D-Tam™, PEG-400) or corn oil may be more effective than soap and water.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If easy to do, remove contact lens, if worn. Protect unharmed eye. Keep eye wide open while rinsing. Seek medical advice.
If swallowed	:	Gently wipe or rinse the inside of the mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Keep respiratory tract clear. Keep at rest. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. Take victim immediately to hospital. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	:	Severe allergic skin reactions, bronchiospasm and anaphylactic shock This product is a respiratory irritant and potential respiratory sensitiser: repeated inhalation of vapour or aerosol at levels above the occupational exposure limit could cause respiratory sensitisation. Symptoms may include irritation to the eyes, nose, throat and lungs, possibly combined with dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitised persons.
Protection of first-aiders	:	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If potential for exposure exists refer to Section 8 for specific personal protective equipment. First Aid responders should pay attention to self-protection and use the recommended protective clothing
Notes to physician	:	Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Foam Carbon dioxide (CO2) Dry powder
Unsuitable extinguishing media	:	Water may be used if no other available and then in copious quantities. Reaction between water and hot isocyanate may be vigorous.
Specific hazards during firefighting	:	Do not allow run-off from fire fighting to enter drains or water courses. The pressure in sealed containers can increase under the influence of heat. Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	:	Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.
Specific extinguishing methods	:	Cool containers/tanks with water spray.
Further information	:	Standard procedure for chemical fires. Due to reaction with water producing CO2-gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Prevent fire extinguishing water from contaminating surface water or the ground water system. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	.	Immediately evacuate personnel to safe areas. Use personal protective equipment. If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Ensure adequate ventilation.

Keep people away from and upwind of spill/leak.
Only qualified personnel equipped with suitable protective equipment may intervene.
For additional precautions and advice on safe handling, see section 7.
Never return spills in original containers for re-use.
Make sure that there is a sufficient amount of neutralizing/ absorbent material near the storage area.
The danger areas must be delimited and identified using relevant warning and safety signs.
Treat recovered material as described in the section "Disposal considerations".
For disposal considerations see section 13.

Environmental precautions : Do not allow uncontrolled discharge of product into the environment.
Do not allow material to contaminate ground water system.
Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
Local authorities should be advised if significant spillages cannot be contained.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Clean-up methods - small spillage
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Clean contaminated surface thoroughly.
Sweep up or vacuum up spillage and collect in suitable container for disposal.
Neutralize small spillages with decontaminant.
The compositions of liquid decontaminants are given in Section 16.
Remove and dispose of residues.
Clean-up methods - large spillage
If the product is in its solid form:
Spilled MDI flakes should be picked up carefully.
The area should be vacuum cleaned to remove remaining dust particles completely.
If the product is in its liquid form:
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Leave to react for at least 30 minutes.
Shovel into open-top drums for further decontamination.
Wash the spillage area with water.
Test atmosphere for MDI vapour.
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

Technical measures : Ensure that eyewash stations and safety showers are close to

the workstation location.

Local/Total ventilation	.	Use only with adequate ventilation.
Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	For personal protection see section 8. Avoid formation of aerosol. Do not breathe vapours or spray mist. Do not breathe vapours/dust. Do not swallow. Do not get in eyes or mouth or on skin. Do not get on skin or clothing. Avoid exposure - obtain special instructions before use. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. Keep container closed when not in use. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Industrial use of aprotic polar solvents for cleaning can release hazardous primary aromatic amines (>0.1%)
Conditions for safe storage	:	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labelled containers. Observe label precautions. Protect from moisture. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Materials to avoid	:	For incompatible materials please refer to Section 10 of this SDS.
Recommended storage temperature	:	61 - 100 °F / 16 - 38 °C
Storage period	:	12 Months
Further information on storage stability	:	No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of	Control parameters /	Basis

		exposure)	Permissible concentration	
Diphenylmethanediisocyanate, polymeric	9016-87-9	C	0.02 ppm 0.2 mg/m3	OSHA Z-1
		C	0.02 ppm 0.2 mg/m3	OSHA P0
		C	0.02 ppm 0.2 mg/m3	NIOSH REL
		TWA	0.005 ppm 0.05 mg/m3	NIOSH REL
4,4'-methylenediphenyl diisocyanate	101-68-8	TWA	0.005 ppm	ACGIH
		TWA	0.005 ppm 0.05 mg/m3	NIOSH REL
		C	0.02 ppm 0.2 mg/m3	NIOSH REL
		C	0.02 ppm 0.2 mg/m3	OSHA Z-1
		C	0.02 ppm 0.2 mg/m3	OSHA P0
2,4'-methylenediphenyl diisocyanate	5873-54-1	C	0.02 ppm 0.2 mg/m3	OSHA Z-1
		TWA	0.005 ppm 0.05 mg/m3	NIOSH REL
		C	0.02 ppm 0.2 mg/m3	NIOSH REL
		C	0.02 ppm 0.2 mg/m3	OSHA P0

Personal protective equipment

Respiratory protection — Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.
Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
In emergency, non-routine and unknown exposure situations, including confined space entries, a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA)or a full facepiece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply, should be used.

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Remarks		The suitability for a specific workplace should be discussed with the producers of the protective gloves. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin. Use chemical resistant gloves classified under Standard EN374: protective gloves against chemicals and microorganisms. Examples of glove materials that might provide suitable protection include: Butyl rubber, Chlorinated polyethylene, Polyethylene, Ethyl vinyl alcohol copolymers laminated ("EVAL"), Polychloroprene (Neoprene®), Nitrile/butadiene rubber ("nitrile" or "NBR"), Polyvinyl chloride ("PVC" or "vinyl"), Fluoroelastomer (Viton®). When prolonged or frequently repeated contact may occur, a glove with protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN374) is recommended. When only brief contact is expected, a glove with protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN374) is recommended. Notice: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all requisite workplace factors such as, but not limited to : other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove supplier By industrial use of aprotic polar solvents for cleaning : Butyl rubber (0.7mm), Nitrile rubber (0.4mm), Chloroprene (0.5mm)
Eye protection	:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Chemical splash goggles. Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded. Please follow all applicable local/national requirements when selecting protective measures for a specific workplace. Ensure that eyewash stations and safety showers are close to the workstation location.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place. Recommended: Overall (preferably heavy cotton) or Tyvek-Pro Tech 'C', Tyvek Pro 'F' disposable coverall.
Protective measures	:	Personal protective equipment comprising: suitable protective

	gloves, safety goggles and protective clothing The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Ensure that eye flushing systems and safety showers are located close to the working place.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	No data is available on the product itself.
Odour	:	No data is available on the product itself.
Odour Threshold	:	No data is available on the product itself.
pH	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	No data is available on the product itself.
Flash point	:	424.99 °F / 218.33 °C Method: ISO Method, other, open cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Flammability (liquids)	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself

Relative density	:	1.2
Density	:	No data is available on the product itself.
Solubility(ies)		
Water solubility	:	No data is available on the product itself.
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	:	No data is available on the product itself.
Viscosity	.	No data is available on the product itself.
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.
Particle size	:	No data is available on the product itself.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Reaction with water (moisture) produces CO2-gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if the miscibility of the reaction partners is good or is supported by stirring or by the presence of solvents. MDI is insoluble with, and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.
Conditions to avoid	:	Extremes of temperature and direct sunlight. Exposure to air or moisture over prolonged periods.
Incompatible materials	:	Acids Amines Bases Metals

water

Hazardous decomposition products : Combustion products may include: carbon monoxide, carbon dioxide, nitrogen oxides, hydrocarbons and HCN. In the event of extreme heat (>500 degrees C), aniline is suspected of being formed.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute inhalation toxicity : Assessment: The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.
Remarks: Methods used to generate the exposure concentrations in the animal studies use extreme laboratory conditions and does not represent actual exposure conditions of the material in the workplace, storage, transportation or expected use on the market due to the very low vapor pressure. Therefore, these test results cannot be used to for hazard classification of the material. Rather, an acute toxicity estimate is calculated based on weight of evidence and expert judgement and is used to justify a modified classification for acute inhalation toxicity.

Acute toxicity estimate: 1.25 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Diphenylmethanediisocyanate, polymeric:

Acute oral toxicity : LD50 (Rat, male): > 10,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat, male and female): 431.18 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

4,4'-methylenediphenyl diisocyanate:

Acute oral toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Remarks: Information given is based on data obtained from similar substances.

Acute inhalation toxicity : LC50 (Rat, male and female): 431.18 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit): > 9,400 mg/kg
Remarks: Information given is based on data obtained from similar substances.

2,4'-methylenediphenyl diisocyanate:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Information given is based on data obtained from similar substances.

Acute inhalation toxicity : LC50 (Rat, male and female): 431.18 mg/m3
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The component/mixture is moderately toxic after short term inhalation.

Acute dermal toxicity : LD50 (Rabbit, male and female): > 9,400 mg/kg
Method: OECD Test Guideline 402
GLP: no
Remarks: Information given is based on data obtained from similar substances.

Skin corrosion/irritation

Components:

Diphenylmethanediisocyanate, polymeric:

Assessment : Irritating to skin.
Result : Irritating to skin.

4,4'-methylenediphenyl diisocyanate:

Species : Rabbit
Assessment : Irritating to skin.
Method : OECD Test Guideline 404
Result : Irritating to skin.

2,4'-methylenediphenyl diisocyanate:

Species : Rabbit
Assessment : Irritating to skin.
Method : OECD Test Guideline 404
Result : Irritating to skin.

Serious eye damage/eye irritation

Components:

Diphenylmethanediisocyanate, polymeric:

Species	:	Rabbit
Result	:	Mild eye irritation
Method	:	OECD Test Guideline 405
Remarks		largely based on human evidence

4,4'-methylenediphenyl diisocyanate:

Species	:	Rabbit
Result		Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

2,4'-methylenediphenyl diisocyanate:

Species	:	Rabbit
Result	:	Eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Information given is based on data obtained from similar substances. largely based on human evidence

Respiratory or skin sensitisation

Components:

Diphenylmethanediisocyanate, polymeric:

Exposure routes	:	Skin
Assessment	:	The product is a skin sensitiser, sub-category 1B.
Result	:	The product is a skin sensitiser, sub-category 1B.
Remarks	:	Information given is based on data obtained from similar substances.

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Respiratory Tract
Species	:	Rat
Assessment	:	May cause sensitisation by inhalation.
Result	:	May cause sensitisation by inhalation.

4,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Skin
Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.

Test Type	:	Local lymph node assay (LLNA)
Exposure routes	:	Respiratory Tract
Species	:	Guinea pig
Assessment	:	May cause sensitisation by inhalation.
Result	:	May cause sensitisation by inhalation.

Assessment : May cause allergy or asthma symptoms or breathing

difficulties if inhaled., May cause an allergic skin reaction.

2,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Respiratory Tract
Species	:	Guinea pig
Assessment	:	May cause sensitisation by inhalation.
Result	:	May cause sensitisation by inhalation.
Remarks	:	Information given is based on data obtained from similar substances.
Species	:	Guinea pig
Assessment	:	May cause sensitisation by skin contact.
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.

Germ cell mutagenicity

Components:

Diphenylmethanediisocyanate, polymeric:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: Not classified due to inconclusive data.
GLP: yes

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Concentration: 0 - 1200 µg/plate
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: negative

Genotoxicity in vivo : Test Type: comet assay
Species: Rat (male)
Cell type: Liver cells
Application Route: inhalation (dust/mist/fume)
Dose: 2.5/4.9/12 mg/m3
Method: OECD Test Guideline 489
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Test Type: Micronucleus test
Species: Rat (male)
Cell type: Somatic
Application Route: Inhalation
Exposure time: 3 Weeks
Dose: 113 mg/m3
Method: OECD Test Guideline 474
Result: negative
Remarks: Information given is based on data obtained from similar substances.

4,4'-methylenediphenyl diisocyanate:

Genotoxicity in vitro

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Directive 67/548/EEC, Annex, B.13/14
Result: negative

Genotoxicity in vivo

Test Type: Micronucleus test
Species: Rat (male)
Cell type: Somatic
Application Route: Inhalation
Exposure time: 3 Weeks
Method: OECD Test Guideline 474
Result: negative

Test Type: comet assay
Species: Rat (male)
Cell type: Liver cells
Application Route: Inhalation (dust/mist/fume)
Dose: 2.5/4.9/12 mg/m3
Method: OECD Test Guideline 489
Result: negative

2,4'-methylenediphenyl diisocyanate:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Genotoxicity in vivo : Test Type: comet assay
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Test Type: Micronucleus test
Species: Rat (male)
Cell type: Somatic
Application Route: Inhalation
Exposure time: 3 Weeks
Method: OECD Test Guideline 474
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Carcinogenicity

Product:

Remarks : Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in a chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m3), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adenocarcinoma). There were no lung tumours at 1 mg/m3 and no effects at 0.2 mg/m3. Overall, the tumour incidence,

both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur.

Remarks : Industrial use of aprotic polar solvents for cleaning can release hazardous primary aromatic amines (>0.1%)
Based on animal studies, primary aromatic amines are considered as potential carcinogen to humans. Some of those chemicals are proven carcinogens to humans
Provided the recommended personal protective equipment and hygiene measures are applied, no adverse effects to human health are to be expected

Components:

Diphenylmethanediisocyanate, polymeric:

Species	:	Rat, female
Application Route		Inhalation
Exposure time	:	24 month(s)
Dose		.7 mg/m³
Frequency of Treatment	:	5 daily
Result		negative

Species	:	Rat, male and female
Application Route	:	Inhalation (dust/mist/fume)
Exposure time	:	24 mon
Activity duration	:	6 h
Dose	:	0, 0.2, 1.0, 6.0 mg/m³
Frequency of Treatment	:	5 days/week
NOAEL	:	1 mg/m³
LOAEL	:	6 mg/m³
Method	:	OECD Test Guideline 453

4,4'-methylenediphenyl diisocyanate:

Species	:	Rat, female
Application Route	:	Inhalation
Exposure time	:	24 month(s)
Activity duration	:	17 h
Dose	:	0, 0.2, 0.7, 2.1 mg/m3 mg/m³
Frequency of Treatment	:	5 days/week
NOEL	:	0.7 mg/m³
LOAEL	:	0.23 mg/m³
Result	:	positive
Target Organs	:	Lungs

2,4'-methylenediphenyl diisocyanate:

Species	:	Rat, male and female
Application Route	:	Inhalation
Exposure time	:	24 month(s)

Dose	:	1 mg/m³
Frequency of Treatment	:	5 daily
NOAEL	:	1 mg/m³
Method	:	OECD Test Guideline 453
Target Organs	:	Lungs
Remarks	:	Information given is based on data obtained from similar substances.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP

Reproductive toxicity

Components:

Diphenylmethanediisocyanate, polymeric:

Effects on foetal development	:	Test Type: Pre-natal Species: Rat, females Application Route: inhalation (dust/mist/fume) Dose: 0/1/4/12 mg/m3 General Toxicity Maternal: NOAEC: 4 mg/m³ Method: OECD Test Guideline 414 Result: No teratogenic effects

2,4'-methylenediphenyl diisocyanate:

Effects on foetal development	:	Test Type: Pre-natal Species: Rat, females Application Route: Inhalation General Toxicity Maternal: NOAEC: 4 mg/m³ Developmental Toxicity: NOAEC: 4 mg/m³ Result: No teratogenic effects Remarks: Information given is based on data obtained from similar substances.

STOT - single exposure

Components:

Diphenylmethanediisocyanate, polymeric:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	May cause respiratory irritation.

4,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory system
Assessment	:	May cause respiratory irritation., The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

2,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation., May cause respiratory irritation.

STOT - repeated exposure

Components:

Diphenylmethanediisocyanate, polymeric:

Assessment	:	May cause damage to organs through prolonged or repeated exposure.

4,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory system
Assessment	:	May cause damage to organs through prolonged or repeated exposure., The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

2,4'-methylenediphenyl diisocyanate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory Tract
Assessment	:	May cause damage to organs through prolonged or repeated exposure., The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Repeated dose toxicity

Components:

Diphenylmethanediisocyanate, polymeric:

Species	:	Rat, female
LOEC	:	1 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	2 years 17 h
Number of exposures	:	5 days/week
Dose	:	0, 0.2, 0.7, 2.1 mg/m3
Method	:	Chronic toxicity
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

4,4'-methylenediphenyl diisocyanate:

Species	:	Rat, female
LOEC	:	1 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	2 years 17 h
Number of exposures	:	5 days/week
Dose	:	0, 0.2, 0.7, 2.1 mg/m3

Method	:	Chronic toxicity
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

2,4'-methylenediphenyl diisocyanate:

Species	:	Rat, female
LOEC	:	1 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	2 years 17 h
Number of exposures	:	5 days/week
Dose	:	0, 0.2, 0.7, 2.1 mg/m3
Method	:	Chronic toxicity
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Diphenylmethanediisocyanate, polymeric:

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 1,000 mg/l End point: mortality Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 31.7 mg/l End point: Immobilization Exposure time: 48 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	:	EL50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Test substance: Fresh water

Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

EL10 (Desmodesmus subspicatus (green algae)): > 100 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): >= 10 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Toxicity to microorganisms : EC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

EC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209
Remarks: Information given is based on data obtained from similar substances.

NOEC (activated sludge): 250 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209
Remarks: Information given is based on data obtained from similar substances.

Toxicity to soil dwelling organisms : LC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg
Exposure time: 14 d
Method: OECD Test Guideline 207

Plant toxicity : EC50: >1000 milligram per kilogram
Exposure time: 14 d
Species: Avena sativa (oats)
Method: OECD Test Guideline 208

NOEC: >=1000 milligram per kilogram
Exposure time: 14 d
Species: Avena sativa (oats)

EC50: >1000 milligram per kilogram
Exposure time: 14 d
Species: Lactuca sativa (lettuce)

NOEC: >=1000 milligram per kilogram
Exposure time: 14 d
Species: Lactuca sativa (lettuce)
Method: OECD Test Guideline 208

4,4'-methylenediphenyl diisocyanate:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 100 mg/l
End point: mortality
Exposure time: 96 h
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 9 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): >= 10 mg/l
Exposure time: 21 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211
Remarks: Information given is based on data obtained from similar substances.

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209

Toxicity to soil dwelling organisms : NOEC (Eisenia fetida (earthworms)): >= 1,000 mg/kg
Exposure time: 336 h

Plant toxicity : EC50: >1000 milligram per kilogram
Exposure time: 14 d
Species: Avena sativa (oats)

EC50: >1000 milligram per kilogram
Exposure time: 14 d
Species: Lactuca sativa (lettuce)

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

2,4'-methylenediphenyl diisocyanate:

Toxicity to fish	:	LL50 (Danio rerio (zebra fish)): > 100 mg/l End point: mortality Exposure time: 96 h Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 3.7 mg/l End point: Immobilization Exposure time: 48 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EL10 (algae): > 100 mg/l Exposure time: 72 h Test substance: Fresh water Method: OECD Test Guideline 201 NOELR (algae): >= 100 mg/l Exposure time: 72 h Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): >= 10 mg/l Exposure time: 21 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211 Remarks: Information given is based on data obtained from similar substances.
Toxicity to microorganisms	:	EC50 (activated sludge): > 1,000 mg/l Exposure time: 3 h Test substance: Fresh water Method: OECD Test Guideline 209 Remarks: Information given is based on data obtained from similar substances. NOEC (activated sludge): 250 mg/l Exposure time: 3 h Test substance: Fresh water Method: OECD Test Guideline 209 Remarks: Information given is based on data obtained from similar substances.
Toxicity to soil dwelling organisms	:	EC50 (Eisenia fetida (earthworms)): > 1,000 mg/kg Exposure time: 14 d Method: OECD Test Guideline 207 Remarks: Information given is based on data obtained from similar substances.
Plant toxicity	:	EC50: >1000 milligram per kilogram Exposure time: 14 d Species: Avena sativa (oats) Method: OECD Test Guideline 208

NOEC: >=1000 milligram per kilogram
Exposure time: 14 d
Species: Avena sativa (oats)
Method: OECD Test Guideline 208

EC50: >1000 milligram per kilogram
Exposure time: 14 d
Species: Lactuca sativa (lettuce)
Method: OECD Test Guideline 208

NOEC: >=1000 milligram per kilogram
Exposure time: 14 d
Species: Lactuca sativa (lettuce)
Method: Terrestrial Plants Test: Seedling Emergence and Seedling Growth Test

Ecotoxicology Assessment

Acute aquatic toxicity : Toxic to aquatic life.

Persistence and degradability

Components:

Diphenylmethanediisocyanate, polymeric:

Biodegradability : aerobic
Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: Inherent Biodegradability: Modified MITI Test (II)
Test substance: Fresh water

Biochemical Oxygen Demand (BOD) : 77 mg/l
Incubation time: 28 d
Test substance: Fresh water
Method: OECD Test Guideline 302C

Stability in water : Degradation half life (DT50): 0.8 d (25 °C)
Method: No information available.
GLP: no
Remarks: Fresh water

4,4'-methylenediphenyl diisocyanate:

Biodegradability : aerobic
Inoculum: activated sludge, non-adapted
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Test substance: Fresh water

Stability in water : Degradation half life (DT50): 20 hrs (25 °C)
Remarks: Fresh water

2,4'-methylenediphenyl diisocyanate:

Biodegradability : Inoculum: Domestic sewage
Concentration: 30 mg/l
Result: Not biodegradable
Biodegradation: 0 %
Exposure time: 28 d
Method: Inherent Biodegradability: Modified MITI Test (II)
Remarks: Information given is based on data on the components and the ecotoxicology of similar products.

Biochemical Oxygen Demand (BOD) : 77 mg/l

Bioaccumulative potential

Components:

Diphenylmethanediisocyanate, polymeric:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Exposure time: 28 d
Concentration: 0.08 mg/l
Test substance: Fresh water
Remarks: Based on data from similar materials

4,4'-methylenediphenyl diisocyanate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 200
Exposure time: 28 d
Concentration: 0.08 µg/l
Method: OECD Test Guideline 305
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 4.51 (72 °F / 22 °C)
pH: 7
Method: OECD Test Guideline 117

2,4'-methylenediphenyl diisocyanate:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 200
Concentration: 0.08 µg/l
Method: OECD Test Guideline 305
GLP: yes
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 4.52 (68 °F / 20 °C)
pH: 7
Method: OECD Test Guideline 117
GLP: no

Mobility in soil

Components:

4,4'-methylenediphenyl diisocyanate:

Distribution among environmental compartments	:	log Koc: 4.5 Method: QSAR
Stability in soil	:	Soil temperature: 72 °F / 22 °C Dissipation time: 24 h Method: OECD Test Guideline 307

2,4'-methylenediphenyl diisocyanate:

Distribution among environmental compartments	:	Koc: 4.5 Method: QSAR

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as dangerous goods

IATA-DGR
Not regulated as dangerous goods

IMDG-Code
Not regulated as dangerous goods

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	NA 3082

Proper shipping name	:	Other regulated substances, liquid, n.o.s. (Methylene Diphenyl Diisocyanate)
Class		9
Packing group		III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant		no

Special precautions for user

Remarks : 49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
4,4'-methylenediphenyl diisocyanate	101-68-8	5000	10002

SARA 311/312 Hazards : Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitisation
Specific target organ toxicity (single or repeated exposure)

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Diphenylmethanediisocyanate, polymeric	9016-87-9	>= 50 - < 70 %
4,4'-methylenediphenyl diisocyanate	101-68-8	>= 30 - < 50 %

The following chemical(s), >= 0.1%, are listed as HAP under the U.S. Clean Air Act, Section 112 (40 CFR 61):

4,4'-methylenediphenyl diisocyanate	101-68-8

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

DSL : All components of this product are on the Canadian DSL

AIIC : On the inventory, or in compliance with the inventory

NZIoC : On the inventory, or in compliance with the inventory

622jj

ENCS	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: On the inventory, or in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory

Inventories

AIIC (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TECI (Thailand), TSCA (USA)

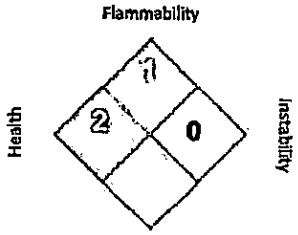
TSCA - 5(a) Significant New Use Rule List of Chemicals
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)
No substances are subject to TSCA 12(b) export notification requirements.

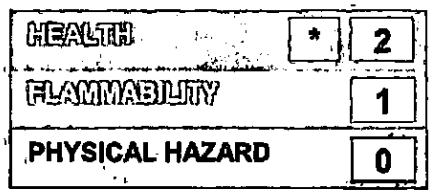
SECTION 16. OTHER INFORMATION

Further Information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard

Liquid decontaminants (percentages by weight or volume) :
Decontaminant 1 : *- sodium carbonate : 5 - 10 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 2 : *- concentrated ammonia solution : 3 - 8 % *- liquid detergent : 0.2 - 2 % *- water : to make up to 100 %
Decontaminant 1 reacts slower with diisocyanates but is more environmentally friendly than decontaminant 2.

Decontaminant 2 contains ammonia. Ammonia presents health hazards. (See supplier safety information.)

Revision Date		11/15/2022
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / C	:	Ceiling value not be exceeded at any time.
OSHA P0 / C	:	Ceiling limit
OSHA Z-1 / C	:	Ceiling

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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SAFETY DATA SHEET

FOR INDUSTRIAL USE ONLY

Cascowax™ EW-58S

Section 1. Product and company identification

GHS product identifier	:	Cascowax™ EW-58S
MSDS Number	:	300000003466
Product type	:	Wax
Material uses	:	Wood Adhesives, Composites, Laminates or Related Board Products

Manufacturer/Supplier/Importer : Hexion Inc.
180 East Broad Street
Columbus, Ohio
43215 USA

Contact person : service@hexion.com

Telephone : For additional health and safety or regulatory information, call
1 888 443 9466.

Emergency telephone number : For Emergency Medical Assistance
Call Health & Safety Information Services
1-866-303-6949

For Emergency Transportation Information
CHEMTREC US Domestic (800) 424-9300
CHEMTREC International (703) 527-3887
CANUTEC CA Domestic (613) 996-6666

Part of the CASCO® Brand of Adhesives and Resins from Hexion Inc.

Section 2. Hazards identification

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.
Hazard statements : No known significant effects or critical hazards.

Precautionary statements

General : Not applicable.

Prevention : Not applicable.

Response : Not applicable.

Storage	:	Not applicable.
Disposal	:	Not applicable.
Other hazards which do not result in classification	:	None known.

Section 3. Composition/information on ingredients

Substance/mixture	:	Mixture

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.
Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	:	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
Inhalation	:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Skin contact	:	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	:	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:	No specific treatment.
Protection of first aid personnel	:	No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	:	None known.
Specific hazards arising from the chemical	:	In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products	:	Decomposition products may include the following materials: carbon dioxide carbon monoxide
Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and material for containment and cleaning up

Small spill	:	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	:	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13 of SDS). Dispose of via a licensed waste disposal contractor. Note: see section 1 of SDS for emergency contact information and section 13 of SDS for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	:	Put on appropriate personal protective equipment (see section 8 of SDS).
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See

also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10 of SDS) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection	:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	:	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state	:	Liquid
Color	:	Opaque, white to off-white
Odor	:	Not available
Odor threshold	:	Not available
pH	:	8.0 - 9.5
Melting point/ Freezing point	:	0 °C (32 °F)
Boiling point	:	100 °C (212 °F)
Flash point	:	Not determined
Burning time	:	Not available
Burning rate	:	Not available
Evaporation rate	:	Not available
Flammability (solid, gas)	:	Not available
Lower and upper explosive (flammable) limits	:	**Lower:** Not applicable. **Upper:** Not applicable.
Vapor pressure	:	Not available
Vapor density	:	Less than 1 [Air = 1]
Relative density	:	1.0
Solubility	:	Not available
Solubility in water	:	Not available
Partition coefficient: n-octanol/water	:	Not available
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	Not available
SADT	:	Not available
Viscosity	:	**Dynamic:** 30 - 250 cPs

Kinematic: Not available

Other information

The SDS is not to be used as a specification sheet. For Specific technical information on the product listed above, a sales specification sheet should be obtained from your Hexion representative.

Section 10. Stability and reactivity

Reactivity	:	Stable under normal conditions.
Chemical stability	:	The product is stable.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	No specific data.
Incompatible materials	:	Reactive or incompatible with the following materials: oxidizing materials acids
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Conclusion/Summary : Not available

Irritation/Corrosion

Conclusion/Summary

Skin	:	Not available
eyes	:	Not available
Respiratory	:	Not available

Sensitization

Conclusion/Summary

Skin	:	Not available
Respiratory	:	Not available

Mutagenicity

Conclusion/Summary : Not available

Carcinogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

Teratogenicity

Conclusion/Summary : Not available

Specific target organ toxicity (single exposure)
Not available

Specific target organ toxicity (repeated exposure)
Not available

Aspiration hazard
Not available

Information on likely routes of exposure : Not available

Potential acute health effects

Eye contact	:	No known significant effects or critical hazards.
Inhalation	:	No known significant effects or critical hazards.
Skin contact	:	No known significant effects or critical hazards.
Ingestion	:	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	:	No specific data.
Inhalation	:	No specific data.
Skin contact	:	No specific data.
Ingestion	:	No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects	:	Not available
Potential delayed effects	:	Not available

Long term exposure

Potential immediate effects	:	Not available
Potential delayed effects	:	Not available

Potential chronic health effects

Conclusion/Summary : Not available

General	:	No known significant effects or critical hazards.
Carcinogenicity	:	No known significant effects or critical hazards.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects	:	No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available

Section 12. Ecological information

Toxicity

Conclusion/Summary : Not available

Persistence/degradability

Conclusion/Summary : Not available

Bioaccumulative potential
Not available

Mobility in soil

Soil/water partition coefficient (KOC) : Not available

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International transport regulations

Regulatory information	UN/NA number	Proper shipping name	Classes/*PG	Reportable Quantity (RQ)
CFR		Non-regulated		
TDG		Non-regulated		
IMO/IMDG		Non-regulated		
IATA (Cargo)		Non-regulated		

*PG : Packing group

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

United States

HCS Classification : Not classified

U.S. Federal regulations : **United States - TSCA 12(b) - Chemical export notification:** None required.
United States - TSCA 5α2 - Final significant new use rules: Not listed
United States - TSCA 5α2 - Proposed significant new use rules: Not listed
United States - TSCA 5(e) - Substances consent order: Not listed
SARA 311/312 Classification - Not applicable.
SARA 311/312 Classification - Not applicable

California Prop. 65:

This product does not require a Safe Harbor warning under California Prop. 65.

United States inventory (TSCA 8b) : All components are active or exempted.

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
Canada inventory: All components are listed or exempted.
Japan inventory: Not determined.
China inventory (IECSC): Not determined.
Korea inventory (KECI): All components are listed or exempted.
New Zealand Inventory (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.
United States inventory (TSCA 8b): All components are active or exempted.
Taiwan inventory (TCSI): Not determined.

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Section 16. Other information

Hazardous Material Information System III (U.S.A.) :

Health	1
Flammability	1
Physical hazard	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.
The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Full text of abbreviated H statements : Not applicable.

History

Date of printing	:	03/20/2020
Date of issue/Date of revision	:	11/04/2019
Date of previous issue	:	07/30/2015
Version	:	10.1
Prepared by	:	Product Safety Stewardship
Key to abbreviations	:	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail UN = United Nations
References	:	Not available

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DELIVERY RECEIPT

036-0132486

TERMS PREPAID

PAGE: 1 OF 1

TRAILER L544997

AE 0003

0360132486

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0845347
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1 KRONOSPAN WAY

EASTABOGA, AL 36260
Contact: GREG GOODWIN
Phone..: 0-256-741-8755
Business hours 8.00 - 17.00
Receiving hours -

Shipper

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HEXION
1201 10TH AVE
COLUMBUS, GA 31901

Appointment Information

ORIGIN	DEST.	DATE	P.O.#	SHIPPER REF #	O SCAC	ORIG. CARRIER FB#	DATE	TH D	SCAC	DEST. CARRIER FB#
OPK	GAD	3/20/20	See below	86678616						

UNITS	HM	DESCRIPTION OF ARTICLES	CLASS	WEIGHT IN LBS	RATE	CHARGES
		RATE INFORMATION				
		DRVR SIGNED FOR: 2 TB				
4138		CASCOWAX (ADHESIVE)		4,386		
		NMFC ITEM 004620-05				
		RATED AS CLASS 55				
		RATED WITH DEFICIT WEIGHT		614		
		Purchase Order number... 4384885-010				
		TOTAL HANDLING UNITS: 2				
		TOTAL PIECES: 4138		4,386		

THIS IS NOT AN INVOICE

AE PRO#: 036-0132486

Date: 3/24/20 Seal No.: _____

Skids Del: _____ PCS Del: 2 TB in stock

STRETCH WRAP INTACT [ ]Yes [ ]No [ ]N/A

COLOR: [ ]Blue [ ]Clear [ ]Other _____

Time in: 1142 Time Out: _____

Delay Time (hh:mm) _____

Driver Signature CUS TO MEMOPY ONLY

ADDITIONAL SERVICES PERFORMED

— INSIDE DELIVERY — LIFT GATE
— RESIDENTIAL DELIVERY — CONSTRUCTION SITE
— NON COMMERCIAL DELIVERY — SORT AND SEGREGATE
— SECURITY INSPECTION

ADDITIONAL CHARGES MAY APPLY

ABOVE SHIPMENT RECEIVED IN GOOD ORDER EXCEPT WHERE NOTED

Print Name CU STO MEMO PYO NLY

Signature _____

Company Name CUSTOMER COPY ONLY

THIS IS NOT AN INVOICE

For Customer Service Assistance Call 1-800-283-7489

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TOTAL FREIGHT CHARGES

COLLECT C.O.D. FEE

TOTAL COLLECT DUE

ORC: CASH / CHECK (Circle One)

CHECK: AMOUNT:

C.O.D. AMOUNT (IN ADDITION TO TOTAL SHOWN ABOVE)

COD: CASH / CHECK TO SHIPPER (Circle One)

CHECK: AMOUNT:

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Safety Data Sheet

acc. to 29 CFR 1910.1200 App D

impress
THE DECOR COMPANY

iCR951 - release agent

Version number: GHS 4.0
Replaces version: GHS 3

Revision: 2023-05-31

SECTION 1: Identification

1.1 Product identifier

Trade name: iCR951 - release agent

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Additive for the wood industry / wood processing industry
All other uses are not advised

1.3 Details of the supplier of the safety data sheet

IMPRESS Decor Austria GmbH
Zollfeldstraße 90
A-9300 St. Veit a. d. Glan
Austria

Telephone: +43 5 94 96 0
e-mail: austria@impress.biz
Website: www.impress.biz

e-mail (competent person): austria@impress.biz (IMPRESS Decor Austria GmbH)

1.4 Emergency telephone number

Emergency information service: +43 5 94 96 0
This number is only available during the following office hours: Mon-Fri 08:00 AM - 12:00 PM

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Section	Hazard class	Category	Hazard class and category	Hazard statement
A.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
A.3	serious eye damage/eye irritation	1	Eye Dam. 1	H318

For full text of abbreviations: see SECTION 16.

2.2 Label elements

Labelling acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

- Signal word: danger
- Pictograms

GHS05

- Hazard statements

H315 Causes skin irritation.
H318 Causes serious eye damage.

- Precautionary statements

P280	Wear protective gloves.
P302+P352	If on skin: Wash with plenty of water.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a poison center/doctor.
P321	Specific treatment (see on this label).
P362	Take off contaminated clothing and wash before reuse.

- Hazardous ingredients for labelling: 2-Propylheptanol ethoxylate, 2-ethylhexanol, ethoxylated, phosphated, sodium salt, NaOH

2.3 Other hazards

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance in a concentration of ≥ 0.1%.

Endocrine disrupting properties

Does not contain an endocrine disruptor (EDC) in a concentration of ≥ 0.1%.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not relevant (mixture)

3.2 Mixtures

Description of the mixture

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms	Notes
2-Propylheptanol ethoxylate	CAS No 160875-66-1	5 - < 10	Eye Dam. 1 / H318		
2-ethylhexanol, ethoxylated, phosphated, sodium salt	CAS No 111798-26-6	5 - < 10	Skin Irrit. 2 / H315 Eye Dam. 1 / H318		
NaOH	CAS No 1310-73-2	< 1	Skin Corr. 1A / H314 Eye Dam. 1 / H318		

For full text of abbreviations: see SECTION 16.

SECTION 4: First-aid measures

4.1 Description of first-aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

Following skin contact

Wash with plenty of soap and water.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water spray, BC-powder, Carbon dioxide (CO2)

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Coordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapors/dust/aerosols/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains

Advice on how to clean up a spill

Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage: sawdust, kieselgur (diatomite), sand, universal binder

Appropriate containment techniques

Use of adsorbent materials.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

Store in a closed container.

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Use only in well-ventilated areas.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Control of the effects

Protect against external exposure, such as

Heat, Frost, UV-radiation/sunlight

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
US	sodium hydroxide	1310-73-2	PEL		2						29 CFR 1910.1000

Notation

Ceiling-C	ceiling value is a limit value above which exposure should not occur
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified

8.2 Exposure controls

Appropriate engineering controls

General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. In the case of wanting to use the gloves again, clean them before taking off and air them well. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Type of material

NBR: acrylonitrile-butadiene rubber (nitrile)

- Other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	liquid
Color	not determined
Particle	not relevant (liquid)
Odor	characteristic

Other safety parameters

pH (value)	not determined
Melting point/freezing point	not determined
Initial boiling point and boiling range	not determined
Flash point	not determined
Evaporation rate	Not determined
Flammability (solid, gas)	not relevant, (fluid)
Vapor pressure	not determined
Density	not determined
Vapor density	this information is not available
Relative density	Information on this property is not available

	Solubility(ies)	not determined
	Partition coefficient	
	- n-octanol/water (log KOW)	this information is not available
	Auto-ignition temperature	not determined
	Viscosity	not determined
	Explosive properties	none
	Oxidizing properties	none
9.2	**Other information**	there is no additional information

SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials".

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

There are no specific conditions known which have to be avoided.

10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Test data are not available for the complete mixture.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Acute toxicity

The classification criteria for these hazard classes are not met.

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitization

The classification criteria for these hazard classes are not met.

Germ cell mutagenicity

The classification criteria for this hazard class are not met.

Carcinogenicity

The classification criteria for this hazard class are not met.

Reproductive toxicity

The classification criteria for this hazard class are not met.

Specific target organ toxicity - single exposure

The classification criteria for this hazard class are not met.

Specific target organ toxicity - repeated exposure

The classification criteria for this hazard class are not met.

Aspiration hazard

The classification criteria for this hazard class are not met.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB. Does not contain a PBT-/vPvB-substance in a concentration of ≥ 0.1%.

12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (EDC) in a concentration of ≥ 0.1%.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packages

Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1	**UN number**	not subject to transport regulations
14.2	**UN proper shipping name**	not relevant
14.3	**Transport hazard class(es)**	none
14.4	**Packing group**	not assigned
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to IMO instruments

Information for each of the UN Model Regulations

Transport of dangerous goods by road or rail (49 CFR US DOT) - Additional information

Not subject to transport regulations.

International Maritime Dangerous Goods Code (IMDG) - Additional information

Not subject to IMDG.

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Not subject to ICAO-IATA.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

National regulations (United States)

Superfund Amendment and Reauthorization Act (SARA TITLE III)

- The List of Extremely Hazardous Substances and Their Threshold Planning Quantities (EPCRA Section 302, 304)

none of the ingredients are listed

- Specific Toxic Chemical Listings (EPCRA Section 313)

none of the ingredients are listed

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- List of Hazardous Substances and Reportable Quantities (CERCLA section 102a) (40 CFR 302.4)

Name of substance	CAS No	Remarks	Statutory code	Final RQ pounds (Kg)
NaOH	1310-73-2		1	1000 (454)

Legend
1 "1" indicates that the statutory source is section 311(b)(2) of the Clean Water Act

Clean Air Act

none of the ingredients are listed

Right to Know Hazardous Substance List

- Cleaning Product Right to Know Act Substance List (CA-RTK)

Name of substance	CAS No	Functionality	Authoritative Lists
NaOH	1310-73-2		OEHHA RELs

- Toxic or Hazardous Substance List (MA-TURA)

Name of substance	CAS No	DEP CODE	PBT / HHS / LHS	PBT / HHS Threshold	De Minimis Concentration Threshold
NaOH	1310-73-2				1.0 %

- Hazardous Substance List (NJ-RTK)

Name of substance	CAS No	Remarks	Classifications
NaOH	1310-73-2		CO R1

Legend
CO Corrosive
R1 Reactive - First Degree

- Hazardous Substance List (Chapter 323) (PA-RTK)

Name acc. to inventory	CAS No	Classification
SODIUM HYDROXIDE (NA(OH))	1310-73-2	E

Legend
E Environmental hazard

- Hazardous Substance List (RI-RTK)

Name of substance	CAS No	References
NaOH	1310-73-2	T, F
NaOH	1310-73-2	T, F
NaOH	1310-73-2	T, F

Legend
F Flammability (NFPA®)
T Toxicity (ACGIH®)

California Environmental Protection Agency (Cal/EPA): Proposition 65 - Safe Drinking Water and Toxic Enforcement Act of 1987

none of the ingredients are listed

Industry or sector specific available guidance(s)

NPCA-HMIS® III

Hazardous Materials Identification System. American Coatings Association.

Category	Rating	Description
Chronic	/	none
Health	3	major injury likely unless prompt action is taken and medical treatment is given
Flammability	0	material that will not burn under typical fire conditions
Physical hazard	0	material that is normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosive
Personal protection	-	

NFPA® 704

National Fire Protection Association: Standard System for the Identification of the Hazards of Materials for Emergency Response (United States).

Category	Degree of hazard	Description
Flammability	0	material that will not burn under typical fire conditions
Health	3	material that, under emergency conditions, can cause serious or permanent injury
Instability	0	material that is normally stable, even under fire conditions
Special hazard		

National inventories

Country	Inventory	Status
US	TSCA	all ingredients are listed

Legend
TSCA Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information, including date of preparation or last revision

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
29 CFR 1910.1000	29 CFR 1910.1000, Tables Z-1, Z-2, Z-3 - Occupational Safety and Health Standards: Toxic and Hazardous Substances (permissible exposure limits)
49 CFR US DOT	49 CFR U.S. Department of Transportation
ACGIH®	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DEP CODE	Department of Environmental Protection Code
DGR	Dangerous Goods Regulations (see IATA/DGR)
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye

622hhh

Abbr.	Descriptions of used abbreviations
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
HHS	Higher hazard substance
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
LHS	Lower hazard substance
NFPA®	National Fire Protection Association (United States)
NPCA-HMIS® III	National Paint and Coatings Association: Hazardous Materials Identification System - HMIS® III, Third Edition
OSHA	Occupational Safety and Health Administration (United States)
PBT	Persistent, Bioaccumulative and Toxic
PEL	Permissible exposure limit
ppm	Parts per million
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
STEL	Short-term exposure limit
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

OSHA Hazard Communication Standard (HCS), 29 CFR 1910.1200.

Transport of dangerous goods by road or rail (49 CFR US DOT). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties: The classification is based on tested mixture.
Health hazards, Environmental hazards: The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

C.

Thermal Oil Heaters

1. Indirect Heating (104 Form)
2. Operating Scenarios
3. Air Pollutant Control Device (110 Form)

1.

Indirect Heating (104 Forms)

(a) 204.73 MMBtu/hr Thermal Oil Heater (K7)
(b) 204.73 MMBtu/hr Thermal Oil Heater (K8)
(c) 56.20 MMBtu/hr Thermal Oil Heater (K9)
(d) 56.20 MMBtu/hr Thermal Oil Heater (K10)
(e) 56.20 MMBtu/hr Thermal Oil Heater (K11)
(f) 56.20 MMBtu/hr Thermal Oil Heater (K12)

(a)

204.73 MMBtu/hr Thermal Oil Heater (K7)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K7 Waste Wood-Fired Thermal Oil Heater (Stoker/Wet Biomass)

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: N/A

Rated capacity-input: 204.73 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ■ Water tube ☐ other(specify): _____

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood	5461	Btu/lb	N/A	8	N/A	N/A
Other (specify)						

Standby:

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

4. **Purpose (If multipurpose, note percent in each use category):**

☐ Space heat _____ % ☐ Power generation _____ % ■ Process heat 100 %

Other (specify): _____

5. **Normal schedule of operation:**

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

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

Part 63, Subpart DDDDD, Tables 4.3 and 4. Maintain opacity to less than or equal to10% opacity.
Part 63, Subpart DDDDD, Table 3.3. Conduct annual tune-up.
Part 63, Subpart DDDDD, Table 3.4, Perform one-time energy assessment , if one has not been performed. Part 60, Subpart Db, 60.43b(c)(1). Facility requests combined PM_{10} and PM_{cond} limit of 6.14 lbs/hr and combined ~~$PM_{2.5}$ and PM_{cond} limit of 5.87 lbs/hr.~~

7. **Fugitive Emissions (attach calculation worksheets):** N/A

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

■ Yes ☐ No (If "yes", complete ADEM Form 110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	20.47 2.66 11	89.67 66	NSPS MACT	20.47 2.66	0.10 lbs / MMBtu 0.013 lbs MMBtu Input
Sulfur dioxide	2.25	9.86	AP-42	2.25	4.0 lbs/MMBtu Input
Nitrogen oxides	36.65	160.53	AP-42 & Eng Est	36.65	0.179 lbs/MMBtu Input
Carbon monoxide	36.65	160.53	AP-42	36.65	390 ppm @ 3% O2 (30-day rolling avg)
VOC's	7.32	32.06	AP-42	N/A	7.32 lbs/hr
Other PM_{10} $PM_{2.5}$ PM_{cond}	2.66 2.39 3.48	11.66 10.45 15.24	AP-42, Table 1.6-3, 1.6-4	2.66 2.39 3.48	0.132 lbs/MMBtu Input 0.0117 lbs/MMBtu Input 0.017 lbs MMBtu Input
Mercury	0.0001638	0.0007174	NESHAP Subpart DDDDD, Table 1	N/A	0.0000008 lbs/MMBtu Input
HCL	0.0429933	0.1183107	NESHAP Subpart DDDDD, Table 1	N/A	0.00021 lbs MMBtu Input
Other	4.10	17.99	N/A	N/A	N/A
GHG	45,945	201,288	EPA GHG Calculator	N/A	N/A

10. **Stack data:** EP# TOH-1 (K7 Portion)

UTM Coordinate (E-W)	594.864	(km)	**UTM Coordinate (N-S)**	3719.468	(km)
Latitude	33.610763	(LAT)	**Longitude**	-85.977420	(LONG)
Height above grade	230	(feet)	**Gas temperature at exit**	338	(°F)
Inside diameter at exit (round)	8.5	(feet)	**Gas Velocity**	36.01	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	**Volume of gas discharged**	122,601.5	(ACFM)
Base Elevation	603	(feet)	**GEP Stack Height**	N/A	(feet)

Are sampling ports available? ☒ **Yes** ☐ **No** **(If "yes", describe. Draw on separate sheet if necessary):**

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

The K7 Combustion Chamber will act as the control device for reducing HAP emissions from Zones 1, 2, 3, and 16 of the three OSB Dryers as required in Part 63, Subpart DDDD, Tables 1B and 2. The facility will maintain a 3-hour block average firebox temperature above the minimum temperature established during the performance test. Compliance will be demonstrated using one of the following four options:

Reduce emissions of total HAP, measured as THC, by 90 percent	Total HAP emissions, measured using the methods in Table 4 to this subpart over the 3-hour performance test, are reduced by at least 90 percent, as calculated using the procedures in §63.2262; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions were reduced by at least 90 percent.
Limit emissions of total HAP, measured as THC, to 20 ppmvd	The average total HAP emissions, measured using the method in Table 4 to this subpart over the 3-hour performance test, do not exceed 20 ppmvd; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions did not exceed 20 ppmvd.
Reduce methanol or formaldehyde emissions by 90 percent	The methanol or formaldehyde emissions measured using the methods in Table 4 to this subpart over the 3-hour performance test, are reduced by at least 90 percent, as calculated using the procedures in §63.2262; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions were reduced by at least 90 percent.
Limit methanol or formaldehyde emission to less than or equal to 1 ppmvd (if uncontrolled emissions are greater than or equal to 10 ppmvd)	The average methanol or formaldehyde emissions, measured using the methods in Table 4 to this subpart over the 3-hour performance test, do not exceed 1 ppmvd; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions did not exceed 1 ppmvd. If the process unit is a reconstituted wood product press or a reconstituted wood product board cooler, your capture device either meets the EPA Method 204 criteria for a PTE or achieves a capture efficiency of greater than or equal to 95 percent.

(b)

204.73 MMBtu/hr Thermal Oil Heater (K8)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K8 Waste Wood-Fired Thermal Oil Heater (Stoker/Wet Biomass)

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: N/A

Rated capacity-input: 204.73 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ☒ Water tube ☐ other(specify): _

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas		Btu/ft^3				
L. P. Gas		Btu/ft^3				
Wood	5451	Btu/lb	N/A	8	N/A	N/A
Other (specify)						

Standby:

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

4. **Purpose (if multipurpose, note percent in each use category):**

☐ Space heat _____ % ☐ Power generation _____ % ■ Process heat 100 %

Other (specify): _____

5. **Normal schedule of operation:**

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

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

Part 63, Subpart DDDDD, Table 4.3 and 4. Maintain opacity to less than or equal to 10% opacity.
Part 63, Subpart DDDDD, Table 3.3. Conduct annual tune-up.
Part 63, Subpart DDDDD, Table 3.4, Perform one-time energy assessment, if one has not been performed. Part 60, Subpart Db, 60.43b(c)(1). Facility requests combined PM_{10} and PM_{cond} limit of 6.14 lbs/hr and combined $PM_{2.5}$ and PM_{cond} limit of 5.87 lbs/hr.

7. **Fugitive Emissions (attach calculation worksheets):** N/A

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

■ Yes ☐ No (If "yes", complete ADEM Form 110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	20.47 2.66	89.67 11.66	NSPS PSD	20.47 2.66	0.10 lbs/MMBtu 0.013 lbs MMBtu Input
Sulfur dioxide	2.25	9.86	AP-42	2.25	4.0 lbs/MMBtu Input
Nitrogen oxides	36.65	160.53	AP-42 & Eng Est	36.65	0.179 lbs/MMBtu Input
Carbon monoxide	36.65	160.53	AP-42	36.65	390 ppm @ 3% O2 (30-day rolling avg)
VOC's	7.32	32.06	AP-42	N/A	7.32 lbs/hr
Other PM_{10} $PM_{2.5}$ PM_{cond}	2.66 2.39 3.48	11.66 10.45 15.24	AP-42, Table 1.6-3, 1.6-4	2.71 2.39 3.48	0.132 lbs/MMBtu Input 0.0117 lbs/MMBtu Input 0.017 lbs/MMBtu Input
Mercury	0.0001638	0.0007174	NESHAP Subpart DDDDD, Table 1	N/A	0.0000008 lbs/MMBtu Input
HCL	0.0429933	0.1883107	NESHAP Subpart DDDDD, Table 1	N/A	0.00021 lbs MMBtu Input
Other	4.10	17.99	N/A	N/A	N/A
GHG	45,945	201,288	EPA GHG Calculator	N/A	N/A

10. **Stack data:** EP# TOH-1 (K8 Portion)

UTM Coordinate (E-W)	594.864	(km)	UTM Coordinate (N-S)	3719.468	(km)
Latitude	33.610763	(LAT)	Longitude	-85.977420	(LONG)
Height above grade	230	(feet)	Gas temperature at exit	338	(°F)
Inside diameter at exit (round)	8.5	(feet)	Gas Velocity	36.01	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	Volume of gas discharged	122,601.5	(ACFM)
Base Elevation	603	(feet)	GEP Stack Height	N/A	(feet)

Are sampling ports available? ☒ Yes ☐ No (If "yes", describe. Draw on separate sheet if necessary):

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

The K7 Combustion Chamber will act as the control device for reducing HAP emissions from Zones 1, 2, 3, and 16 of the three OSB Dryers as required in Part 63, Subpart DDDD, Tables 1B and 2. The facility will maintain a 3-hour block average firebox temperature above the minimum temperature established during the performance test. Compliance will be demonstrated using one of the following four options:

Reduce emissions of total HAP, measured as THC, by 90 percent	Total HAP emissions, measured using the methods in Table 4 to this subpart over the 3-hour performance test, are reduced by at least 90 percent, as calculated using the procedures in §63.2262; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions were reduced by at least 90 percent.
Limit emissions of total HAP, measured as THC, to 20 ppmvd	The average total HAP emissions, measured using the method in Table 4 to this subpart over the 3-hour performance test, do not exceed 20 ppmvd; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions did not exceed 20 ppmvd.
Reduce methanol or formaldehyde emissions by 90 percent	The methanol or formaldehyde emissions measured using the methods in Table 4 to this subpart over the 3-hour performance test, are reduced by at least 90 percent, as calculated using the procedures in §63.2262; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions were reduced by at least 90 percent.
Limit methanol or formaldehyde emission to less than or equal to 1 ppmvd (if uncontrolled emissions are greater than or equal to 10 ppmvd)	The average methanol or formaldehyde emissions, measured using the methods in Table 4 to this subpart over the 3-hour performance test, do not exceed 1 ppmvd; AND you have a record of the operating requirement(s) listed in Table 2 to this subpart for the process unit over the performance test during which emissions did not exceed 1 ppmvd. If the process unit is a reconstituted wood product press or a reconstituted wood product board cooler, your capture device either meets the EPA Method 204 criteria for a PTE or achieves a capture efficiency of greater than or equal to 95 percent.

(c)

56.20 MMBtu/hr Thermal Oil Heater (K9)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K9 Thermal Oil Heater

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: Custom

Rated capacity-input: 56.20 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ☐ Water tube ■ other(specify): Thermic Fluid Heater

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby: N/A

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

4. **Purpose (if multipurpose, note percent in each use category):**

☐ **Space heat** ___ % ☐ **Power generation** ___ % ■ **Process heat** 100 %

Other (specify): ___

5. **Normal schedule of operation:**

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

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

Part 63, Subpart DDDDD, Table 3.3- Annual Tune-Up.
~~Part 60, Subpart Dc, 60.43c(b)(1).~~
Combust Natural Gas Only. Perform one-time energy assessment, if one has not been performed.
Facility requests combined PM_{10} and PM_{cond} limit of 0.47 lbs/hr and a combined $PM_{2.5}$ and PM_{cond} limit of 0.47 lbs/hr.

7. **Fugitive Emissions (attach calculation worksheets):** N/A

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

○ **Yes** ◉ **No (If "yes", complete ADEM Form 110)**

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.15	0.66	AP-Table 1.4-2	0.15	0.0027 lbs MMBtu Input
Sulfur dioxide	0.03	0.15	AP-Table 1.4-2	0.03	4.0 lbs/MMBtu Input
Nitrogen oxides	2.50	10.95	Manufacturer's Data	2.50	0.0445 lbs/MMBtu Input
Carbon monoxide	0.265	1.156	Manufacturer's Data	N/A	0.00472 lbs/MMBtu Input
VOC's	0.031	0.13	AP-Table 1.4-2	N/A	0.00095 lbs/MMBtu Input
Other HAPs	0.01	0.05	AP-42-Table 1.4-2.3 and 4	N/A	N/A
GHG	6785	29,719	AP-42 Table 1.4-2	N/A	120.734 lbs/MMBtu Input
PM Condensables	0.32	1.40	AP-42 Table 1.4-2	N/A	0.0057 lbs MMBtu Input

10. **Stack data:** EP #TOH-1 (K9 Portion)

UTM Coordinate (E-W)	594.864	(km)	**UTM Coordinate (N-S)**	3719.468	(km)
Latitude	33.610763	(LAT)	**Longitude**	-85.977420	(LONG)
Height above grade	230	(feet)	**Gas temperature at exit**	338	(°F)
Inside diameter at exit (round)	8.50	(feet)	**Gas Velocity**	7.62	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	**Volume of gas discharged**	25,930	(ACFM)
Base Elevation	603	(feet)	**GEP Stack Height**	N/A	(feet)

Are sampling ports available? ☒ **Yes** ☐ **No** **(If "yes", describe. Draw on separate sheet if necessary):**

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

(d)

56.20 MMBtu/hr Thermal Oil Heater (K10)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K10 Thermal Oil Heater

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: Custom

Rated capacity-input: 56.20 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ☐ Water tube ■ other(specify): Thermic Fluid Heater

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby: N/A

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

4. **Purpose (if multipurpose, note percent in each use category):**

☐ **Space heat** ____ % ☐ **Power generation** ____ % ■ **Process heat** 100 %

Other (specify): ____

5. **Normal schedule of operation:**

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

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

Part 63, Subpart DDDDD, Table 3.3- Annual Tune-Up.
~~Part 60, Subpart Dc, 60.43c(b)(1).~~
Combust Natural Gas Only. Perform one-time energy assessment, if one has not been performed.
Facility requests combined PM_{10} and PM_{cond} limit of 0.47 and a combined $PM_{2.5}$ and PM_{cond} limit of 0.47 lbs/hr.

7. **Fugitive Emissions (attach calculation worksheets):** N/A

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

○ Yes ◉ No **(If "yes", complete ADEM Form 110)**

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.15	0.66	AP-Table 1.4-2	0.15	0.0027 lbs MMBtu Input
Sulfur dioxide	0.03	0.15	AP-Table 1.4-2	0.03	4.0 lbs/MMBtu Input
Nitrogen oxides	2.50	10.95	Manufacturer's Data	2.50	0.0445 lbs/MMBtu Input
Carbon monoxide	0.265	1.156	Manufacturer's Data	N/A	0.00472 lbs/MMBtu Input
VOC's	0.031	0.13	AP-Table 1.4-2	N/A	0.00095 lbs/MMBtu Input
HAPs	0.01	0.05	AP-42-Table 1.4-2,3 and 4	N/A	N/A
GHG	6785	29,719	AP-42 Table 1.4-2	N/A	120.734 lbs/MMBtu Input
PM Condensables	0.32	1.40	AP-42 Table 1.4-2	N/A	0.0057 lbs MMBtu Input

10. **Stack data:** EP# TOH-1 (K10 Portion)

UTM Coordinate (E-W)	594.864	(km)	**UTM Coordinate (N-S)**	3719.468	(km)
Latitude	33.610763	(LAT)	**Longitude**	-85.977420	(LONG)
Height above grade	230	(feet)	**Gas temperature at exit**	338	(°F)
Inside diameter at exit (round)	8.50	(feet)	**Gas Velocity**	7.62	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	**Volume of gas discharged**	25,930	(ACFM)
Base Elevation	603	(feet)	**GEP Stack Height**	N/A	(feet)

Are sampling ports available? ☒ Yes ☐ No **(If "yes", describe. Draw on separate sheet if necessary):**

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

(e)

56.20 MMBtu/hr Thermal Oil Heater (K11)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K11 Thermal Oil Heater

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: Custom

Rated capacity-input: 56.20 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ☐ Water tube ■ other(specify): Thermic Fluid Heater

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby: N/A

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

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ___ % ☐Power generation _____ % ■Process heat 100 %

Other (specify): _____

5. Normal schedule of operation:

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

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

Part 63, Subpart DDDDD, Table 3.3-Annual Tune-Up. Part 60, Part 60, Subpart Dc, 60.43c(b)(1). ~~Combust Natural Gas Only. Perform one-time energy assessment, if one has not been performed.~~ Opacity limit of 10%.
~~Facility requests combined PM10 and PMcond limit of 0.47 and a combined PM2.5 and PMcond limit of 0.47 lbs/hr.~~

7. Fugitive Emissions (attach calculation worksheets): N/A

POLLUTANT	POTENTIAL EMISSIONS		BASIS OF CALCULATION	REGULATORY EMISSION LIMIT	REGULATORY EMISSION LIMIT
	lb/hr	t/yr		(lb/hr)	(in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

○Yes ◉No (If "yes", complete ADEM Form 110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.15	0.66	AP-Table 1.4-2	0.15	0.0027 lbs MMBtu Input
Sulfur dioxide	0.03	0.15	AP-Table 1.4-2	0.03	4.0 lbs/MMBtu Input
Nitrogen oxides	2.50	10.95	Manufacturer's Data	2.50	0.0445 lbs/MMBtu Input
Carbon monoxide	0.265	1.156	Manufacturer's Data	N/A	0.00472 lbs/MMBtu Input
VOC's	0.031	0.13	AP-Table 1.4-2	N/A	0.00095 lbs/MMBtu Input
Other HAPs	0.01	0.05	AP-42-Table 1.4-2.3 and 4	N/A	N/A
GHG	6785	29,719	AP-42 Table 1.4-2	N/A	120.734 lbs/MMBtu Input
PM Condensables	0.32	1.40	AP-42 Table 1.4-2	N/A	0.0057 lbs MMBtu Input

10. **Stack data:** EP #TOH-1 (K11 Portion)

UTM Coordinate (E-W)	594.864	(km)	**UTM Coordinate (N-S)**	3719.468	(km)
Latitude	33.610763	(LAT)	**Longitude**	-85.977420	(LONG)
Height above grade	230	(feet)	**Gas temperature at exit**	338	(°F)
Inside diameter at exit (round)	8.50	(feet)	**Gas Velocity**	7.62	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	**Volume of gas discharged**	25,930	(ACFM)
Base Elevation	603	(feet)	**GEP Stack Height**	N/A	(feet)

Are sampling ports available? ■ Yes ☐ No **(If "yes", describe. Draw on separate sheet if necessary):**

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

(f)

56.20 MMBtu/hr Thermal Oil Heater (K12)

PERMIT APPLICATION
FOR
INDIRECT HEATING EQUIPMENT
(FUEL BURNING EQUIPMENT)

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
Do not write in this space

1. **Name of facility or organization:** Kronospan LLC

2. **Unit Description (i.e. No. 1 Power Boiler):** K12 Thermal Oil Heater

Equipment manufacturer's information

Name of manufacturer: CEATEC

Model number: Custom

Rated capacity-input: 56.20 **(MMBtu/hr.)**

Boiler type: ☐ Fire tube ☐ Water tube ■ other(specify): Thermic Fluid Heater

Manufactured date: 2024

Proposed installation date: 06/25

Original installation date (if existing): N/A

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

3. **Type of fuel used:**

Primary:

Fuel	Heat Content	Units	Max. % Sulfur	Max. % Ash	Grade No. [fuel oil only]	Supplier [used oil only]
Coal		Btu/lb				
Fuel Oil		Btu/gal				
Natural Gas	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

Standby: N/A

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

4. Purpose (if multipurpose, note percent in each use category):

☐Space heat ____ % ☐Power generation ____ % ■Process heat 100 %

Other (specify): ____

5. Normal schedule of operation:

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

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

Part 63, Subpart DDDDD, Table 3.3-Annual Tune-Up, Part 60, Subpart Dc, 60.43c(b)(1). Combust Natural Gas Only. Perform one-time energy assessment, if one has not been performed. Opacity limit of 10%. Facility requests combined PM10 and PMcond limit of 0.47 and a combined PM2.5 and PMcond limit of 0.47 lbs/hr.

7. Fugitive Emissions (attach calculation worksheets): N/A

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate					
Sulfur dioxide					
Nitrogen oxides					
Carbon monoxide					
VOC's					
Other					

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

○Yes ◎No (If "yes", complete ADEM Form 110)

9. **Point Emissions (attach calculation worksheets):**

POLLUTANT	POTENTIAL EMISSIONS lb/hr	POTENTIAL EMISSIONS t/yr	BASIS OF CALCULATION	REGULATORY EMISSION LIMIT (lb/hr)	REGULATORY EMISSION LIMIT (in units of standard)
Particulate	0.15	0.66	AP-Table 1.4-2	0.15	0.0027 lbs MMBtu Input
Sulfur dioxide	0.03	0.15	AP-Table 1.4-2	0.03	4.0 lbs/MMBtu Input
Nitrogen oxides	2.50	10.95	Manufacturer's Data	2.50	0.0445 lbs/MMBtu Input
Carbon monoxide	0.265	1.156	Manufacturer's Data	N/A	0.00472 lbs/MMBtu Input
VOC's	0.031	0.13	AP-Table 1.4-2	N/A	0.00095 lbs/MMBtu/Input
HAPs	0.01	0.05	AP-42-Table 1.4-2.3 and 4	N/A	N/A
GHG	6785	29,719	AP-42 Table 1.4-2	N/A	120.734 lbs/MMBtu Input
PM Condensables	0.32	1.40	AP-42 Table 1.4-2	N/A	0.0057 lbs MMBtu Input

10. **Stack data:** EP# TOH-1 (K12 Portion)

UTM Coordinate (E-W)	594.864	(km)	**UTM Coordinate (N-S)**	3719.468	(km)
Latitude	33.610763	(LAT)	**Longitude**	-85.977420	(LONG)
Height above grade	230	(feet)	**Gas temperature at exit**	338	(°F)
Inside diameter at exit (round)	8.50	(feet)	**Gas Velocity**	7.62	(Ft/Sec)
Inside area at exit (not round)	N/A	(sq. feet)	**Volume of gas discharged**	25,930	(ACFM)
Base Elevation	603	(feet)	**GEP Stack Height**	N/A	(feet)

Are sampling ports available? ☒ Yes ☐ No **(If "yes", describe. Draw on separate sheet if necessary):**

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

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

Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 04/17/2024

2.

Operating Scenarios

a. Option #1 - Discharge to Atmosphere
b. Option #2 - Discharge to MDF Dryer

a. Option #1 – Discharge to Atmosphere

Two Biomass Thermal Oil Heaters and two of the four NG Thermal Oil Heaters in operation. Dryers 1, 2, and 3 will have zones 1, 2, 3, and 16 exhausting to the two Biomass heaters. All heaters in this scenario will vent to atmosphere via the common stack.

b. Option #2 – Discharge to MDF Dryer (See Attached Table)

Under Option #2, there are three separate operating scenarios:

(i) Scenario #1

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, D3) along with existing Thermal Oil Heater K4 and proposed Thermal Oil Heaters K9, K10, K11, and K12 will be vented to the MDF Dryer. Proposed Thermal Oil Heaters K7 and K8 will not be in operation.

(ii) Scenario #2

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, D3) along with Thermal Oil Heater K7 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K8 will not be in operation.

(iii) Scenario #3

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, D3) along with Thermal Oil Heater K8 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K7 will not be in operation.

	Operating Scenario for MDF Dryer with OSB – Option 1	Operating Scenario for MDF Dryer with OSB – Option 2	Operating Scenario for MDF Dryer with OSB – Option 3
K7		X	
K8			X
K9	X	2 of 4 heaters	2 of 4 heaters
K10	X		
K11	X		
K12	X		
OSB Dryer 1			
OSB Dryer 2			
OSB Dryer 3			

3.

Air Pollution Control Devices

a. MC1 (K7)
b. MC2 (K8)
c. EF1 (K7)
d. EF2 (K8)
e. SNCR (K7)
f. SNCR (K8)
g. Medium Low – NOx Burner (K9)
h. Medium Low – NOx Burner (K10)
i. Medium Low – NOx Burner (K11)
j. Medium Low – NOx Burner (K12)

a.

MC1

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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 (MC1)
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Custom

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

Thermal Oil Heater #7

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	115.00	75.00	28.75
Designed	46.00	30.00	11.50
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	60	60	60
Manufacturer's guaranteed	N/A	N/A	N/A

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** _____

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): _____

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

   Name of manufacturer _____ **Model No.** _____

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

   _____

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Hg		
Mass emission rate (#/hr)			
Uncontrolled	0.0007		
Designed	0.0003		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	N/A		
Manufacturer's guaranteed	N/A		

6. **Gas conditions:** Discharges to Hybrid Filter (EF1)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)		73,625	
(ACFM, existing conditions)		122,060	
Temperature (°F)		338	
Velocity (ft/sec)		28.27	
Percent moisture		<10	

Pressure drop across device: _____ **(inches H_2O)**

7. **Stack dimensions:** N/A - Discharges to Hybrid Filter (EF1)

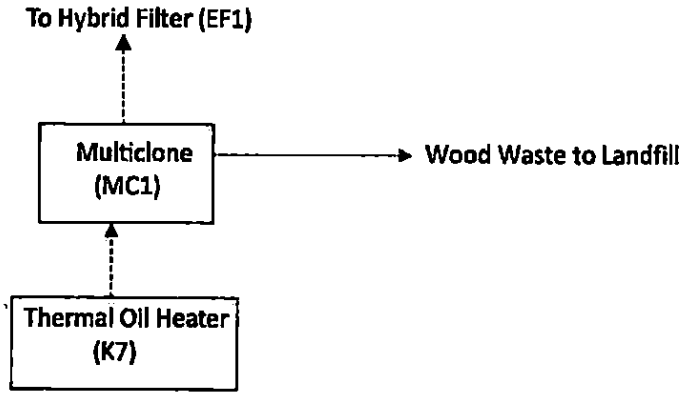
UTM Coordinate (E-W) _____ **(km)**		**UTM Coordinate (N-S)** _____ **(km)**	
Latitude _____ **(LAT)**		**Longitude** _____ **(LONG)**	
Height above grade _____ **(feet)**		**Gas temperature at exit** _____ **(°F)**	
Inside diameter at exit (round) _____ **(feet)**		**Gas Velocity** _____ **(Ft/Seo)**	
Inside area at exit (not round) _____ **(sq. feet)**		**Volume of gas discharged** _____ **(ACFM)**	
Base Elevation _____ **(feet)**		**GEP Stack Height** _____ **(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.**
9. **Enclosed are: N/A**

- ☐ **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. N/A**
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.)**

N/A


To Hybrid Filter (EF1)
Multiclone
(MC1)
Wood Waste to Landfill
Thermal Oil Heater
(K7)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	301 tpy			
Composition	Wood Ash			
Is waste hazardous?	No			
Method of disposal	Landfilling			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/17/2024

b.

MC2

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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 (MC2)
☐ Absorber	☐ Adsorber
☐ Condenser	☐ Wet Suppression

Wet scrubber (kind): _____

Stage 1 - Vapor balance (type): _____

Other (describe): _____

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

Name of manufacturer CEATEC **Model No.** Custom

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

Thermal Oil Heater #8

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	115.00	75.00	28.75
Designed	46.00	30.00	11.50
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	60	60	60
Manufacturer's guaranteed	N/A	N/A	N/A

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** _____

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): _____

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

Name of manufacturer _____ **Model No.** _____

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

_____

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	Hg		
Mass emission rate (#/hr)			
Uncontrolled	0.0007		
Designed	0.0003		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	N/A		
Manufacturer's guaranteed	N/A		

6. **Gas conditions:** Discharges to Hybrid Filter (EF2)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)		73,625	
(ACFM, existing conditions)		122,060	
Temperature (°F)		338	
Velocity (ft/sec)		28.27	
Percent moisture		<10	

Pressure drop across device: _____ **(inches H_20)**

7. **Stack dimensions:** N/A - Discharges to Hybrid Filter (EF2)

UTM Coordinate (E-W) _____ **(km)**		**UTM Coordinate (N-S)** _____ **(km)**	
Latitude _____ **(LAT)**		**Longitude** _____ **(LONG)**	
Height above grade _____ **(feet)**		**Gas temperature at exit** _____ **(°F)**	
Inside diameter at exit (round) _____ **(feet)**		**Gas Velocity** _____ **(Ft/Sec)**	
Inside area at exit (not round) _____ **(sq. feet)**		**Volume of gas discharged** _____ **(ACFM)**	
Base Elevation _____ **(feet)**		**GEP Stack Height** _____ **(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.**

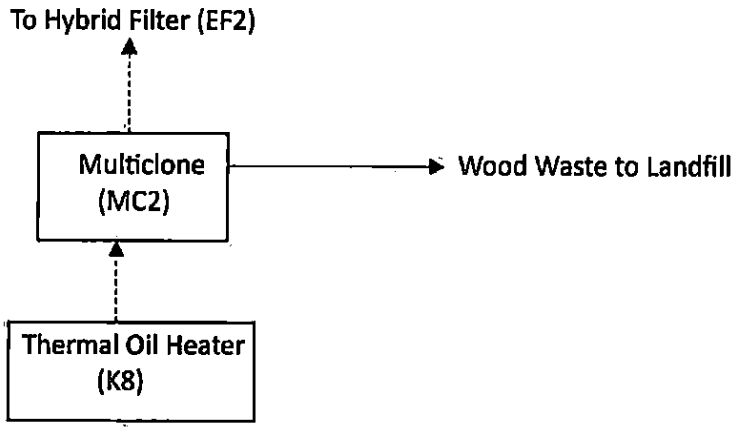
9. **Enclosed are: N/A**

- ☐ **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. N/A**

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.)**

N/A


To Hybrid Filter (EF2)
Multiclone
(MC2)
Wood Waste to Landfill
Thermal Oil Heater
(K8)

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	301 tpy			
Composition	Wood Ash			
Is waste hazardous?	No			
Method of disposal	Landfilling			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/17/2024

c.

EF1

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Hybrid Filter (EF1) - Combination Electrofilter with Bag Filter w/Lime Injection

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

Name of manufacturer CEATEC **Model No.** CE - HF - 60MW

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

Thermal Oil Heater #7, via Multiclone MC1

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	46.00	30	11.50
Designed	2.66	2.66	2.39
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.013 lbs/MMBtu	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>94	>91	>79
Manufacturer's guaranteed	N/A	N/A	N/A

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ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** _____

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): _____

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

Name of manufacturer _____ **Model No.** _____

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

_____

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	**Pollutant #2**	**Pollutant #3**
	Hg	HCl	
Mass emission rate (#/hr)			
Uncontrolled	0.0003	0.893	
Designed	0.0001638	0.043	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.0000008 lbs/MMBtu	0.00021 lbs/MMBtu	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	>45	>95	
Manufacturer's guaranteed	N/A	N/A	

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	73,625		73,625
(ACFM, existing conditions)	122,060		122,602
Temperature (°F)	338		338
Velocity (ft/sec)	35.85		36.01
Percent moisture	<10		<10

Pressure drop across device: 2.00 **(inches H_20)**

7. **Stack dimensions:** EP #TOH-1 (EF1 Portion)

UTM Coordinate (E-W)	594.864	**(km)**	**UTM Coordinate (N-S)**	3719.468	**(km)**
Latitude	33.610763	**(LAT)**	**Longitude**	-85.977420	**(LONG)**
Height above grade	230	**(feet)**	**Gas temperature at exit**	338	**(°F)**
Inside diameter at exit (round)	8.50	**(feet)**	**Gas Velocity**	36.01	**(Ft/Sec)**
Inside area at exit (not round)	N/A	**(sq. feet)**	**Volume of gas discharged**	122,602	**(ACFM)**
Base Elevation	603	**(feet)**	**GEP Stack Height**	N/A	**(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.**

9. **Enclosed are:**

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

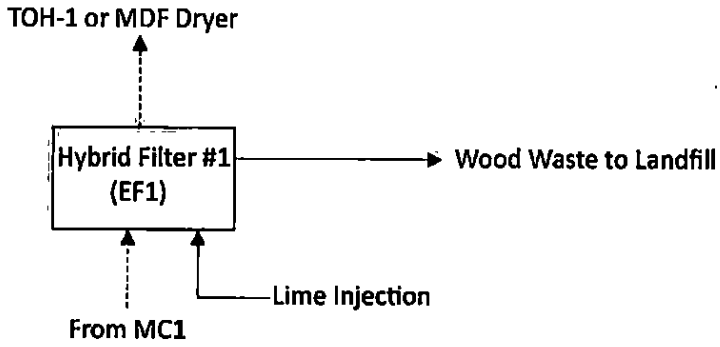
10. **If the pollution control device is of unusual design, please provide a sketch of the device.** N/A

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.)**

Part 63, Subpart DDDD, Table 4.3 and 4 - Maintain opacity at less than or equal to 10 percent opacity (COMS unit)

See manufacturer's information.

Lime injection rate = 66 - 100 lbs/hr (To be established during performance test.


TOH-1 or MDF Dryer
Hybrid Filter #1
(EF1)
Wood Waste to Landfill
Lime Injection
From MC1

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

N/A

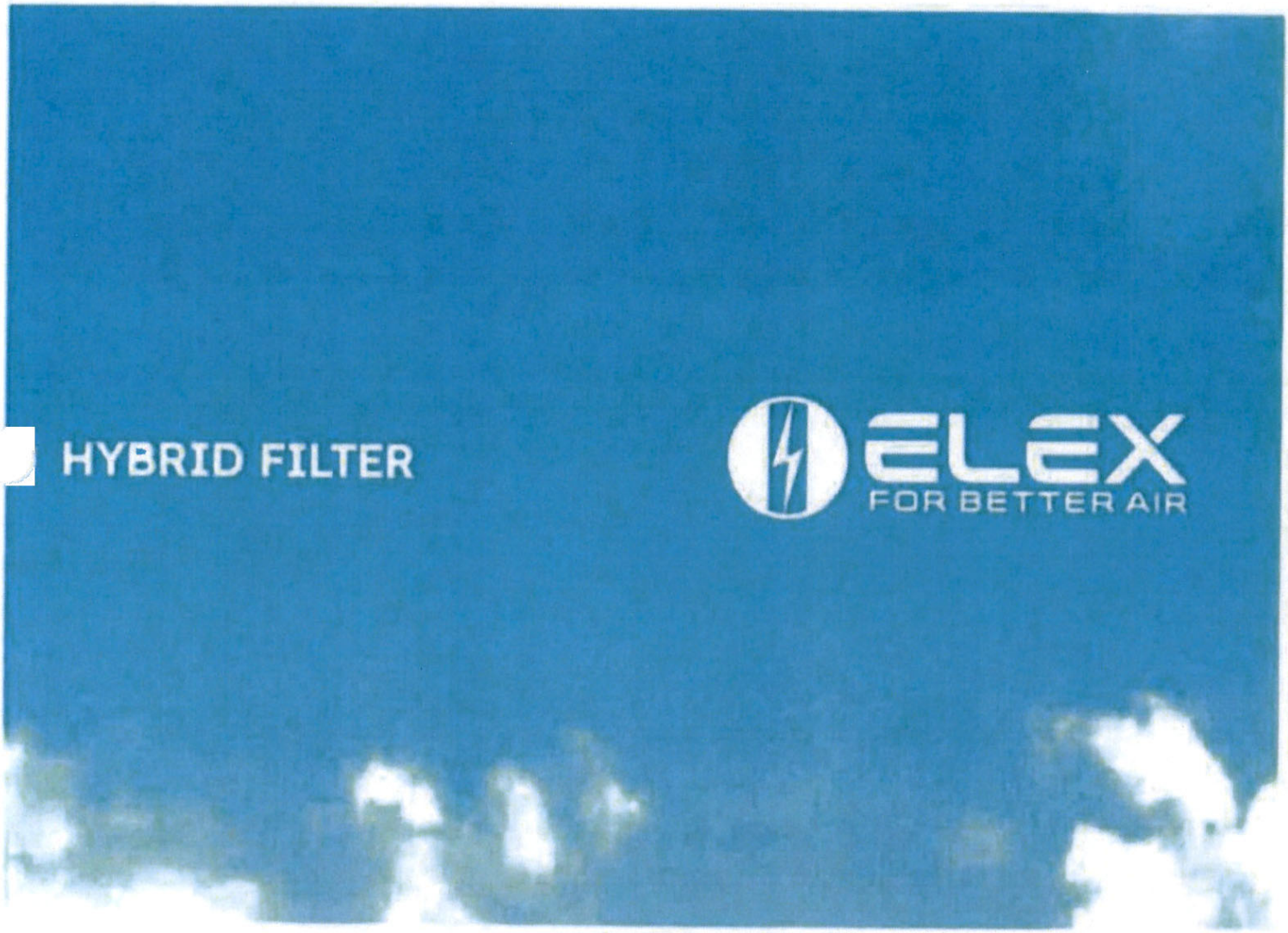
13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	185 tpy			
Composition	Wood Ash			
Is waste hazardous?	No			
Method of disposal	Landfilling			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Kenneth M. Layton

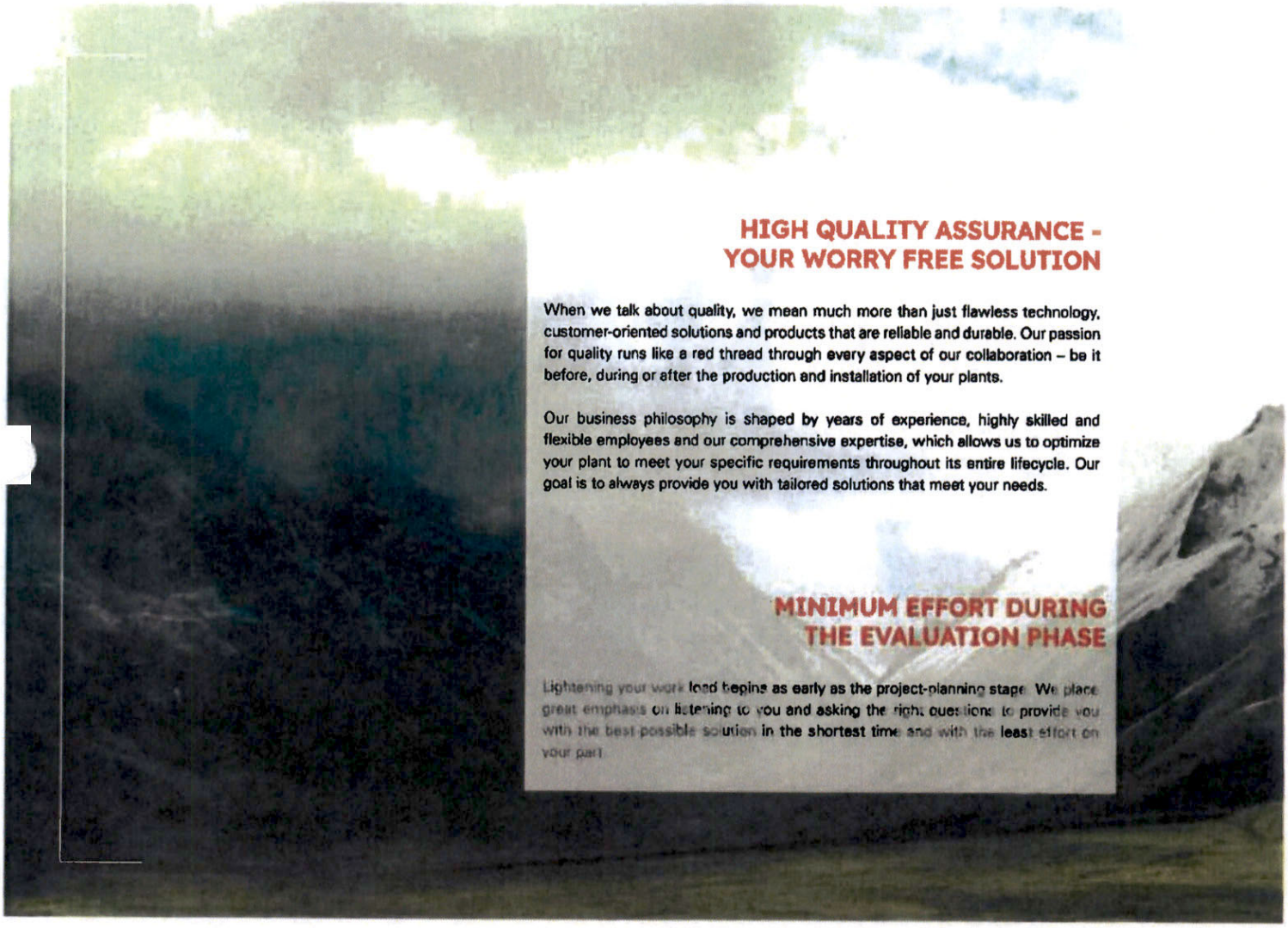
Signature Kenneth M. Layton Date 04/17/2024


HYBRID FILTER
ELEX
FOR BETTER AIR

ELEX – EXCELLENT INDUSTRIAL GAS CLEANING SINCE 1934

ELEX is the globally recognised leader for the cleaning of industrial gases and recovery of reusable materials. Each of the more than 7'000 plants installed worldwide since 1934 focuses on specific customer needs. Depending on stated requirements, the plants are either completely manufactured by ELEX or within the parameters of project-related cooperation agreements, as new units or extensions to existing plants.

We are dedicated not only to cutting-edge technology but also to the utmost reliability and durability of our products. This commitment lies at the heart of our product design, making our name synonymous with the flawless purification of industrial gases. Our expertise in crafting integrated solutions assures our customers that they can trust us both now and in the future. ELEX stands unrivaled in quality and our innovative spirit will undoubtedly continue to shape the next 7'000 units and beyond.



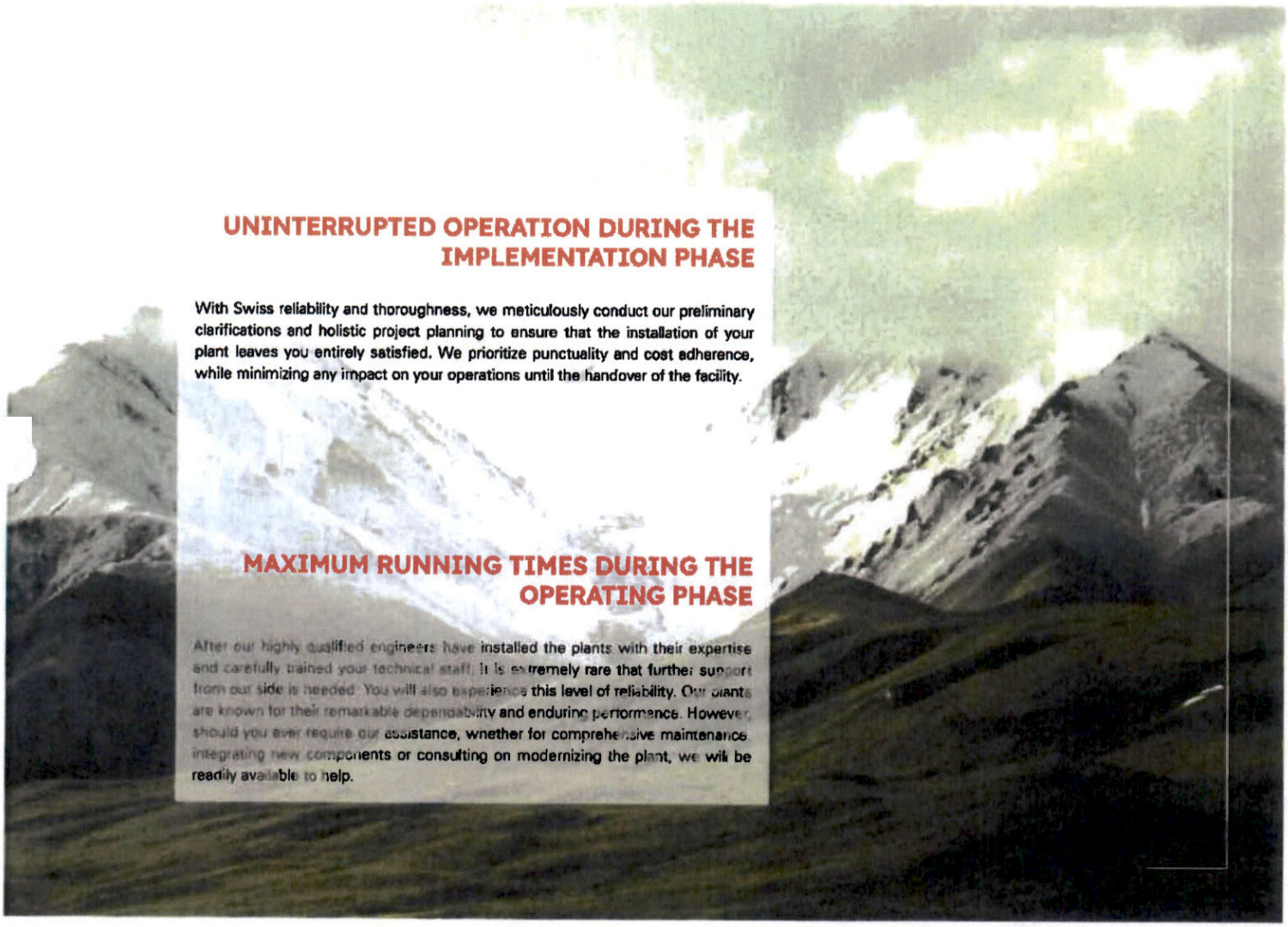
HIGH QUALITY ASSURANCE - YOUR WORRY FREE SOLUTION

When we talk about quality, we mean much more than just flawless technology, customer-oriented solutions and products that are reliable and durable. Our passion for quality runs like a red thread through every aspect of our collaboration – be it before, during or after the production and installation of your plants.

Our business philosophy is shaped by years of experience, highly skilled and flexible employees and our comprehensive expertise, which allows us to optimize your plant to meet your specific requirements throughout its entire lifecycle. Our goal is to always provide you with tailored solutions that meet your needs.

MINIMUM EFFORT DURING THE EVALUATION PHASE

Lightening your work load begins as early as the project-planning stage. We place great emphasis on listening to you and asking the right questions to provide you with the best possible solution in the shortest time and with the least effort on your part.



UNINTERRUPTED OPERATION DURING THE IMPLEMENTATION PHASE

With Swiss reliability and thoroughness, we meticulously conduct our preliminary clarifications and holistic project planning to ensure that the installation of your plant leaves you entirely satisfied. We prioritize punctuality and cost adherence, while minimizing any impact on your operations until the handover of the facility.

MAXIMUM RUNNING TIMES DURING THE OPERATING PHASE

After our highly qualified engineers have installed the plants with their expertise and carefully trained your technical staff, it is extremely rare that further support from our side is needed. You will also experience this level of reliability. Our plants are known for their remarkable dependability and enduring performance. However, should you ever require our assistance, whether for comprehensive maintenance, integrating new components or consulting on modernizing the plant, we will be readily available to help.

Cement works, Spain
Preheater kiln

Cement works, Brazil
Preheater kiln

HYBRID FILTER

The clever combination of a practically maintenance-free electrofilter with a bag filter creates a remarkable synergy effect, enabling outstanding pure gas values with low specific energy consumption. Our tailor-made hybrid filter systems are the result of decades of experience and continuous research, aimed at delivering the best possible outcome for you.

SCOPE OF APPLICATION

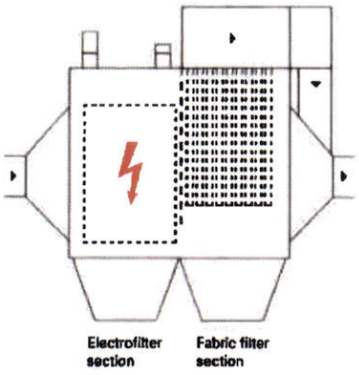
Hybrid filter systems are most commonly applied in the cement industry and with coal- or biomass-fired boilers. We are here to assist you in finding the optimal solution tailored to your specific needs. Leveraging our extensive experience and relentless research, we provide carefully customized hybrid filter systems that consistently ensure the achievable optimum for your operations.

SUCCESS FIGURES

70 HYBRID FILTERS

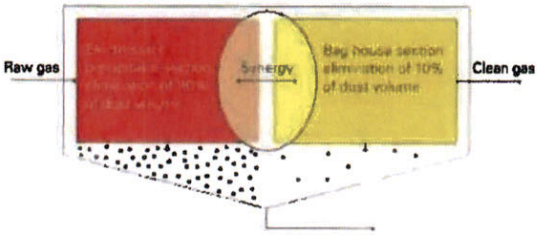
5'000 PIECES OF TUBES

16'500 m² MAX. FABRIC FILTER AREA



ELEX HYBRID FILTERS INCREASE THE EFFICIENCY OF EXISTING INSTALLATIONS

Over time, operating conditions may change or the desire for an expansion of production capacity may arise. In such scenarios, existing filter systems often reach their limitations and they no longer meet the necessary requirements. It is precisely in these situations where the conversion from a electrostatic precipitator to a hybrid filter presents itself as an elegant solution to adapt to the new conditions without the need to replace the entire system.



THE ADVANTAGES COMPARED WITH CONVENTIONAL BAG HOUSES

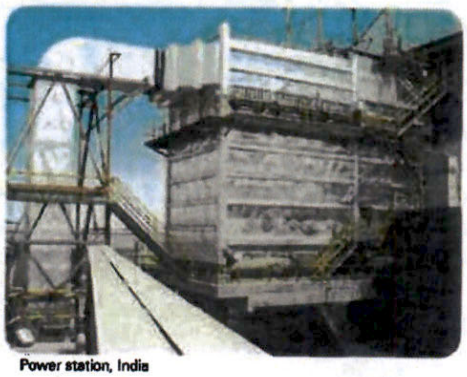
One electrostatic precipitator field alone is capable of eliminating at least 90% of the dust volume at very low energy consumption. Thanks to the ionisation and agglomeration effect in the electrostatic precipitator section, pressure loss in the bag house is reduced by up to 40%. As only 10% of the cleaning performance is carried out by the bag house, the use of compressed air is significantly reduced, which consequently significantly extends the life and maintenance intervals of the filter media. As a result, overall efficiency is higher than with bag houses.

Cement works, Spain
Preheeter kiln

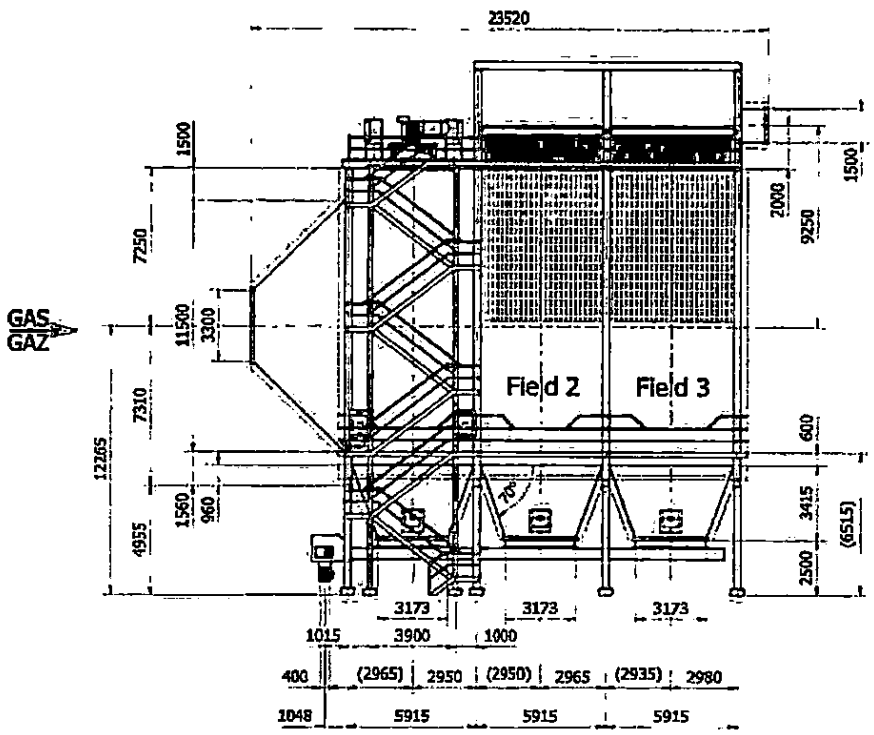
Cement works, Spain
Cement mill

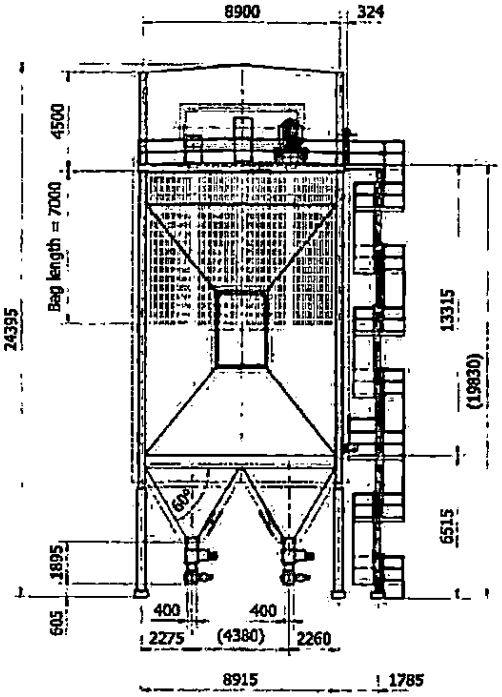
OUR ENGINEERS LOOK FORWARD TO THE CHALLENGE

Hybrid filters have become sought after not only within the cement industry or for coal- or biomass-fired boilers but also due to their exceptional adaptability across various industries. Our personalized pre-discussion will ensure we pinpoint the perfect solution tailored meticulously to meet your specific requirements. Moreover, we are pleased to offer references that align with your upcoming project, granting valuable insights into our successful past undertakings. You can confidently rely on our comprehensive expertise to optimize your systems and achieve remarkable performance levels.



Power station, India

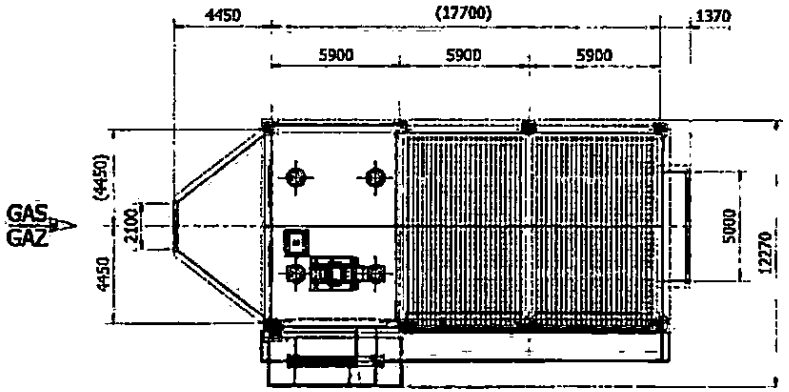


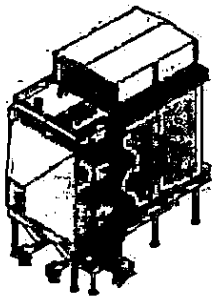


Field 2:
24 x 28 bags
672 bags in total

Field 3:
24 x 28 bags
672 bags in total

Bag:
Ø150mm x 7000mm
1344 bags in total inside the HF





	Designation / Bezeichnung: Hybridfilter Hybrid filter	Scale / Masstab: 1 : 150	
	Designation / Name: 3427s_4_B_3x5.9_v_s_rl_st Order No. / Order No.: 10308	Drawn by / Gezeichnet: 12.07.2024	CSC
		Checked by / Geprüft: 12.07.2024	AWE
		Article No. / Artikel No.: 10018576	
	ELEX AG	Document No. / Dokument No.: 10018576 A	Sheet / Page: 1 / 1

Diese Unterlagen sind unser geistiges Eigentum. Ohne unsere ausdrückliche Genehmigung dürfen sie weder vervielfältigt noch Dritten zugänglich gemacht werden.
Without our express authorization this drawing can neither be copied nor disclosed to third persons.

A2

d.

EF2

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization Kronospan LLC

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
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression
- Wet scrubber (kind):
- Stage 1 - Vapor balance (type):
- Other (describe): Hybrid Filter (EF2) Combination Electrofilter with Bag Filter w/Lime Injection

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. CE - HW - 60MW

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

Thermal Oil Heater #8, via Multiclone MC2

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	PM	PM10	PM2.5
Mass emission rate (#/hr)			
Uncontrolled	46.00	30	11.50
Designed	2.66	2.66	2.39
Manufacturer's guaranteed	N/A	N/A	N/A
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.018 lbs/MMBtu	N/A	N/A
Manufacturer's guaranteed	N/A	N/A	N/A
Removal efficiency (%)			
Designed	>94	>91	>79
Manufacturer's guaranteed	N/A	N/A	N/A

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. Name of facility or organization _____

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): _____

3. Control device manufacturer's information:

Name of manufacturer _____ Model No. _____

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

_____

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	Hg	HCl	
Mass emission rate (#/hr)			
Uncontrolled	0.0003	0.893	
Designed	0.0001638	0.043	
Manufacturer's guaranteed	N/A	N/A	
Mass emission rate (Expressed as units of standard)			
Required by regulation	0.0000008 lbs/MMBtu	0.00021 lbs/MMBtu	
Manufacturer's guaranteed	N/A	N/A	
Removal efficiency (%)			
Designed	>45	>95	
Manufacturer's guaranteed	N/A	N/A	

6. **Gas conditions:**

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)	73,625		73,625
(ACFM, existing conditions)	122,060		122,602
Temperature (°F)	338		338
Velocity (ft/sec)	35.85		36.01
Percent moisture	<10		<10

Pressure drop across device: 2.00 **(inches H_2O)**

7. **Stack dimensions:** EP #TOH-1 (EF2 Portion)

UTM Coordinate (E-W)	594.864	**(km)**	**UTM Coordinate (N-S)**	3719.468	**(km)**
Latitude	33.610763	**(LAT)**	**Longitude**	-85.977420	**(LONG)**
Height above grade	230	**(feet)**	**Gas temperature at exit**	338	**(°F)**
Inside diameter at exit (round)	8.50	**(feet)**	**Gas Velocity**	36.01	**(Ft/Sec)**
Inside area at exit (not round)	N/A	**(sq. feet)**	**Volume of gas discharged**	122,602	**(ACFM)**
Base Elevation	603	**(feet)**	**GEP Stack Height**	N/A	**(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.**

9. **Enclosed are:** See EF1

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

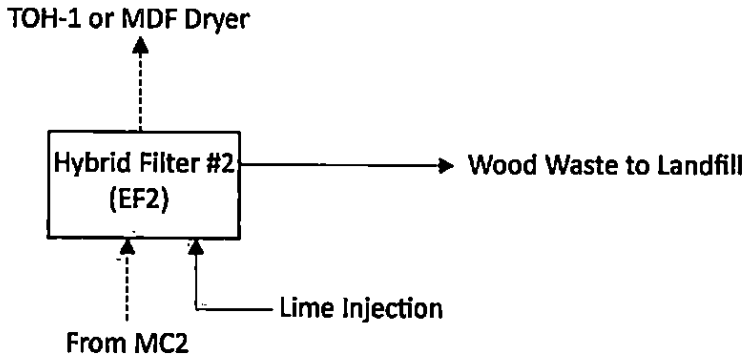
10. **If the pollution control device is of unusual design, please provide a sketch of the device.** N/A

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.)**

Part 63, Subpart DDDDD, Table 4.3 and 4 - Maintain opacity at less than or equal to 10 percent opacity (COMS Unit).

See manufacturer's information.

Lime injection rate = 66 - 110 lbs/hr (To be established during performance test)


TOH-1 or MDF Dryer
Hybrid Filter #2
(EF2)
Wood Waste to Landfill
Lime Injection
From MC2

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

N/A

13. Disposal of collected air pollutants:

	Solid waste	Solid waste	Liquid waste	Liquid waste
Volume	185 tpy			
Composition	Wood Ash			
Is waste hazardous?	No			
Method of disposal	Landfilling			
Final destination	Landfill			

If collected air pollutants are recycled, describe:

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/17/2024

e.

SNCR (K7)

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Selective Non-Catalytic Reduction (Urea Injection)

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

Name of manufacturer Custom Built **Model No.** N/A

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

204.73 MMBtu/hr Wood-Fired Thermal Oil Heater (K7)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled	74.73		
Designed	36.65		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	50.95		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A Discharges to Multiclone (MC1) / Hybrid Filter (EF1)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_2O)

7. Stack dimensions: N/A - Discharges to Multiclone (MC1) / Hybrid Filter (EF1)

UTM Coordinate (E-W)	_____ (km)	UTM Coordinate (N-S)	_____ (km)
Latitude	_____ (LAT)	Longitude	_____ (LONG)
Height above grade	_____ (feet)	Gas temperature at exit	_____ (°F)
Inside diameter at exit (round)	_____ (feet)	Gas Velocity	_____ (Ft/Sec)
Inside area at exit (not round)	_____ (sq. feet)	Volume of gas discharged	_____ (ACFM)
Base Elevation	_____ (feet)	GEP Stack Height	_____ (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.

9. Enclosed are: N/A

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

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

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.)

Concentrated urea is continuously introduced into the furnace at a rate to be determined during performance test. A pump curve will be developed based upon the results from the performance test. The range will be based upon information developed during the performance test.

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

N/A

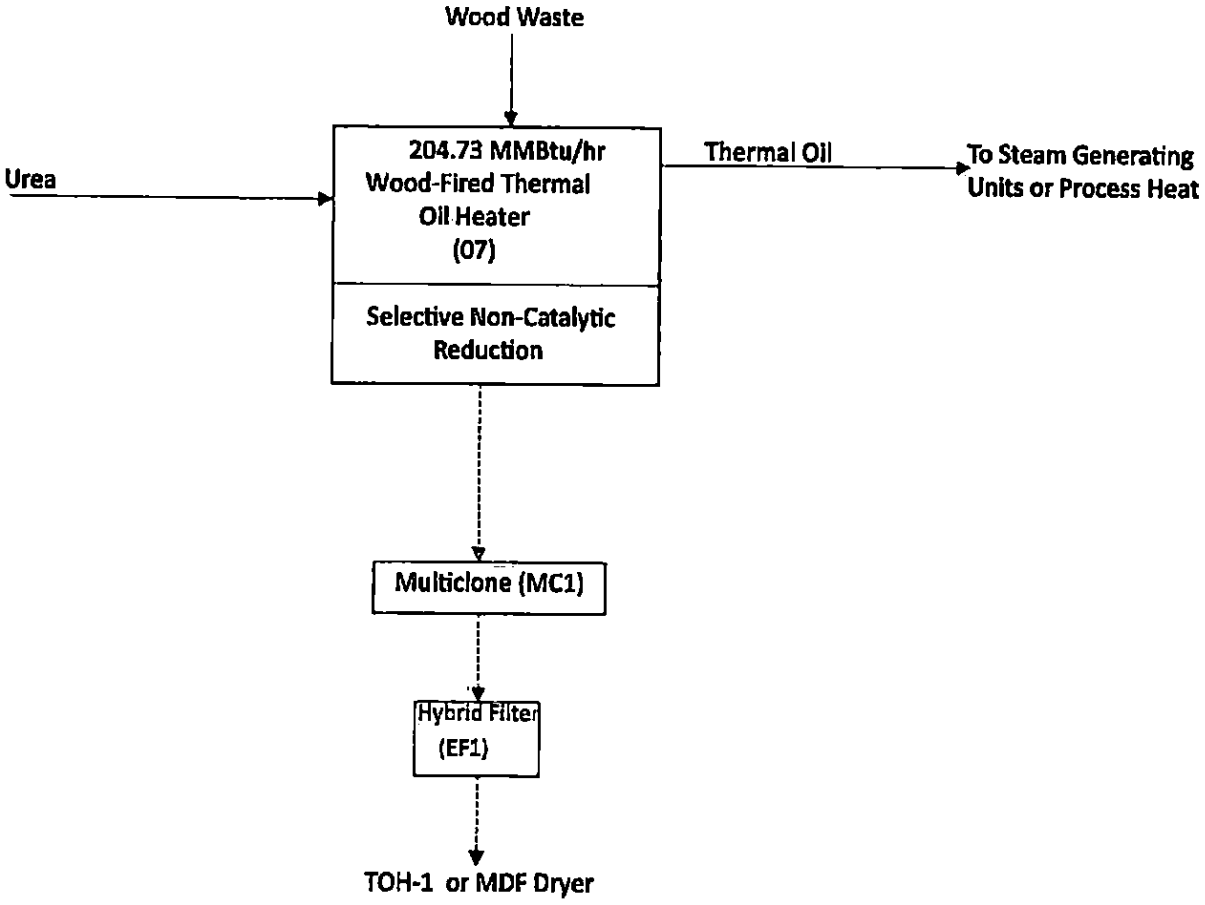
13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe: N/A

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton **Date** 04/17/2024


Wood Waste
Urea
204.73 MMBtu/hr
Wood-Fired Thermal
Oil Heater
(07)
Selective Non-Catalytic
Reduction
Thermal Oil
To Steam Generating
Units or Process Heat
Multiclone (MC1)
Hybrid Filter
(EF1)
TOH-1 or MDF Dryer

f.

SNCR (K8)

ADEM

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PERMIT APPLICATION

FOR

AIR POLLUTION CONTROL DEVICE

☐☐☐ - ☐☐☐☐ - ☐☐☐☐
(ADEM Use Only)

1. **Name of facility or organization** Kronospan LLC

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): Selective Non-Catalytic Reduction (Urea Injection)

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

Name of manufacturer Custom Built **Model No.** N/A

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

204.73 MMBtu/hr Wood-Fired Thermal Oil Heater (K8)

5. **Emission parameters:**

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled	74.73		
Designed	36.65		
Manufacturer's guaranteed	N/A		
Mass emission rate (Expressed as units of standard)			
Required by regulation	N/A		
Manufacturer's guaranteed	N/A		
Removal efficiency (%)			
Designed	50.95		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A Discharges to Multiclone (MC2) / Hybrid Filter (EF2)

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68°f, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (°F)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions: N/A - Discharges to Multiclone (MC2) / Hybrid Filter (EF2)

UTM Coordinate (E-W)	_____	(km)	UTM Coordinate (N-S)	_____	(km)
Latitude	_____	(LAT)	Longitude	_____	(LONG)
Height above grade	_____	(feet)	Gas temperature at exit	_____	(°F)
Inside diameter at exit (round)	_____	(feet)	Gas Velocity	_____	(Ft/Sec)
Inside area at exit (not round)	_____	(sq. feet)	Volume of gas discharged	_____	(ACFM)
Base Elevation	_____	(feet)	GEP Stack Height	_____	(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.

9. Enclosed are: N/A

- ☐ 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. N/A

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.)

Concentrated urea is continuously introduced into the furnace at a rate to be determined from the performance test. A pump curve will be developed based upon the results from the performance test. The range is based upon information developed during the performance test.

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

N/A

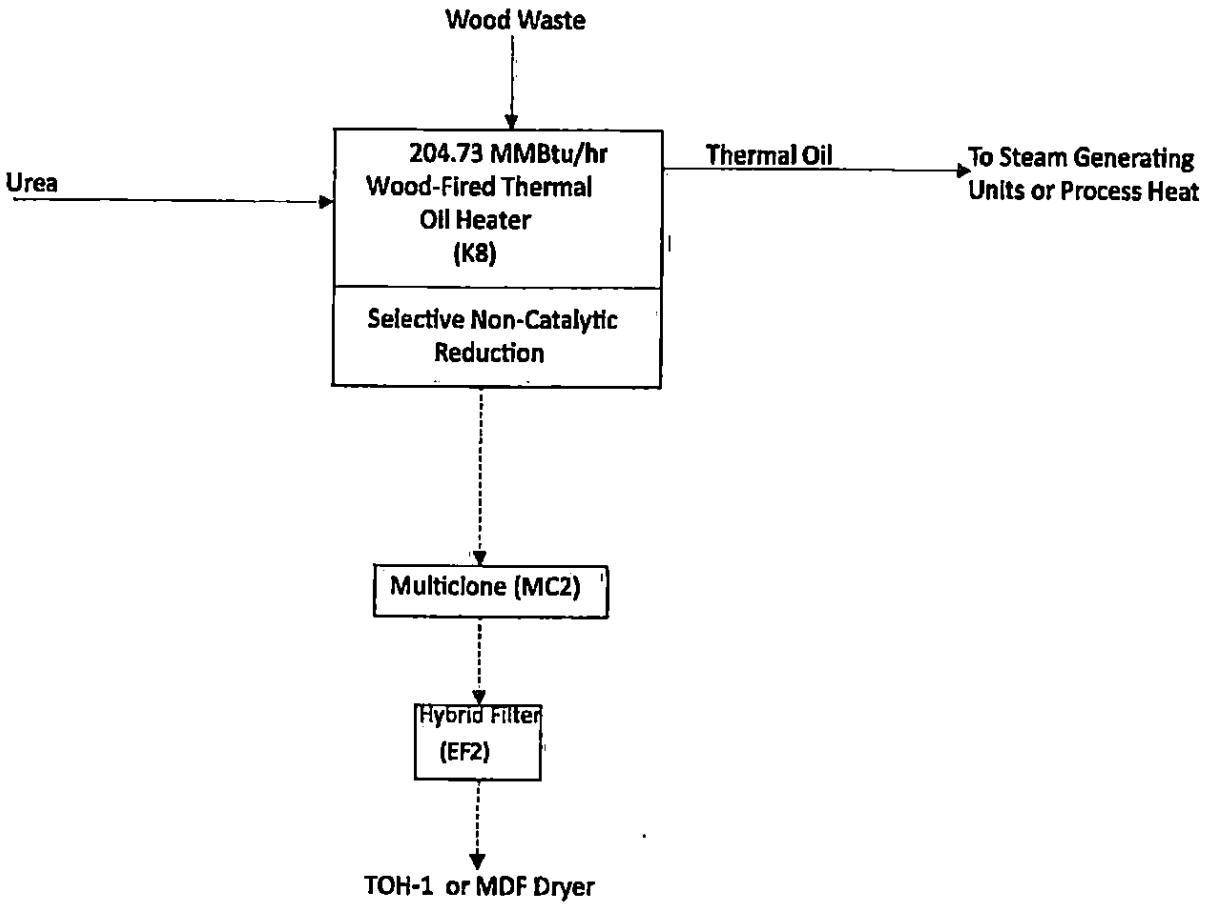
13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe: N/A

Name of person preparing application Kenneth M. Layton

Signature Kenneth M. Layton Date 04/17/2024


Wood Waste
Urea
204.73 MMBtu/hr
Wood-Fired Thermal
Oil Heater
(K8)
Thermal Oil
To Steam Generating
Units or Process Heat
Selective Non-Catalytic
Reduction
Multiclone (MC2)
Hybrid Filter
(EF2)
TOH-1 or MDF Dryer

g.

Medium Low – NOx Burner (K9)

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization Kronospan LLC

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
- [ ] Thermal Oxidizer
- [ ] Wet scrubber (kind): _____
- [x] Other (describe): Medium Low-NOx Burner

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Custom

4. Emission source(s) to which device is installed or is to be installed:

K9 Thermal Oil Heater

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled ..(Conventional Burner).....	5.62		
Designed.....	2.50		
Manufacturer's guaranteed	2.50		
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	0.0445 lbs/MMBtu		
Manufacturer's guaranteed	0.0445 lbs/MMBtu		
Removal efficiency (%)			
Designed.....	55.50		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (ºF)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions:

Stack No. & Description: TOH-1 /Thermal Oil Heater Exhaust Stack or MDF Dryer (K9 Portion) Stack Type: V

Stack UTM Coordinate (E-W)	594.864	(km)	Stack UTM Coordinate (N-S)	3719.468	(km)
Latitude	33.610763	(LAT)	Longitude	-85.977420	(LONG)
Height above grade	230	(ft)	Gas temperature at exit	338	(ºF)
Inside diameter at exit (round)	8.50	(ft)	Gas Velocity	7.62	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	25,930	(ACFM)
Base Elevation	603	(ft)	GEP Stack Height	NA	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ■ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ■ Yes ☐ No

If yes, provide units: K7, K8, K9, K10, K11, and K12 Thermal Oil Heaters

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

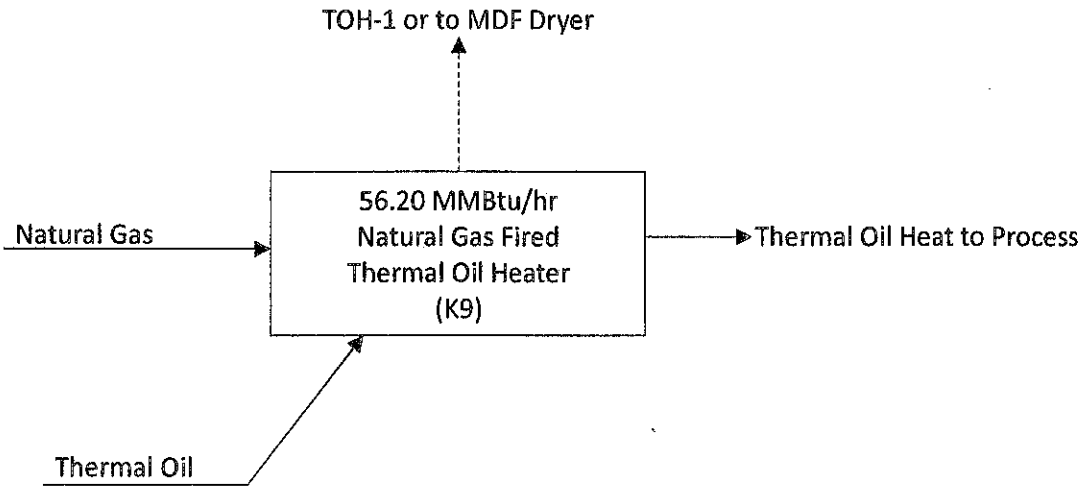
9. Enclosed are: N/A

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

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

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.)

Medium low-NOx burners add internal staging, controlled recirculation, or modified air-fuel zoning so combustion happens insteps rather than all at once.


TOH-1 or to MDF Dryer
Natural Gas
56.20 MMBtu/hr
Natural Gas Fired
Thermal Oil Heater
(K9)
Thermal Oil Heat to Process
Thermal Oil

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 06/14/2026

h.

Medium Low – NOx Burner (K10)

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization: Kronospan LLC

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
- [ ] Afterburner
- [ ] Cyclone
- [ ] Absorber
- [ ] Condenser
- [ ] Thermal Oxidizer
- [ ] Wet scrubber (kind): _____
- [x] Other (describe): Medium Low-NOx Burner
- [ ] Electrostatic precipitator
- [ ] Baghouse
- [ ] Multiclone
- [ ] Adsorber
- [ ] Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer: CEATEC Model No.: Custom

4. Emission source(s) to which device is installed or is to be installed:

K10 Thermal Oil Heater

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled ..(Conventional Burner).....	5.62		
Designed.....	2.50		
Manufacturer's guaranteed	2.50		
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	0.0445 lbs/MMBtu		
Manufacturer's guaranteed	0.0445 lbs/MMBtu		
Removal efficiency (%)			
Designed.....	55.50		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (ºF)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions:

Stack No. & Description: TOH-1 /Thermal Oil Heater Exhaust Stack or MDF Dryer (K10 Portion) Stack Type: V

Stack UTM Coordinate (E-W)	594.864	(km)	Stack UTM Coordinate (N-S)	3719.468	(km)
Latitude	33.610763	(LAT)	Longitude	-85.977420	(LONG)
Height above grade	230	(ft)	Gas temperature at exit	338	(ºF)
Inside diameter at exit (round)	8.50	(ft)	Gas Velocity	7.62	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	25,930	(ACFM)
Base Elevation	603	(ft)	GEP Stack Height	NA	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ■ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ■ Yes ☐ No

If yes, provide units: K7, K8, K9, K10, K11, and K12 Thermal Oil Heaters

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

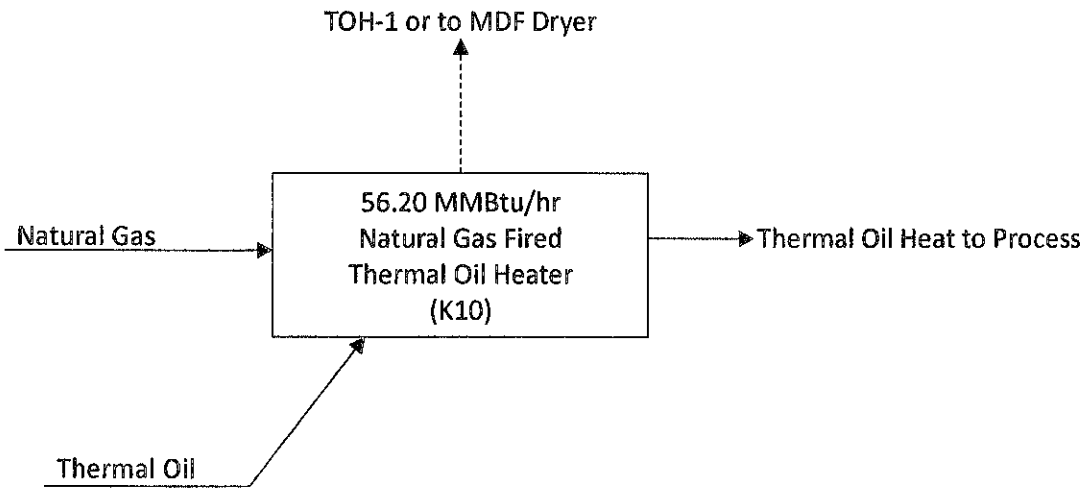
9. Enclosed are: N/A

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

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

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.)

Medium low-NOx burners add internal staging, controlled recirculation, or modified air-fuel zoning so combustion happens insteps rather than all at once.


TOH-1 or to MDF Dryer
Natural Gas
56.20 MMBtu/hr
Natural Gas Fired
Thermal Oil Heater
(K10)
Thermal Oil Heat to Process
Thermal Oil

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 06/14/2026

i.

Medium Low – NOx Burner (K11)

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization Kronospan LLC

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
- ☐ Afterburner
- ☐ Cyclone
- ☐ Absorber
- ☐ Condenser
- ☐ Thermal Oxidizer
- ☐ Wet scrubber (kind): _____
- ☒ Other (describe): Medium Low-NOx Burner
- ☐ Electrostatic precipitator
- ☐ Baghouse
- ☐ Multiclone
- ☐ Adsorber
- ☐ Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer CEATEC Model No. Custom

4. Emission source(s) to which device is installed or is to be installed:

K11 Thermal Oil Heater

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled ..(Conventional Burner).....	5.62		
Designed.....	2.50		
Manufacturer's guaranteed	2.50		
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	0.0445 lbs/MMBtu		
Manufacturer's guaranteed	0.0445 lbs/MMBtu		
Removal efficiency (%)			
Designed.....	55.50		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (ºF)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions:

Stack No. & Description: TOH-1 /Thermal Oil Heater Exhaust Stack or MDF Dryer ~~(K11 Portion)~~ Stack Type: V

Stack UTM Coordinate (E-W)	594.864	(km)	Stack UTM Coordinate (N-S)	3719.468	(km)
Latitude	33.610763	(LAT)	Longitude	-85.977420	(LONG)
Height above grade	230	(ft)	Gas temperature at exit	338	(ºF)
Inside diameter at exit (round)	8.50	(ft)	Gas Velocity	7.62	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	25,930	(ACFM)
Base Elevation	603	(ft)	GEP Stack Height	NA	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ■ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ■ Yes ☐ No

If yes, provide units: K7, K8, K9, K10, K11, and K12 Thermal Oil Heaters

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

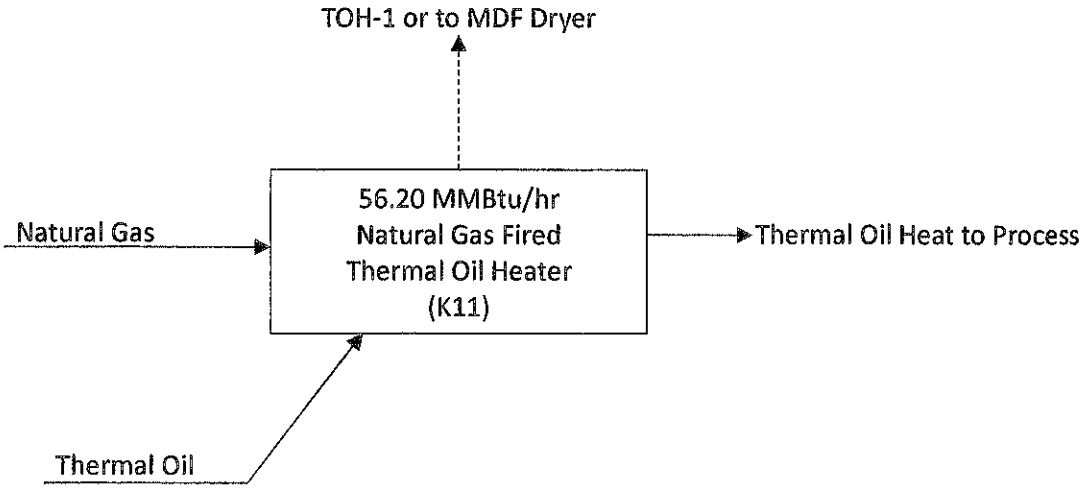
9. Enclosed are: N/A

☐ 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. N/A

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.)

Medium low-NOx burners add internal staging, controlled recirculation, or modified air-fuel zoning so combustion happens insteps rather than all at once.


TOH-1 or to MDF Dryer
Natural Gas
56.20 MMBtu/hr
Natural Gas Fired
Thermal Oil Heater
(K11)
Thermal Oil Heat to Process
Thermal Oil

694n

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 06/14/2026

j.

Medium Low – NOx Burner (K12)

ADEM

PERMIT APPLICATION FOR AIR POLLUTION CONTROL DEVICE
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
AIR DIVISION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]

Do not write in this space

1. Name of facility or organization: Kronospan LLC

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
- [ ] Afterburner
- [ ] Cyclone
- [ ] Absorber
- [ ] Condenser
- [ ] Thermal Oxidizer
- [ ] Wet scrubber (kind): _____
- [x] Other (describe): Medium Low-NOx Burner
- [ ] Electrostatic precipitator
- [ ] Baghouse
- [ ] Multiclone
- [ ] Adsorber
- [ ] Wet Suppression

3. Control device manufacturer's information:

Name of manufacturer: CEATEC Model No.: Custom

4. Emission source(s) to which device is installed or is to be installed:

K12 Thermal Oil Heater

5. Emission parameters:

	Pollutants Removed		
	Pollutant #1	Pollutant #2	Pollutant #3
	NOx		
Mass emission rate (#/hr)			
Uncontrolled ..(Conventional Burner).....	5.62		
Designed.....	2.50		
Manufacturer's guaranteed	2.50		
Mass emission rate (Expressed as units of standard)			
Required by regulation.....	0.0445 lbs/MMBtu		
Manufacturer's guaranteed	0.0445 lbs/MMBtu		
Removal efficiency (%)			
Designed.....	55.50		
Manufacturer's guaranteed	N/A		

6. Gas conditions: N/A

	Inlet	Intermediate Locations	Outlet
Volume (SDCFM, 68ºf, 29.92" hg)			
(ACFM, existing conditions)			
Temperature (ºF)			
Velocity (ft/sec)			
Percent moisture			

Pressure drop across device: _____ (inches H_20)

7. Stack dimensions:

Stack No. & Description: TOH-1 /Thermal Oil Heater Exhaust Stack or MDF Dryer ~~(K12 Portion)~~ Stack Type: V

Stack UTM Coordinate (E-W)	594.864	(km)	Stack UTM Coordinate (N-S)	3719.468	(km)
Latitude	33.610763	(LAT)	Longitude	-85.977420	(LONG)
Height above grade	230	(ft)	Gas temperature at exit	338	(ºF)
Inside diameter at exit (round)	8.50	(ft)	Gas Velocity	7.62	(ft/Sec)
Inside area at exit (not round)	N/A	(ft^2)	Volume of gas discharged	25,930	(ACFM)
Base Elevation	603	(ft)	GEP Stack Height	NA	(ft)

Are sampling ports available? (If "yes", describe. Draw on separate sheet if necessary) ☒ Yes ☐ No :

Is this a merged stack (do multiple units use this release point)? ☒ Yes ☐ No

If yes, provide units: K7, K8, K9, K10, K11, and K12 Thermal Oil Heaters

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

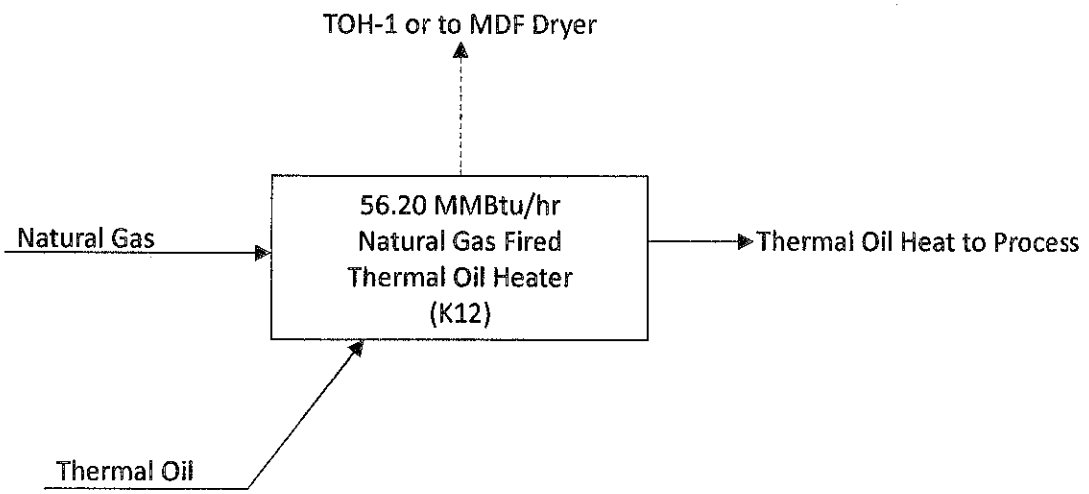
9. Enclosed are: N/A

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

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

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.)

Medium low-NOx burners add internal staging, controlled recirculation, or modified air-fuel zoning so combustion happens insteps rather than all at once.


TOH-1 or to MDF Dryer
Natural Gas
56.20 MMBtu/hr
Natural Gas Fired
Thermal Oil Heater
(K12)
Thermal Oil Heat to Process
Thermal Oil

694s

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

N/A

13. Disposal of collected air pollutants: N/A

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

If collected air pollutants are recycled, describe:

N/A

Name of person preparing application: Kenneth M. Layton

Company of preparer: Layton Environmental Engineering

Signature: Kenneth M. Layton Date: 06/14/2026

D.

Emergency Generators
(107 Form)

1. **EG #6**
2. **EG #7**
3. **EG #8**

NOTE: Engines have not yet been ordered.
The applications will be revised and resubmitted
once the information is available.

1.

EG #6

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

___ - ____ - ____
Permit Number (ADEM Use Only)

1. Facility or Organization Name: Kronospan LLC **Location:** 1 Kronospan Way / Eastaboga / AL / 36260

2. Purpose of Application:

- [x] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 06/2025

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Cummins B. Model Number: C. Model Year:

D. Facility's Identification Number or Description: Emergency Generator #6 E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: B. Date Manufactured: C. Date Modified/Reconstructed: N/A

D. For a used engine, approximate date engine was first placed into service at any location: N/A

5. Engine Function: [ ] Compression [x] Electrical Generation (Maximum Electrical Output: 750 KW) [ ] Fire/Other Pump Driver
[ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe:

6. Engine Operation: [x] Emergency Only [ ] Non-emergency, please provide typical operating schedule in items A-D below:
[ ] Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year:
D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 1220 B. Maximum Engine Power (kWm): 910 C. Maximum Heat Input (MMBtu/hr): 7.089

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [x] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [x] 4-Stroke RICE [ ] N/A [ ] Other:

F. Air/Fuel Mix: [ ] Rich Burn RICE [x] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other:

G. Ignition Type: [ ] Spark [x] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 3.87

8. Compressor Specifications:

A. Compressor Type: B. Compressor Mfg. Date: C. Location on well? Yes [ ] No [ ]

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information:	Fuel Type/ Description	Heat Content	Sulfur Content (Indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (Indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel Fuel	139,000 BTU/gallon	<15 ppm	<90 ppm	100	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
NOx	11.62	2.90			NSPS Subpart IIII	N/A
CO	6.99	1.75			NSPS Subpart IIII	N/A
VOC	1.29	0.32			NSPS Subpart IIII	N/A
PM	0.40	0.10			NSPS Subpart IIII	N/A
SO_2	0.0107	0.003			AP-42, Table 3.3-1	N/A
Formaldehyde	0.0006	0.0002			AP-42, Table 3.3-3	N/A
Total HAP	0.0112	0.003			AP-42, Table 3.4-3 & 4	N/A
GHG	1150	288			AP-42, Table 3.4	N/A
PM Condensables	0.055	0.014			AP-42, Table 3.4-2	N/A

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart 0000/0000a
- ■ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ■ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx + NMHC	4.8	g/bHp-hr	NSPS, Subpart IIII	4.8 g/bHp-hr
CO	2.6	g/bHp-hr	NSPS, Subpart IIII	2.6 g/bHp-hr
PM	0.15	g/bHp-hr	NSPS, Subpart IIII	0.15 g/bHp-hr
Annual Hours of Operation	500	hrs/yr	Permit Limit	N/A
Opacity	0	Percent	Permit Limit	N/A

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ○ N/A ○ No ◉ Yes (If yes, attach a copy of the certification)

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

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NO_x Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [x] Other: Engine Design Modification
- [ ] Other:
- [ ] Other:

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? (●) Yes ( ) No (If "No", must attach ADEM Form 437)

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

A. UTM Coordinate (E-W) (km): 594.772
B. UTM Coordinate (N-S) (km): 3719.439
C. Height above grade (ft): 8.5
D. Latitude: 33.610508
E. Longitude: -85.978408
G. Exhaust Gas Volume (ACFM): 5358
H. Inside Diameter at Exit (round) (ft): 0.833
I. Base Elevation (ft): 603
J. Exhaust Gas Temperature (°F): 888
K. Inside Area at Exit (not round) (sq. ft.): N/A
L. GEP Stack Height (ft): N/A
M. Are sampling ports available? Yes ( ) No (●)

16. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Kenneth M. Layton

Company/Affiliation: Layton Environmental Engineering, LLC

Signature: Kenneth M Layton

Date: 04/17/2024

2.

EG #7

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

___ - ____ - ____
Permit Number (ADEM Use Only)

1. Facility or Organization Name: Kronospan LLC **Location:** 1 Kronospan Way / Eastaboga / AL / 36260

2. Purpose of Application:

- [x] Initial installation of a new engine (i.e. engine that has never been in service at any location)
- [ ] Initial installation of a used engine (i.e. an engine that has been in service at another location)
- [ ] Modification/Reconstruction of an engine currently installed at the facility
- [ ] Update information for an engine currently installed at the facility
- [ ] Title V Application
- [ ] Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 06/2025

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Cummins B. Model Number: C. Model Year:

D. Facility's Identification Number or Description: Emergency Generator #7 E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: B. Date Manufactured: C. Date Modified/Reconstructed: N/A

D. For a used engine, approximate date engine was first placed into service at any location: N/A

5. Engine Function: [ ] Compression [x] Electrical Generation (Maximum Electrical Output: 750 KW) [ ] Fire/Other Pump Driver
[ ] NFPA Certified [ ] Research & Development [ ] Test Cell/Stand [ ] Other, please describe:

6. Engine Operation: [x] Emergency Only [ ] Non-emergency, please provide typical operating schedule in Items A-D below:
[ ] Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year:
D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 1220 B. Maximum Engine Power (kWm): 910 C. Maximum Heat Input (MMBtu/hr): 7.089

D. Type: [ ] Simple Cycle Turbine [ ] Combined Cycle Turbine [ ] Regenerative Cycle Turbine [x] Reciprocating Engine

E. Piston Movement: [ ] 2-Stroke RICE [x] 4-Stroke RICE [ ] N/A [ ] Other:

F. Air/Fuel Mix: [ ] Rich Burn RICE [x] Lean Burn RICE [ ] Diffusion Flame Turbine [ ] Lean Premix Turbine [ ] Other:

G. Ignition Type: [ ] Spark [x] Compression [ ] N/A H. Cylinder Displacement (Liters per cylinder): 3.87

8. Compressor Specifications:

A. Compressor Type: B. Compressor Mfg. Date: C. Location on well? Yes [ ] No [ ]

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information:	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel Fuel	139,000 BTU/gallon	<15 ppm	<90 ppm	100	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
NOx	11.62	2.90			NSPS Subpart IIII	N/A
CO	6.99	1.75			NSPS Subpart IIII	N/A
VOC	1.29	0.32			NSPS Subpart IIII	N/A
PM	0.40	0.10			NSPS Subpart IIII	N/A
SO2	0.0107	0.003			AP-42, Table 3.3-1	N/A
Formaldehyde	0.0006	0.0002			AP-42, Table 3.3-3	N/A
Total HAP	0.0112	0.003			AP-42, Table 3.4-3 & 4	N/A
GHG	1150	288			AP-42, Table 3.4	N/A
PM Condensables	0.055	0.014			AP-42, Table 3.4-2	N/A

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart 0000/0000a
- ■ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ■ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other: _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx + NMHC	4.8	g/bHp-hr	NSPS, Subpart IIII	4.8 g/bHp-hr
CO	2.6	g/bHp-hr	NSPS, Subpart IIII	2.6 g/bHp-hr
PM	0.15	g/bHp-hr	NSPS, Subpart IIII	0.15 g/bHp-hr
Annual Hours of Operation	500	hrs/yr	Permit Limit	N/A
Opacity	0	Percent	Permit Limit	N/A

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ○ N/A ○ No ◉ Yes (If yes, attach a copy of the certification)

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

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NO_X Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [x] Other: Engine Design Modification
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? (•) Yes ( ) No (If "No", must attach ADEM Form 437)

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

A. UTM Coordinate (E-W) (km): 594.617
B. UTM Coordinate (N-S) (km): 3719.502
C. Height above grade (ft): 8.5
D. Latitude: 33.611086
E. Longitude: -85.980069
G. Exhaust Gas Volume (ACFM): 5358
H. Inside Diameter at Exit (round) (ft): 0.833
I. Base Elevation (ft): 603
J. Exhaust Gas Temperature (°F): 888
K. Inside Area at Exit (not round) (sq. ft.): N/A
L. GEP Stack Height (ft): N/A
M. Are sampling ports available? Yes ( ) No (•)

16. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Kenneth M. Layton

Company/Affiliation: Layton Environmental Engineering, LLC

Signature: Kenneth M Layton

Date: 04/17/2024

3.

EG #8

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
PERMIT APPLICATION FOR
STATIONARY INTERNAL COMBUSTION ENGINES

☐☐☐ – ☐☐☐☐ – ☐☐☐☐
Permit Number (ADEM Use Only)

1. Facility or Organization Name: Kronospan LLC **Location:** 1 Kronospan Way / Eastaboga / AL / 36260

2. Purpose of Application:

- ☒ Initial installation of a new engine (i.e. engine that has never been in service at any location)
- ☐ Initial installation of a used engine (i.e. an engine that has been in service at another location)
- ☐ Modification/Reconstruction of an engine currently installed at the facility
- ☐ Update information for an engine currently installed at the facility
- ☐ Title V Application
- ☐ Other, please describe:

If this application is for the installation, modification, or reconstruction of an engine, please provide the date construction is scheduled to begin: 06/2025

If this application is for an engine currently installed at this facility, please provide the date that the engine was initially installed at this facility:

3. Engine Identification:

A. Manufacturer's Name: Cummins B. Model Number: C. Model Year:

D. Facility's Identification Number or Description: Emergency Generator #8 E. Serial Number:

4. Engine Applicability Dates:

A. For a new engine, Date Ordered: B. Date Manufactured: C. Date Modified/Reconstructed: N/A

D. For a used engine, approximate date engine was first placed into service at any location: N/A

5. Engine Function: ☐ Compression ☒ Electrical Generation (Maximum Electrical Output: 750 KW) ☐ Fire/Other Pump Driver ☐ NFPA Certified ☐ Research & Development ☐ Test Cell/Stand ☐ Other, please describe:

6. Engine Operation: ☒ Emergency Only ☐ Non-emergency, please provide typical operating schedule in items A-D below: ☐ Limited Use (<100 hr/yr) A. Hours Per Day: B. Days Per Week: C. Weeks per Year: D. Peak Season (if any):

7. Engine Specifications:

A. Maximum Brake Horsepower (bhp): 1220 B. Maximum Engine Power (kWm): 910 C. Maximum Heat Input (MMBtu/hr): 7.089

D. Type: ☐ Simple Cycle Turbine ☐ Combined Cycle Turbine ☐ Regenerative Cycle Turbine ☒ Reciprocating Engine

E. Piston Movement: ☐ 2-Stroke RICE ☒ 4-Stroke RICE ☐ N/A ☐ Other:

F. Air/Fuel Mix: ☐ Rich Burn RICE ☒ Lean Burn RICE ☐ Diffusion Flame Turbine ☐ Lean Premix Turbine ☐ Other:

G. Ignition Type: ☐ Spark ☒ Compression ☐ N/A H. Cylinder Displacement (Liters per cylinder): 3.87

8. Compressor Specifications:

A. Compressor Type: B. Compressor Mfg. Date: C. Location on well? Yes ☐ No ☐

D. Compressor Installation Date: E. Compressor Serial Number: F. Compressor Brake Horsepower (bhp):

9. Fuel Information:	Fuel Type/ Description	Heat Content	Sulfur Content (indicate % by weight or ppm)	Fuel-Bound Nitrogen Content (indicate % by weight or ppm)	Percent (%) of Gross Heat Input On annual basis	Max Ash %	Used Oil Supplier
Primary Fuel	Diesel Fuel	139,000 BTU/gallon	<15 ppm	<90 ppm	100	N/A	N/A
Secondary/Backup Fuel	N/A						

10. Point Source Emissions (You must attach calculations and, if used as the basis for emission estimates, manufacturer specification sheets):

Pollutant	Uncontrolled[1] Potential Emission Rate		Controlled[1,2] Potential Emission Rate		Basis for Potential Emissions Calculation/Estimate (e.g. AP-42, Manufacturer Data)	Comment (Optional)
	lb/hr	ton/yr	lb/hr	ton/yr		
NOx	11.62	2.90			NSPS Subpart IIII	N/A
CO	6.99	1.75			NSPS Subpart IIII	N/A
VOC	1.29	0.32			NSPS Subpart IIII	N/A
PM	0.40	0.10			NSPS Subpart IIII	N/A
SO2	0.0107	0.003			AP-42, Table 3.3-1	N/A
Formaldehyde	0.0006	0.0002			AP-42, Table 3.3-3	N/A
Total HAP	0.0112	0.003			AP-42, Table 3.4-3 & 4	N/A
GHG	1150	288			AP-42, Table 3.4	N/A
PM Condensables	0.055	0.014			AP-42, Table 3.4-2	N/A

[1]Potential emissions should be calculated based on 8,760 hr/yr and maximum operation unless an enforceable limit will be applicable.

[2]If the pollutant is uncontrolled, leave blank.

11. Applicable Regulations (Mark all that apply):

- ☐ 40 CFR 63, Subpart YYYY, NESHAP for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart GG, NSPS for Stationary Gas Turbines
- ☐ 40 CFR 60, Subpart KKKK, NSPS for Stationary Combustion Turbines
- ☐ 40 CFR 60, Subpart 0000/0000a
- ☒ 40 CFR 63, Subpart ZZZZ, NESHAP for Stationary RICE
- ☒ 40 CFR 60, Subpart IIII, NSPS for Stationary Compression Ignition ICE
- ☐ 40 CFR 60, Subpart JJJJ, NSPS for Stationary Spark Ignition ICE
- ☐ Other _____

12. Regulatory Standards, Limitations, and Requirements:

A.

Pollutant/Parameter	Rate/Value	Units of Standard	Regulatory Basis[3]	Engine Potential Emission Rate (in units of standard)
Example: NOx + NMHC	*6.4*	*g/kW-hr*	*NSPS, Subpart IIII*	*4.95 g/kW-hr*
Example: Annual Operation	*6,000*	*hr/yr*	*SMS-PSD*	*NA*
NOx + NMHC	4.8	g/bHp-hr	NSPS, Subpart IIII	4.8 g/bHp-hr
CO	2.6	g/bHp-hr	NSPS, Subpart IIII	2.6 g/bHp-hr
PM	0.15	g/bHp-hr	NSPS, Subpart IIII	0.15 g/bHp-hr
Annual Hours of Operation	500	hrs/yr	Permit Limit	N/A
Opacity	0	Percent	Permit Limit	N/A

[3]For federal regulations, specify which NSPS or NESHAP is the basis. If a synthetic minor limit is being requested or is already applicable, specify either SMS-PSD or SMS-Title V

B. For engines subject to emission standards under NSPS, Subpart IIII or NSPS, Subpart JJJJ, is this engine certified by the manufacturer pursuant to the applicable regulation to meet the applicable emission standards? ○ N/A ○ No ◉ Yes (If yes, attach a copy of the certification)

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

13. Pollution Control Information:

A. Device/Technology Type(s):

- [x] No Controls
- [ ] Air-to-Fuel Ratio Controller
- [ ] Water or Steam Injection
- [ ] Low NO_x Burners
- [ ] Oxidation Catalyst
- [ ] Selective Non-catalytic Reduction (SNCR)
- [ ] Non-selective Catalytic Reduction (NSCR/3-way Catalyst)
- [ ] Selective Catalytic Reduction (SCR)
- [x] Other: Engine Design Modification
- [ ] Other: _____
- [ ] Other: _____

B. Control Efficiencies (Typical Operation)

Pollutant	% Reduction
NOx	
CO	
VOC	
Formaldehyde	

C. Operational Parameters (if any):

14. Compliance Status:

Is this engine in compliance with all applicable air pollution rules and regulations? (•) Yes ( ) No (If "No", must attach ADEM Form 437)

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

A. UTM Coordinate (E-W) (km): 594.475
B. UTM Coordinate (N-S) (km): 3719.298
C. Height above grade (ft): 8.5
D. Latitude: 33.609267
E. Longitude: -85.981621
G. Exhaust Gas Volume (ACFM): 5358
H. Inside Diameter at Exit (round) (ft): 0.833
I. Base Elevation (ft): 603
J. Exhaust Gas Temperature (°F): 888
K. Inside Area at Exit (not round) (sq. ft.): N/A
L. GEP Stack Height (ft): N/A
M. Are sampling ports available? Yes ( ) No (•)

16. Clarifying/Supplemental Information (Optional):

Please provide the following for the person preparing this application:

Name (Print or Type): Kenneth M. Layton

Company/Affiliation: Layton Environmental Engineering, LLC

Signature: Kenneth M. Layton

Date: 04/17/2024

E.

MDF Plant Modifications

1. 105 Form

1.

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105 Form

PERMIT APPLICATION
FOR
MANUFACTURING OR PROCESSING OPERATION

[ ][ ][ ] - [ ][ ][ ][ ] - [ ][ ][ ][ ]
Do not write in this space

1. Name of facility or organization: Kronospan LLC

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 ___ Fiberboard Manufacturing Process (Pre-Press Activities)

Cleaned chips are conveyed to a storage bin and then to a pre-steaming bin. From the bin the chips are softened in a steam-pressurized digester and then transferred into a pressurized refiner chamber with startup cyclone. In the refiner chamber the softened chips are mechanically pulped into fibers suitable for making the board. Off-spec material generated at startup is conveyed to a relief cyclone.
Wood waste from the cyclone is dropped into a bunker (bunker #1) and transferred via front-end loader to the K4 Thermal Oil Heater Fuel Storage Building.
The fibers are blended with resin, wax, and other additives in a blowline which is a duct that discharges the resonated fibers into a 102.36 MMBtu/hr natural gas-fired dryer. After drying, the fibers are separated from the gas ~~steam by two fiber recovery cyclones in parallel. Emissions from the fiber recovery cyclones are vented to an RTO~~ unit (RTO-1). The recovered fiber is then conveyed to two sifters, in parallel, to remove unwanted material from the ~~product stream. The fiber is then separated from the air stream by two sifter cyclones, in parallel. Emissions from~~ the sifter and sifter cyclones are conveyed to a baghouse (BH2) Fines from the sifter are pneumatically transferred to the K2 Thermal Oil Heater Fuel Storage Building.
~~Various operations from the OSB Plant will be ducted to the MDF Dryer, under one of the three following scenarios:~~ (See Attached)

3. Type of unit or process (e.g., calcining kiln, cupola furnace): Storage, Cleaning/Pressurized Refiner, Resin ~~Storage/Preparation, Blowline Blending,~~ 102.36 MMBtu/hr NG Dryer, and Dual Sifter Systems

Make: Custom Model: N/A

Rated process capacity (manufacturer's or designer's guaranteed maximum) in pounds/hour: 40 tons (dry wt)

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

Original installation date (if existing): 2008

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

A. Scenario #1

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heaters K9, K10, K11, and K12 will be vented to the MDF Dryer. This will occur when Thermal Oil Heaters K7 and K8 are not in operation.

B. Scenario #2

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heater K7 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K8 will not be in operation.

C. Scenario #3

Zones #1, #2, #3, and #16 from each of the OSB Dryers (D1, D2, and D3) along with Thermal Oil Heater K8 and two (2) of the four (4) Natural Gas Thermal Oil Heaters (K9, K10, K11, and K12) will be vented to the MDF Dryer. Thermal Oil Heater K7 will not be in operation.

	Operating Scenario for MDF Dryer with OSB – Option 1	Operating Scenario for MDF Dryer with OSB – Option 2	Operating Scenario for MDF Dryer with OSB – Option 3
K7		X	
K8			X
K9	X	2 of 4 heaters	2 of 4 heaters
K10	X		
K11	X		
K12	X		
OSB Dryer 1	X*	X*	X*
OSB Dryer 2	X*	X*	X*
OSB Dryer 3	X*	X*	X*

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

Material	Process Rate Average (lb/hr)	Maximum (lb/hr)	Quantity tons/year
Wood Chips	80,000 (dry)	80,000 (dry)	350,400 (dry)
UF Resin	1,980	1,980	8672.4

6. **Total heat input capacity of process heating equipment (exclude fuel used by indirect heating equipment previously described on ADEM Form 104):** 102.36 **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	1,000	Btu/ft^3	N/A	N/A	N/A	N/A
L. P. Gas		Btu/ft^3				
Wood		Btu/lb				
Other (specify)						

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

Products	Quantity/year	Units of production
Fiberboard	350,400	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):**

N/A

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

(●) Yes ( ) No **(Where a control device exists, ADEM Form 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		Geographic Coordinates		Height Above Grade (Feet)	GEP Stack Height (Feet)	Base Elevation (Feet)	Inside Diameter for Round Opening (Feet)	Inside Area if NOT Round Opening (sq. feet)	Gas Exit Velocity (Feet/Sec)	Volume of Gas Discharged (ACFM)	Exit Temperature (°F)
	E-W (km)	N-S (km)	LAT	LONG								
RTO-1	595.049	3719.567	33.611638	-85.975411	82.10	N/A	603	10.96	N/A	70.00	396,332	238.2
FP2	594.976	3719.513	33.611157	-85.	60.00	N/A	603	4.60	N/A	72.16	70,575	120

* 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)
RTO-1	A. PM	3.61	15.83	Permit #X052	5.99 (RTO-1 Total)	N/A
	B. PM_{10}	2.67	11.71	Engineering Estimate	N/A	N/A
	C. $PM_{2.5}$	2.34	10.25	Engineering Estimate	N/A	N/A
	D. NOx	41.91	183.56	Permit #X052 and Engineering Estimate	48.14 (RTO-1 Total)	N/A
	E. CO	11.06	48.44	Permit #X052 and Engineering Estimate	33.81 (RTO-1 Total)	N/A
	F. VOC	27.20	119.12	Permit #X052 and Engineering Estimate	31.35 (RTO-1 Total)	N/A
	G. HAPs (total)	2.92	12.79			N/A
	1. Acetaldehyde	0.08	0.35	AP-42 and Eng. Est.	N/A	N/A
	2. Formaldehyde	0.92	4.03	AP-42 and Eng. Est.	N/A	90% to DRE
	3. Methanol	1.92	8.41	AP-42 and Eng. Est.	N/A	N/A
	H. GHG	3,622	15,864	AP-42 and EPA 2011 Guidance		N/A
FP2						
	A. PM	0.77	3.37	Permit #X052	0.77	N/A
	B. PM_{10}	0.77	3.37	Permit #X052	0.77	N/A
	C. $PM_{2.5}$	0.30	1.31	Engineering Estimate	N/A	N/A

12. Using a flow diagram:

(1) Illustrate input of raw materials,
(2) Label production processes, process fuel combustion, process equipment and air pollution control equipment,
(3) Illustrate locations of air contaminant release so that emission points under item 10 can be identified.

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

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)
Total	A. PM	4.38	19.20	N/A	N/A	N/A
	B. PM_{10}	3.44	15.08	N/A	N/A	N/A
	C. $PM_{2.5}$	2.64	11.56	N/A	N/A	N/A
	D. NOx	41.91	183.56	N/A	N/A	N/A
	E. CO	11.06	48.44	N/A	N/A	N/A
	F. VOC	27.20	119.12	N/A	N/A	N/A
	G. HAPs (total)	2.92	12.87	N/A	N/A	N/A
	1. Acetaldehyde	0.08	0.35	N/A	N/A	N/A
	2. Formaldehyde	0.92	4.03	N/A	N/A	N/A
	3. Methanol	1.92	8.41	N/A	N/A	N/A
	H. GHG	3.622	0.08	N/A	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.

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

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

☒ Yes ☐ No

(if "no", a compliance schedule, 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?**

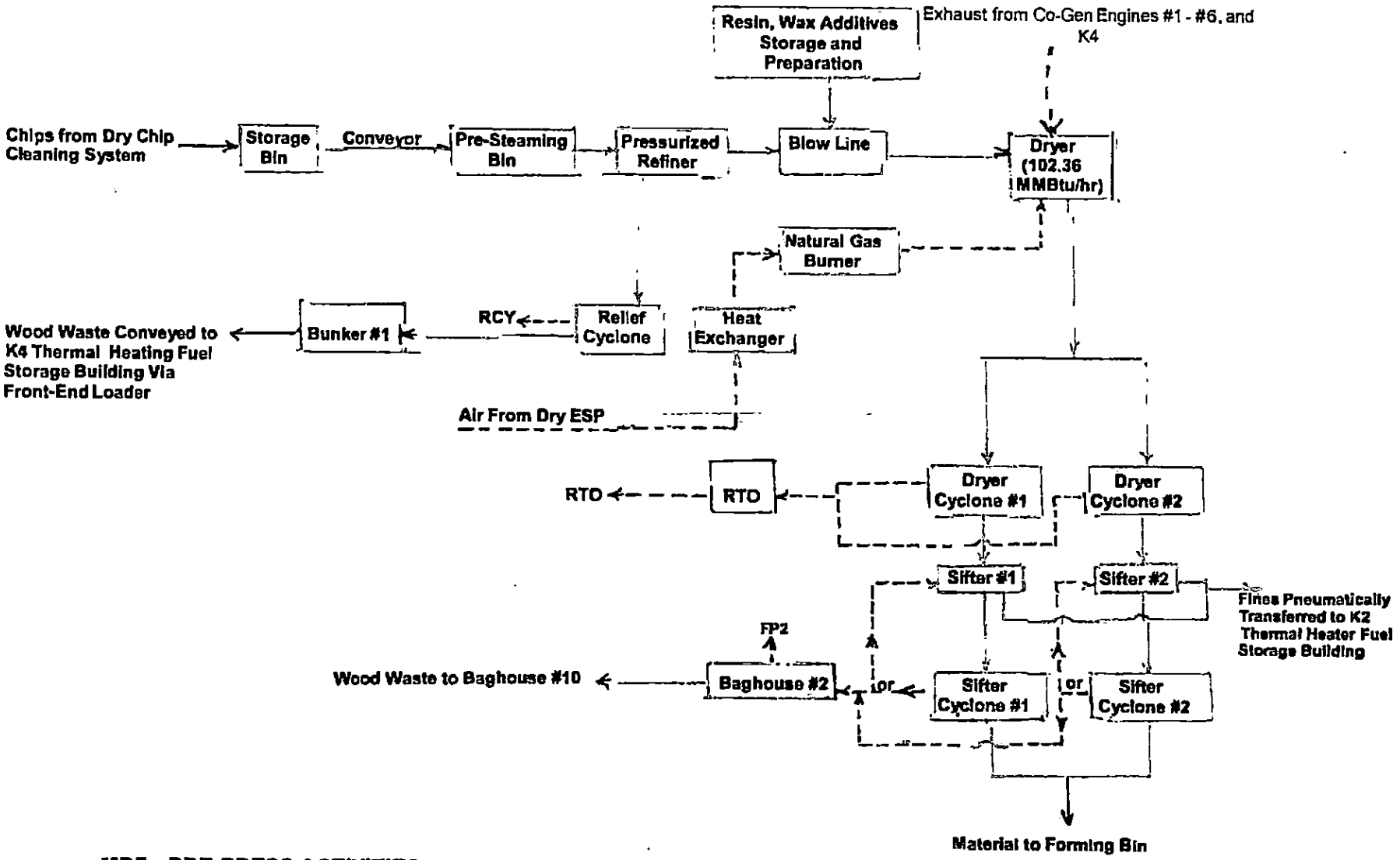
☐ Yes ☒ No

List storage piles or other facility (if any): N/A

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

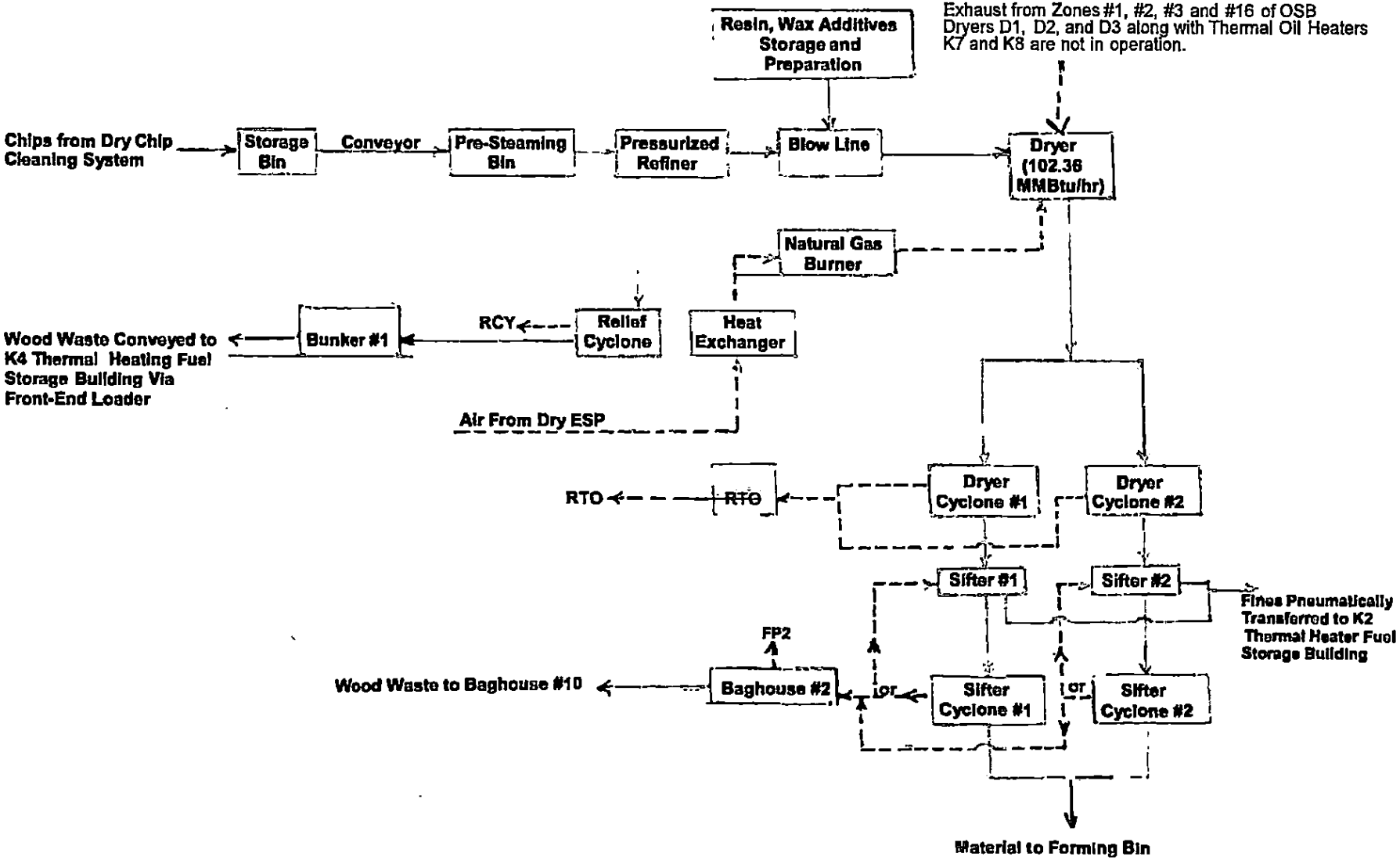
Name of person preparing application: Kenneth M. Layton

Signature: Kenneth M. Layton **Date:** 08/29/24



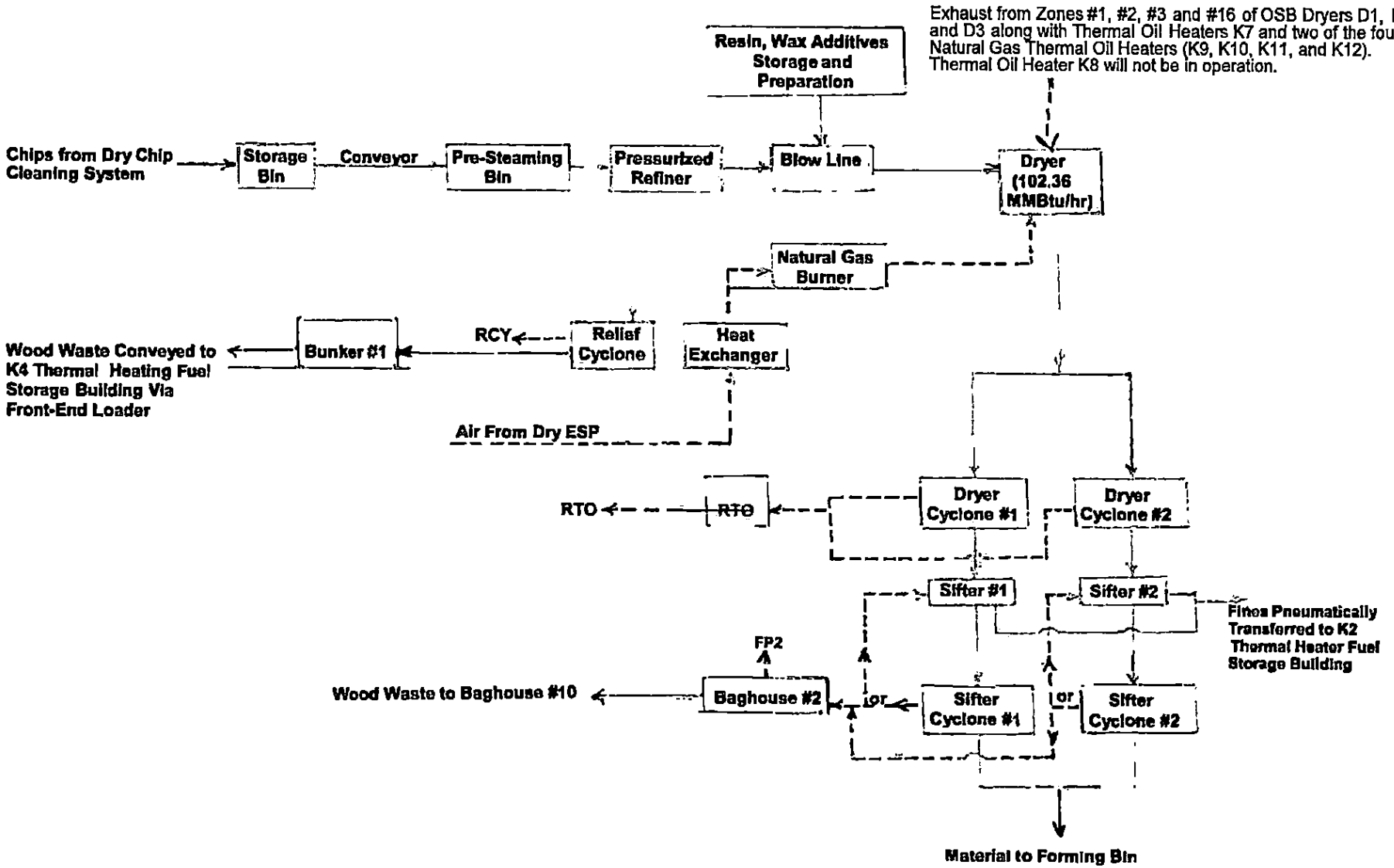
MDF PRE-PRESS ACTIVITIES

Current Operating Scenarios



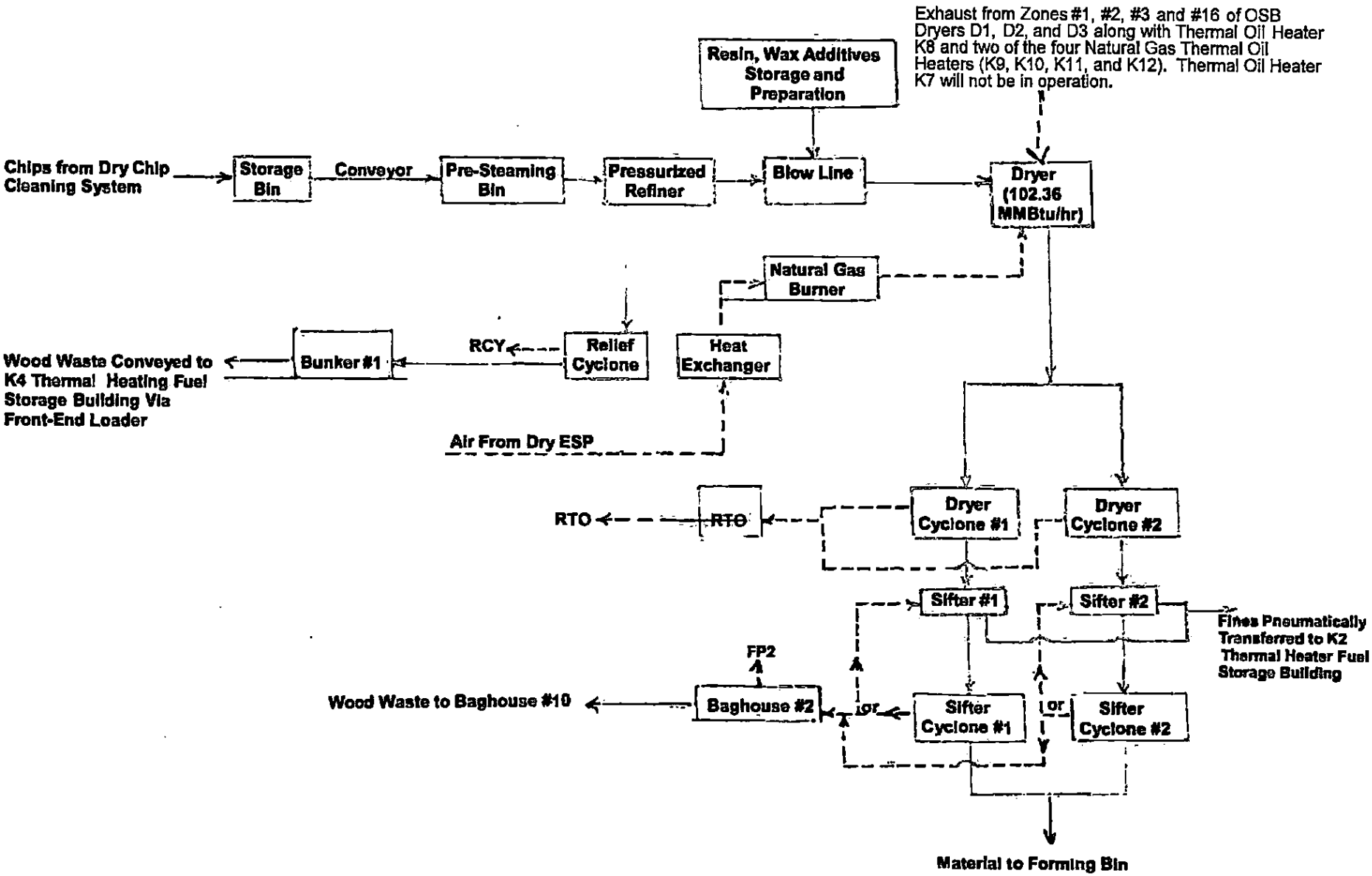
PRE-PRESS ACTIVITIES

Operating Scenario #1



PRE-PRESS ACTIVITIES

Operating Scenario #2



PRE-PRESS ACTIVITIES

Operating Scenario #3

V.

Emission Calculations

A. OSB
B. Thermal Oil Heaters
C. Emergency Generator

A.

OSB

1. Log Debarking/Chipping
2. Manufacturing (Stranding-Finishing)
3. Edge Sealing
4. Storage Tanks
5. Stenciling (T & I Activity)

1.

Log Debarking/Chipping

a. To Stranders
b. To Stacker/Reclaimer

a.

To Strander

Log Processing

I. PM

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	121.53	1,064,603	0.0024	0.29	1.28	(1)
(1) AP-42, Table 10.3-1, adjustment for enclosure							

II. PM_{10}

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	121.53	1,064,603	0.0012	0.15	0.64	(2)
(2) Engineering Judgment (Assume PM_{10} is 50% of PM)							

III. $PM_{2.5}$

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	121.53	1,064,603	0.00024	0.03	0.13	(3)
(3) Engineering Judgment (Assume $PM_{2.5}$ is 10% of PM for debarking)							

IV. VOC

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	121.53	1,064,603	N/A	N/A	N/A	(4)
(4) NCASI 1995 Technical Session							

b.

To Stacker/Reclaimer

Log Processing

I. PM

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	130	1,064,603	0.0024	0.31	1.37	(1)
B. Chipper	F-CH1	130	1,064,603	0.00083	0.11	0.47	(5)
				Total	0.42	1.84	

(1) AP-42, Table 10.3-1, adjustment for enclosure
(5) NCASI Technical Bulletin 1068 and Building Enclosure Removal Factor of 90%

II. PM_{10}

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	130	1,064,603	0.0012	0.16	0.68	(2)
B. Chipper	F-CH1	130	1,064,603	0.000415	0.05	0.24	(2)
				Total	0.21	0.92	

(2) Engineering Judgment (Assume PM_{10} is 50% of PM)

Log Processing

III. $PM_{2.5}$

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	130	1,064,603	0.00024	0.03	0.14	(3)
B. Chipper	F-CH1	130	1,064,603	0.0002075	0.03	0.12	(3)
				Total	0.06	0.26	

(3) Engineering Judgment (Assume $PM_{2.5}$ is 10% of PM for debarking and 25% PM for others)

IV. VOC

Process	Emission Point	Throughput (Oven Dried Tons)		Emission Factor (lbs/ton)	Emission Rate		Emission Factor Source
		tph	tpy		lbs/hr	tpy (potential)	
A. Debarker	F-DB	130	1,064,603	N/A	N/A	N/A	(4)
B. Chipper	F-CH1	130	1,064,603	0.05	6.50	28.47	(4)
				Total	6.50	28.47	

(4) NCASI 1995 Technical Session

2.

Manufacturing (Stranding/Flaking – Finishing)

PM

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		
	odt/hr (msf/hr - 3/8")	odt/yr (msf/yr - 3/8")	Factor (lbs/odt) (lbs/msf - 3/8")	Source	Rate (lbs/hr)	ID#	Efficiency (gr/dscf)	dscfm	lbs/hr	tons/yr	Stack ID
A. Flaking											
1. Flaker #1	46.30	405,588	11.15	(1)	516.245	CYFL1/CFFL1/BE	0.0002185	7,961	0.015	0.066	Strander Building
2. Flaker #2	46.30	405,588	11.15	(1)	516.245	CYFL2/CFFL2/BE	0.0002185	7,961	0.015	0.066	Strander Building
3. Flaker #3	46.30	405,588	11.15	(1)	516.245	CYFL3/CFFL3/BE	0.0002185	7,961	0.015	0.066	Strander Building
4. Flaker #4	46.30	405,588	11.15	(1)	516.245	CYFL4/CFFL4/BE	0.0002185	7,961	0.015	0.066	Strander Building
Total	185.2	1,622,352							0.06	0.264	
B. Stranding											
1. Strander #1	40.51	354,868	11.15	(1)	451.6865	DCST1/BE	0.0002185	26,536	0.05	0.22	Strander Building
2. Strander #2	40.51	354,868	11.15	(1)	451.6865	DCST2/BE	0.0002185	26,536	0.05	0.22	Strander Building
3. Strander #3	40.51	354,868	11.15	(1)	451.6865	DCST3/BE	0.0002185	26,536	0.05	0.22	Strander Building
Total	121.53	1,064,603							0.15	0.66	
C. Drying											
1. Dryer #1	40.51	354,868	4.70	(2)	190.40	D1C2, D1C3, D1C4, D1C5, D1C6, D1C7	0.002185	683,240	12.80	56.05	D-20.1
2. Dryer #2	40.51	354,868	4.70	(2)	190.40	D2C2, D2C3, D2C4, D2C5, D2C6, D2C7	0.002185	683,240	12.80	56.05	D-20.2
3. Dryer #3	40.51	354,868	4.70	(2)	190.40	D3C2, D3C3, D3C4, D3C5, D3C6, D3C7	0.002185	683,240	12.80	56.05	D-20.3
Total	121.53	1,064,603							38.40	168.14	
D. Sifting/Screening	121.53	1,064,603	7.82	(1)	950.00	DCSS	0.002185	42,457	0.80	3.50	SS-2.2
E. Blending (Gluing)	121.53	1,064,603	3.84	(1)	466.6752	DCB	0.002185	31,843	0.60	2.68	BG-2.1
F. Mat Forming	121.53	1,064,603	2.17	(1)	263.7201	CYMF/DCMF, PCY/WS System	0.0004	79,607	0.30	1.33	D-20.3, via PCY-4.1
G. Mat Trimming	(141.842)	(1,242,536)	(5.16)	(1)	731.90472	CYMT/DCMT, PCY/WS System	0.0004	31,843	0.11	0.50	D-20.3, via PCY-4.1
H. Pressing	(141.842)	(1,242,536)	(0.13)	(3)	18.43946	PCY/WS System	0.00218	101,138	1.84	8.06	D-20.3, via PCY-4.1
I. Finishing											
1. Diagonal Sawing	(141.842)	(1,242,536)	(5.16)	(4)	731.90472	CYDS/DCDS, PCY/WS System	0.0004	29,720	0.11	0.50	D-20.3, via PCY-4.1
2. Cut-To-Size Sawing	(141.842)	(1,242,536)	(5.16)	(4)	731.90472	CYCTS/DCCTS, CYCTS/DCCTS, PCY/WS System	0.0004	15,921	0.060	0.25	D-20.3, via PCY-4.1
3. Sanding	(141.842)	(1,242,536)	(10.32)	(1)	1463.81	DCSA, PCY/WS System	0.0004	74,300	0.27	1.16	D-20.3, via PCY-4.1
4. Tongue and Groove					0						
a. Unit #1	(47.28)	(414,179)	(5.16)	(4)	243.9648	CYTG1/DCTG1, PCY/WS System	0.0004	21,228	0.075	0.33	D-20.3, via PCY-4.1
b. Unit #2	(47.28)	(414,179)	(5.16)	(4)	243.9648	CYTG2/DCTG2, PCY/WS System	0.0004	21,228	0.075	0.33	D-20.3, via PCY-4.1
c. Unit #3	(47.28)	(414,179)	(5.16)	(4)	243.9648	CYTG3/DCTG3, PCY/WS System	0.0004	21,228	0.075	0.33	D-20.3, via PCY-4.1
Finishing Total	(141.84)	(1,242,537)							0.670	2.90	
Total											

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		Stack ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	Rate (lbs/hr)	ID#	Efficiency (gr/dscf)	dscfm	lbs/hr	tons/yr	
J. Wood Waste Transfer											
A. Granulate Cyclofilters											
1. SL/CL Screeners to Silo											
2. Former Cyclone to Silo						CF19.1	0.002185	3,715	0.07	0.30	CF-19.1
3. Diagonal, C-T-S, and T&G Cyclones to Silo						CF11.1	0.002185	1,657	0.03	0.15	CF-11.1
4. OSB Silo to PB Flaker Silo						CF18.1	0.002185	2,919	0.05	0.24	CF-18.1
5. MDF Silo to OSB Boiler Silo						CF16.2	0.002185	3,715	0.07	0.30	CF-16.2
6. PB Core Large Silo to OSB Core Large Silo						CF15.1	0.002185	3,715	0.07	0.30	CF-15.1
Granulate Total						CF16.1	0.002185	3,715	0.07	0.30	CF-16.1
									0.37	1.59	
B. Dust Cyclofilters											
1. Strander Dust Collectors to Silo											
2. Dryer Dust CollectorS to Silo						CF14.1	0.002185	1,857	0.03	0.15	CF-14.1
3. Sifter, Blending, Mat Forming/Trimming Dust Collectors to Silo						CF8.1	0.002185	1,327	0.02	0.11	CF-8.1
4. Screaners Dust to Silo						CF9.1	0.002185	1,857	0.03	0.15	CF-9.1
5. Diagonal, C-T-S, and T&G Dust Collectors to Silo						CF19.2	0.002185	1,857	0.03	0.15	CF-19.2
6. Sanding Dust Collector to Silo						CF18.2	0.002185	2,919	0.05	0.24	CF-18.2
7. OSB Dust Silo to OSB Boiler Dust Silo						CF10.1	0.002185	1,857	0.03	0.15	CF-10.1
8. OSB Boiler Dust Silo to MDF Dust Silo						CF12.1	0.002185	3,715	0.07	0.30	CF-12.1
9. MDF Dust Silo to OSB Boiler Dust Silo						CF12.2	0.002185	3,715	0.07	0.30	CF-12.2
Dust Total						CF13.1	0.002185	2,919	0.05	0.24	CF-13.1
Grand Total									0.41	1.79	
									43.71	191.41	

EMISS	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		
	odt/hr (msf/hr - 3/8")	odt/yr (msf/yr - 3/8")	Factor (lbs/odt) (lbs/msf - 3/8")	Source	Rate (lbs/hr)	ID#	Efficiency (gr/dscf)	dscfm	lbs/hr	tons/yr	Stack ID
Flaking											
1. Flaker #1	46.30	405,588	4.45	(1)	206.50	CFF1	0.00016	7,961	0.011	0.048	Strander Building
2. Flaker #2	46.30	405,588	4.45	(1)	206.50	CFF2	0.00016	7,961	0.011	0.048	Strander Building
3. Flaker #3	46.30	405,588	4.45	(1)	206.50	CFF3	0.00016	7,961	0.011	0.048	Strander Building
4. Flaker #4	46.30	405,588	4.45	(1)	206.50	CFF4	0.00016	7,961	0.011	0.048	Strander Building
Total	185.20	1,622,352							0.044	0.192	
Stranding											
1. Strander #1	40.51	354,865	4.45	(1)	180.68	DCST1	0.00016	26,536	0.036	0.158	Strander Building
2. Strander #2	40.51	354,865	4.45	(1)	180.68	DCST2	0.00016	26,536	0.036	0.158	Strander Building
3. Strander #3	40.51	354,865	4.45	(1)	180.68	DCST3	0.00016	26,536	0.036	0.158	Strander Building
Total	121.53	1,064,604							0.108	0.474	
Drying											
1. Dryer #1	40.51	354,868	2.87	(1)	116.26	D1C2, D1C3, D1C4, D1C5, D1C6, D1C7	0.00150	683,240	8.73	38.24	D-20.1
2. Dryer #2	40.51	354,868	2.87	(1)	116.26	D2C2, D2C3, D2C4, D2C5, D2C6, D2C7	0.00150	683,240	8.73	38.24	D-20.2
3. Dryer #3	40.51	354,868	2.87	(1)	116.26	D3C2, D3C3, D3C4, D3C5, D3C6, D3C7	0.00150	683,240	8.73	38.24	D-20.3
Total	121.53	1,064,604							26.19	114.72	
Sifting/Screening	121.53	1,064,604	3.70	(1)	450.00	DCSS	0.002	42,457	0.60	2.68	SS-2.2
Blending (Gluing)	121.53	1,064,604	1.92	(1)	233.3376	DCB	0.002	31,843	0.45	1.97	BG-2.1
Mat Forming	121.53	1,064,604	1.085	(1)	131.86005	CYMF/DCMF, PCY/WS System	0.00011	79,607	0.08	0.33	D-20.3, via PCY-4.1
Mat Trimming	(141.842)	(1,242,536)	(2.58)	(1)	365.95236	CYMT/DCMT, PCY/WS System	0.00011	31,843	0.03	0.13	D-20.3, via PCY-4.1
Pressing	(141.842)	(1,242,536)	(0.04)	(1)	5.67368	PCY/WS System	0.00106	101,138	0.92	4.04	D-20.3, via PCY-4.1
Finishing											
. Diagonal Sawing	(141.842)	(1,242,536)	(2.58)	(1)	365.95236	CYDS/DCDS	0.00011	29,720	0.03	0.12	D-20.3, via PCY-4.1
. Cut-To-Size Sawing	(141.842)	(1,242,536)	(2.58)	(1)	365.95236	CYCTS/DCCTS; CYCTS/DCCTS, PCY/WS System	0.00011	15,921	0.02	0.07	D-20.3, via PCY-4.1
. Sanding	(141.842)	(1,242,536)	(5.16)	(1)	731.90	DCSA, PCY/WS System	0.00011	74,300	0.07	0.31	D-20.3, via PCY-4.1
. Tongue and Groove					0						
a. Unit #1	(47.28)	(414,179)	(2.58)	(1)	121.9824	CYTG1/DCTG1, PCY/WS System	0.00011	21,228	0.02	0.09	D-20.3, via PCY-4.1
b. Unit #2	(47.28)	(414,179)	(2.58)	(1)	121.9824	CYTG2/DCTG2, PCY/WS System	0.00011	21,228	0.02	0.09	D-20.3, via PCY-4.1
c. Unit #3	(47.28)	(414,179)	(2.58)	(1)	121.9824	CYTG3/DCTG3, PCY/WS System	0.00011	21,228	0.02	0.09	D-20.3, via PCY-4.1
Finishing Total	(141.84)	(1,242,537)							0.175	0.77	

EMISSI	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		Stack ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	Rate (lbs/hr)	ID#	Efficiency (grfdscf)	dscfm	lbs/hr	tons/yr	
I. Wood Waste Transfer											
A. Granulate Cyclofilters											
1. SL/CL Screeners to Silo											
2. Former Cyclone to Silo						CF19.1	0.0015	3,715	0.05	0.21	CF-19.1
3. Diagonal, C-T-S, and T&G Cyclones to Silo						CF11.1	0.0015	1,857	0.03	0.13	CF-11.1
4. OSB Silo to PB Flaker Silo						CF18.1	0.0015	2,919	0.04	0.16	CF-18.1
5. MDF Silo to OSB Boiler Silo						CF16.2	0.0015	3,715	0.05	0.21	CF-16.2
6. PB Core Large Silo to OSB Core Large Silo						CF15.1	0.0015	3,715	0.05	0.21	CF-15.1
Granulate Total						CF16.1	0.0015	3,715	0.05	0.21	CF-16.1
									0.27	1.13	
I. Dust Cyclofilters											
1. Strander Dust Collectors to Silo											
2. Dryer Dust CollectorS to Silo						CF14.1	0.0015	1,857	0.02	0.10	CF-14.1
3. Sifter, Blending, Mat Forming/Trimming Dust Collectors Silo						CF8.1	0.0015	1,327	0.02	0.07	CF-8.1
4. Screeners Dust to Silo						CF9.1	0.0015	1,857	0.02	0.10	CF-9.1
5. Diagonal, C-T-S, and T&G Dust Collectors to Silo						CF19.2	0.0015	1,857	0.03	0.13	CF-19.2
6. Sanding Dust Collector to Silo						CF18.2	0.0015	2,919	0.04	0.16	CF-18.2
7. OSB Dust Silo to OSB Boiler Dust Silo						CF10.1	0.0015	1,857	0.03	0.13	CF-10.1
8. OSB Boiler Dust Silo to MDF Dust Silo						CF12.1	0.0015	3,715	0.05	0.21	CF-12.1
9. MDF Dust Silo to OSB Boiler Dust Silo						CF12.2	0.0015	3,715	0.05	0.21	CF-12.2
Dust Total						CF13.1	0.0015	2,919	0.04	0.16	CF-13.1
Grand Total									0.30	1.27	
									29.07	127.71	

PM2.5

PM2.5	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		
	odt/hr (mat'hr - 3/8")	odt/yr (mat'yr - 3/8")	Factor (lbs/odt) (lbs/mat - 3/8")	Source	Rate (lbs/hr)	ID#	Efficiency (grideff)	dscfm	lbs/hr	tons/yr	Stack ID
A. Flaking											
1. Flaker #1	46.30	149,150	2.78	(1)	128.71	CFF1	0.00003	7,961	0.002	0.009	Strander Building
2. Flaker #2	46.30	149,150	2.78	(1)	128.71	CFF2	0.00003	7,961	0.002	0.009	Strander Building
3. Flaker #3	46.30	149,150	2.78	(1)	128.71	CFF3	0.00003	7,961	0.002	0.009	Strander Building
4. Flaker #4	46.30	149,150	2.78	(1)	128.71	CFF4	0.00003	7,961	0.002	0.009	Strander Building
Total	185.20	596,600							0.008	0.035	
B. Stranding											
1. Strander #1	40.51	354,868	2.78	(1)	111.62	DCST1	0.00003	26,536	0.007	0.03	Strander Building
2. Strander #2	40.51	354,868	2.78	(1)	111.62	DCST2	0.00003	26,536	0.007	0.03	Strander Building
3. Strander #3	40.51	354,868	2.78	(1)	111.62	DCST3	0.00003	26,536	0.007	0.03	Strander Building
Total	121.53	1,064,604							0.021	0.09	
C. Drying											
1. Dryer #1	40.51	354,868	0.47	(1)	19.04	D1C2, D1C3, D1C4, D1C5, D1C6, D1C7	0.000142	683,240	0.83	3.64	D-20.1
2. Dryer #2	40.51	354,868	0.47	(1)	19.04	D2C2, D2C3, D2C4, D2C5, D2C6, D2C7	0.000142	683,240	0.83	3.64	D-20.2
3. Dryer #3	40.51	354,868	0.47	(1)	19.04	D3C2, D3C3, D3C4, D3C5, D3C6, D3C7	0.000142	683,240	0.83	3.64	D-20.3
Total	121.53	1,064,604							2.49	10.92	
D. Sifting/Screening	121.53	1,064,604	0.782	(1)	95.00	DCSS	0.0003	42,457	0.11	0.48	SS-2.2
E. Blending (Gluing)	121.53	1,064,604	0.38	(1)	46.1814	DCB	0.0003	31,843	0.08	0.35	BG-2.1
F. Mat Forming	121.53	1,064,604	0.22	(1)	26.7366	CYMF/DCMF, PCY/WS System	0.00009	79,607	0.06	0.26	D-20.3, via PCY-4.1
G. Mat Trimming	(141.842)	(1,242,535)	(0.13)	(1)	18.43946	CYMT/DCMT, PCY/WS System	0.00009	31,843	0.025	0.11	D-20.3, via PCY-4.1
H. Pressing	(141.842)	(1,242,535)	(0.02)	(1)	2.83884	PCY/WS System	0.001	101,138	0.86	3.77	D-20.3, via PCY-4.1
I. Finishing											
1. Diagonal Sawing	(141.842)	(1,242,535)	(0.516)	(1)	73.190472	CYDS/DCDS	0.00009	29,720	0.023	0.10	D-20.3, via PCY-4.1
2. Cut-To-Size Sawing	(141.842)	(1,242,535)	(0.516)	(1)	73.190472	CYCTS/DCCTS, CYCTS/DCCTS, PCY/WS System	0.0009	15,921	0.014	0.06	D-20.3, via PCY-4.1
3. Sanding	(141.842)	(1,242,535)	(1.032)	(1)	146.38	DCSA, PCY/WS System	0.00009	74,300	0.056	0.25	D-20.3, via PCY-4.1
4. Tongue and Groove					0						D-20.3, via PCY-4.1
a. Unit #1	(47.28)	(414,179)	(0.516)	(1)	24.39648	CYTG1/DCTG1, PCY/WS System	0.00009	21,228	0.017	0.07	D-20.3, via PCY-4.1
b. Unit #2	(47.28)	(414,178)	(0.515)	(1)	24.39648	CYTG2/DCTG2, PCY/WS System	0.00009	21,228	0.017	0.07	D-20.3, via PCY-4.1
c. Unit #3	(47.26)	(414,179)	(0.516)	(1)	24.39648	CYTG3/DCTG3, PCY/WS System	0.00009	21,228	0.017	0.07	D-20.3, via PCY-4.1
Finishing Total	(141.84)	(1,242,537)							0.150	0.62	

EMISSION U	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE			CONTROLLED EMISSION RATE		Stack ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	Rate (lbs/hr)	ID#	Efficiency (grd/scf)	dscfm	lbs/hr	tons/yr	
J. Wood Waste Transfer											
A. Granulato Cyclofilters											
1. SL/CL Screeners to Silo											
2. Former Cyclone to Silo						CF19.1	0.0003	3,715	0.01	0.04	CF-19.1
3. Diagonal, C-T-S, and T&G Cyclones to Silo						CF11.1	0.0003	1,857	0.005	0.02	CF-11.1
4. OSB Silo to PB Flaker Silo						CF18.1	0.0003	2,919	0.008	0.04	CF-18.1
5. MDF Silo to OSB Boiler Silo						CF16.2	0.0003	3,715	0.01	0.04	CF-16.2
6. PB Core Large Silo to OSB Core Large Silo						CF15.1	0.0003	3,715	0.01	0.04	CF-15.1
Granulate Total						CF18.1	0.0003	3,715	0.01	0.04	CF-16.1
									0.05	0.22	
B. Dust Cyclofilters											
1. Strander Dust Collectors to Silo											
2. Dryer Dust CollectorS to Silo						CF14.1	0.0003	1,857	0.005	0.02	CF-14.1
3. Sifter, Blending, Mat Forming/Trimming Dust Collectors to Silo						CF8.1	0.0003	1,327	0.003	0.01	CF-8.1
4. Screeners Dust to Silo						CF9.1	0.0003	1,857	0.005	0.02	CF-9.1
5. Diagonal, C-T-S, and T&G Dust Collectors to Silo						CF19.2	0.0003	1,857	0.005	0.02	CF-19.2
6. Sanding Dust Collector to Silo						CF18.2	0.0003	2,919	0.008	0.04	CF-18.2
7. OSB Dust Silo to OSB Boiler Dust Silo						CF10.1	0.0003	1,857	0.005	0.02	CF-10.1
8. OSB Boiler Dust Silo to MDF Dust Silo						CF12.1	0.0003	3,715	0.01	0.04	CF-12.1
9. MDF Dust Silo to OSB Boiler Dust Silo						CF12.2	0.0003	3,715	0.01	0.04	CF-12.2
Dust Total						CF13.1	0.0003	2,919	0.008	0.04	CF-13.1
Grand Total									0.06	0.25	
									3.91	17.11	

VOC

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE		EMISSION RATE		
	odt/hr	odt/yr	Factor (lbs/odt)	Source	Rate (lbs/hr)	ID#	1 - Removal Efficiency (%)	lbs/hr	tons/yr	Stack ID
A. Flaking										
1. Flaker #1	46.30	149,150	0.123	(1)	5.695		1.0	5.695	9.1725	FL-1.1
2. Flaker #2	46.30	149,150	0.123	(1)	5.695		1.0	5.695	9.1725	FL-1.2
3. Flaker #3	46.30	149,150	0.123	(1)	5.695		1.0	5.695	9.1725	FL-1.3
4. Flaker #4	46.30	149,150	0.123	(1)	5.695		1.0	5.695	9.1725	FL-1.4
Total	**185.20**	**596,600**						**22.760**	**36.69**	
B. Stranding										
1. Strander #1	40.51	354,868	0.022	(5)	22.28		1.0	0.891	3.904	ST-1.5
2. Strander #2	40.51	354,868	0.022	(5)	22.28		1.0	0.891	3.904	ST-1.6
3. Strander #3	40.51	354,868	0.022	(5)	22.28		1.0	0.891	3.904	ST-1.7
Total	**121.53**	**1,064,604**						**2.673**	**11.71**	
C. Drying										
1. Dryer #1	40.51	354,868	0.75	(2)	30.38		1.0	30.38	133.08	D-20.1
2. Dryer #2	40.51	354,868	0.75	(2)	30.38		1.0	30.38	133.08	D-20.2
3. Dryer #3	40.51	354,868	0.75	(2)	30.38		1.0	30.38	133.08	D-20.3
Total	**121.53**	**1,064,604**						**91.14**	**399.24**	
D. Sifting/Screening	121.53	1,064,604	0.145	(3)	17.621850		1.0	17.62	77.18	SS-2.2
E. Blending (Gluing)	121.53	1,064,604	0.165	(4)	20.05245		1.0	20.052	87.83	BG-2.1
F. Mat Forming	121.53	1,064,604	0.0713	(4)	8.667	PCY/WS System	0.15	1.30	5.69	D-20.3, via PCY-4.1
G. Mat Trimming	141.842	1,242,536	0.02585	(7)	3.6667	PCY/WS System	0.15	0.55	2.42	D-20.3, via PCY-4.1
H. Pressing	141.842	1,242,536	0.2585	(6)	36.6667	PCY/WS System	0.15	5.50	24.09	D-20.3, via PCY-4.1
I. Finishing										
1. Diagonal Sawing	141.842	1,242,536	0.039	(7)	5.531838	PCY/WS System	0.15	0.83	3.63	D-20.3, via PCY-4.1
2. Cut-To-Size Sawing	141.842	1,242,536	0.02585	(1)	3.6667	PCY/WS System	0.15	0.55	2.41	D-20.3, via PCY-4.1
3. Sanding	141.842	1,242,536	0.0682	(5)	9.6667	PCY/WS System	0.15	1.45	6.35	D-20.3, via PCY-4.1
4. Tongue and Groove					0					
a. Unit #1	47.28	414,179	0.007	(8)	0.3333	PCY/WS System	0.15	0.05	0.20	D-20.3, via PCY-4.1
b. Unit #2	47.28	414,179	0.007	(8)	0.3333	PCY/WS System	0.15	0.05	0.20	D-20.3, via PCY-4.1
c. Unit #3	47.28	414,179	0.007	(8)	0.3333	PCY/WS System	0.15	0.05	0.20	D-20.3, via PCY-4.1
Finishing Total	**141.84**	**1,242,537**						**2.98**	**12.99**	

VOC

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			CONTROL DEVICE		EMISSION RATE		Stack ID
	msf/hr (3/8")	msf/yr (3/8")	Factor (lbs/msf) (3/8")	Source	Rate (lbs/hr)	ID#	Efficiency (%)	lbs/hr	tons/yr	
J. Wood Waste Transfer										
A. Granulate Cyclofilters										
1. SL/CL Screeners to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF19.1	1.0	0.64	2.80	CF-19.1
2. Former Cyclone to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF11.1	1.0	0.64	2.80	CF-11.1
3. Diagonal, C-T-S, and T&G Cyclones to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF18.1	1.0	0.64	2.80	CF-18.1
4. OSB Silo to PB Flaker Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF16.2	1.0	0.64	2.80	CF-16.2
5. MDF Silo to OSB Boiler Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF15.1	1.0	0.64	2.80	CF-15.1
6. PB Core Large Silo to OSB Core Large Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF16.1	1.0	0.64	2.80	CF-16.1
Granulate Total								3.84	16.80	
B. Dust Cyclofilters										
1. Strander Dust Collectors to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF14.1	1.0	0.64	2.80	CF-14.1
2. Dryer Dust CollectorS to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF8.1	1.0	0.64	2.80	CF-8.1
3. Sifter, Blending, Mat Forming/Trimming Dust Collectors to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF9.1	1.0	0.64	2.80	CF-9.1
4. Screeners Dust to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF19.2	1.0	0.64	2.80	CF-19.2
5. Diagonal, C-T-S, and T&G Dust Collectors to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF18.2	1.0	0.64	2.80	CF-18.2
6. Sanding Dust Collector to Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF10.1	1.0	0.64	2.80	CF-10.1
7. OSB Dust Silo to OSB Boiler Dust Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF12.1	1.0	0.64	2.80	CF-12.1
8. OSB Boiler Dust Silo to MDF Dust Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF12.2	1.0	0.64	2.80	CF-12.2
9. MDF Dust Silo to OSB Boiler Dust Silo	141.842	1,242,536	0.0045	(8)	0.638289	CF13.1	1.0	0.64	2.80	CF-13.1
Dust Total								5.76	25.20	
Grand Total								174.20	699.84	

Uncontrolled Emission Factor/Source

(1) Rosenburg Forest Products
(2) Based upon ADEM agreed emission factor
(3) Kronospan Testing at Similar Unit at Particleboard Plant
(4) NCASI, Handbook 2013
(5) Engineering Estimate
(6) AP-42, Table 10.6.1-7
(7) NCASI Database
(8) Perplexity AI

Controlled Emission Factors

A. Press - Assume 85% removal in Cyclone/Wet Scrubber System

Based upon Shippensville, PA OSB Plant testing and literature date showing that a wet scrubber at a southern pine wood products facility can achieve up to 90% VOC removal with optimized system design (e.g. enhanced scrubber solutions, high liquid-to-gas ratios, turbulance). Also, studies have shown that a substantial majority of terpines/alpha-pirenes are removed at the dryer, where the water escaping the wood helps mobilize the terpines to the surface for evaporation.

Emissions From Dryer Zones #1, 2, 3, and 16 Vented to K7 and K8

Emission Units	Production Rate ODT/hr (MSF/hr - 3/8")	Uncontrolled Emission Factor lbs/ODT (lbs/MSF - 3/8")	Uncontrolled Emission Rate (lbs/hr)	Uncontrolled Emission Rate (tons/yr)	K7/K8 Removal Factor	Controlled Emissions Exiting K7/K8 (lbs/hr)	Controlled Emissions Exiting K7/K8 (tons/yr)
Emission Units							
Dryer #1							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			1.231	5.394		0.123	0.540
Dryer #2							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			1.231	5.394		0.123	0.540
Dryer #3							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			1.231	5.394		0.123	0.540

NOx

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		EMISSION FACTOR	EMISSION RATE				STACK ID
	odt/hr	msf/hr (3/8" Basis)	lbs/odt	lbs/msf (3/18" Basis)	Source	Lbs/Hr			Tons/Year	
						Uncontrolled	Controlled	Emitted		
A. Drying										
1. Dryer #1	N/A	47.28	N/A	0.00662	(1)	0.3129936	N/A	0.31	1.37	D-20.1
2. Dryer #2	N/A	47.28	N/A	0.00662	(1)	0.3129936	N/A	0.31	1.37	D-20.2
3. Dryer #3	N/A	47.28	N/A	0.00662	(1)	0.3129936	N/A	0.31	1.37	D-20.3
Drying Total								**0.94**	**4.11**	
B. Pressing	N/A	141.84	N/A	0.044	(2)	6.241048	N/A	**6.24**	**27.34**	D-20.3, via PCY-4.1
Grand Total								**7.18**	**31.45**	
NOTE: Production in MSF/HR (3/8" basis)										
Based Upon 8760 Hours Per Year										

Emission Factor Source

(1) Engineering Estimate

(2) NACASI, 2020 Technical Bulletin #1068, Table 6.9

CO

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	EMISSION RATE				STACK ID
	odt/hr	msf/hr	lbs/odt	lbs/msf (3/8")	Source	Lbs/Hr				
						Uncontrolled	Controlled	Emitted	Tons/Year	
A. Drying										
1. Dryer #1	N/A	47.28	N/A	0.0812	(1)	3.839136	N/A	3.84	16.82	D-20.1
2. Dryer #2	N/A	47.28	N/A	0.0812	(1)	3.839136	N/A	3.84	16.82	D-20.2
3. Dryer #3	N/A	47.28	N/A	0.0812	(1)	3.839136	N/A	3.84	16.82	D-20.3
Drying Total								11.52	50.45	
B. Pressing		141.84	N/A	0.09	(2)	12.76578	N/A	12.77	55.91	D-20.3, PCY-4.1
Grand Total								24.28	106.36	
NOTE: Production in MSF/HR (3/8" basis)										
Based Upon 8760 Hours Per Year										

(1) Engineering Estimates

(2) NACASI 2020 Technical Bulletin #1068, Table 6.9

ACETALDEHYDE

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS				STACK ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	lbs/hr	tons/yr	
A. Drying							
1. Dryer #1	40.51	354,868	0.0008	NCASI TRI Handbook	0.032	0.142	D-20.1
2. Dryer #2	40.51	354,868	0.0008	NCASI TRI Handbook	0.032	0.142	D-20.2
3. Dryer #3	40.51	354,868	0.0008	NCASI TRI Handbook	0.032	0.142	D-20.3
Total	**121.53**	**1,064,604**			**0.096**	**0.426**	

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			Control Device		EMISSION RATE		STACK ID
	msf/hr (3/8")	msf/yr (3/8")	Factor (lbs/msf) (3/8")	Source	Rate (lbs/hr)	ID#	1-Control Efficiency (%)	lbs/hr	tons/yr	
D. Blending	121.53 odt	1,064,604 odt	0.00098 lbs/odt	(5)	0.12	N/A	1.00	**0.119**	**0.522**	BG-2.1
E. Mat Forming	121.53 odt	1,064,604 odt	0.00007 lbs/odt	(5)	0.01	PCY/WS System	0.15	**0.002**	**0.007**	D-20.3, via PCY-4.1
F. Pressing	141.842	1,242,536	0.01	(12)	1.42	PCY/WS System	0.15	**0.210**	**0.930**	D-20.3, via PCY-4.1
Grand Total								**0.427**	**1.885**	

FORMALDEHYDE

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS				
	odt/hr	odt/yr	Factor (lbs/odt)	Source	lbs/hr	tons/yr	Stack ID
A. Drying							
1. Dryer #1	40.51	354,868	0.0026	NCASI TRI Handbook	0.105	0.461	D-20.1
2. Dryer #2	40.51	354,868	0.0026	NCASI TRI Handbook	0.105	0.461	D-20.2
3. Dryer #3	40.51	354,868	0.0026	NCASI TRI Handbook	0.105	0.461	D-20.3
Total	121.53	1,064,604			0.315	1.383	

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			Control Device		CONTROLLED EMISSION RATE		
	msf/hr (3/8")	msf/yr (3/8")	Factor (lbs/msf) (3/8")	Source	Rate (lbs/hr)	ID #	1-Removal Efficiency (%)	lbs/hr	tons/yr	Stack ID
B. Blending/Gluing	121.53 odt	1,064,604 odt	0.0036 lbs/odt	(5)	0.437508	N/A	1.0	0.44	1.92	BG-2.1
C. Mat Forming	121.53 odt	1,064,604 odt	0.0016 lbs/odt	(5)	0.194448	PCY/WS System	0.15	0.03	0.13	D-20.3, via PCY-4.1
D. Pressing	141.842 odt	1,242,536	0.048	(5)	6.8508	PCY/WS System	0.15	1.02	4.47	D-20.3, via PCY-4.1
E. Finishing										
1. Diagonal Sawing	141.842	1,242,536	0.00067	(6)	0.09503414	PCY/WS System	0.15	0.014	0.06	D-20.3, via PCY-4.1
2. Cut-To-Size Sawing	141.842	1,242,536	0.00067	(6)	0.09503414	PCY/WS System	0.15	0.014	0.06	D-20.3, via PCY-4.1
3. Sanding	141.842	1,242,536	0.001	(4)	0.141842	PCY/WS System	0.15	0.021	0.09	D-20.3, via PCY-4.1
Finishing Total								0.049	0.21	
Grand Total								1.854	8.113	

ACROLEIN

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS				
	MSF/hr (3/8" basis)	MSF/yr (3/8" basis)	Factor (lbs/msf (3/8"))	Source	lbs/hr	tons/yr	Stack ID
A. Drying							
1. Dryer #1	47.28	414,179	0.00025	NCASI TRI Handbook	0.012	0.052	D-20.1
2. Dryer #2	47.28	414,179	0.00025	NCASI TRI Handbook	0.012	0.052	D-20.2
3. Dryer #3	47.28	414,179	0.00025	NCASI TRI Handbook	0.012	0.052	D-20.3
Total	141.842	1,242,537			0.036	0.156	

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR			CONTROL DEVICE		Controlled Emission Rate		STACK ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	Uncontrolled (lbs/hr)	ID#	Efficiency (%)	lbs/hr	tons/yr	
B. Mat Forming	121.53	1,064,604	0.000011	(5)	0.00133683	CYMF/DCMF, PCY/WS System	85	0.0002	0.0009	D-20.3, via PCY-4.1
Grand Total								0.0362	0.157	

METHANOL

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS				STACK ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	lbs/hr	tons/yr	
A. Flaking							
1. Flaker #1	46.30	405,588	0.0073	(1)	0.338	1.48	FL-1.1
2. Flaker #2	46.30	405,588	0.0073	(1)	0.338	1.48	FL-1.2
3. Flaker #3	46.30	405,588	0.0073	(1)	0.338	1.48	FL-1.3
3. Flaker #4	46.30	405,588	0.0073	(1)	0.338	1.48	FL-1.4
Total	185.20	1,622,352			1.35	5.92	
B. Stranding							
1. Strander #1	40.51	354,868	0.0073	(1)	0.296	1.296	ST-1.5
2. Strander #2	40.51	354,868	0.0073	(1)	0.296	1.296	ST-1.6
3. Strander #3	40.51	354,868	0.0073	(1)	0.296	1.296	ST-1.7
Total	121.53	1,064,604			0.888	3.885	
C. Drying							
1. Dryer #1	40.51	354,868	0.0245	NCASI TRI Handbook	0.992	4.347	D-20.1
2. Dryer #2	40.51	354,868	0.0245	NCASI TRI Handbook	0.992	4.347	D-20.2
3. Dryer #3	40.51	354,868	0.0245	NCASI TRI Handbook	0.992	4.347	D-20.3
Total	121.53	1,064,604			2.976	13.041	

Methanol

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR			CONTROL DEVICE		Controlled Emission Rate		STACK ID
	msf/hr (3/8")	msf/yr (3/8")	Factor (lbs/msf) (3/8")	Source	Rate (lbs/hr)	ID	1 - Removal Efficieny (%)	lbs/hr	tons/yr	
D. Blending/Gluing	141.842	1,242,536	0.063	(5)	8.936	N/A	1.00	8.94	39.14	BG-2.1
E. Mat Forming	141.842	1,242,536	0.034	(4)	4.823	PCY/WS System	0.15	0.72	3.17	D-20.3, via PCY-4.1
F. Pressing	141.842	1,242,536	0.12	(12)	17.02	PCY/WS System	0.15	2.55	11.18	D-20.3, via PCY-4.1
G. Finishing										
1. Diagonal Sawing	141.842	1,242,536	0.0333	(4)	4.72	PCY/WS System	0.15	0.71	3.10	D-20.3, via PCY-4.1
2. Cut-to-Size Sawing	141.842	1,242,536	0.022	(4)	3.1333	PCY/WS System	0.15	0.47	2.06	D-20.3, via PCY-4.1
3. Sanding	141.842	1,242,536	0.002	(4)	0.284	PCY/WS System	0.15	0.04	0.18	D-20.3, via PCY-4.1
Finishing Total								1.22	5.34	
Grand Total								16.406	71.871	

MIBK

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.84		0.00095	(6)	N/A	N/A	0.1347	N/A	0.13	0.59	BG-2.1
B. Pressing		141.84		0.0132	(6)	PCY/WS System	85	1.8723	0.28	0.28	1.23	D-20.3, via PCY-4.1
Grand Total										0.41	1.82	

PHENOL

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS		EMISSION RATE		STACK ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	lbs/hr	tons/yr	
A. Flaking							
1. Flaker #1	46.30	405,588	0.0045	(1)	0.21	0.91	FL-1.1
2. Flaker #2	46.30	405,588	0.0045	(1)	0.21	0.91	FL-1.2
3. Flaker #3	46.30	405,588	0.0045	(1)	0.21	0.91	FL-1.3
4. Flaker #4	46.30	405,588	0.0045	(1)	0.21	0.91	FL-1.4
Total	**185.20**	**1**			**0.84**	**3.64**	
B. Strander							
1. Strander #1	40.51	354,868	0.0045	(1)	0.182	0.80	ST-1.5
2. Strander #2	40.51	354,868	0.0045	(1)	0.182	0.80	ST-1.6
3. Strander #3	40.51	354,868	0.0045	(1)	0.182	0.80	ST-1.7
Total	**121.53**	**1,622,352**			**0.55**	**2.40**	
C. Drying							
1. Dryer #1	40.51	354,868	0.00195	NCASI TRI Handbook	0.079	0.346	D-20.1
2. Dryer #2	40.51	354,868	0.00195	NCASI TRI Handbook	0.079	0.346	D-20.2
3. Dryer #3	40.51	354,868	0.00195	NCASI TRI Handbook	0.079	0.346	D-20.3
Total	**121.53**	**1,064,604**			**0.237**	**1.038**	

Phenol

EMISSION UNIT	MAXIMUM PRODUCTION RATE		UNCONTROLLED EMISSIONS			Control Device		EMISSION RATE		STACK ID
	msf/hr (3/8")	msf/yr (3/8")	Factor (lbs/msf) (3/8")	Source	Rate (lbs/hr)	ID#	1-Control Efficiency (%)	lbs/hr	tons/yr	
D. Blending	121.53 odt	1,064,604 odt	0.00165 lbs/odt	(5)	0.20	N/A	1.00	**0.20**	**0.88**	BG-2.1
E. Mat Forming	121.53 odt	1,064,604 odt	0.0043 lbs/odt	(5)	0.52	CYMF/DSMF, PCY/WS System	0.15	**0.08**	**0.34**	D-20.3, via PCY-4.1
F. Pressing	141.842	1,242,536	0.015	(12)	2.13	PCY/WS System	0.15	**0.32**	**1.40**	D-20.3, via PCY-4.1
Grand Total								**0.837**	**3.658**	

PROPIONALDEHYDE

Emission Unit	Maximum Production Rate		UNCONTROLLED EMISSIONS				STACK ID
	odt/hr	odt/yr	Factor (lbs/odt)	Source	lbs/hr	tons/yr	
A. Drying							
1. Dryer #1	40.51	354868	0.00026	NCASI TRI Handbook	0.011	0.046	D-20.1
2. Dryer #2	40.51	354868	0.00026	NCASI TRI Handbook	0.011	0.046	D-20.2
3. Dryer #3	40.51	354868	0.00026	NCASI TRI Handbook	0.011	0.046	D-20.3
Total	121.53				0.033	0.138	

Emission Unit	Production Rate		Uncontrolled Emission Factor		Uncontrolled Emission Factor	Control Device		Uncontrolled	Emission Rate lbs/hr			Stack ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID #	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.84		0.00916	(5)			1.3	N/A	1.3	5.69	BG-2.1
B. Mat Forming		141.84		0.000011	(5)	PCY/WS System	85	0.0016	0.00	0.00	0.00	D-20.3, via PCY-4.1
C. Pressing		141.84		0.00267	(6)	PCY/WS System	85	0.3787	0.06	0.06	0.25	D-20.3, via PCY-4.2
Grand Total										1.393	6.078	

STYRENE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	ODT/HR	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.000423	(6)	N/A	N/A	0.0600	N/A	0.06	0.26	BG-2.1
B. Pressing		141.842		0.00511	(6)	PCY/WS System	85	0.7248	0.11	0.11	0.48	D-20.3, via PCY-4.1
Grand Total										0.17	0.74	

BENZENE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.00017		N/A	N/A	0.0241	N/A	0.02	0.11	BG-2.1
B. Mat Forming		141.842		0.0008		PCY/WS System	85	0.1135	0.02	0.01	0.08	D-20.3, via PCY-4.1
C. Pressing		141.842		0.0003		PCY/WS System	85	0.0433	0.01	0.01	0.03	D-20.3, via PCY-4.1
Grand Total										**0.04**	**0.21**	

METHYLENE CHLORIDE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.000345	(6)	N/A	N/A	0.0489	N/A	0.05	0.21	BG-2.1
B. Pressing		141.842		0.00417	(6)	PCY/WS System	85	0.5915	0.09	0.09	0.39	D-20.3, via PCY-4.1
Grand Total										0.14	0.60	

TOLUENE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.000374	(6)	N/A	N/A	0.05	N/A	0.05	0.23	BG-2.1
B. Mat Forming		141.842		0.000697	(6)	PCY/WS System	85	0.0989	0.015	0.02	0.07	D-20.3, via PCY-4.1
C. Pressing		141.842		0.00452	(6)	PCY/WS System	85	0.6411	0.1	0.10	0.42	D-20.3, via PCY-4.1
Grand Total										0.17	0.72	

XYLENE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.000431	(6)	N/A	N/A	0.06	N/A	0.06	0.27	BG-2.1
B. Mat Forming		141.842		0.0000102	(6)	PCY-WS System	85	0.0014	0.0002	0.0002	0.0009	D-20.3, via PCY-4.1
C. Pressing		141.842		0.00521	(6)	PCY-WS System	85	0.7390	0.1100	0.1100	0.49	D-20.3, via PCY-4.1
Grand Total										0.17	0.76	

CHLOROETHANE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.842		0.000262	(6)	N/A	N/A	0.0372	N/A	0.04	0.16	BG-2.1
B. Pressing		141.842		0.00307	(6)	PCY/WS System	85	0.4355	0.065	0.07	0.29	D-20.3, via PCY-4.1
Grand Total										0.11	0.45	

1,2-DICHLOROETHANE

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		Uncontrolled	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Blending		141.84		0.000402	(6)	N/A	N/A	0.0570	N/A	0.06	0.25	BG-2.1
B. Pressing		141.84		0.00476	(6)	PCY/WS System	85	0.6752	0.1	0.10	0.44	D-20.3, via PCY-4.1
Grand Total										0.16	0.69	

Extra Page If Needed

MDI

EMISSION UNIT	PRODUCTION RATE		UNCONTROLLED EMISSION FACTOR		UNCONTROLLED EMISSION FACTOR	CONTROL DEVICE		UNCONTROLLED	EMISSION RATE Lbs/Hr			STACK ID
	odt/hr	msf/hr (3/8")	lbs/odt	lbs/msf (3/8")/hr	Source	ID#	Efficiency (%)		Controlled	Emitted	Tons/Year	
A. Mat Forming		141.482		0.00000317	(6)	PCY/WS System	95	0.000448498	0.000023	0.000023	0.0001	D-20.3, via PCY-4.1
B. Pressing		141.842		0.0011	(12)	PCY/WS System	95	0.1560262	0.008	0.008	0.035	D-20.3, via PCY-4.1
Grand Total										0.008	0.035	

PM Condensables

PM Condensables						
Emission Unit	Maximum Production Rate		Emissions			
	odt/hr (msf/hr – 3/8")	odt/yr (msf/yr – 3/8")	Factor (lbs/odt) (lbs/msf – 3/8")	Source	Rate	
					(lbs/hr)	(tons/yr)
A. Drying						
1. Dryer #1	40.51	354,868	0.023	(1)	0.93	4.07
2. Dryer #2	40.51	354,868	0.023	(1)	0.93	4.07
3. Dryer #3	40.51	354,868	0.023	(1)	0.93	4.07
Total	121.53	1,064,603			2.79	12.21
B. Press	(141.84)	(1,242,536)	(0.0286)	(2)	4.06	17.78

Source: NCASI, Technical Bulletin #1068

(1) The PMcond emission factor of 0.023 lbs/ODT for an individual heated OSB Conveyor Dryer was obtained from NCASI Technical Bulletin #1068, Table 5.9, with factor adjusted for operating temperature exhaust factor and good engineering judgment.

(2) Dryer (NCASI, Technical Bulletin #1068)

3.

Edge Sealing

Edge Sealing

A. Booth #1

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent Solids	Solids (lbs/hr)	Percent Overspray	Solids Overspray (lbs/hr)	Uncontrolled (lbs/hr)	Percent Controlled Efficiency	Hours of Operation	Emission Rate	
												(lbs/hr)	tpy
1	PM	12.96	8.20	106.272	35	37.195	9.0	3.348	3.348	99	8760	0.033	0.147
2	PM_{10}	12.96	8.20	106.272	35	37.195	9.0	3.348	1.674	99	8760	0.017	0.073
3	$PM_{2.5}$	12.96	8.20	106.272	35	37.195	9.0	3.348	0.335	95	8760	0.017	0.073

a - Assume PM_{10} is 50% of PM

b - Assume $PM_{2.5}$ is 10% of PM

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent VOC	Hours of Operation	Emission Rate	
							(lbs/hr)	(tpy)
1	VOC	12.96	8.2	106.272	0.01	8760	0.011	0.047

Edge Sealing

A - Booth #2

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent Solids	Solids (lbs/hr)	Percent Overspray	Solids Overspray (lbs/hr)	Uncontrolled (lbs/hr)	Percent Controlled Efficiency	Hours of Operation	Emission Rate (lbs/hr)	Emission Rate (tpy)
1	PM	12.96	8.20	106.272	35	37.195	9.0	3.348	3.348	99	8760	0.033	0.147
2	PM10	12.96	8.20	106.272	35	37.195	9.0	3.348	1.674	99	8760	0.017	0.078
3	PM2.5	12.96	8.20	106.272	35	37.195	9.0	3.348	0.335	95	8760	0.017	0.073

a - Assume PM_{10} is 50% of PM

b - Assume $PM_{2.5}$ is 10% of PM

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent VOC	Hours of Operation	Emission Rate (lbs/hr)	Emission Rate (tpy)
1	VOC	12.96	8.2	106.272	0.01	8760	0.011	0.047

Edge Sealing

A. Booth #3

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent Solids	Solids (lbs/hr)	Percent Overspray	Solids Overspray (lbs/hr)	Uncontrolled (lbs/hr)	Percent Controlled Efficiency	Hours of Operation	Emission Rate	
												(lbs/hr)	tpy
1	PM	12.96	8.20	106.272	35	37.195	9.0	3.348	3.348	99	8760	0.033	0.147
2	PM_{10}	12.96	8.20	106.272	35	37.195	9.0	3.348	1.674	99	8760	0.017	0.073
3	$PM_{2.5}$	12.96	8.20	106.272	35	37.195	9.0	3.348	0.335	95	8760	0.017	0.073

a - Assume PM_{10} is 50% of PM

b - Assume $PM_{2.5}$ is 10% of PM

	Pollutant	Application Rate (gallons/hr)	Density (lbs/gallon)	Quantity (lbs/hr)	Weight Percent VOC	Hours of Operation	Emission Rate	
							(lbs/hr)	(tpy)
1	VOC	12.96	8.2	106.272	0.01	8760	0.011	0.047

Emission Factor Source Summary

A. OSB Plant

1. PM Emission Factor

   a. Log Processing

      Based upon AP-42

   b. Manufacturing Operation

      PM emissions were based upon a grain outlet loading rate of 0.002185 gr/dscf. This is based upon information supplied by the vendor.

2. PM_{10} Emission Factor

   PM_{10} emission factor was determined using testing data from particleboard units F4, F5, and F6. From the testing a PM_{10}/PM ratio of 0.75515:1.0 was established. Therefore, a PM_{10} outlet grain loading rate of 0.00165 was used.

3. $PM_{2.5}$ Emission Factor

   $PM_{2.5}$ emission factor was determined using testing data from particleboard units F4, F5, and F6. From the testing a $PM_{2.5}$/PM ratio of 0.1378:1. was established. Therefore, a $PM_{2.5}$ outlet grain loading rate of 0.0003 was used.

4. VOC Emission Factor

   a. Log Processing

      Chipper – NCASI

   b. Flaker – Roseburg Forest Products

   c. Stranders – Engineering Judgment. Emissions are minimal due to less surface exposed.

   d. Dryer – Agreed upon emission factor of 1.50 lbs VOC/ODT

   e. Sifter – Kronospan testing at similar Particleboard Unit F-4 converted to lbs/ODT, with safety factor.

Emissions From Dryer Zones #1, 2, 3, and 16 Vented to K7 and K8

Emission Units	Production Rate ODT/hr (MSF/hr 3/8")	Uncontrolled Emission Factor lbs/ODT (lbs/MSF - 3/8")	Uncontrolled Emission Rate (lbs/hr)	Uncontrolled Emission Rate (tons/yr)	K7/K8 Removal Factor	Controlled Emissions Exiting K7/K8 (lbs/hr)	Controlled Emissions Exiting K7/K8 (tons/yr)
Emission Units							
Dryer #1							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			**1.231**	**5.394**		**0.123**	**0.540**
Dryer #2							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			**1.231**	**5.394**		**0.123**	**0.540**
Dryer #3							
A. VOC	40.51	0.75	30.37	133.02	0.10	3.037	13.30
B. HAPs							
1. Acetaldehyde	40.51	0.0008	0.032	0.142	0.10	0.003	0.014
2. Methanol	40.51	0.0245	0.992	4.347	0.10	0.099	0.435
3. Formaldehyde	40.51	0.0026	0.105	0.461	0.10	0.011	0.046
4. Phenol	40.51	0.00195	0.079	0.346	0.10	0.008	0.035
5. Acrolein	(47.28)	(0.00025)	0.012	0.052	0.10	0.001	0.005
6. Propionaldehyde	(47.28)	(0.00052)	0.011	0.046	0.10	0.001	0.005
Total			**1.231**	**5.394**		**0.123**	**0.540**

747a1

f. Blending – NCASI Technical Bulletin #1068, with 25% reduction due to use of PMDI/MDI resin

g. Mat Forming – MCASI Handbook, 2013, with Safety Factor

h. Mat Trimming – NCASI Database, with Safety Factor

i. Diagonal Saw – NCASI Database, with Safety Factor

j. Cut-to-Size Saw – NCASI Database with Safety Factor

j. Sanding – Roseburg Forest Products Application with Safety Factor

l. Tongue and Groove – Engineering Estimate

m. Wood Waste Handling – Engineering Estimate

3. NO_x

a. Dryer – Engineering Estimate. No direct fire. The NOx emission factor is an estimated value and should not be used for regulatory purposes. Existing OSB permitted facilities utilize indirect-fired conveyor strand dryers venting directly to the atmosphere did not address NOx. No emission factors currently exist. The emission factor in the application should not be for regulatory purposes or as a basis for required testing.

b. Press – NCASI, Technical Bulletin 1068, Table 6.9

4. HAPs

All HAPs are from AP-42

4.

Storage Tanks

I. Tank #R-1
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7-6.4\times10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) = $(0.000024)*(150)*(6.4\times10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
= 0.0002 lbs/yr

L_T (avg) = 0.003 lbs/yr + 0.0002 lbs/yr
= 0.0032 lbs/yr (0.0000016 tpy)

II. Tank #R-2
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7-6.4\times10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

= 0.003 lbs/yr

L_w (avg) = $(0.000024)*(150)*(6.4\times10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
= 0.0002 lbs/yr

L_T (avg) = 0.003 lbs/yr + 0.0002 lbs/yr
= 0.0032 lbs/yr (0.0000016 tpy)

III. Tank #R-3
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7 - 6.4 \times 10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) $= (0.000024)*(150)*(6.4 \times 10^{-8})*(27{,}977)*(35.19)*(1.0)*(1.0)$
$= 0.0002$ lbs/yr

L_T (avg) $= 0.003$ lbs/yr + 0.0002 lbs/yr
$= 0.0032$ lbs/yr (0.0000016 tpy)

IV. Tank #R-4
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7-6.4\times10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) $= (0.000024)*(150)*(6.4\times10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
$= 0.0002$ lbs/yr

L_T (avg) $= 0.003$ lbs/yr + 0.0002 lbs/yr
$= 0.0032$ lbs/yr (0.0000016 tpy)

V. Tank #R-5
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7-6.4\times10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) = $(0.000024)*(150)*(6.4\times10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
= 0.0002 lbs/yr

L_T (avg) = 0.003 lbs/yr + 0.0002 lbs/yr
= 0.0032 lbs/yr (0.0000016 tpy)

VI. Tank #R-6
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7 - 6.4 \times 10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) $= (0.000024)*(150)*(6.4 \times 10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
$= 0.0002$ lbs/yr

L_T (avg) $= 0.003$ lbs/yr + 0.0002 lbs/yr
$= 0.0032$ lbs/yr (0.0000016 tpy)

VII. Tank #R-7
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7 - 6.4 \times 10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

$= 0.003$ lbs/yr

L_w (avg) = $(0.000024)*(150)*(6.4 \times 10^{-8})*(27,977)*(35.19)*(1.0)*(1.0)$
= 0.0002 lbs/yr

L_T (avg) = 0.003 lbs/yr + 0.0002 lbs/yr
= 0.0032 lbs/yr (0.0000016 tpy)

VIII. Tank #R-8
MDI/PMDI Resin (Density = 10.01 lbs/gallon)

A. VOC

$L_b = (0.0026)*(M_v)*(P_v/(P_a - P_v)^{0.68}*D^{1.73}*H^{0.51}*T^{0.5}*FP*C*K_c$

$L_w = (0.000024)*(M_v)*(P_v)*(V)*(N)*(K_n)*(K_c)$

where M_v = molecular wt. of vapor (lb/lb mole) = 150
P_a = atmospheric pressure (psia) = 14.7
P_v = true value pressure (psia) = 6.4×10^{-8} psia
D = tank diameter (ft) = 9.833
H = average vapor space (ft) = 30.0
T = average ambient temperature change (°F) = 5
F_p = paint factor = 1.0 (assumed – see attachment)
C = adjustment factor for small diameter tanks = 0.44
K_c = product factor = 1.0 (for all organic liquids – see attachment)
V = tank capacity (gal) = 27,977
N = turnovers per year = 984,515 / 27,977 = 35.19
K_n = turnover factor = 1.0 (see attachment)

For the tank we have:

$$L_b = (0.026)(150)\left(\frac{6.4 \times 10^{-8}}{14.7 - 6.4 \times 10^{-8}}\right)^{0.68}(9.83)^{1.73}(30)^{0.51}(5)^{0.5}(1.0)(0.53)(1.0)$$

= 0.003 lbs/yr

L_w (avg) = $(0.000024)*(150)*(6.4 \times 10^{-8})*(27{,}977)*(35.19)*(1.0)*(1.0)$
= 0.0002 lbs/yr

L_T (avg) = 0.003 lbs/yr + 0.0002 lbs/yr
= 0.0032 lbs/yr (0.0000016 tpy)

5.

Stenciling

Ink Stenciling Operation

A. VOC

1. lbs/hr = (0.013 gallons/hr)(8.34 lbs/gallon)(0.80 lbs VOC/lb)
= 0.087

2. tons/yr = (0.087 lbs/hr)(8760 hr/yr) / (2000 lbs/ton)
= 0.381

B. PM (uncontrolled)

1. lbs/hr = (0.013 gallons/hr)(8.34 lbs/gallon)(0.20 lbs VOC/lb)
= 0.022

2. tons/yr = (0.022 lbs/hr)(8760 hr/yr) / (2000 lbs/ton)
= 0.095

B.

Thermal Oil Heaters

1. 204.73 MMBtu/hr Thermal Oil Heater (K7)
2. 204.73 MMBtu/hr Thermal Oil Heater (K8)
3. 56.20 MMBtu/hr Thermal Oil Heater (K9)
4. 56.20 MMBtu/hr Thermal Oil Heater (K10)
5. 56.20 MMBtu/hr Thermal Oil Heater (K11)
6. 56.20 MMBtu/hr Thermal Oil Heater (K12)

1.

204.73 MMBtu/hr Thermal Oil Heater (K7)

Kronospan LLC

Thermal Oil Heater

Pollutant	CAS #	Actual Quantity of Wood Consumed tons/hr	Actual Quantity of Wood Consumed tons/year	Hours of Operation/year (Actual)	Hours of Operation/year (Potential)	Heating Value of Wood (BTU/lb)	Actual Wood Waste Firing Rate (MMBTU/hr)	Emission Factor (lbs/MMBTU)	Emission Rates lbs/hr (Actual)	Emission Rates lbs/hr (Potential)	Emission Rates tons/year (Actual)	Emission Rates tons/year (Potential)
A. PM		15.07	60,267.89	8760	8760	6794	204.73	0.013000000000	2.66	2.66	11.66	11.66
B. PM_{10}		15.07	60,267.89	8760	8760	6794	204.73	0.013000000000	2.66	2.66	11.66	11.66
C. $PM_{2.5}$		15.07	60,267.89	8760	8760	6794	204.73	0.011674000000	2.39	2.39	10.45	10.45
D. SO_2		15.07	60,267.89	8760	8760	6794	204.73	0.011000000000	2.25	2.25	9.86	9.86
E. NO_x		15.07	60,267.89	8760	8760	6794	204.73	0.179016000000	36.65	36.65	160.53	160.53
F. CO		15.07	60,267.89	8760	8760	6794	204.73	0.179016000000	36.65	36.65	160.53	160.53
G. VOC		15.07	60,267.89	8760	8760	6794	204.73	0.013480000000	2.76	2.76	12.09	12.09
H. HAPs												
1. Volatiles												
a. POMs												
Acenaphthene	83-32-9	15.07	60,267.89	8760	8760	6794	204.73	0.0000009100000	0.000186304	0.000186304	0.000816013	0.000816013
Acenaphthylene	203-96-8	15.07	60,267.89	8760	8760	6794	204.73	0.0000050000000	0.00102365	0.00102365	0.004483587	0.004483587
Anthracene	120-12-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000030000000	0.00061419	0.00061419	0.002690152	0.002690152
Benzo(a)anthracene	56-55-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000006500000	1.33076E-05	1.33076E-05	5.82866E-05	5.82866E-05
Benzo(a)pyrene	50-32-8	15.07	60,267.89	8760	8760	6794	204.73	0.0000026000000	0.000532298	0.000532298	0.002331465	0.002331465
Benzo(b)fluoranthene	205-99-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000010000000	0.00020473	0.00020473	8.96717E-05	8.96717E-05
Benzo(e)pyrene	192-97-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000000526000	6.32298E-07	6.32298E-07	2.33147E-06	2.33147E-06
Benzo(g,h,i)perylene	191-24-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000000933000	1.90399E-05	1.90399E-05	8.33947E-05	8.33947E-05
Benzo(j,k)fluorathene	206-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000001600000	3.27568E-05	3.27568E-05	0.000143475	0.000143475
Benzo(k)fluoranthene	207-08-9	15.07	60,267.89	8760	8760	6794	204.73	0.0000001760000	3.37028E-06	3.37028E-06	3.32618E-05	3.32618E-05
Carbazole	86-74-8	15.07	60,267.89	8760	8760	6794	204.73	0.0000001800000	0.000368314	0.000368314	0.001614051	0.001614051
2-Chloronephthalene	91-58-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000000240000	4.91352E-07	4.91352E-07	2.15212E-06	2.15212E-06
Chrysene	218-01-9	15.07	60,267.89	8760	8760	6794	204.73	0.0000000380000	7.77674E-06	7.77674E-06	3.40753E-05	3.40753E-05
Dibenzo(a,h)anthracene	53-70-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000000091000	1.86304E-06	1.86304E-06	8.16013E-06	8.16013E-06
Fluoranthene	206-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000001500000	0.000327568	0.000327568	0.001434748	0.001434748
Fluorene	86-73-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000003400000	0.000696062	0.000696062	0.003048839	0.003048839
Indeno(1,2,3,c,d)pyrene	193-39-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000000870000	1.78115E-06	1.78115E-06	7.80144E-06	7.80144E-06
2-Methylnaphthalene	91-57-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000001600000	3.27568E-06	3.27568E-06	0.000143475	0.000143475
Perylene	198-55-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000000362000	1.0646E-07	1.0646E-07	4.66293E-07	4.66293E-07
Phenanthrene	85-01-8	15.07	60,267.89	8760	8760	6794	204.73	0.0000000700000	0.00143311	0.00143311	0.006277022	0.006277022
Pyrene	129-00-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000003700000	0.000757501	0.000757501	0.003317854	0.003317854
Benzo (j,k) fluorene	206-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000029000000	0.005937237	0.005937237	0.026121698	0.026121698
7,12 - Dimethylbenzo(a)anthracene	57-97-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000001200000	2.45676E-05	2.45676E-05	0.000107608	0.000107608
Total POMs								0.0000567836200	1.16E-02	1.16E-02	5.09E-02	5.09E-02
b. Acetaldehyde	75-07-0	15.07	60,267.89	8760	8760	6794	204.73	0.0008300000000	0.1695259	0.1695259	0.7442754421	0.7442754421
c. Acetophenone	98-86-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000000632000	0.551365E-07	0.551365E-07	2.3605E-06	2.3605E-06
d. Acrolein	107-02-8	15.07	60,267.89	8760	8760	6794	204.73	0.0003800000000	0.0777974	0.0777974	0.340752512	0.340752512
e. Benzene	71-43-2	15.07	60,267.89	8760	8760	6794	204.73	0.0040000000000	0.81892	0.81892	3.5868960	3.5868960
f. Bis(2-Ethylhexyl)phthalate	117-81-7	15.07	60,267.89	8760	8760	6794	204.73	0.0042000000000	0.859866	0.859866	3.76831308	3.76831308
g. Bromomethane	74-83-9	15.07	60,267.89	8760	8760	6794	204.73	0.0000004700000	9.62231E-05	9.62231E-05	0.000421457	0.000421457
i. Carbon Tetrachloride	56-23-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000150000000	0.00307095	0.00307095	0.013450761	0.013450761
j. Chlorobenzene	108-90-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000300000000	0.00675809	0.00675809	0.029591674	0.029591674
k. Chloroform	67-66-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000290000000	0.00573244	0.00573244	0.025108367	0.025108367
l. Chloromethane	74-87-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000230000000	0.00470879	0.00470879	0.0206245	0.0206245
m. 1,2-Dibromoethane	106-93-4	15.07	60,267.89	8760	8760	6794	204.73	0.0000660000000	0.01352015	0.01352015	0.059219457	0.059219457
n. 1,2-Dichloroethane	107-06-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000290000000	0.00593717	0.00593717	0.026004805	0.026004805
o. 1,2-Dichloropropane	78-87-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000330000000	0.00676609	0.00676609	0.029591674	0.029591674
p. 2,4-Dinitrophenol	51-28-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000001600000	3.68514E-05	3.68514E-05	0.000161409	0.000161409
q. Ethylbenzene	100-41-4	15.07	60,267.89	8760	8760	6794	204.73	0.0000151000000	0.00634683	0.00634683	0.027798239	0.027798239
r. 2,3,7,8-Tetrachlorodibenzo-p-dioxins	1746-01-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000000000066	1.76068E-09	1.76068E-09	7.71177E-09	7.71177E-09
s. 4-Nitrophenol	100-02-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000001100000	2.25203E-05	2.25203E-05	9.86369E-05	9.86369E-05
t. Pentachlorophenol	87-86-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000000510000	1.04412E-05	1.04412E-05	4.57326E-05	4.57326E-05
u. Phenol	108-95-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000510000000	0.01044123	0.01044123	0.045732587	0.045732587
v. Propionaldehyde	123-38-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000610000000	0.01248853	0.01248853	0.054699761	0.054699761
w. Styrene	100-42-5	15.07	60,267.89	8760	8760	6794	204.73	0.0001900000000	0.388987	0.388987	1.70378306	1.70378306
x. Toluene	108-88-3	15.07	60,267.89	8760	8760	6794	204.73	0.0009200000000	0.1883518	0.1883518	0.824980006	0.824980006
y. Trichloroethene	79-01-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000300000000	0.0061419	0.0061419	0.026901522	0.026901522
z. 2,4,6-Trichlorophenol	88-06-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000000220000	4.50406E-06	4.50406E-06	1.97276E-05	1.97276E-05
aa. Vinyl Chloride	75-01-4	15.07	60,267.89	8760	8760	6794	204.73	0.0000180000000	0.00368514	0.00368514	0.016140913	0.016140913
bb. Xylene	1330-20-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000250000000	0.00511825	0.00511825	0.022417935	0.022417935
cc. Naphthalene	91-20-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000970000000	0.01985881	0.01985881	0.086981588	0.086981588
dd. Formaldehyde	50-00-0	15.07	60,267.89	8760	8760	6794	204.73	0.0044000000000	0.900812	0.900812	3.94555656	3.94555656
ee. Methanol	67-56-1	15.07	60,267.89	8760	8760	6794	204.73	0.0007300000000	0.1494529	0.1494529	0.654603702	0.654603702
Volatile Totals								0.0178466168288	3.67E+00	3.67E+00	1.61E+01	1.61E+01
2. Particulates												
a. Antimony	7440-36-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000000780000	1.61737E-05	1.61737E-05	7.08407E-05	7.08407E-05
b. Arsenic	7440-38-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000002200000	4.50406E-05	4.50406E-05	0.000197278	0.000197278
c. Beryllium	7440-41-7	15.07	60,267.89	8760	8760	6794	204.73	0.0000000110000	2.25203E-06	2.25203E-06	9.86369E-06	9.86369E-06
d. Cadmium	7440-43-9	15.07	60,267.89	8760	8760	6794	204.73	0.0000000410000	8.39393E-06	8.39393E-06	3.67654E-05	3.67654E-05
e. Chromium	7440-47-3	15.07	60,267.89	8760	8760	6794	204.73	0.0000002700000	4.29933E-05	4.29933E-05	0.000188311	0.000188311
f. Cobalt	7440-48-4	15.07	60,267.89	8760	8760	6794	204.73	0.0000000650000	1.33075E-05	1.33075E-05	5.82866E-05	5.82866E-05
g. Lead	7439-92-1	15.07	60,267.89	8760	8760	6794	204.73	0.0000004800000	9.82704E-05	9.82704E-05	0.000430424	0.000430424
h. Manganese	7439-96-5	15.07	60,267.89	8760	8760	6794	204.73	0.0000160000000	0.00327568	0.00327568	0.014347478	0.014347478
i. Mercury	7439-97-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000038000000	0.0001535	0.0001535	0.0007174	0.0007174
j. Nickel	7440-02-0	15.07	60,267.89	8760	8760	6794	204.73	0.0000003300000	0.75609E-05	0.75609E-05	0.000295917	0.000295917
k. Selenium	7782-49-2	15.07	60,267.89	8760	8760	6794	204.73	0.0000000280000	5.73244E-06	5.73244E-06	2.51081E-05	2.51081E-05
l. Particulate Total								0.0000162640000	3.74E-03	3.74E-03	1.64E-02	1.64E-02
3. Others												
a. Chlorine	7782-50-5	15.07	60,267.89	8760	8760	6794	204.73	0.0007900000000	0.1617587	0.1617587	0.708406746	0.708406746
b.Dichloromethane	75-09-2	15.07	60,267.89	8760	8760	6794	204.73	0.0002900000000	0.0593717	0.0593717	0.260048048	0.260048048
c. Hydrogen Chloride	7647-01-0	15.07	60,267.89	8760	8760	6794	204.73	0.0002100000000	0.0429933	0.0429933	0.1883107	0.1883107
d. Tetrachloroethane	127-18-4	15.07	60,267.89	8760	8760	6794	204.73	0.0003800000000	0.00777974	0.00777974	0.034075261	0.034075261
e. 1,1,1-Trichloroethane	71-55-6	15.07	60,267.89	8760	8760	6794	204.73	0.0000031000000	0.00634683	0.00634683	0.027798239	0.027798239
Others Total								0.0013590000000	2.78E-01	2.78E-01	1.22E+00	1.22E+00
Total								0.0193238836236	3.95E+00	3.95E+00	1.73E+01	1.73E+01

K7

A. GHG

1. lbs/hr = (224.464 lb CO_2 Eq.)(204.73 MMBtu/hr)
   = 45,903

2. tons/yr = (45,945 lb/hr)(8760 hr/yr) / (2000 lb/ton)
   = 201,055

B. PM_{cond}

1. lbs/hr = (0.017 lb PM_{cond}/MMBtu)(204.73 MMBtu/hr)
   = 3.48

2. tons/yr = (3.48)(8760 hr/yr) / (2000 lb/ton)
   = 15.24

C. VOC (Total Exiting K7)

1. lbs/hr = (2.76 lbs/hr + (45.57 lbs/hr)(1-0.90 removal efficiency)
   = 7.32

2. tons/yr = (7.32 lb/hr)(8760 hr/yr) / (2000 lb/ton)
   = 32.06

Emission Factor Source

A. **Wood-Fired Thermal Heater (K7)**

1. PM, SO_2, NO_x, CO, VOC – Manufacturer's Data
2. PM_{10} – Assumed 74% of PM
3. $PM_{2.5}$ – Assumed 65% of PM
4. HAPs
   a. AP-42, Table 1.6-3 and 4
   b. NCASI, 2020 Technical Bulletin #1068 (HCl)
   c. NCASI, TRI Handbook (Hg)
4. PM Condensibles – AP-42, Table 1.6-1
5. GHG – EPA GHG Calculator

KRONOSPAN, Anniston: OSB-Energyplant
Biomass Combustion Plant 2x60MW with Thermal Oil Heaters 2x30MW and Hotwater Generators 2x15MW

Emissions			Boiler 1: 60MW totals	totals	Boiler 2: 60MW totals	totals	Boiler 1+2
Reference O2, Flow at 0°C=32°F	6	11 %	125,000 Nm3/hr	73825 CFM	125,000 Nm3/hr	73825 CFM	147250 CFM
Flow at 170°C=338°F			202,839 Bm3/hr	119472 CFM	202,839 Bm3/hr	119472 CFM	238944 CFM
VOC: Volatile Organic Compounds	15	10 mg/Nm³	1,250,000 mg/hr	2.76 lbs/hr	1,250,000 mg/hr	2.76 lbs/hr	5.51 lbs/hr
NOx	200	130 mg/Nm³	16,625,000 mg/hr	36.65 lbs/hr	16,625,000 mg/hr	36.65 lbs/hr	73.30 lbs/hr
CO	200	130 mg/Nm³	16,625,000 mg/hr	36.65 lbs/hr	16,625,000 mg/hr	36.65 lbs/hr	73.30 lbs/hr
SO2	150	100 mg/Nm³	12,500,000 mg/hr	27.56 lbs/hr	12,500,000 mg/hr	27.56 lbs/hr	55.12 lbs/hr
Staub / dust: PM	20	13.3 mg/Nm³	1,662,500 mg/hr	3.67 lbs/hr	1,662,500 mg/hr	3.67 lbs/hr	7.33 lbs/hr
Temperature at inlet of chimney		170 °C	338 °F	338 °F	338 °F	338 °F	338 °F
Flowrate			125,000 Nm3/hr	73825 CFM	125,000 Nm3/hr	73825 CFM	147250 CFM
Flowrate			202,839 Bm3/hr	119472 CFM	202,839 Bm3/hr	119472 CFM	238944 CFM
Diameter of Chimney							2,600 mm 3,048 mm
Diameter of Chimney							102 inches 120 mm
Inside diameter of chimney							5,31 m2
Inside diameter of chimney							57,1 sqft
Velocity at outlet of chimney							21 m/s
Velocity at outlet of chimney							70 ft/sec
Hight of Chimney							230 ft
Hight of Chimney							70 m

		converted
convert	1 mg/hr	2.2046E-06 lbs/hr
ACFM	Actual Cubic Feet per Minute	
SCFM	Standard Cubic Feet per Minute	
VOC	Volatile Organic Compounds	
TVOC	Total Volatile Organic Compounds	
PM	Particulate Matter (Staubgehalt)	
PM2,5	Particulate Matter, diameter less than 2,5 microns (Staubgehalt)	
PM10	Particulate Matter, diameter less than 10 microns (Staubgehalt)	
Nm3/hr	Nominal cubic meter per hour at 1,01325bar and 0°C and % humidity	
Bm3/hr	Operating cubic meter per hour at flue gas temperature °C	
cfm	Cubic Feet per Minute	
ft	feet	
sqft	square feet	
lbs	Pfund	

1 mg/hr	=	2.2046E-06 lbs/hr
1 Nm3/hr	=	589 cfm
1 ft	=	0,3048 m
1 m	=	3,28 ft
1 m/s	=	3,28 ft/sec
1 ft	=	12 inches
1 inches	=	0,0254 m
1 lbs	=	0,453592 kg

B1: Emissions, as daily average value

Reference oxygen	11 %
NOx	120 mg/Nm3
CO	50 mg/Nm3
HCl: Hydrogen Cloride	6 mg/Nm3
SO2: Sulphur Dioxid	30 mg/Nm3
Dust:	5 mg/Nm3
TvOC: Total volatile organic carbon	10 mg/Nm3

Masse

1 = 0,453592

Pfund ⇕ Kilogramm ⇕

Formel: Masse durch 2.205 dividieren, um ein ungefähres Ergebnis zu er

1 = 3,28084

Meter ⇕ Fuß ⇕

Formel: Länge mit 3.281 multiplizieren, um ein ungefähres Ergebnis

Temperatur

0 = 32

Grad Celsius ⇕ Grad Fahrenheit ⇕

Formel: 0 °C × 9/5 + 32 = 32 °F

1 = 12

Fuß ⇕ Zoll ⇕

Formel: Länge mit 12 multiplizieren

125000	cubic m/hr
73572,2212763775	cfm

Die SI-Einheit kann einfach in Kubikfuß pro Minute (CFM) umgerechnet werden: Ein m³/h entspricht ca. 0,589CFM und ein CFM entspricht ca. 1,699m³/h. 04.10.2022

1 = 0,0254

Zoll ⇕ Meter ⇕

Formel: Länge durch 39,37 dividieren

Länge

2600 = 102,3622

Millimeter ⇕ Zoll ⇕

Gas Volume Conversion - Convert Gas volume from given condition to SCFM (Standard Cubic Feet per Minute @ 14.7 PSIA, 60°F), ACFM (Actual Cubic Feet per Minute), MMSCFD (Million Standard Cubic Feet per Day @ 14.7 PSIA, 60°F), Nm3/h (Normal Cubic Meter per hour @ 1 Atm, 0°C), Sm3/h (Standard Cubic Meter per hour @ 1 Atm, 15°C), ACMH (Actual Cubic Meter per hour) & ACMS (Actual Cubic Meter per second)

Convert

Gas Volume /hr 1N200 Nm³/h

Solution

Based on Gas Laws

V2 = V1 * (P1/P2) * (T2/T1) * (Z2/Z1)

Converting to uniform units

From	Nm3/h		
Pressure	1.00	Atm Abs	
Temperature	0.00	°C	
Compressibility Factor (Z)	1.0		
To	ACFM		
Pressure	1.0000	Atm Abs	
Temperature	170.8000		
Compressibility Factor	1.0		

V1 = 105944.000 Nm³/m
P1 = 1.000 Atm Abs
T1 = 273.150 °K
T2 = 443.150 °K
V2 = 105944.000*(1.0001.0001)*(443.150/273.150)*(1.000/1.000)
V2 = 171850.226 ACFM

Formel: länge durch 25,4 dividieren

Länge

1 = 0,3048

Fu3 Meter

Formel: Länge durch 3,281 dividieren, um ein ungefähres Ergebnis zu erl

NO2 (NOx)	1 ppm	2.053 mg/Nm3
NO	1 ppm	1.339 mg/Nm3
N2O	1 ppm	1.964 mg/Nm3
CO2	1 ppm	1.964 mg/Nm3
CO	1 ppm	1.250 mg/Nm3
SO2	1 ppm	2.859 mg/Nm3

Umrechnungsfaktor ppm oder vpm auf mg/Nm3:

NO2	2,053
NO	1,339
N2O	1,964
NH3	0,760
NH2CONH2	2,680
HNCO	1,920
HCN	1,206
CO2	1,964
CO	1,250
SO2	2,859
SO3	3,573
SO4	4,286
H2SO3	3,662
H2SO4	4,376
(NH4)2SO4	5,897
H2O	0,804
CH4	0,716
C3H8	1,968

CO (g/GJ) $CO = \frac{21}{21-O_{2\ gemess.}} \times CO\ (ppm) \times FBr \times 1,25$

NO_x (g/GJ) $NO_x = \frac{21}{21-O_{2\ gemess.}} \times NO_x\ (ppm) \times FBr \times 2,05$

SO_2 (g/GJ) $SO_2 = \frac{21}{21-O_{2\ gemess.}} \times SO_2\ (ppm) \times FBr \times 2,93$

2.

204.73 MMBtu/hr Thermal Oil Heater (K8)

Thermal Oil Heater

Pollutant	CAS #	Actual Quantity of Wood Consumed		Hours of Operation/year		Heating Value of Wood	Actual Wood Waste Firing Rate	Emission Factor	Emission(s)			
		ton/hr	ton/year	(Actual)	(Potential)	(BTU/lb)	(MMBTU/hr)	(lbs/MMBTU)	lbs/hr (Actual)	lbs/hr (Potential)	ton/year (Actual)	ton/year (Potential)
A. PM		15.07	60,267.89	8760	8760	6794	204.73	0.013000000000	2.66	2.66	11.66	11.66
B. PM_{10}		15.07	60,267.89	8760	8760	6794	204.73	0.013000000000	2.66	2.66	11.66	11.66
C. $PM_{2.5}$		15.07	60,267.89	8760	8760	6794	204.73	0.011674000000	2.39	2.39	10.45	10.45
D. SO_2		15.07	60,267.89	8760	8760	6794	204.73	0.011000000000	2.25	2.25	9.86	9.86
E. NO_x		15.07	60,267.89	8760	8760	6794	204.73	0.179018000000	36.65	36.65	160.53	160.53
F. CO		15.07	60,267.89	8760	8760	6794	204.73	0.179018000000	36.65	36.65	160.53	160.53
G. VOC		16.07	60,267.89	8760	8760	6794	204.73	0.013490000000	2.76	2.76	12.09	12.09
H. HAPs												
- 1. Volatiles												
a. PCMs												
Acenaphthene	83-32-9	15.07	60,267.89	8760	8760	6794	204.73	0.000009100000	0.000186304	0.000186304	0.000816013	0.000816013
Acenaphthylene	208-96-8	15.07	60,267.89	8760	8760	6794	204.73	0.000050000000	0.00102365	0.00102365	0.004483587	0.004483587
Anthracene	120-12-7	15.07	60,267.89	8760	8760	6794	204.73	0.000003500000	0.00061419	0.00061419	0.002690152	0.002690152
Benzo(a)anthracene	56-55-3	15.07	60,267.89	8760	8760	6794	204.73	0.000000650000	1.33076E-05	1.33076E-05	5.82666E-05	5.82666E-05
Benzo(a)pyrene	50-32-8	15.07	60,267.89	8760	8760	6794	204.73	0.000026000000	0.000532298	0.000532298	0.002331465	0.002331465
Benzo(b)fluoranthene	205-99-2	15.07	60,267.89	8760	8760	6794	204.73	0.000001000000	0.000020473	0.000020473	8.96717E-05	8.96717E-05
Benzo(e)pyrene	192-97-2	15.07	60,267.89	8760	8760	6794	204.73	0.000000260000	5.32298E-06	5.32298E-06	2.33146E-06	2.33146E-06
Benzo(g,h,i)perylene	191-24-2	15.07	60,267.89	8760	8760	6794	204.73	0.000000930000	1.90399E-05	1.90399E-05	8.33947E-05	8.33947E-05
Benzo(j,k)fluoranthene	208-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.000001600000	3.27568E-05	3.27568E-05	0.000143475	0.000143475
Benzo(k)fluoranthene	207-08-9	15.07	60,267.89	8760	8760	6794	204.73	0.000000360000	7.37028E-06	7.37028E-06	3.22818E-05	3.22818E-05
Carbazole	86-74-8	15.07	60,267.89	8760	8760	6794	204.73	0.000018000000	0.000368514	0.000368514	0.001614091	0.001614091
2-Chloronaphthalene	91-58-7	15.07	60,267.89	8760	8760	6794	204.73	0.000000024000	4.91352E-07	4.91352E-07	2.15212E-06	2.15212E-06
Chrysene	218-01-9	15.07	60,267.89	8760	8760	6794	204.73	0.000000380000	7.77074E-06	7.77074E-06	3.40753E-06	3.40753E-06
dibenzo(a,h)anthracene	53-70-3	15.07	60,267.89	8760	8760	6794	204.73	0.000000081000	1.65304E-06	1.65304E-06	7.16013E-06	7.16013E-06
Fluoranthene	206-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.000015800000	0.000327568	0.000327568	0.001434748	0.001434748
Fluorene	86-73-7	15.07	60,267.89	8760	8760	6794	204.73	0.000003400000	0.000696082	0.000696082	0.003048839	0.003048839
Indeno(1,2,3-c,d)pyrene	193-39-5	15.07	60,267.89	8760	8760	6794	204.73	0.000000870000	1.78115E-05	1.78115E-05	7.80144E-05	7.80144E-05
2-Methylnaphthalene	91-57-6	15.07	60,267.89	8760	8760	6794	204.73	0.000001600000	3.27568E-05	3.27568E-05	0.000143475	0.000143475
Perylene	198-55-0	15.07	60,267.89	8760	8760	6794	204.73	0.000000081000	1.65846E-07	1.65846E-07	7.26303E-07	7.26303E-07
Phenanthrene	85-01-8	15.07	60,267.89	8760	8760	6794	204.73	0.000000700000	0.00143311	0.00143311	0.006277022	0.006277022
Pyrene	129-00-0	15.07	60,267.89	8760	8760	6794	204.73	0.000003700000	0.000757501	0.000757501	0.003317854	0.003317854
Benzo (j,k) fluorene	206-44-0	15.07	60,267.89	8760	8760	6794	204.73	0.000012900000	0.002640997	0.002640997	0.011566938	0.011566938
7,12 - Dimethylbenz(a)anthracene	57-97-6	15.07	60,267.89	8760	8760	6794	204.73	0.000001200000	2.45876E-05	2.45876E-05	0.000107606	0.000107606
Total PCMs								0.000005836200	1.16E-02	1.16E-02	5.09E-02	5.09E-02
b. Acetaldehyde	75-07-0	15.07	60,267.89	8760	8760	6794	204.73	0.000830000000	0.1699259	0.1699259	0.744275442	0.744275442
c. Acetophenone	98-86-2	15.07	60,267.89	8760	8760	6794	204.73	0.000000032000	6.55136E-07	6.55136E-07	2.8695E-06	2.8695E-06
d. Acrolein	107-02-8	15.07	60,267.89	8760	8760	6794	204.73	0.000380000000	0.0777974	0.0777974	0.340752612	0.340752612
e. Benzene	71-43-2	15.07	60,267.89	8760	8760	6794	204.73	0.004000000000	0.81892	0.81892	3.5868696	3.5868696
f. Bis(2-Ethylhexyl)phthalate	117-81-7	15.07	60,267.89	8760	8760	6794	204.73	0.004200000000	0.859866	0.859866	3.76821304	3.76821304
g. Bromomethane	74-83-9	15.07	60,267.89	8760	8760	6794	204.73	0.000004700000	9.622331E-05	9.622331E-05	0.000421457	0.000421457
i. Carbon Tetrachloride	56-23-5	15.07	60,267.89	8760	8760	6794	204.73	0.000150000000	0.00307095	0.00307095	0.013455761	0.013455761
j. Chlorobenzene	108-90-7	15.07	60,267.89	8760	8760	6794	204.73	0.000033000000	0.00675609	0.00675609	0.029591674	0.029591674
k. Chloroform	67-66-3	15.07	60,267.89	8760	8760	6794	204.73	0.000028000000	0.00573244	0.00573244	0.025108087	0.025108087
l. Chloromethane	74-87-3	15.07	60,267.89	8760	8760	6794	204.73	0.000022900000	0.00470879	0.00470879	0.0206245	0.0206245
m. 1,2-Dibromoethane	106-93-4	15.07	60,267.89	8760	8760	6794	204.73	0.000055000000	0.01126015	0.01126015	0.049319457	0.049319457
n. 1,2-Dichloroethane	107-06-2	15.07	60,267.89	8760	8760	6794	204.73	0.000029000000	0.00593717	0.00593717	0.026004806	0.026004806
o. 1,2-Dichloropropane	78-87-5	15.07	60,267.89	8760	8760	6794	204.73	0.000033000000	0.00675609	0.00675609	0.029591674	0.029591674
p. 2,4-Dinitrophenol	51-28-5	15.07	60,267.89	8760	8760	6794	204.73	0.000001800000	3.68514E-05	3.68514E-05	0.000161409	0.000161409
q. Ethylbenzene	100-414	15.07	60,267.89	8760	8760	6794	204.73	0.000031000000	0.00634683	0.00634683	0.027798239	0.027798239
r. 2,3,7,8-Tetrachlorodibenzo-p-dioxins	1746-01-6	15.07	60,267.89	8760	8760	6794	204.73	0.000000000088	1.76068E-09	1.76068E-09	7.71177E-09	7.71177E-09
s. 4-Nitrophenol	100-02-7	15.07	60,267.89	8760	8760	6794	204.73	0.000001100000	2.25203E-05	2.25203E-05	9.86389E-05	9.86389E-05
t. Pentachlorophenol	87-86-5	15.07	60,267.89	8760	8760	6794	204.73	0.000000510000	1.04412E-05	1.04412E-05	4.57326E-05	4.57326E-05
u. Phenol	108-95-2	15.07	60,267.89	8760	8760	6794	204.73	0.000005100000	0.01044123	0.01044123	0.045732587	0.045732587
v. Propionaldehyde	123-38-6	15.07	60,267.89	8760	8760	6794	204.73	0.000006100000	0.01248853	0.01248853	0.054699761	0.054699761
w. Styrene	100-42-5	15.07	60,267.89	8760	8760	6794	204.73	0.001900000000	0.388887	0.388887	1.70376306	1.70376306
x. Toluene	108-88-3	15.07	60,267.89	8760	8760	6794	204.73	0.000920000000	0.1883516	0.1883516	0.824980008	0.824980008
y. Trichloroethene	79-01-6	15.07	60,267.89	8760	8760	6794	204.73	0.000030000000	0.0061419	0.0061419	0.026901522	0.026901522
z. 2,4,5-Trichlorophenol	88-06-2	15.07	60,267.89	8760	8760	6794	204.73	0.000000220000	4.50406E-06	4.50406E-06	1.97278E-05	1.97278E-05
aa. Vinyl Chloride	75-01-4	15.07	60,267.89	8760	8760	6794	204.73	0.000018000000	0.00368514	0.00368514	0.016140913	0.016140913
bb. Xylene	1330-20-7	15.07	60,267.89	8760	8760	6794	204.73	0.000002500000	0.00511825	0.00511825	0.022417935	0.022417935
cc. Naphthalene	91-20-3	15.07	60,267.89	8760	8760	6794	204.73	0.000009700000	0.01985881	0.01985881	0.086981588	0.086981588
dd. Formaldehyde	50-00-0	15.07	60,267.89	8760	8760	6794	204.73	0.000440000000	0.900812	0.900812	3.94555656	3.94555656
ee. Methanol	67-56-1	15.07	60,267.89	8760	8760	6794	204.73	0.000735000000	0.1494529	0.1494529	0.654603702	0.654603702
Volatile Totals								0.017946199288	3.67E+00	3.67E+00	1.61E+01	1.61E+01
2. Particulates												
a. Antimony	7440-36-0	15.07	60,267.89	8760	8760	6794	204.73	0.000000790000	1.61737E-05	1.61737E-05	7.08407E-05	7.08407E-05
b. Arsenic	7440-38-2	15.07	60,267.89	8760	8760	6794	204.73	0.000002200000	4.50406E-06	4.50406E-06	0.000197279	0.000197279
c. Beryllium	7440-41-7	15.07	60,267.89	8760	8760	6794	204.73	0.000001100000	2.25203E-06	2.25203E-06	9.86389E-06	9.86389E-06
d. Cadmium	7440-43-9	15.07	60,267.89	8760	8760	6794	204.73	0.000004100000	8.39393E-06	8.39393E-06	3.67654E-05	3.67654E-05
e. Chromium	7440-47-3	15.07	60,267.89	8760	8760	6794	204.73	0.000021000000	4.29933E-05	4.29933E-05	0.000188311	0.000188311
f. Cobalt	7440-48-4	15.07	60,267.89	8760	8760	6794	204.73	0.000000650000	1.33076E-06	1.33076E-06	5.82666E-06	5.82666E-06
g. Lead	7439-92-1	15.07	60,267.89	8760	8760	6794	204.73	0.000004500000	9.82704E-05	9.82704E-05	0.000430424	0.000430424
h. Manganese	7439-96-5	15.07	60,267.89	8760	8760	6794	204.73	0.000160000000	0.00327568	0.00327568	0.014347478	0.014347478
i. Mercury	7439-97-6	15.07	60,267.89	8760	8760	6794	204.73	0.000008000000	0.00001638	0.00001638	0.0007174	0.0007174
j. Nickel	7440-02-0	15.07	60,267.89	8760	8760	6794	204.73	0.000003300000	6.75608E-06	6.75608E-06	0.000295917	0.000295917
k. Selenium	7782-49-2	15.07	60,267.89	8760	8760	6794	204.73	0.000002800000	5.73244E-06	5.73244E-06	2.51061E-05	2.51061E-05
l. Particulats Total								0.000182640000	3.59E-03	3.74E-03	1.64E-02	1.64E-02
3. Others												
a. Chlorine	7782-50-5	15.07	60,267.89	8760	8760	6794	204.73	0.000790000000	0.1617367	0.1617367	0.708406746	0.708406746
b.Dichloromethane	75-09-2	15.07	60,267.89	8760	8760	6794	204.73	0.000290000000	0.0593717	0.0593717	0.260048046	0.260048046
c. Hydrogen Chloride	7647-01-0	15.07	60,267.89	8760	8760	6794	204.73	0.000210000000	0.0429933	0.0429933	0.1883107	0.1883107
d. Tetrachloroethene	127-18-4	15.07	60,267.89	8760	8760	6794	204.73	0.000038000000	0.00777974	0.00777974	0.034075261	0.034075261
e. 1,1,1-Trichloroethane	71-55-6	15.07	60,267.89	8760	8760	6794	204.73	0.000310000000	0.00634683	0.00634683	0.027798239	0.027798239
Others Total								0.001359000000	2.78E-01	2.78E-01	1.22E+00	1.22E+00
Total								0.019323838286	3.95E+00	3.96E+00	1.73E+01	1.73E+01

K8

A. GHG

1. lbs/hr = (224.464 lb CO_2 Eq.)(204.73 MMBtu/hr)
   = 45,903

2. tons/yr = (45,945 lb/hr)(8760 hr/yr) / (2000 lb/ton)
   = 201,055

B. PM_{cond}

1. lbs/hr = (0.017 lb PM_{cond}/MMBtu)(204.73 MMBtu/hr)
   = 3.48

2. tons/yr = (3.48)(8760 hr/yr) / (2000 lb/ton)
   = 15.24

C. VOC (Total Exiting K8)

1. lbs/hr = (2.76 lbs/hr + (45.57 lbs/hr)(1-0.90 removal efficiency)
   = 7.32

2. tons/yr = (7.32 lb/hr)(8760 hr/yr) / (2000 lb/ton)
   = 32.06

Emission Factor Source

A. <u>Wood-Fired Thermal Heater (K8)</u>

1. PM, SO_2, NO_x, CO, VOC – Manufacturer's Data
2. PM_{10} – Assumed 74% of PM
3. $PM_{2.5}$ – Assumed 65% of PM
4. HAPs
   a. AP-42, Table 1.6-3 and 4
   b. NCASI, 2020 Technical Bulletin #1068 (HCl)
   c. NCASI, TRI Handbook (Hg)
5. PM Condensibles – AP-42, Table 1.6-1
6. GHG – EPA GHG Calculator

3.

56.20 MMBtu/hr Thermal Oil Heater (K9)

Kronospan K9 Heater

56.2 MM BTU/hr Natural Gas Fired Thermal Oil Heater # 9

Pollutant	CAS #	Actual Quantity of Natural Gas Consumed		Hours of Operation/year		Heating Value of Natural Gas	Maximum Natural Gas Firing Rate	Maximum Natural Gas Firing Rate	Emission Factor	Emission Rates			
										lbs/hr		tons/year	
		MMCF/hr	MMCF/year	(Actual)	(Potential)	(BTU/lb)	(MMCF/hr)	(MMBTU/hr)	(lbs/MMBTU)	(Actual)	(Potential)	(Actual)	(Potential)
A. PM (Filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
B. PM_{10}/PM2.5 (filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
C. SO_2		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0006	0.03372	0.03372	0.147694	0.147694
D. NO_x		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0445	2.50	2.50	10.95	10.95
E. CO		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.047	0.264	0.264	1.15632	1.156
F. VOC		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00055	0.03091	0.03091	0.135386	0.135386
G. HAPs													
1. Volatiles													
a. POM													
2-Methylnaphthalene	91-57-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
3-Methylchloroanthene	56-49-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
7,12-Dimethylbenzyl(a)anthrancene		0.0562	492.312	8760	8760	1000	0.0562	56.2	1.64E-08	9.22E-07	9.22E-07	4.04E-06	4.04E-06
Acenaphthene	83-32-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Acenaphthylene	203-96-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Anthracene	120-12-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.44E-09	1.37E-07	1.37E-07	6.01E-07	6.01E-07
Benzo(a)anthracene	56-55-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(a)pyrene	50-32-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(b)fluorathene	205-99-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(g,h,i)perylene	191-24-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(k)fluoranthene	205-82-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Crysene	218-01-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Dibenzo(a,h)anthracene	53-70-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Fluoranthene	206-44-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	3.4E-09	1.91E-07	1.91E-07	8.37E-07	8.37E-07
Fluorene	86-73-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.84E-09	1.6E-07	1.6E-07	6.99E-07	6.99E-07
Indeno(1,2,3-cd)pyrene	193-39-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Phenathrene	85-01-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.74E-08	9.78E-07	9.78E-07	4.28E-06	4.28E-06
Pyrene	129-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	5.4E-09	3.03E-07	3.03E-07	1.33E-06	1.33E-06
Total POMs									9.03E-08	5.08E-06	5.08E-06	2.22E-05	2.22E-05
b. Benzene	71-43-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000214	0.00012	0.00012	0.000527	0.000527
c. Dichlorobenzene	25321-22-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000124	6.97E-05	6.97E-05	0.000305	0.000305
d. Formaldehyde	50-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000754	0.004237	0.004237	0.01856	0.01856
e. Hexane	110-54-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00184	0.103408	0.103408	0.452927	0.452927
f. Naphthalene	91-20-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000614	3.45E-05	3.45E-05	0.000151	0.000151
g. Toluene	108-88-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000344	0.000193	0.000193	0.000847	0.000847
Volatile Totals									1.92E-03	1.08E-01	1.08E-01	0.473339	4.73E-01
2. Particulates													
a. Arsenic	7440-38-2	0.0562	492.312		8760	1000	0.0562	56.2	0.0000002	1.12E-05	1.12E-05	4.92E-05	4.92E-05
b. Beryllium	7440-41-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000012	6.74E-07	6.74E-07	2.95E-06	2.95E-06
c. Cadmium	7440-43-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000011	6.18E-05	6.18E-05	0.000271	0.000271
d. Chromium	7440-47-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000014	7.87E-05	7.87E-05	0.000345	0.000345
e. Cobalt	7440-48-4	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000084	4.72E-06	4.72E-06	2.07E-05	2.07E-05
f. Manganese	7439-96-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000038	2.14E-05	2.14E-05	9.35E-05	9.35E-05
g. Mercury	7439-97-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000026	1.46E-05	1.46E-05	6.4E-05	6.4E-05
h. Nickel	7440-02-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000021	0.000118	0.000118	0.000517	0.000517
i. Selenium	7782-49-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
j. Lead	7439-92-1	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000005	2.81E-05	2.81E-05	0.000123	0.000123
Total Particulates									0.00000606	0.000341	0.000341	0.001492	0.001492
3. Total HAPs									1.93E-03	1.08E-01	1.08E-01	4.75E-01	4.75E-01
I. GHG		0.0562	492.362	8760	8760	1000	0.0562	56.62	120,734	6785	6785	29719	29719

PM Condensables (Source: AP-42, Table 1.4-2)

K9

lbs/hr	=	(0.0057 lbs/MMBtu)(56.20 MMBtu/hr)
	=	0.32
tons/yr	=	(0.32 lbs/hr)(8760 hrs/yr) / (2000 lbs/ton)
	=	1.40

Emission Factor Source

A. Natural Gas-Fired Thermal Heater (K9)

1. PM, PM_{10}, $PM_{2.5}$, NO_x, CO – Manufacturer's Data
2. SO_2, PM_{cond}, VOC – AP-42, Table 1.4-2
3. HAPs
   a. AP-42, Table 1..4-3 and 1.4-4

4.

56.20 MMBtu/hr Thermal Oil Heater (K10)

Kronospan K10 Heater

56.2 MM BTU/hr Natural Gas Fired Thermal Oil Heater # 10

Pollutant	CAS #	Actual Quantity of Natural Gas Consumed		Hours of Operation/year		Heating Value of Natural Gas	Maximum Natural Gas Firing Rate	Maximum Natural Gas Firing Rate	Emission Factor	Emission Rates			
		MMCF/hr	MMCF/year	(Actual)	(Potential)	(BTU/lb)	(MMCF/hr)	(MMBTU/hr)	(lbs/MMBTU)	lbs/hr (Actual)	lbs/hr (Potential)	tons/year (Actual)	tons/year (Potential)
A. PM (Filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
B. PM_{10}/PM2.5 (filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
C. SO_2		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0006	0.03372	0.03372	0.147694	0.147694
D. NO_x		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0445	2.50	2.50	10.95	10.95
E. CO		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.047	0.264	0.264	1.15632	1.158
F. VOC		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00055	0.03091	0.03091	0.135386	0.135386
G. HAPs													
1. Volatiles													
a. POM													
2-Methylnaphthalene	91-57-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
3-Methylchlorcanthene	56-49-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
7,12-Dimethylbenzyl(a)anthrancene		0.0562	492.312	8760	8760	1000	0.0562	56.2	1.64E-08	9.22E-07	9.22E-07	4.04E-06	4.04E-06
Acenaphthene	83-32-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Acenaphthylene	203-96-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Anthracene	120-12-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.44E-09	1.37E-07	1.37E-07	6.01E-07	6.01E-07
Benzo(a)anthracene	56-55-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(a)pyrene	50-32-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(b)fluorathene	205-99-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(g,h,i)perylene	191-24-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(k)fluoranthene	205-82-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Crysene	218-01-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Dibenzo(a,h)anthracene	53-70-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Fluoranthene	206-44-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	3.4E-09	1.91E-07	1.91E-07	8.37E-07	8.37E-07
Fluorene	86-73-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.84E-09	1.6E-07	1.6E-07	6.99E-07	6.99E-07
Indeno(1,2,3-cd)pyrene	193-39-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Phenathrene	85-01-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.74E-08	9.78E-07	9.78E-07	4.28E-06	4.28E-06
Pyrene	129-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	5.4E-09	3.03E-07	3.03E-07	1.33E-06	1.33E-06
Total POMs									9.03E-08	5.08E-06	5.08E-06	2.22E-05	2.22E-05
b. Benzene	71-43-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000214	0.00012	0.00012	0.000527	0.000527
c. Dichlorobenzene	25321-22-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000124	6.97E-05	6.97E-05	0.000305	0.000305
d. Formaldehyde	50-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000754	0.004237	0.004237	0.01856	0.01856
e. Hexane	110-54-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00184	0.103408	0.103408	0.452927	0.452927
f. Naphthalene	91-20-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000614	3.45E-05	3.45E-05	0.000151	0.000151
g. Toluene	108-88-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000344	0.000193	0.000193	0.000847	0.000847
Volatile Totals									1.92E-03	1.08E-01	1.08E-01	0.473339	4.73E-01
2. Particulates													
a. Arsenic	7440-38-2	0.0562	492.312		8760	1000	0.0562	56.2	0.0000002	1.12E-05	1.12E-05	4.92E-05	4.92E-05
b. Beryllium	7440-41-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000012	6.74E-07	6.74E-07	2.95E-06	2.95E-06
c. Cadmium	7440-43-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000011	6.18E-05	6.18E-05	0.000271	0.000271
d. Chromium	7440-47-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000014	7.87E-05	7.87E-05	0.000345	0.000345
e. Cobalt	7440-48-4	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000084	4.72E-06	4.72E-06	2.07E-05	2.07E-05
f. Manganese	7439-96-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000038	2.14E-05	2.14E-05	9.35E-05	9.35E-05
g. Mercury	7439-97-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000026	1.46E-05	1.46E-05	6.4E-05	6.4E-05
h. Nickel	7440-02-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000021	0.000118	0.000118	0.000517	0.000517
i. Selenium	7782-49-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
j. Lead	7439-92-1	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000005	2.81E-05	2.81E-05	0.000123	0.000123
Total Particulates									0.00000608	0.000341	0.000341	0.001492	0.001492
3. Total HAPs									1.93E-03	1.08E-01	1.08E-01	4.75E-01	4.75E-01
I. GHG		0.0562	492.312	8760	8760	1000	0.0562	56.62	120.734	6785	6785	29719	29719

PM Condensables (Source: AP-42, Table 1.4-2)

K10

lbs/hr	=	(0.0057 lbs/MMBtu)(56.20 MMBtu/hr)
	=	0.32
tons/yr	=	(0.32 lbs/hr)(8760 hrs/yr) / (2000 lbs/ton)
	=	1.40

Emission Factor Source

A. **Natural Gas-Fired Thermal Heater (K10)**

1. PM, PM_{10}, $PM_{2.5}$, NO_x, CO – Manufacturer's Data
2. SO_2, PM_{cond}, VOC – AP-42, Table 1.4-2
3. HAPs
   a. AP-42, Table 1..4-3 and 1.4-4

5.

56.20 MMBtu/hr Thermal Oil Heater (K11)

Kronospan K11 Heater

56.2 MM BTU/hr Natural Gas Fired Thermal Oil Heater # 11

Pollutant	CAS #	Actual Quantity of Natural Gas Consumed		Hours of Operation/year		Heating Value of Natural Gas	Maximum Natural Gas Firing Rate	Maximum Natural Gas Firing Rate	Emission Factor	Emission Rates			
										lbs/hr		tons/year	
		MMCF/hr	MMCF/year	(Actual)	(Potential)	(BTU/lb)	(MMCF/hr)	(MMBTU/hr)	(lbs/MMBTU)	(Actual)	(Potential)	(Actual)	(Potential)
A. PM (Filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
B. PM_{10}/PM2.5 (filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
C. SO_2		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0006	0.03372	0.03372	0.147694	0.147694
D. NO_x		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0445	2.50	2.50	10.95	10.95
E. CO		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.047	0.264	0.264	1.15632	1.156
F. VOC		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00055	0.03091	0.03091	0.135386	0.135386
G. HAPs													
1. Volatiles													
a. POM													
2-Methylnaphthalene	91-57-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
3-Methylchloroanthene	56-49-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
7,12-Dimethylbenzyl(a)anthrancene		0.0562	492.312	8760	8760	1000	0.0562	56.2	1.64E-08	9.22E-07	9.22E-07	4.04E-06	4.04E-06
Acenaphthene	83-32-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Acenaphthylene	203-96-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Anthracene	120-12-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.44E-09	1.37E-07	1.37E-07	6.01E-07	6.01E-07
Benzo(a)anthracene	56-55-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(a)pyrene	50-32-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(b)fluoranthene	205-99-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(g,h,i)perylene	191-24-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(k)fluoranthene	205-82-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Crysene	218-01-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Dibenzo(a,h)anthracene	53-70-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Fluoranthene	206-44-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	3.4E-09	1.91E-07	1.91E-07	8.37E-07	8.37E-07
Fluorene	86-73-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.84E-09	1.6E-07	1.6E-07	6.99E-07	6.99E-07
Indeno(1,2,3-cd)pyrene	193-39-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Phenathrene	85-01-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.74E-08	9.78E-07	9.78E-07	4.28E-06	4.28E-06
Pyrene	129-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	5.4E-09	3.03E-07	3.03E-07	1.33E-06	1.33E-06
Total POMs									9.03E-08	5.08E-06	5.08E-06	2.22E-05	2.22E-05
b. Benzene	71-43-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000214	0.00012	0.00012	0.000527	0.000527
c. Dichlorobenzene	25321-22-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000124	6.97E-05	6.97E-05	0.000305	0.000305
d. Formaldehyde	50-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000754	0.004237	0.004237	0.01856	0.01856
e. Hexane	110-54-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00184	0.103408	0.103408	0.452927	0.452927
f. Naphthalene	91-20-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000614	3.45E-05	3.45E-05	0.000151	0.000151
g. Toluene	108-88-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000344	0.000193	0.000193	0.000847	0.000847
Volatile Totals									1.92E-03	1.08E-01	1.08E-01	0.473339	0.473339
2. Particulates													
a. Arsenic	7440-38-2	0.0562	492.312		8760	1000	0.0562	56.2	0.0000002	1.12E-05	1.12E-05	4.92E-05	4.92E-05
b. Beryllium	7440-41-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000012	6.74E-07	6.74E-07	2.95E-06	2.95E-06
c. Cadmium	7440-43-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000011	6.18E-05	6.18E-05	0.000271	0.000271
d. Chromium	7440-47-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000014	7.87E-05	7.87E-05	0.000345	0.000345
e. Cobalt	7440-48-4	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000084	4.72E-06	4.72E-06	2.07E-05	2.07E-05
f. Manganese	7439-96-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000038	2.14E-05	2.14E-05	9.35E-05	9.35E-05
g. Mercury	7439-97-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000026	1.46E-05	1.46E-05	6.4E-05	6.4E-05
h. Nickel	7440-02-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000021	0.000118	0.000118	0.000517	0.000517
i. Selenium	7782-49-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
j. Lead	7439-92-1	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000005	2.81E-05	2.81E-05	0.000123	0.000123
Total Particulates									0.00000608	0.000341	0.000341	0.001492	0.001492
3. Total HAPs									1.93E-03	1.08E-01	1.08E-01	4.75E-01	4.75E-01
I. GHG		0.0562	492.312	8760	8760	1000	0.0562	56.62	120,734	6785	6785	29719	29719

PM Condensables (Source: AP-42, Table 1.4-2)

K11

lbs/hr	=	(0.0057 lbs/MMBtu)(56.20 MMBtu/hr)
	=	0.32
tons/yr	=	(0.32 lbs/hr)(8760 hrs/yr) / (2000 lbs/ton)
	=	1.40

Emission Factor Source

A. Natural Gas-Fired Thermal Heater (K11)

1. PM, PM_{10}, $PM_{2.5}$, NO_x, CO – Manufacturer's Data
2. SO_2, PM_{cond}, VOC – AP-42, Table 1.4-2
3. HAPs
   a. AP-42, Table 1..4-3 and 1.4-4

6.

56.20 MMBtu/hr Thermal Oil Heater (K12)

Kronospan K12 Heater

56.2 MM BTU/hr Natural Gas Fired Thermal Oil Heater # 12

Pollutant	CAS #	Actual Quantity of Natural Gas Consumed		Hours of Operation/year		Heating Value of Natural Gas	Maximum Natural Gas Firing Rate	Maximum Natural Gas Firing Rate	Emission Factor	Emission Rates			
										lbs/hr		tons/year	
		MMCF/hr	MMCF/year	(Actual)	(Potential)	(BTU/lb)	(MMCF/hr)	(MMBTU/hr)	(lbs/MMBTU)	(Actual)	(Potential)	(Actual)	(Potential)
A. PM (Filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
B. PM_{10}/PM2.5 (filterable)		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00267	0.150054	0.150054	0.657237	0.657237
C. SO_2		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0006	0.03372	0.03372	0.147694	0.147694
D. NO_x		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0445	2.50	2.50	10.95	10.95
E. CO		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.047	0.264	0.264	1.15632	1.156
F. VOC		0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00055	0.03091	0.03091	0.135386	0.135386
G. HAPs													
1. Volatiles													
a. POM													
2-Methylnaphthalene	91-57-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
3-Methylchloroanthene	56-49-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
7,12-Dimethylbenzyl(a)anthrancene		0.0562	492.312	8760	8760	1000	0.0562	56.2	1.64E-08	9.22E-07	9.22E-07	4.04E-06	4.04E-06
Acenaphthene	83-32-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Acenaphthylene	203-96-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Anthracene	120-12-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.44E-09	1.37E-07	1.37E-07	6.01E-07	6.01E-07
Benzo(a)anthracene	56-55-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(a)pyrene	50-32-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(b)fluorathene	205-99-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Benzo(g,h,i)perylene	191-24-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Benzo(k)fluoranthene	205-82-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Crysene	218-01-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Dibenzo(a,h)anthracene	53-70-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.24E-09	6.97E-08	6.97E-08	3.05E-07	3.05E-07
Fluoranthene	206-44-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	3.4E-09	1.91E-07	1.91E-07	8.37E-07	8.37E-07
Fluorene	86-73-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	2.84E-09	1.6E-07	1.6E-07	6.99E-07	6.99E-07
Indeno(1,2,3-cd)pyrene	193-39-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.84E-09	1.03E-07	1.03E-07	4.53E-07	4.53E-07
Phenathrene	85-01-8	0.0562	492.312	8760	8760	1000	0.0562	56.2	1.74E-08	9.78E-07	9.78E-07	4.28E-06	4.28E-06
Pyrene	129-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	5.4E-09	3.03E-07	3.03E-07	1.33E-06	1.33E-06
Total POMs									9.03E-08	5.08E-06	5.08E-06	2.22E-05	2.22E-05
b. Benzene	71-43-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000214	0.00012	0.00012	0.000527	0.000527
c. Dichlorobenzene	25321-22-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000124	6.97E-05	6.97E-05	0.000305	0.000305
d. Formaldehyde	50-00-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000754	0.004237	0.004237	0.01856	0.01856
e. Hexane	110-54-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00184	0.103408	0.103408	0.452927	0.452927
f. Naphthalene	91-20-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000614	3.45E-05	3.45E-05	0.000151	0.000151
g. Toluene	108-88-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000344	0.000193	0.000193	0.000847	0.000847
Volatile Totals									1.92E-03	1.08E-01	1.08E-01	0.473339	4.73E-01
2. Particulates													
a. Arsenic	7440-38-2	0.0562	492.312		8760	1000	0.0562	56.2	0.0000002	1.12E-05	1.12E-05	4.92E-05	4.92E-05
b. Beryllium	7440-41-7	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000012	6.74E-07	6.74E-07	2.95E-06	2.95E-06
c. Cadmium	7440-43-9	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000011	6.18E-05	6.18E-05	0.000271	0.000271
d. Chromium	7440-47-3	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000014	7.87E-05	7.87E-05	0.000345	0.000345
e. Cobalt	7440-48-4	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000084	4.72E-06	4.72E-06	2.07E-05	2.07E-05
f. Manganese	7439-96-5	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000038	2.14E-05	2.14E-05	9.35E-05	9.35E-05
g. Mercury	7439-97-6	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.00000026	1.46E-05	1.46E-05	6.4E-05	6.4E-05
h. Nickel	7440-02-0	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000021	0.000118	0.000118	0.000517	0.000517
i. Selenium	7782-49-2	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.000000024	1.35E-06	1.35E-06	5.91E-06	5.91E-06
j. Lead	7439-92-1	0.0562	492.312	8760	8760	1000	0.0562	56.2	0.0000005	2.81E-05	2.81E-05	0.000123	0.000123
Total Particulates									0.00000606	0.000341	0.000341	0.001492	0.001492
3. Total HAPs									1.93E-03	1.08E-01	1.08E-01	4.75E-01	4.75E-01
I. GHG		0.0562	492.312	8760	8760	1000	0.0562	56.62	120.734	6785	6785	29719	29719

PM Condensables (Source: AP-42, Table 1.4-2)

K12

lbs/hr	=	(0.0057 lbs/MMBtu)(56.20 MMBtu/hr)
	=	0.32
tons/yr	=	(0.32 lbs/hr)(8760 hrs/yr) / (2000 lbs/ton)
	=	1.40

Emission Factor Summary

A. Thermal Oil Heaters K7 and K8

1. PM, SO_2, NO_x, CO, VOC – Manufacturer's Data
2. PM_{10} – Assumed 74% of PM
3. $PM_{2.5}$ – Assumed 65% of PM
4. HAPs
   a. AP-42, Table 1.6-3 and 4
   b. NCASI, 2020 Technical Bulletin #1068 (HCl)
   c. NCASI, TRI Handbook (Hg)
5. PM Condensibles – AP-42, Table 1.6-1
6. GHG – EPA GHG Calculator

B. Thermal Oil Heaters K9, K10, K11, K12

PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC – Same factors used for identical units K5 and K6 at Particleboard Plant.

C.

Emergency Generators

I. Emergency Generator Engine #6 (CUMMINS)

A. Potential (Based Upon 500 Hours of Operation Per Year)

Parameter	BHP	MMBTU/hr (input)[1]	Hours of Operation	(lbs/hr)	Emissions Factor (g/HP-hr)	tpy
NO_x	1220	7.089	500	11.62	4.32 g/bHp-hr[2]	2.90
CO	1220	7.089	500	6.99	2.60 g/bHp-hr[2]	1.75
VOC	1220	7.089	500	1.29	0.48 g/bHp-hr[2]	0.32
$PM/PM_{10}/PM_{2.5}$ (Filterable)	1220	7.089	500	0.40	0.15 g/bHp-hr[2]	0.10
SO_2	1220	7.089	500	0.0107	0.0015150 g/MMBTU[3]	0.003
HAPs (total)	1220	7.089	500	0.0112	0.001574 g/MMBTU[3]	0.003
Formaldehyde	1220	7.089	500	0.0006	0.0000789 g/MMBTU[3]	0.0002
GHG	1220	7.089	500	1150	162.19 lbs/MMBTU[3]	288

[1] MMBTU/hr = (51.00 gallon/hr)(139,000 BTU/gallon) = 7.089

[2] Subpart IIII Emission Data: NMHC / NO_x limit is 4.80 g/bHp-hr. Assume NO_x is 90% and VOC is 10%

[3] AP-42, Section 3.4

NOTE: Subpart IIII requires compliance with 40 CFR 89.112, Table 1.

II. Emergency Generator Engine #7 (CUMMINS)

A. Potential (Based Upon 500 Hours of Operation Per Year)

Parameter	BHP	MMBTU/hr (input)[1]	Hours of Operation	(lbs/hr)	Emissions Factor (g/HP-hr)	tpy
NO_x	1220	7.089	500	11.62	4.32 g/bHp-hr[2]	2.90
CO	1220	7.089	500	6.99	2.60 g/bHp-hr[2]	1.75
VOC	1220	7.089	500	1.29	0.48 g/bHp-hr[2]	0.32
$PM/PM_{10}/PM_{2.5}$ (Filterable)	1220	7.089	500	0.40	0.15 g/bHp-hr[2]	0.10
SO_2	1220	7.089	500	0.0107	0.0015150 g/MMBTU[3]	0.003
HAPs (total)	1220	7.089	500	0.0112	0.001574 g/MMBTU[3]	0.003
Formaldehyde	1220	7.089	500	0.0006	0.0000789 g/MMBTU[3]	0.0002
GHG	1220	7.089	500	1150	162.19 lbs/MMBTU[3]	288

[1] MMBTU/hr = (51.00 gallon/hr)(139,000 BTU/gallon) = 7.089

[2] Subpart IIII Emission Data: NMHC / NO_x limit is 4.80 g/bHp-hr. Assume NO_x is 90% and VOC is 10%

[3] AP-42, Section 3.4

NOTE: Subpart IIII requires compliance with 40 CFR 89.112, Table 1.

III. Emergency Generator Engine #8 (CUMMINS)

A. Potential (Based Upon 500 Hours of Operation Per Year)

Parameter	BHP	MMBTU/hr (input)[1]	Hours of Operation	(lbs/hr)	Emissions Factor (g/HP-hr)	tpy
NO_x	1220	7.089	500	11.62	4.32 g/bHp-hr[2]	2.90
CO	1220	7.089	500	6.99	2.60 g/bHp-hr[2]	1.75
VOC	1220	7.089	500	1.29	0.48 g/bHp-hr[2]	0.32
$PM/PM_{10}/PM_{2.5}$ (Filterable)	1220	7.089	500	0.40	0.15 g/bHp-hr[2]	0.10
SO_2	1220	7.089	500	0.0107	0.0015150 g/MMBTU[3]	0.003
HAPs (total)	1220	7.089	500	0.0112	0.001574 g/MMBTU[3]	0.003
Formaldehyde	1220	7.089	500	0.0006	0.0000789 g/MMBTU[3]	0.0002
GHG	1220	7.089	500	1150	162.19 lbs/MMBTU[3]	288

[1] MMBTU/hr = (51.00 gallon/hr)(139,000 BTU/gallon) = 7.089
[2] Subpart IIII Emission Data: NMHC / NO_x limit is 4.80 g/bHp-hr. Assume NO_x is 90% and VOC is 10%
[3] AP-42, Section 3.4

NOTE: Subpart IIII requires compliance with 40 CFR 89.112, Table 1.

PM Condensables (Source: AP-42, Table 3.4-2)

EG #6

lbs/hr = (7.089 lbs/MMBtu)(0.0077 MMBtu/hr)
= 0.06

tons/yr = (0.06 lbs/hr)(500 hrs/yr) / (2000 lbs/ton)
= 0.015

EG #7

lbs/hr = (7.089 lbs/MMBtu)(0.0077 MMBtu/hr)
= 0.06

tons/yr = (0.06 lbs/hr)(500 hrs/yr) / (2000 lbs/ton)
= 0.24

EG #7

lbs/hr = (7.089 lbs/MMBtu)(0.0077 MMBtu/hr)
= 0.06

tons/yr = (0.06 lbs/hr)(500 hrs/yr) / (2000 lbs/ton)
= 0.015

VI.

Monitoring and Regulatory Summary

A. OSB
B. Thermal Oil Heaters K7 and K8
C. Thermal Oil Heaters K9, K10, K11, and K12
D. Emergency Generators #6, #7, and #8

NOTE: Additional monitoring information is shown in Pages 807 a-e.

A.

OSB Plant

Monitoring and Regulatory Summary

I. Debarking / Chipping Line

Description	Emission Point
Debarking	F-DB (Fugitive)
Chipping	F-CH (Fugitive)

A. Applicability

1. ADEM Admin. Code 335-3-4-.02
2. ADEM Admin. Code 335-3-14-.04

B. Emission Limit / BACT

1. Debarkers

a.	Opacity	-	Visible Fugitive Emissions
b.	PM	-	0.60 lbs/hr / 2.65 tpy
c.	PM_{10}	-	0.31 lbs/hr / 1.32 tpy
d.	$PM_{2.5}$	-	0.06 lbs/hr / 0.27 tpy

2. Chipper

a.	Opacity	-	Visible Fugitive Emissions
b.	PM	-	0.11 lbs/hr / 0.47 tpy
c.	PM_{10}	-	0.05 lbs/hr / 0.24 tpy
d.	$PM_{2.5}$	-	0.03 lbs/hr / 0.12 tpy
e.	VOC	-	6.50 lbs/hr / 28.47 tpy

C. Monitoring

a. Good Design and Operation (BACT)
b. Good Operating Practices (BACT)

D. Recordkeeping and Reporting

N/A

II. Strand/Flaking Preparation (Stranding and Flaking)

Description	Emission Point
Strander #1	Discharges Inside Strander Building
Strander #2	Discharges Inside Strander Building
Strander #3	Discharges Inside Strander Building
Flaker #1	Discharges Inside Strander Building
Flaker #2	Discharges Inside Strander Building
Flaker #3	Discharges Inside Strander Building
Flaker #4	Discharges Inside Strander Building

A. Applicability

1. ADEM Code 335-3-14-.04
2. ADEM Code 334-4-.02

B. Emission Limits

1. Stranders (3 Total)

a.	PM (Filterable)	-	0.15 lbs/hr / 0.002185 gr/dscf
b.	PM_{10} (Filterable)	-	0.018 lbs/hr / 0.0016 gr/dscf
c.	$PM_{2.5}$ (Filterable)	-	0.021 lbs/hr / 0.0003 gr/dscf
d.	VOC	-	2.67 lbs/hr / 0.15 lbs/wet ton @ 55% moisture
e.	Opacity	-	5%

2. Flakers (4 Total)

a.	PM (Filterable)	-	0.06 lbs/hr / 0.002185 gr/dscf
b.	PM_{10} (Filterable)	-	0.044 lbs/hr / 0.0016 gr/dscf
c.	$PM_{2.5}$ (Filterable)	-	0.008 lbs/hr / 0.0003 gr/dscf
d.	VOC	-	0.082 lbs/wet ton @ 55% moisture / 36.69 tpy
e.	Limit annual flake production to 896,900 wet tons @ 55% moisture per year		
f.	Opacity	-	5%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
1. Stranders (3 Total)	PM	Dust Collector and Good Design / Operation	0.15 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector and Good Design / Operation	0.108 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$	Dust Collector and Good Design / Operation	0.021 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector and Good Design / Operation	5%
	VOC	Good Design / Operation	2.67 lbs/hr / 0.15 lbs wet tons @ 55% moisture
2. Flakers (4 Total)	PM	Dust Collector and Good Design / Operation	0.06 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector and Good Design / Operation	0.044 lbs/hr / 0.0016 gr/dscf
	$PM_{2.5}$	Dust Collector and Good Design / Operation	0.008 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector and Good Design / Operation	5%
	VOC	Good Design / Operation	0.082 lbs wet tons @ 55% moisture / 36.69 lbs/hr

D. Monitoring

1. Dust Collectors DCST1, DCST2, DCST3, CFF1, CFF2, CFF3, and CFF4
   a. Good Design and Operation / BACT
   b. Good Operating Practices / BACT
   c. Install, operate, and maintain pressure drop devices at dust collectors. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.
   d. Prepare and submit CAM Plan at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.
   e. PM (all species) initial and triennial testing
   f. Daily monitoring of Strander and Flaker throughputs.

E. Recordkeeping and Reporting

1. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)
2. Submit Semi-Annual Monitoring Report
3. Daily recording of Strander and Flaker throughputs.

III. Drying

Description	Emission Point
Dryer #1	D-20.1
Dryer #2	D-20.2
Dryer #3	D-20.3

A. Applicability

1. 40 CFR, Part 63, Subpart DDDD
2. ADEM Code 335-3-14-.04

B. Emission Standards / Limits

Each Dryer is subject to the following emission limits:

1. Zones 1, 2, 3, and 16 (Vented to Thermal Oil Heaters K7 and K8)

   a. Comply with one of the following options identified in Part 63, Subpart DDDD, Table 1B at the time of testing.

      (1) Reduce emissions of total HAP, measured as THC (as carbon), by 90 percent; or
      (2) Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd; or
      (3) Reduce methanol emissions by 90 percent; or
      (4) Limit methanol emission to less than or equal to 1 ppmvd if uncontrolled methanol emission entering the control device are greater than or equal to 10 ppmvd; or
      (5) Reduce formaldehyde emissions by 90 percent; or
      (6) Limit formaldehyde emissions to less than or equal to 1 ppmvd if uncontrolled formaldehyde emission entering the control device are greater than or equal to 10 ppmvd.

2. Zones 4 – 15 (Vented to Atmosphere)

   a. PM (Filterable) – 12.80 lbs/hr (0.002185 gr/dscf)
   b. PM_{10}/PM_{cond} – 9.66 lbs/hr (0.00165 gr/dscf)
   c. $PM_{2.5}/PM_{cond}$ – 1.76 lbs/hr (0.0003 gr/dscf)
   d. VOC – 30.38 lbs/hr (0.75 lbs/ODT)
   e. NO_x – 0.31 lbs/hr / (0.0077 lbs/ODT)
   f. CO – 3.84 lbs/hr / (0.095 lbs/ODT)
   g. Opacity – 10%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Each Dryer	PM	Dust Collector for Each Dryer and Good Design/Operation	12.80 lbs/hr / 0.002185 gr/dscf
	PM_{10} / PM_{cond}	Dust Collector for Each Dryer and Good Design/Operation	9.66 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$ / PM_{cond}	Dust Collector for Each Dryer and Good Design/Operation	1.76 lbs/hr / 0.0003 gr/dscf
	VOC	Good Design/Operation	30.38 lbs/hr / 0.75 lbs/ODT
	NO_x	Good Design/Operation	0.31 lbs/hr / 0.0077 lbs / ODT
	CO	Good Design/Operation	3.84 lbs/hr / 0.095 lbs ODT
	Opacity	Dust Collector for Each Dryer and Good Design/Operation	10%

D. Monitoring

Each dryer is subject to the following monitoring requirements:

1. Zones 1, 2, 3, and 16 (Vented to Thermal Oil Heater K7 and K8)

   a. Collect, record, and maintain the 3-hour block average K7 and K8 firebox temperature above the minimum temperature established during the performance test.
   b. Install, operate, and maintain pressure drop devices at dust collectors. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.

2. Zones 4 – 15 (Venting to Atmosphere)

   a. Observe daily for greater than normal emissions (exhaust stacks)
   b. Initiate corrective action within 24 hours if greater than normal emissions are observed
   c. Inspect annually for proper operation
   d. Install, operate, and maintain pressure drop recording devices at each dust collector. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.

3. Prepare and submit CAM Plan at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.

4. Daily monitoring of Dryer throughput.

E. Testing (PM – all species, and VOC)

1. Conduct annual compliance testing

   a. MACT testing will be performed at Thermal Oil Heaters #1 and #2 firebox inlet and outlet.
   b. BACT testing will be performed at Dryer #1, Dryer #2, and Dryer #3 exhaust stacks.

2. NOx/CO

   Initial testing and once / permit term testing

F. Recordkeeping and Reporting

1. Submit Semi-Annual Monitoring Report
2. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)
3. Daily recording of Dryer throughput

IV. Sifting and Gluing

Description	Emission Point
Sifter/Screen	SS-2.2
Blending (Gluing)	BF-2.1

A. Applicability

1. ADEM Code 335-3-14-.04
2. 40 CFR Part 63, Subpart DDDD

B. Emission Limits

1. Sifter/Screening

   a. PM (Filterable) – 0.80 lbs/hr (0.002185 gr/dscf)
   b. PM_{10}/PM_{cond} – 0.60 lbs/hr (0.00165 gr/dscf)
   c. $PM_{2.5}/PM_{cond}$ – 0.11 lbs/hr (0.0003 gr/dscf)
   d. VOC – 17.62 lbs/hr (0.145 lbs/ODT)
   e. Opacity – 0%

d. VOC – 17.62 lbs/hr (0.145 lbs/ODT)
e. Opacity – 0%

2. Blending/Gluing

a. PM (Filterable) – 0.60 lbs/hr (0.002185 gr/dscf)
b. PM_{10} (Filterable) – 0.45 lbs/hr (0.00165 gr/dscf)
c. $PM_{2.5}$ (Filterable) – 0.08 lbs/hr (0.0003 gr/dscf)
d. VOC – 20.05 lbs/hr (0.165 lbs/ODT)
e. Opacity – 0%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
1. Sifter/Screening	PM	Dust Collector	0.80 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector	0.60 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$	Dust Collector	0.11 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector	0%
	VOC	Good Design/Operation	17.62 lbs/hr / 0.145 lbs/ODT
2. Gluing/Blending	PM	Dust Collector	0.60 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector	0.45 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$	Dust Collector	0.08 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector	0%
	VOC	Good Design/Operation	20.05 lbs/hr / 0.165 lbs/ODT

D. Monitoring

1. Sifter / Screen

a. Observe daily for visible emissions
b. Initiate corrective action within 24 hours if visible emissions are observed
c. Inspect annually for proper operation

2. Blending / Gluing

a. Observe daily for visible emissions

b. Initiate corrective action within 24 hours if visible emissions are observed
c. Inspect annually for proper operation
d. Prepare and submit CAM Plan at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.

E. Testing

1. Conduct triennial compliance testing.

F. Recordkeeping and Reporting

1. Submit Semi-Annual Monitoring Report

2. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)

V. OSB Operations Vented to Cyclone/Wet Scrubber (PCY/WS) System, via Press Hall and PCY

Description	Emission Point
Mat Forming	D-20.3, via PCY-4.1, via CYMF, DCMF, Press Hall and PCY/WS System
Matt Trimming	D-20.3, via PCY-4.1, via CYMT, DCMT, Press Hall and PCY/WS System
Pressing	D-20.3, via PCY-4.1, via Press Hall and PCY/WS System
Diagonal Saw	D-20.3, via PCY-4.1, via CYDS, DCDS, Press Hall and PCY/WS System
Cut-To-Size Sawing	D-20.3, via PCY-4.1, via CYCTS, DCCTS, Press Hall, and PCY/WS System
Sanding	D-20.3, via PCY-4.1, via DCSA, Finishing Hall, Press Hall, and PCY/WS System
Tongue and Groove Stations (3)	D-20.3, via PCY-4.1, via CYTG1, CYTG2, CYTG3, DCTG1, DCTG2, DCTG3, Press Hall, and PCY/WS System

A. Applicability

1. 40 CFR, Part 63, Subpart DDDD
2. ADEM Code 335-3-14-.04

B. Emission Standard/Limits

PCY-4.1 (Mat Forming, Mat Saw, Pressing, Diagonal Saw, Cut-To-Size Sawing, and Tongue and Groove)

1. PM (Filterable) – 2.92 lbs/hr (0.0206 lbs / MSF (3/8"))
2. PM_{10} / PM_{cond} – 5.26 lbs/hr (0.0371 lbs / MSF (3/8"))
3. $PM_{2.5}$/ PM_{cond} – 5.15 lbs/hr (0.0363 lbs / MSF (3/8"))
4. Opacity – 15%
5. VOC – 10.33 lbs/hr (0.073 lbs / MSF (3/8"))
6. NO_x – 6.24 lbs/hr (0.044 lbs / MSF (3/8"))
7. CO – 12.77 lbs/hr (0.09 lbs / MSF (3/8"))
8. HAPs – Limit total HAPs, Measured as THC (as carbon) to 20.0 ppmvd (Part 63, Subpart DDDD, Table 1B(2)).

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
1. OSB Operations vented to Cyclone / Wet Scrubber (PCY/WS) System via Press Hall and PCY	PM	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall	2.92 lbs/hr / 0.0206 lbs / MSF (3/8")
	PM_{10} / PM_{cond}	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall	5.26 lbs/hr / 0.0371 lbs / MSF (3/8")
	$PM_{2.5}$ / PM_{cond}	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall	5.15 lbs/hr / 0.0363 lbs/MSF (3/8")
	VOC	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall and Good Design and Operation	10.33 lbs/hr / 0.073 lbs/MSF (3/8")
	Opacity	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall	15%
	NOx	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall and Good Design and Operation	6.24 lbs/hr / 0.044 lbs/MSF (3/8")
	CO	Cyclone/Dust Collector and Cyclone/Wet Scrubber in Press Hall and Good Design and Operation	12.77 lbs/hr / 0.09 lbs/MSF (3/8")

D. Monitoring / Testing

1. PCY-4.1

   a. Install, operate, and maintain pressure drop devices at each dust collector. Record readings daily.
   b. Inspect annually for proper operation.
   c. Install COMS unit in outlet duct prior to venting into Dryer-3 stack.
   d. Conduct performance test to determine Subpart DDDD, Table 1B(2) compliance in accordance with Table 5(3)

e. Demonstrate continuous compliance according to 40 CFR 63.2269 and Table 2(4) to Subpart DDDD by continuously monitoring the pressure drop across the scrubber and the liquid flow rate to the scrubber. Data will be collected at 15-minute intervals. Hourly averages will be used to determine compliance. Operating parameters will be established during the performance test.

f. Submit Performance Total Enclosure (PTE) Verification.

2. Cyclones, CYMF, CYMT, CYDS, CYCTS, CYTG1, CYTG2, CYTG3 and Dust Collectors DCMF, DCMT, DCDS, DCCTS, DCSA, DCTG1, DCTG2, DCTG3, and Cyclone/Wet Scubber (WS) (PCY/WS) System

a. Operate in accordance with manufacturer recommendation

b. Inspect annually for proper operation or more often, if required, when monitoring parameters are not within the range of 1.0 – 8.0 in. H_2O.

c. Prepare and submit CAM Plan (if required) at time of incorporation of units into facility's Title V Operating Permit.

E. Recordkeeping and Reporting

1. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)

2. Submit Semi-Annual Compliance Report (SCR) and Semi-Annual Monitoring Report

3. A plan to address how organic HAPs captured in the wastewater from the scrubber are contained and destroyed to minimize release to the atmosphere such that the desired emission reductions are obtained will be submitted with the Notice of Compliance Status.

VI. Dust and Granulate Transfer and Storage

Description	Emission Point
1. Granulate	
a. Collected Granulate From Screeners to OSB Granulate Silo (OSBGS)	CF-19.1
b. Collected Granulate From DCMF to OSB Granulate Silo (OSBGS)	CF-11.1

c.	Collected Granulate From CYDS, CYCTS, CYTG1, and CYTG2 to OSB Granulate Silo (OSBGS)	CF-18.1
d.	Granulate Transferred From OSB Granulate Silo (MDFGS) to Particleboard Flaker Silo (PBFS)	CF-16.2
e.	Granulate Transferred From MDF Granulate Silo (OSBGS) to OSB Boiler Granulate Silo (OSBBGS)	CF-15.1
f.	Granulate Transferred From Particleboard Core Layer Dry Silo (PCLS) to OSB Core Layer Silo (OSBCS)	CF-16.1

2. Dust

a.	Collected Dust From Dryer Dust Collectors	CF-8.1
b.	Collected Dust From DCDS, DCCTS, DCTG1	CF-18.2
c.	Collected Dust From DCSA to OSB Dust Silo (OSBDS)	CF-10.1
d.	Collected Dust From Screeners to OSB Dust Silo (OSBDS)	CF-19.2
e.	Collected Dust From OSB Dust Silo (OSBDS) OSB Boiler Dust Silo (OSBBDS)	CF-12.1
f.	Collected Dust From OSB Boiler Dust Silo (OSBBDS) to MDF Dust Silo (MFDS)	CF-12.2
g.	Collected Dust From MDF Dust Silo (MDFDS) to OSB Boiler dust Silo (OSBBDS)	CF-13.1
h.	Collected Dust From DSCT1, DCST2, DCST3 CFF1, CFF2, CFF3, and CFF4 to OSB Dust Silo (OSBDS)	CF-14.1
i.	Collected Dust From DCSS, DCB, DCMF, and DCMT to OSB Dust Silo (OSBDS)	CF-9.1

A. Applicability

1. ADEM Code 335-3-14-.04

B. Emission Limit

1. Filterable PM (Total) – 0.78 lbs/hr and 0.002185 gr/dscf
2. Filterable PM_{10} (Total) – 0.57 lbs/hr and 0.00165 gr/dscf
3. Filterable $PM_{2.5}$ (Total) – 0.11 lbs/hr and 0.0003 gr/dscf
4. Opacity – 0%
5. VOC (Total) – 9.60 lbs/hr and 0.0045 lbs/MSF 3/8"

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Dust and Granulate Handling (Total)	PM	Cyclofilters	0.78 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Cyclofilters	0.57 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$	Cyclofilters	0.11 lbs/hr / 0.0003 gr/dscf
	VOC	Good Design and Operation	9.60 lbs/hr / 0.0045 lbs/MSF 3/8"
	Opacity	Good Design and Operation	0%

D. Monitoring

1. Observe daily for visible emissions.
2. Initiate corrective action within 24 hours if visible emissions are observed.
3. Inspect annually for proper operation
4. Prepare and submit CAM plan (if required) at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.

E. Recordkeeping and Reporting

1. Submit Semi-Annual Monitoring Report
2. Maintain records of all emission monitoring performed in a permanent form on-site and make available for inspection (5 years).

VII. Edge Sealer / Stenciling

Description	Emission Point
Edge Sealing Booth #1	ES (Discharges Inside Building)
Edge Sealing Booth #2	ES (Discharges Inside Building)
Edge Sealing Booth #3	ES (Discharges Inside Building)
Stenciling (T & I Activity)	S (Discharges Inside Building)

A. Applicability

1. ADEM Code 335-3-14-.04
2. ADEM Code 335-4-.02
3. NESHAP (Part 63, Subpart DDDD), Table 3(5), 6(5), and 8(5)

B. Emission Limits

1. Filterable PM (Each) – 0.033 lbs/hr and 0.147 tpy
2. Filterable PM_{10} (Each) – 0.017 lbs/hr and 0.074 tpy
3. Filterable $PM_{2.5}$ (Each) – 0.017 lbs/hr and 0.074 tpy
4. VOC (Total) – 0.011 lbs/hr and 0.047 tpy
5. HAPs (Total) – Use Non-HAP Coatings
6. Opacity – 0%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Three Edge Sealing Booths (Each	PM	Particulate Filters/ Building Enclosure	0.033 lbs/hr / 0.147 tpy
	PM_{10}	Particulate Filters/ Building Enclosure	0.017 lbs/hr / 0.074 tpy
	$PM_{2.5}$	Particulate Filters/ Building Enclosure	0.017 lbs/hr / 0.074 tpy
	VOC	Low VOC Paint and Good Design and Operation	0.011 lbs/hr / 0.047 tpy
	Opacity	Good Design and Operation	0%

D. Monitoring

1. Particulate Filters FES1, FES2, and FES3

   a. Operate in accordance with manufacturer recommendation

b. Inspect annually for proper operation or when problems are noted.

c. Use Non-HAP Coatings

E. Recordkeeping and Reporting

1. Maintain records of all emission monitoring performed in a permanent form on-site and make available for inspection (5 years).

B.

Thermal Oil Heaters K7/K8

I. 204.73 MMBTU/hr Wood-Fired Thermal Oil Heater (K7) / 204.73 MMBtu Wood-Fired Thermal Oil Heater (K8)

A. Applicable Regulations

Each unit is subject to the following regulations:

1. ADEM 335-3-14-.04
2. NSPS (40 CFR Part 60, Subpart Db – Standard of Performance for New Stationary Sources, Industrial-Commercial-Institutional Steam Generating Units) and ADEM 335-3-10-.02(2)(b)
3. NESHAP (40 CFR Part 63, Subpart DDDDD – Standard for Hazardous Air Pollutants for Industrial/Commercial/Institutional Boilers and Process Heaters) and ADEM 335-3-11-.06(1)

B. Emission Standards/Limits

Each heater is subject to the following emission standards:

Pollutant	Standard/Limit
PM (Filterable)	0.03 lbs/MMBtu input (NSPS) / 6.14 lbs/hr
PM (Filterable)	0.013 lbs/MMBtu input (NESHAP) / 2.66 lbs/hr
PM_{10} / PM_{cond}	0.03 lbs/MMBtu input / 6.14 lbs/hr
$PM_{2.5}$ / PM_{cond}	0.0287 lbs/MMBtu input / 5.87 lbs/hr
PM	0.17 gr/dscf @ 50% e.a. (SIP)
Opacity	10% avg. (NSPS / NESHAP)
SO_2	4.0 lbs/MMBtu input (SIP)
NO_x	0.18 lbs/MMBtu / 36.65 lbs/hr.
CO	390 ppm volume dry basis corrected to 3% oxygen (NESHAP) / 36.65 lbs/hr / (0.18lbs/MMBtu)
HCl	0.00021 lbs/MMBtu input (NESHAP)
Hg	0.0000008 lbs/MMBtu input (NESHAP)
GHG	224.464 CO_2 eq./MMBtu / 45,903 lbs/hr
VOC	7.32 lbs/hr / 0.036 lbs/MMBtu

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Two 204.73 MMBtu/hr Heaters (Each)	PM	Hybrid Filters for Each Heater Good Combustion Practices and Maintenance	2.66 lbs/hr / 0.013 lbs/MMBtu
	PM_{10} / PM_{cond}	Hybrid Filters for Each Heater Good Combustion Practices and Maintenance	6.14 lbs/hr / 0.03 lbs/MMBtu
	$PM_{2.5}$ / PM_{cond}	Hybrid Filters for Each Heater Good Combustion Practices and Maintenance	5.87 lbs/hr / 0.0287 lbs/MMBtu
	VOC	Good Combustion and Maintenance Good Design/Operation	7.32 lbs/hr / 0.036 lbs/MMBtu
	NO_x	Good Combustion and Maintenance Good Design/Operation	36.65 lbs/hr / 0.18 lbs/MMBtu
	CO	Good Combustion and Maintenance Good Design/Operation	36.65 lbs/hr / 0.18 lbs/MMBtu
	GHG	Good Combustion and Maintenance Good Design/Operation	45,903 lbs/hr / 224.464 CO_2/MMBtu

D. **Monitoring/Testing**

The units are subject to the following monitoring requirements:

1. Annual testing for compliance with MACT emission limit for particulate for three consecutive years. If three consecutive tests demonstrate compliance, frequency may be reduced to once every 36 months.

2. Fuel analysis every 5 years for MACT hydrogen chloride and mercury emission limits.

3. Install, operate, and maintain the new COMs according to PSI of 40 CFR Part 60, Appendix B (Required by MACT and NSPS).

4. Install, operate, and maintain existing CO/CO_2 CEMS according to PS 3 or 4A of 40 CFR Part 60, Appendix B (Required by MACT).

5. The biomass heaters will be tested under the following two scenarios: (1) fresh air used as combustion air, and (2) dryer air used as combustion air. The difference will be considered to be the dryers' contribution, and used to determine MACT compliance.

6. Install, operate, and maintain Secondary Electrical Power Input System.

7. Install, operate, and maintain Firebox Temperature Monitoring System.

8. For the COMs, the site-specific monitoring plan shall include, at a minimum, a daily calibration drift assessment, a quarterly performance audit, and an annual zero alignment audit (MACT).

9. Install and maintain equipment to monitor the performance of the SNCR system; establish operating parameter (i.e., injection rate) based on data collected during performance test.

10. Install and maintain equipment to monitor the performance of the lime injection system; establish operating parameter (i.e., injection rate) based on data collected during performance test.

11. Perform annual tune-up.

12. Conduct daily visual observations of heater stack

13. Annually inspect heaters to ensure unit is operating properly

14. Prepare and submit CAM Plan at time of incorporation of units into facility's Major Source Operating Permit.

E. Recordkeeping/Reporting

The units are subject to the following recordkeeping and recording requirements:

1. For MACT, reduce COMS data as specified in §63.8(g)(2) (6-minute averages) as well as, 1-hour block averages (10% opacity limit).

2. For NSPS, reduce COMS data to 6-minute averages (20% opacity limit.

3. For MACT, reduce CO CEMS data to 30-day rolling averages, recorded on a daily basis for the previous 30 operating days.

4. Maintain records of all performance testing and monitoring data.

5. Form COMS/CEMS, maintain records of all certifications, performance evaluations, inspections, calibrations, and validation checks.

6. Records of the amount of fuel combusted on a monthly basis (NSPS).

7. Calculate and record the annual capacity factor individually for wood and natural gas on a 12-month rolling basis. A new annual capacity factor must be calculated at the end of each calendar month.

8. Records of 3-hour block average injection rates for SNCR system.

9. Records of lime injection rates.

10. Submit semi-annual report for MACT (content specified in §63.7550(c)).

11. Submit semi-annual excess emission reports (content specified in §60.7(c)-(d).

12. Keep records of all daily visual observations and annual inspections

13. Records of 3-hour block average firebox temperatures.

14. Records of monthly and calendar year totals for each boiler.

C.

Thermal Oil Heaters K9, K10, K11, and K12

I. Thermal Oil Heaters K9, K10, K11, and K12

A. Applicable Regulations

Each unit is subject to the following regulations:

1. ADEM 335-3-14-.04
2. NESHAP (40 CFR Part 60, Subpart Db – Standard of Performance for New Stationary Sources, Industrial-Commercial-Institutional Steam Generating Units) and ADEM 335-3-10-.02(2)(b)
3. NESHAP (40 CFR Part 63, Subpart DDDDD – Standard for Hazardous Air Pollutants for Industrial/Commercial/ Institutional Boilers and Process Heaters) and ADEM 335-3-11-.06(1)

B. Emission Standards / Limits

1. Each unit is subject to the following emission standards:

   a. PM – 0.15 lbs/hr (0.00267 lbs/MMBtu)
   b. PM_{10} / PM_{cond} – 0.47 lbs/hr (0.00837 lbs/MMBtu)
   c. $PM_{2.5}$ / PM_{cond} – 0.47 lbs/hr (0.00837 lbs/MMBtu)
   d. VOC – 0.031 lbs/hr (0.00095 lbs/MMBtu)
   e. NO_x – 2.50 lbs/hr (0.0445 lbs/MMBtu)
   f. CO – 0.265 lbs/hr (0.00472 lbs/MMBtu)
   g. GHG – 6,785 lbs/hr (120.734 lbs/MMBtu)
   h. Opacity – 0%

2. BACT for all of the above is good combustion practices and maintenance and use of natural gas.

3. Comply with the applicable work practice standards stated 40 CFR §63.7540 and Table 3. This includes an annual tune-up of the unit.

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Four 56.20 MMBtu/hr Heaters (Each Heater)	PM	Good Combustion Practices and Maintenance Use of Natural Gas	0.15 lbs/hr (0.00267 lbs/MMBtu)
	PM_{10} / PM_{cond}	Good Combustion Practices and Maintenance Use of Natural Gas	0.47 lbs/hr (0.00837 lbs/MMBtu)
	$PM_{2.5}$ / PM_{cond}	Good Combustion Practices and Maintenance Use of Natural Gas	0.47 lbs/hr (0.00837 lbs/MMBtu)
	VOC	Good Combustion Practices and Maintenance Use of Natural Gas	0.031 lbs/hr (0.00095 lbs/MMBtu)
	NO_x	Good Combustion Practices and Maintenance Use of Natural Gas	2.50 lbs/hr (0.0445 lbs/MMBtu)
	CO	Good Combustion Practices and Maintenance Use of Natural Gas	0.265 lbs/hr (0.00472 lbs/MMBtu)
	GHG	Good Combustion Practices and Maintenance Use of Natural Gas	6,785 lbs/hr 120.734 lbs/MMBtu
	Opacity	Good Combustion Practices and Maintenance Use of Natural Gas	0%

D. Monitoring/Testing

Each unit is subject to the following monitoring requirements:

1. Conduct initial and triennial testing.
2. Calculate by monthly the quantity of natural gas consumed at each unit.
3. Conduct each subsequent annual tune-up not more than 13 months after the previous tune up [40 CFR §63.7515(d)].
4. Install, operate, and maintain COMs unit to be installed in the common exhaust duct for all four heaters.
5. Inspect heaters annually for proper operation.
6. Daily monitoring of natural gas combustion.

E. Recordkeeping/Reporting

Each unit is subject to the following recording and recording requirements:

1. Record and maintain records of the amount of natural gas combusted and visual observations.

2. Submit a Semi-Annual Monitoring Report (SMR) for the 56.20 MMBtu/hr Natural Gas Fired Thermal Oil Heaters (K9, K10, K11, and K12).
3. Submit Annual Compliance Certification for the 56.00 MMBtu/hr Natural Gas Fired Thermal Oil Heaters (K9, K10, K11, and K12).
4. Daily records of natural gas combustion.

D.

Emergency Generators #6, #7, and #8

I. Emergency Generators #6, #7, and #8 (1220 bHp Each)

A. Applicability

1. ADEM Admin. Code r. 335-3-16-.03, "Major Source Operating Permits"

2. National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63, Subpart ZZZZ,

3. 40 CFR 60, Subpart IIII, the Standards of Performance for Stationary Compression Ignition Internal Combustions Engines

B. Emission Standards/Limits

1. Shall not cause or allow either engine to operate more than 500 hours during any consecutive 12-month period.

2. Shall not discharge more than one 6-minute average opacity greater than 20% in any 60-minute period. At no time shall any source discharge a 6-minute average opacity of particulate emissions greater than 40%.

3. Opacity from the exhaust of each engine shall not exceed 0%.

4. The particulate emission rate from each engine shall not exceed 0.40 lb/hr/0.15 g/HP-hr.

5. The nitrogen oxide / volatile organic compound emission rate from each engine shall not exceed 12.91 lb/hr/4.8 g/HP-hr.

6. The carbon monoxide emission rate from each engine shall not exceed 6.99 lb/hr/2.6 g/HP-hr..

7. Shall not cause or allow the emissions from these units to exceed the applicable emission standards in 40 CFR §89.112, specifically

   (a) The sum of the emissions of non-methane hydrocarbons (NMHC) and nitrogen oxides (NOx) shall not exceed 4.8 g/bHp-hr;

   (b) Carbon monoxide emissions shall not exceed 2.6 g/bHp-hr.

   (c) Particulate matter (PM) emissions shall not exceed 0.15 g/hHp-hr.

9. The greenhouse gas (GHG) emission rate from each engine shall not exceed 1,150 lb/hr and 162.19 lb/MMBtu.

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Three 1,220 bHP Emergency Generators (Each)	PM	Tier 2 certified engine, good combustion practices and maintenance and use of ULSD fuel.	0.40 lbs/hr / 0.10 tpy (0.15 g/bHP-hr)
	PM_{10}	Tier 2 certified engine, good combustion practices and maintenance and use of ULSD fuel.	0.40 lbs/hr / 0.10 tpy (0.15 g/bHP-hr)
	$PM_{2.5}$	Tier 2 certified engine, good combustion practices and maintenance and use of ULSD fuel.	0.40 lbs/hr / 0.10 tpy (0.15 g/bHP-hr)
	PM_{cond}	Tier 2 certified engine, good combustion practices and maintenance and use of ULSD fuel.	0.06 lbs/ hr / 0.015 tpy
	NO_x/VOC	Tier 2 certified engine, good combustion practices and maintenance.	12.91 lbs/hr (4.8 g/bHP for NMHC & NO_x)
	CO	Tier 2 certified engine, good combustion practices and maintenance.	6.99 lbs/hr (2.6 g/bHP-hr)
	GHG	Tier 2 certified engine, good combustion practices and maintenance.	1,150 lbs/hr / 287.5 tpy
	Opacity	Tier 2 certified engine, good combustion practices and maintenance.	0%

D. Compliance Methods

1. Comply with the applicable requirements as specified in 40 CFR §63.6675, the permittee shall not operate these units except as allowed in §63.6640(f)(1) through (4), which includes the following:

   (a) Emergency situations;

   (b) Maintenance checks and readiness testing, not to exceed 100 hours per year; and

   (c) Non-emergency situations, not to exceed 50 hours per year (these 50 hours count toward the 100 hours per year allowed for maintenance checks and readiness testing). The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of the financial arrangement with another entity.

2. In accordance with 40 CFR 60.4206 and 60.4211(a), operate and maintain these units according to the manufacturer's written instructions.

3. In accordance with 40 CFR §60.4207, meet the following fuel requirements:

   (a) From initial startup until September 30, 2010, not burn any diesel fuel in the unit that does not meet the following per-gallon standards of 40 CFR §80.510(a):

      (i) Sulfur content shall not exceed 500 parts per million (ppm)

      (ii) Cetane index shall be a minimum of 40 or the aromatic content shall not exceed 35 volume percent

   (b) In accordance with 40 CFR, §60.4207, shall not burn any diesel fuel in this unit that does not meet the following per-gallon standards of 40 CFR §80.510(b):

      (i) Sulfur content shall not exceed 15 parts per million (ppm)

      (ii) Cetane index shall be a minimum of 40 or the aromatic content shall not exceed 35 volume percent

(c) In accordance with 40 CFR §60.4209, install and operate a non-resettable hour meter for these units

(d) In accordance with 40 CFR §60.4211(e), only operate these units as specified below:

(i) Emergency situations; and

(ii) Maintenance checks and readiness testing not to exceed 100 hours per year for these units.

E. Emission Monitoring

1. while the processes are operating, someone familiar with the process(s) shall observe the visible emissions from the exhaust associated with these processes a minimum of once daily during daylight hours for greater than normal visible emissions.

2. Whenever greater than normal visible emissions are observed from the exhausts, initiate corrective action as soon as practicable but no longer than 24 hours from the time of observation, followed by an additional observation to confirm that visible emissions have returned to normal.

3. Operate and maintain these units according to the manufacturer's emission-related written instructions or develop a maintenance plan that provides for, to the extent practicable, the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.

4. Install a non-resettable hour meter if one is not already installed.

5. Calculate by the 10th of each calendar month, for the previous calendar month, the total number of hours of operation for the calendar year for each emergency engine.

F. Recordkeeping and Reporting Requirements

1. To demonstrate compliance with the fuel limitations, maintain records of the sulfur content and either the Cetane index or aromatic content of the diesel fuel that is burned in this unit. Maintain in a permanent form suitable for inspection and make readily available for inspection upon request. Records shall be retained for a period of 5 years from the date of generation of each record.

2. Records must be kept for a period of five (5) years from the date of generation and the records must be kept in a suitable format and readily available for review.

3. Submit a Semiannual Monitoring Report (SMR) for the two (2) emergency engines (ENG-04 and ENG-05) to the Air Division no later than 30 days after the end of each semiannual reporting period (January 1st through June 30th and Julys 1st through December 31st).

4. Submit a Semiannual Compliance Report (SCR) for the two (2) engines (ENG-04 and ENG-05) to the Air Division no later than 30 days after the end of each semiannual reporting period (January 1st through June 30th and Julys 1st through December 31st).

PM Monitoring

Operation	Control Device Description	Control Device ID	Emission Point	Venting to Atmosphere				Venting Inside Building			
				Monitoring Method	Range	Frequency	Data Recording Method / Storage	Monitoring Method	Range	Frequency	Data Recording Method / Storage
A. Flaking	Flaker #1 Cyclofilter	CFFL1	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant
	Flaker #2 Cyclofilter	CFFL2	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
	Flaker #3 Cyclofilter	CFFL3	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
	Flaker #4 Cyclofilter	CFFL4	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
B. Stranding	Strander #1 Dust Collector	DCST1	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
	Strander #2 Dust Collector	DCST2	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
	Strander #3 Dust Collector	DCST3	Inside Strander Bldg	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System
C. Drying	Dryer #1 Dust Collector #1 (Zones 1, 2, 3, and 16)	D1C1	TOH-1	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #2 (Zones 4 and 15)	D1C2	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #3 (Zones 5 and 14)	D1C3	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #4 (Zones 6 and 13)	D1C4	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #5 (Zones 7 and 12)	D1C5	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #6 (Zones 8 and 11)	D1C6	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #1 Dust Collector #7 (Zones 9 and 10)	D1C7	TOH-1	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #1 (Zones 1, 2, 3, and 16)	D2C1	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #2 (Zones 4 and 15)	D2C2	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #3 (Zones 5 and 14)	D2C3	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #4 (Zones 6 and 13)	D2C4	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #5 (Zones 7 and 12)	D2C5	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #2 Dust Collector #6 (Zones 8 and 11)	D2C6	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded In the Plant HMI System	N/A	N/A	N/A	N/A

PM Monitoring

Operation	Control Device Description	Control Device ID	Emission Point	Venting to Atmosphere				Venting Inside Building			
				Monitoring Method	Range	Frequency	Data Recording Method / Storage	Monitoring Method	Range	Frequency	Data Recording Method / Storage
	Dryer #2 Dust Collector #7 (Zones 9 and 10)	D2C7	D-20.2	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #1 (Zones 1, 2, 3, and 16)	D3C1	TOH-1	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #2 (Zones 4 and 15)	D3C2	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust collector #3 (Zones 5 and 14)	D3C3	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #4 (Zones 6 and 12)	D3C4	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #5 (Zones 7 and 12)	D3C5	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #6 (Zones 8 and 11)	D3C6	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
	Dryer #3 Dust Collector #7 (Zones 9 and 10)	D3C7	D-20.3	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
Dryer #1 Emission Point	N/A	N/A	D-20.1	Visual Observations	10% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
Dryer #2 Emission Point	N/A	N/A	D-20.2	Visual Observations	10% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
Dryer #3 Emission Point	N/A	N/A	D-20.3	Visual Observations	10% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
D. Sifting / Screening	Sifting / Screening Dust Collector	DCSS	SS-2.2	Visual Observations	5%	Daily	Daily Logs	N/A	N/A	N/A	N/A
E. Blending / Gluing	Blending / Gluing Dust Collector	DCS	BG-2.1	Visual Observations	5%	Daily	Daily Logs	N/A	N/A	N/A	N/A
F. Forming and Trimming	Forming / Trimming Dust Collectors (2)	DCMF/DCMT	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
G. Pressing	Press Cyclone and Wet Scrubber	PCY/WS	D-20.3	COMs Unit	15%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
H. Finishing											
1. Diagonal Saw	Diagonal Saw Dust Collector	DCDS	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
2. Cut-To-Size Saw	Cut-To-Size Dust Collector	DCCTS	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
3. Sanding	Sanding Dust Collector	DCSA	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
4. Tongue and Groove #1	Tongue and Groove Line #1 Dust Collector	DCTG1	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
5. Tongue and Groove #2	Tongue and Groove Line #2 Dust Collector	DCTG2	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
6. Tongue and Groove #3	Tongue and Groove Line #3 Dust Collector	DCTG3	D-20.3	N/A	N/A	N/A	N/A	Pressure Drop Differencial	1.0 - 8.0 in H2O	Daily	Electronically Recorded in the Plant HMI System
I. Wood Granulates Transfer	Wood Granulate Cyclone	CF11.1	CF-11.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A

PM Monitoring

Operation	Control Device Description	Control Device ID	Emission Point	Venting to Atmosphere				Venting Inside Building			
				Monitoring Method	Range	Frenquency	Data Recording Method / Storage	Monitoring Method	Range	Frenquency	Data Recording Method / Storage
	Wood Granulate Cyclone	CF16.1	CF-16.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Granulate Cyclone	CF16.2	CF-16.2	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Granulate Cyclone	CF18.1	CF-18.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Granulate Cyclone	CF15.1	CF15.1								
	Wood Granulate Cyclone	CF19.1	CF19.1								
J. Wood Dust Transfer	Wood Dust Cyclone	CF8.1	CF-8.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF9.1	CF-9.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF19.2	CF-19.2	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF10.1	CF-10.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF12.1	CF-12.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF12.2	CF-12.2	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF13.1	CF-13.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF14.1	CF-14.1	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
	Wood Dust Cyclone	CF18.2	CF-18.2	Visual Observations	0%	Daily	Daily Logs	N/A	N/A	N/A	N/A
K. K7 (204.73 MMBtu/hr) Thermal Oil Heater	K7 Hybrid Filter	EF1	TOH-1	COMs Unit	10%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
L. K8 (204.73 MMBtu/hr) Thermal Oil Heater	K8 Hybrid Filter	EF2	TOH-1	COMs Unit	10%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
M. K9 (56.20 MMBtu/hr) Thermal Oil Heater	N/A	N/A	TOH-1	K9, K10, K11, and K12 have shared COMs Unit	0%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
N. K10 (56.20 MMBtu/hr) Thermal Oil Heater	N/A	N/A	TOH-2	K9, K10, K11, and K12 have shared COMs Unit	0%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
O. K11 (56.20 MMBtu/hr Thermal Oil Heater	N/A	N/A	EG-6	K9, K10, K11, and K12 have shared COMs Unit	0%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
P. K12 (56.20 MMBtu/hr) Thermal Oil Heater	N/A	N/A	EG-7	K9, K10, K11, and K12 have shared COMs Unit	0%	Continuous	Trace Environmental Software	N/A	N/A	N/A	N/A
Q. (3) 1,220 BHP Emergency Generators	N/A	N/A	EG-6, EG-7, and EG-8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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VOC Monitoring

Operation	Control Device Description	Control Device ID	Emission Point	Venting to Atmosphere				Venting Inside Building			
				Monitoring Method	Range	Frequency	Data Recording Method	Monitoring Method	Range	Frequency	Data Recording Method
A. Flaking (Flakers #1, #2, #3, and #4)	N/A	N/A	Inside Strander Bldg	N/A	N/A	N/A	N/A	Daily Wet Tons Throughput	<6690 wet tons/day @ 55% moisture	Daily	Electronically Recorded in the Plant HMI System
B. Stranding (Stranders #1, #2, and #3)	N/A	N/A	Inside Strander Bldg	N/A	N/A	N/A	N/A	Daily Wet Tons Throughput	<4390 wet ton /day @ 55% moisture	Daily	Electronically Recorded in the Plant HMI System
C. Drying											
Dryers 1, 2, 3	N/A	N/A	D-20.1-3	Daily Oven Dry Tons Throughput	<2917 odt/day Aggrigate of all 3 Dryers Combined	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
4. Dryer Zones #1, #2, #3, and #16 From Each Dryer	Thermal Oil Heater K7 or K8 Combustion Chambers	TOH1 or TOH2	TOH-1	MACT	MACT	MACT	MACT	N/A	N/A	N/A	N/A
D. Sifting/Screening	N/A	N/A	SS-2.2	Daily Oven Dry Tons Throughput	<2917 odt/day	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
E. Blending/Gluing	N/A	N/A	BG-2.1	Daily Oven Dry Tons Throughput	<2917 odt/day	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
F. Forming and Trimming	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
G. Pressing	Press Hall Cyclone and Wet Scrubber	PCYWS	D-20.3	Pressure Drop Differencial	2.0 – 6.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
				Liquid Flow Rate to Scrubber	800-1000 gpd Based Upon MDF Press Hall Scrubber	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
H. Finishing											
1. Diagonal Saw	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
2. Cut-To-Size Saw	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
3. Sanding	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
4. Tongue and Groove (Lines #1, #2, and #3)	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
I. Wood Granulate Transfer	N/A	N/A	CF-11.1, CF-16.1, CF-16.2, CF-18.1	Visual Observations	0% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
J. Wood Dust Transfer	N/A	N/A	CF-8.1, CF-9.1, CF-10.1, CF-12.1, CF-12.2, CF-13.1, CF-14.1, CF-18.2	Visual Observations	0% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
K. Thermal Oil Heaters K7 and K8	N/A	N/A	TOH-1	K7 and K8 Combustion Chamber Temperature	At or Above Temperature Established in Performance Test	Continuous	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
L. Thermal Oil Heaters K9, K10, K11, and K12	N/A	N/A	TOH-1	Combust Natural Gas Natural Gas Usage and Recording	N/A	Daily	Daily Logs	N/A	N/A	N/A	N/A
M. (3) 1,220 BHP Emergency Generators	N/A	N/A	EG-6, EG-7, and EG-8	N/A	N/A	On-Going	Plant Records	N/A	N/A	N/A	N/A

807d

Operation	NOx			HCl		
	Heater Urea Injection Rate (l / hr)	Monitoring Frequency	Data Recording Method / Storage	Baghouse Lime Injection Rate (kg / hr)	Monitoring Frequency	Data Recording Method / Storage
A. K7 (204.73 MMBtu/hr) Thermal Oil Heater	55 - 82 l / hr 14.6 - 21.5 gal / hr	Continuous	Electronically Recorded in the Plant HMI System	37 - 61 kg / hr 81.40 - 134.82 lbs / hr	lbs / hr Once Per Eight Hours	Electronically Recorded in the Plant HMI System
B. K8 (204.73 MMBtu/hr) Thermal Oil Heater	55 - 82 l / hr 14.6 - 21.5 gal / hr	Continuous	Electronically Recorded in the Plant HMI System	37 - 61 kg / hr 81.40 - 134.82 lbs / hr	lbs / hr Once Per Eight Hours	Electronically Recorded in the Plant HMI System

Operation	CO			NOx		
	Monitoring Method	**Monitoring Frequency**	**Data Recording Method/Storage**	**Monitoring Method**	**Monitoring Frequency**	**Data Recording Method/Storage**
A. K9, K10, K11, and K12 Thermal Oil Heaters (56.20 MMBtu/hr) - Each	Combustion of Natural Gas Only / Records of Natural Gas Usage	Daily	Electronically Recorded in the Plant HMI System	Combustion of Natural Gas Only / Records of Natural Gas Usage	Daily	Electronically Recorded in the Plant HMI System
B. K7 and K8 Thermal Oil Heaters (204.73 MMBtu/hr) - Each	CO CEMS Unit Converting ppm to lbs/hr (BACT) Utilizing the F-Factor	Continuous	30-Day Rolling Average Electronically Recorded in the Plant HMI System			

Operation	GHG		
	Monitoring Method	Monitoring Frequency	Data Recording Method/Storage
A. K7 (204.73 MMBtu/hr) Thermal Oil Heater	Wood Waste Consumption	Daily	Electronically Recorded in the Plant HMI System
B. K8 (204.73 MMBtu/hr) Thermal Oil Heater	Wood Waste Consumption	Daily	Electronically Recorded in the Plant HMI System
C. K9, K10, K11, and K12 Thermal Oil Heaters (56.20 MMBtu/hr) -Each	Natural Gas Consumption	Daily	Electronically Recorded in the Plant HMI System

VII.

Fugitive Dust Control Plan

Table of Contents

1.0 Introduction
2.0 Health and Environmental Impacts
3.0 Plan Objectives
4.0 Facility Operations
5.0 Fugitive Dust Sources and Controls
6.0 Inspections
7.0 Training
8.0 Recordkeeping/Reporting
9.0 Record of Revisions and Updates

1.0 Introduction

Fugitive dust is particulate matter resulting from industrial activities generated in the open air (e.g., not through a stack). It includes both visible and non-visible particulate matter.

The Alabama Department of Environmental Management (ADEM) regulates fugitive dust pursuant to Alabama Code of Admin. Rule 335-3-4-.02, *Fugitive Dust*. This rule states that "no person shall cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. The facility location map is shown as Figure 1.

2.0 Health and Environmental Impacts

Fugitive dust is an air pollutant that can be generated during activities such as sawmill operations. Not only is dust a hazard to workers, it is a hazard to the public and affects the environment.

2.1 Health Hazards

Fine dust inhaled deep into the lungs has been linked to a variety of health problems, ranging from nose and throat irritation to respiratory illnesses, such as bronchitis, lung-damage, and asthma. The silica in dust has been shown to cause silicosis, chronic obstructive pulmonary disease, and renal disease.

2.2 Environmental Hazards

Dust can migrate into nearby surface water, where it affects aquatic communities and contributes to the nutrient loading of the surface water ecosystem. Additionally, fugitive dust that settles on nearby vegetation can weaken or kill the vegetation.

Wind generation of dust particles can cause the erosion of valuable topsoil and contribute to the soiling and discoloration of personal property.

3.0 Plan Objectives

The Fugitive Dust Control Plan identifies control measures and practices to minimize and control fugitive dust. The plan defines the ways in which personnel and subcontractors will mitigate dust emissions at the plant.

To meet these objectives, the Fugitive Dust Control Plan:

- Identifies potential fugitive dust sources at the facility
- Identifies control measures and practices to control and minimize fugitive dust
- Identifies fugitive dust control record keeping requirements
- Identifies fugitive dust control notification requirements

4.0 Facility Operations

Kronospan, LLC (KRONOSPAN) conducts the following operations at their Eastaboga facility:

- Medium-density fiberboard (MDF) manufacturing
- Particleboard (PB) manufacturing
- Urea-formaldehyde resin manufacturing
- Laminated flooring (LF) manufacturing
- Oriented Strand Board (OSB) manufacturing (New)
- Co-generation (heat and powered) operations

5.0 Fugitive Dust Sources and Controls

Potential sources of fugitive dust include the following:

- Exposed material (chips/sawdust, etc.) handling and storage area
- MDF, PB, LF, and OSB manufacturing
- Access Roads

5.1 Exposed Material Handling (Chips, Sawdust, etc.)

5.1.1 Activities

$PM_{2.5}$ emissions are minimized by the use of enclosed structures. The transfer and storage of chips and sawdust from the chipper to the outside storage pile is accomplished using a radial stacker that minimizes the material drop height thereby reducing the potential for $PM_{2.5}$ emissions.

5.1.2 Precautions

- If necessary, keep the transfer (storage) area wet, by using water sprays, to prevent windblown emissions.
- Maintain low drop heights for material handling activities. If necessary, install and maintain dust curtains around material

transfer points, to reduce air movement and isolate dust forming operations.

5.2 MDF, PB, LF, and OSB Manufacturing Operations

5.2.1 Activities

The settling of particulate matter from outside cyclones and baghouses at the MDF, PB, LF, and OSB operations may be a source of $PM_{2.5}$.

5.2.2 Precautions

- Sweep air pollution control device area
- If necessary, keep air pollution control device areas wet, by using water sprays, to prevent windblown emissions.

5.3 Access Roads

5.3.1 Activities

Drag-out tracks from the material handling and storage areas and control device fallout areas can contribute to the formation of fugitive dust.

5.3.2 Precautions

- Sweep effected areas
- Utilize water trucks to prevent fugitive dust from being airborne on an as needed basis.
- Limit vehicle speeds to 5 mph.

6.0 Inspections

In order to assure that the fugitive dust control measures outlined in this Plan are implemented and effective, they will be assessed in the monthly inspection. If all procedures are being conducted as out lined in this Plan, this will be noted accordingly on the inspection form. If repairs are required or process improvements can be made, this will be noted on the inspection form and a timeline for repairs and improvements will be outlined. Inspections will be performed by Michael Wilson, Environmental Manager, or his designee.

The inspection form is enclosed as Attachment A.

7.0 Training

Training is a critical component to the fugitive dust control plan. Training will include a review of the work activities and job site conditions that create dust, proper use of equipment and best management practices to prevent and control dust, and when to take corrective action. All employees will be trained annually.

8.0 Recordkeeping/Reporting

All inspection records will be kept in the office of the Environmental Manager and will be made available to ADEM upon request. All records will be kept for a minimum of five (5) years.

9.0 Record of Revisions and Updates

This Fugitive Dust Control Plan will be assessed annually. As part of the assessment, all processes and procedures will be reviewed for their effectiveness and efficiency at minimizing or eliminating the generation of fugitive dust. If any new measures have been implemented during the year, these will be incorporated into the plan.

The record is enclosed as Attachment B.

Attachment A

Inspection Log

Fugitive Dust Site Inspection Form

Inspection Criteria	Observations	Follow-Up Action	Status	Inspection Initials
Is visible dust observed?				
Is facility well maintained (i.e., good housekeeping, area cleaned up?)				
Are proper control measures used (e.g., sweeper, water truck, etc.)?				
Are vehicles moving below speed limit?				
Are appropriate haul sizes maintained on haul vehicles (if applicable)?				
Are storage pile heights maintained below level of windbreak (if applicable)?				
Are low drop heights maintained for material handling activity?				

_____

Date

Attachment B

Record of Revisions and Updates

Record of Revisions and Updates

Revision Number	Date	Revisions Made	By Whom
		Initial Issue	

Oriented Strand Board (OSB) Manufacturing Operation
PSD Air Permit Application

RECEIVED
JUN 26 2026
ADEM AIR DIVISION
FEE EX 06/26/2026

KRONOSPAN, LLC
1 Kronospan Way
Eastaboga, Alabama 36260

April 2026
Corrected Pages Only - June 2026

LAYTON
ENVIRONMENTAL ENGINEERING, LLC

1900 Crestwood Blvd., Suite 114
Birmingham, Alabama 35210

Phone (205) 951-3700

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 requirements.

Emission unit or source: I. OSB Plant
B. Stranding/Flaking (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
Inside Strander Building (Stranding)	PM	0.15 lbs/hr / (0.002185 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	PM_{10}	0.108 lbs/hr / (0.0016 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	$PM_{2.5}$	0.021 lbs/hr / (0.0003 gr/dscf)	SIP (335-3-14-.04)	Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	VOC	2.67 lbs/hr / (0.015 lbs/wet tons @ 55% moisture)	SIP (335-3-14-.04)	Good Design and Operation / Daily Throughput Daily Pressure Differential Monitoring and Recording	X	
	Opacity	5%	SIP (335-3-4-.02)	Daily Visual Observations Daily Pressure Differential Monitoring and Recording	X	
Inside Strander Building (Flaking)	PM	0.06 lbs/hr / (0.002185 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	PM_{10}	0.044 lbs/hr / (0.0016 gr/dscf)	SIP (335-3-14-.04)	Good Operating Practices Daily Pressure Differential Monitoring and Recording	X	
	$PM_{2.5}$	0.008 lbs/hr / (0.0003 gr/dscf)	SIP (335-3-14-.04)	Good Design and Operation Daily Pressure Differential Monitoring and Recording	X	
	VOC	22.78 lbs/hr / 36.69 tpy / (0.082 lbs/wet tons @ 55% moisture)	SIP (335-3-14-.04)	Good Design and Operation / Daily Throughput Daily Pressure Differential Monitoring and Recording	X	
	Opacity	5%	SIP (335-3-4-.02)	Daily Visual Observations	X	
		Annual flaker production is limited to 896,900 wet tons @ 55% moisture per year.				
NOTE: gr/dscf values are from the dust collector exhaust and does not include building enclosure emission reduction factor. Daily monitoring and recording of Strander and Flaker throughputs.						

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
C. Drying (Dryers #1, #2, and #3) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
D-20.1	PM	12.80 lbs/hr/ (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operations Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operations Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR Part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	
D-20.2	PM	12.80 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63 CFR, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Emission unit or source: I. OSB Plant
C. Drying (Dryers #1, #2, and #3) (description)

Emission Point No.	Pollutant [4]	Standard	Program [1]	Method used to determine compliance	Compliance Status	
					IN[2]	OUT[3]
D-20.3 (Dryers Only)	PM	12.80 lbs/hr (0.002185 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	PM_{10} / PM_{cond}	9.66 lbs/hr (0.00165 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	$PM_{2.5}$ / PM_{cond}	1.76 lbs/hr (0.0003 gr/dscf)	SIP (335-3-14-.04)	Annual Testing / Daily Visual Observations Daily Pressure Differential Monitoring	X	
	NO_x	0.31 lbs/hr (0.0077 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	CO	3.84 lbs/hr (0.095 lbs/odt)	SIP (335-3-14-.04)	Good Design / Good Operation Initial Testing and Once / Permit Term Testing	X	
	Opacity	10%	SIP (335-3-14-.04)	Daily Visual Observations	X	
	HAPs	Part 63 CFR, Subpart DDDD, Table 1B*	SIP (335-3-14-.04) 40 CFR part 63, Subpart DDDD	Annual Testing / Collecting and Recording Thermal Oil Heaters K7 and K8 Temperature	X	
	VOC	30.38 lbs/hr (0.75 lbs/ODT)	SIP (335-3-14-.04)	Annual Testing	X	

Note: Daily monitoring and recording of dryer throughput shall be performed.

[1] PSD, non-attainment NSR, NSPS, NESHAP (40 CFR Part 61), NESHAP (40 CFR Part 63), accidental release (112(r)), SIP regulation, Title IV, Enhanced Monitoring , Title VI, Other (specify)
[2] Attach compliance plan
[3] Attach compliance schedule (ADEM Form-437)
[4] Fugitive emissions must be included as separate entries

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

Insignificant Activity	Basis
PMDI Storage Tanks	Deminimus
Wax Storage Tanks	Deminimus
Hardener Storage Tanks	Deminimus
Release Agent Storage Tanks	Deminimus
Shuttle Wagon	Deminimus
Bucket Wheel Loader	Deminimus
Forklifts	Deminimus
Stenciling	Deminimus
Wood Granulate and Dust Handling	Deminimus

II. Strand/Flaking Preparation (Stranding and Flaking)

Description	Emission Point
Strander #1	Discharges Inside Strander Building
Strander #2	Discharges Inside Strander Building
Strander #3	Discharges Inside Strander Building
Flaker #1	Discharges Inside Strander Building
Flaker #2	Discharges Inside Strander Building
Flaker #3	Discharges Inside Strander Building
Flaker #4	Discharges Inside Strander Building

A. Applicability

1. ADEM Code 335-3-14-.04
2. ADEM Code 334-4-.02

B. Emission Limits

1. Stranders (3 Total)

a.	PM (Filterable)	-	0.15 lbs/hr / 0.002185 gr/dscf
b.	PM_{10} (Filterable)	-	0.018 lbs/hr / 0.0016 gr/dscf
c.	$PM_{2.5}$ (Filterable)	-	0.021 lbs/hr / 0.0003 gr/dscf
d.	VOC	-	2.67 lbs/hr / 0.15 lbs/wet ton @ 55% moisture
e.	Opacity	-	5%

2. Flakers (4 Total)

a.	PM (Filterable)	-	0.06 lbs/hr / 0.002185 gr/dscf
b.	PM_{10} (Filterable)	-	0.044 lbs/hr / 0.0016 gr/dscf
c.	$PM_{2.5}$ (Filterable)	-	0.008 lbs/hr / 0.0003 gr/dscf
d.	VOC	-	0.082 lbs/wet ton @ 55% moisture / 36.69 tpy
e.	Limit annual flake production to 896,900 wet tons @ 55% moisture per year		
f.	Opacity	-	5%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
1. Stranders (3 Total)	PM	Dust Collector and Good Design / Operation	0.15 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector and Good Design / Operation	0.108 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$	Dust Collector and Good Design / Operation	0.021 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector and Good Design / Operation	5%
	VOC	Good Design / Operation	2.67 lbs/hr / 0.15 lbs wet tons @ 55% moisture
2. Flakers (4 Total)	PM	Dust Collector and Good Design / Operation	0.06 lbs/hr / 0.002185 gr/dscf
	PM_{10}	Dust Collector and Good Design / Operation	0.044 lbs/hr / 0.0016 gr/dscf
	$PM_{2.5}$	Dust Collector and Good Design / Operation	0.008 lbs/hr / 0.0003 gr/dscf
	Opacity	Dust Collector and Good Design / Operation	5%
	VOC	Good Design / Operation	0.082 lbs wet tons @ 55% moisture / 36.69 lbs/hr

D. Monitoring

1. Dust Collectors DCST1, DCST2, DCST3, CFF1, CFF2, CFF3, and CFF4
   a. Good Design and Operation / BACT
   b. Good Operating Practices / BACT
   c. Install, operate, and maintain pressure drop devices at dust collectors. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.
   d. Prepare and submit CAM Plan at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.
   e. PM (all species) initial and triennial testing
   f. Daily monitoring of Strander and Flaker throughputs.

E. Recordkeeping and Reporting

1. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)
2. Submit Semi-Annual Monitoring Report
3. Daily recording of Strander and Flaker throughputs.

III. Drying

Description	Emission Point
Dryer #1	D-20.1
Dryer #2	D-20.2
Dryer #3	D-20.3

A. Applicability

1. 40 CFR, Part 63, Subpart DDDD
2. ADEM Code 335-3-14-.04

B. Emission Standards / Limits

Each Dryer is subject to the following emission limits:

1. Zones 1, 2, 3, and 16 (Vented to Thermal Oil Heaters K7 and K8)

   a. Comply with one of the following options identified in Part 63, Subpart DDDD, Table 1B at the time of testing.

      (1) Reduce emissions of total HAP, measured as THC (as carbon), by 90 percent; or
      (2) Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd; or
      (3) Reduce methanol emissions by 90 percent; or
      (4) Limit methanol emission to less than or equal to 1 ppmvd if uncontrolled methanol emission entering the control device are greater than or equal to 10 ppmvd; or
      (5) Reduce formaldehyde emissions by 90 percent; or
      (6) Limit formaldehyde emissions to less than or equal to 1 ppmvd if uncontrolled formaldehyde emission entering the control device are greater than or equal to 10 ppmvd.

2. Zones 4 – 15 (Vented to Atmosphere)

   a. PM (Filterable) – 12.80 lbs/hr (0.002185 gr/dscf)
   b. PM_{10}/PM_{cond} – 9.66 lbs/hr (0.00165 gr/dscf)
   c. $PM_{2.5}/PM_{cond}$ – 1.76 lbs/hr (0.0003 gr/dscf)
   d. VOC – 30.38 lbs/hr (0.75 lbs/ODT)
   e. NO_x – 0.31 lbs/hr / (0.0077 lbs/ODT)
   f. CO – 3.84 lbs/hr / (0.095 lbs/ODT)
   g. Opacity – 10%

C. BACT

Source	Pollutant	Proposed BACT	BACT Limits
Each Dryer	PM	Dust Collector for Each Dryer and Good Design/Operation	12.80 lbs/hr / 0.002185 gr/dscf
	PM_{10} / PM_{cond}	Dust Collector for Each Dryer and Good Design/Operation	9.66 lbs/hr / 0.00165 gr/dscf
	$PM_{2.5}$ / PM_{cond}	Dust Collector for Each Dryer and Good Design/Operation	1.76 lbs/hr / 0.0003 gr/dscf
	VOC	Good Design/Operation	30.38 lbs/hr / 0.75 lbs/ODT
	NO_x	Good Design/Operation	0.31 lbs/hr / 0.0077 lbs / ODT
	CO	Good Design/Operation	3.84 lbs/hr / 0.095 lbs ODT
	Opacity	Dust Collector for Each Dryer and Good Design/Operation	10%

D. Monitoring

Each dryer is subject to the following monitoring requirements:

1. Zones 1, 2, 3, and 16 (Vented to Thermal Oil Heater K7 and K8)

   a. Collect, record, and maintain the 3-hour block average K7 and K8 firebox temperature above the minimum temperature established during the performance test.
   b. Install, operate, and maintain pressure drop devices at dust collectors. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.

2. Zones 4 – 15 (Venting to Atmosphere)

   a. Observe daily for greater than normal emissions (exhaust stacks)
   b. Initiate corrective action within 24 hours if greater than normal emissions are observed
   c. Inspect annually for proper operation
   d. Install, operate, and maintain pressure drop recording devices at each dust collector. Record daily. Maintain pressure drop between manufacturer's recommended setting range of 1.0 – 8.0 in. H_2O.

3. Prepare and submit CAM Plan at time of incorporation of units into facility's Title V Operating Permit. The proposed monitoring meets CAM requirements.

4. Daily monitoring of Dryer throughput.

E. Testing (PM – all species, and VOC)

1. Conduct annual compliance testing

   a. MACT testing will be performed at Thermal Oil Heaters #1 and #2 firebox inlet and outlet.
   b. BACT testing will be performed at Dryer #1, Dryer #2, and Dryer #3 exhaust stacks.

2. NOx/CO

   Initial testing and once / permit term testing

F. Recordkeeping and Reporting

1. Submit Semi-Annual Monitoring Report
2. Maintain records of all emission monitoring performed in a permanent form on-site and available for inspection (5 years)
3. Daily recording of Dryer throughput

IV. Sifting and Gluing

Description	Emission Point
Sifter/Screen	SS-2.2
Blending (Gluing)	BF-2.1

A. Applicability

1. ADEM Code 335-3-14-.04
2. 40 CFR Part 63, Subpart DDDD

B. Emission Limits

1. Sifter/Screening

   a. PM (Filterable) – 0.80 lbs/hr (0.002185 gr/dscf)
   b. PM_{10}/PM_{cond} – 0.60 lbs/hr (0.00165 gr/dscf)
   c. $PM_{2.5}/PM_{cond}$ – 0.11 lbs/hr (0.0003 gr/dscf)
   d. VOC – 17.62 lbs/hr (0.145 lbs/ODT)
   e. Opacity – 0%

VOC Monitoring

Operation	Control Device Description	Control Device ID	Emission Point	Venting to Atmosphere				Venting Inside Building			
				Monitoring Method	Range	Frequency	Data Recording Method	Monitoring Method	Range	Frequency	Data Recording Method
A. Flaking (Flakers #1, #2, #3, and #4)	N/A	N/A	Inside Strander Bldg	N/A	N/A	N/A	N/A	Daily Wet Tons Throughput	<6690 wet tons/day @ 55% moisture	Daily	Electronically Recorded in the Plant HMI System
B. Stranding (Stranders #1, #2, and #3)	N/A	N/A	Inside Strander Bldg	N/A	N/A	N/A	N/A	Daily Wet Tons Throughput	<4390 wet ton /day @ 55% moisture	Daily	Electronically Recorded in the Plant HMI System
C. Drying											
Dryers 1, 2, 3	N/A	N/A	D-20.1-3	Daily Oven Dry Tons Throughput	<2917 odt/day Aggrigate of all 3 Dryers Combined	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
4. Dryer Zones #1, #2, #3, and #16 From Each Dryer	Thermal Oil Heater K7 or K8 Combustion Chambers	TOH1 or TOH2	TOH-1	MACT	MACT	MACT	MACT	N/A	N/A	N/A	N/A
D. Sifting/Screening	N/A	N/A	SS-2.2	Daily Oven Dry Tons Throughput	<2917 odt/day	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
E. Blending/Gluing	N/A	N/A	BG-2.1	Daily Oven Dry Tons Throughput	<2917 odt/day	Hourly	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
F. Forming and Trimming	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
G. Pressing	Press Hall Cyclone and Wet Scrubber	PCYWS	D-20.3	Pressure Drop Differencial	2.0 – 6.0 in H2O	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
				Liquid Flow Rate to Scrubber	800-1000 gpd Based Upon MDF Press Hall Scrubber	Daily	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
H. Finishing											
1. Diagonal Saw	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
2. Cut-To-Size Saw	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
3. Sanding	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
4. Tongue and Groove (Lines #1, #2, and #3)	N/A	N/A	D-20.3	N/A	N/A	N/A	N/A	Daily MSF (3/8") Throughput	<3404 MSF/day (3/8" Basis)	Daily	Electronically Recorded in the Plant HMI System
I. Wood Granulate Transfer	N/A	N/A	CF-11.1, CF-16.1, CF-16.2, CF-18.1	Visual Observations	0% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
J. Wood Dust Transfer	N/A	N/A	CF-8.1, CF-9.1, CF-10.1, CF-12.1, CF-12.2, CF-13.1, CF-14.1, CF-18.2	Visual Observations	0% Opacity	Daily	Daily Logs	N/A	N/A	N/A	N/A
K. Thermal Oil Heaters K7 and K8	N/A	N/A	TOH-1	K7 and K8 Combustion Chamber Temperature	At or Above Temperature Established in Performance Test	Continuous	Electronically Recorded in the Plant HMI System	N/A	N/A	N/A	N/A
L. Thermal Oil Heaters K9, K10, K11, and K12	N/A	N/A	TOH-1	Combust Natural Gas Natural Gas Usage and Recording	N/A	Daily	Daily Logs	N/A	N/A	N/A	N/A
M. (3) 1,220 BHP Emergency Generators	N/A	N/A	EG-6, EG-7, and EG-8	N/A	N/A	On-Going	Plant Records	N/A	N/A	N/A	N/A

807d

Operation	CO			NOx		
	Monitoring Method	**Monitoring Frequency**	**Data Recording Method/Storage**	**Monitoring Method**	**Monitoring Frequency**	**Data Recording Method/Storage**
A. K9, K10, K11, and K12 Thermal Oil Heaters (56.20 MMBtu/hr) - Each	Combustion of Natural Gas Only / Records of Natural Gas Usage	Daily	Electronically Recorded in the Plant HMI System	Combustion of Natural Gas Only / Records of Natural Gas Usage	Daily	Electronically Recorded in the Plant HMI System
B. K7 and K8 Thermal Oil Heaters (204.73 MMBtu/hr) - Each	CO CEMS Unit Converting ppm to lbs/hr (BACT) Utilizing the F-Factor	Continuous	30-Day Rolling Average Electronically Recorded in the Plant HMI System			

Operation	GHG		
	Monitoring Method	Monitoring Frequency	Data Recording Method/Storage
A. K7 (204.73 MMBtu/hr) Thermal Oil Heater	Wood Waste Consumption	Daily	Electronically Recorded in the Plant HMI System
B. K8 (204.73 MMBtu/hr) Thermal Oil Heater	Wood Waste Consumption	Daily	Electronically Recorded in the Plant HMI System
C. K9, K10, K11, and K12 Thermal Oil Heaters (56.20 MMBtu/hr) -Each	Natural Gas Consumption	Daily	Electronically Recorded in the Plant HMI System

Best Available Control Technology (BACT) Analysis

PREPARED FOR
Kronospan, LLC

DATE
6 March 2025; Rev. 1: 16 July 2025; Rev.2: 13 October 2025; Rev.3: 25 November 2025; Rev. 4: 04 February 2026; Rev. 5: 31 March 2026

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Best Available Control Technology (BACT) Analysis

0619650

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APPENDIX A COST EFFECTIVENESS CALCULATIONS

APPENDIX B SOURCE TEST REPORT FOR KRONOSPAN LLC, SHIPPENVILLE, PA

1. BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS

1.1 BACT OVERVIEW

Facility Name: Kronospan, LLC

Facility Location: Eastaboga, Calhoun County, Alabama

Kronospan, LLC (Kronospan) plans to construct and operate an oriented strand board (OSB) plant within their existing facility in Alabama. Maximum production capacity for the OSB plant will be 141.842 1000 square feet per hour (MSF/hr) on a 3/8" basis and 121.53 oven dried tons per hour (ODT/hr).

1.2 REQUIREMENT FOR BEST AVAILABLE CONTROL TECHNOLOGY

The OSB plant proposed by Kronospan will be subject to Best Available Control Technology BACT). The Alabama regulatory requirements are included below.

Chapter 335-3-14-.04 Air Permits Authorizing Construction In Clean Air Areas [Prevention Of Significant Deterioration Permitting (PSD)].

(1) Applicability.

(1)(a) The requirements of this Rule apply to the construction of any new major stationary source (as defined in subparagraph (2)(a) of this Rule) or any project at an existing major stationary source in an area designated as attainment or unclassifiable under sections 107(d)(1)(A)(ii) or (iii) of the Clean Air Act.

(1)(b) The requirements of paragraphs (9) through (17) of this Rule apply to the construction of any new major stationary source or the major modification of any existing major stationary source, except as this Rule otherwise provides.

(1)(c) No new major stationary source or major modification to which the requirements of paragraphs (9) through (17)(c) of this Rule apply shall begin construction without a permit that states that the major stationary source or major modification will meet those requirements.

(1)(d) Except as otherwise provided in subparagraph (1)(j) of this Rule, and consistent with the definition of major modification contained in subparagraph (2)(b) of this Rule, a project is a major modification for a regulated NSR pollutant only if it causes two types of emissions increases - a significant emissions increase [as defined in subparagraph (2)(mm) of this Rule], and a significant net emissions increase [as defined in subparagraphs (2)(c) and (2)(w) of this Rule].

(1)(e) Before beginning actual construction, the procedure for calculating whether a significant emissions increase will occur depends upon the type of emissions units being modified, according to subparagraphs (1)(f) through (i) of this Rule. The procedure for calculating whether a significant net emissions increase will occur at the major stationary source is contained in the definition in subparagraph (2)(c) of this Rule. Regardless of any such preconstruction projections,

a major modification can result only if the project causes a significant emissions increase and a significant net emissions increase.

Emissions of air contaminants subject to BACT include those listed in the following table.

Pollutant	Emissions Rate (tons per year)	Significant
Carbon monoxide	100	Yes
Nitrogen oxides	40	Yes
Sulfur dioxide	40	No
Particulate matter	25	Yes
PM_{10}	15	Yes
$PM_{2.5}$	10 (of direct PM2.5) 40 (of SO2 or NOx)	Yes
Ozone	40 (of VOC or NOX)	Yes
Lead	0.6	No
Fluorides (excluding HF)	3	No
Sulfuric acid mist	7	No
Hydrogen sulfide (H_2S)	10	No
Total reduced sulfur (including H_2S)	10	No
Reduced sulfur compounds (including H_2S)	10	No
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	3.5 x E-06	No
Municipal waste combustor metals (measured as particulate matter)	15	No
Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride)	40	No
Municipal solid waste landfill emissions (measured as nonmethane organic compounds)	50	No

Greenhouse gases (GHGs) CO_2e	75,000	Yes

This BACT analysis addresses BACT determinations for particulate matter (PM), volatile organic compounds (VOC), nitrogen oxides (NOx), carbon monoxide (CO), and greenhouse gas (GHG) emissions.

1.3 NSR BACT AND PROPOSED EMISSION SOURCES

This permit application requests construction of new sources with emissions of Filterable PM, NOx, CO, VOC, PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), and condensable particulate matter (CPM). Since the Kronospan facility is located in areas designated as unclassifiable/attainment areas, the NSR requirements are triggered for Filterable PM, PM_{10}, $PM_{2.5}$, VOC, NOx, CO, and GHG. Emissions of SO_2 do not need to be included in this BACT analysis because SO_2 emissions do not result in a significant emissions increase and a significant net emissions increase.

The scope of the BACT review includes the following source categories:

- Each emissions unit that emits Filterable PM, PM_{10}, $PM_{2.5}$, and VOC from processing and handling of wood and solid materials. These activities include the following:
    - Flakers #1 to #4;
    - Stranders #1 to #3;
    - Blending/Gluing;
    - Sifter/Screening;
    - Forming Line;
    - Mat Saw;
    - Diagonal Saw;
    - Cut-to-Size Saw;
    - Tongue and Groove Lines #1 to #3;
    - Sanding;
    - Dust and Granulate Handling; and
    - Edge Sealing Booths #1 to #3;
- Each emissions unit that emits filterable PM, PM_{10}, $PM_{2.5}$, VOC, NO_x, and CO from manufacturing OSB product. These units include the following:
    - OSB Press; and
    - Belt Dryers #1 to #3;

- Each emissions unit that directly emits Filterable PM, PM_{10}, $PM_{2.5}$, CPM, VOC, NO_x, CO, and GHG from combusting biomass (wood). These units include the two (2) Biomass Heaters #1 and #2 (K7 and K8);
- Each emissions unit that directly emits Filterable PM, PM_{10}, $PM_{2.5}$, CPM, VOC, NO_x, CO, and GHG from combusting natural gas. These units include the four (4) Natural Gas-Fired Thermal Oil Heaters (K9, K10, K11, and K12); and
- Each emissions unit that directly emits Filterable PM, PM_{10}, $PM_{2.5}$, CPM, VOC, NOx, CO, and GHG from combusting diesel. These units include the three (3) Diesel-Fired Emergency Generators #6 to #8.

1.3.1 NEW EQUIPMENT

The new equipment proposed to be added to the air permit is listed below:

- Flakers #1 through #4;
- Stranders #1 through #3;
- Blending/Gluing;
- Sifter/Screening;
- Forming Line;
- Mat Saw;
- OSB Press;
- Diagonal Saw;
- Cut-to-Size Saw;
- Tongue and Groove Lines #1 through #3;
- Sanding;
- Dust and Granulate Handling;
- Belt Dryers #1 through #3;
- Wood-Fired Biomass Heaters #1 through #2 (K7 and K8), 204.73 MMBtu/hr each;
- Natural Gas-Fired Thermal Oil Heaters K9 through K12, 56.2 MMBtu/hr each;
- Diesel-Fired Emergency Generators #6 through #8, 1,220 brake-horsepower (bhp) each; and
- Edge Sealing Booths #1 through #3.

1.3.2 MODIFICATIONS TO EXISTING EQUIPMENT

Modifications are requested for existing equipment or existing emission sources contained in the facility's current air permit as follows:

- Natural Gas-Fired Internal Combustion Cogeneration Engines #1 through #10, one (1) rated at 6,022.53 bhp, one (1) rated at 6,023 bhp, one (1) rated at 6,162 bhp, and seven (7) rated at 6,127 bph each.

A relocation of the Natural Gas-Fired Internal Combustion Cogeneration Engines (permitted in 2022) is requested in this permit application; however, a revised BACT analysis for the relocation will not be required.

2. BACT

This section describes the methods used to determine BACT for the emission sources proposed in this application.

2.1 BACT DEFINITIONS AND APPROACH USED FOR BACT ANALYSIS

BACT is defined in Alabama regulations Chapter 335-3-14-.04 Air Permits Authorizing Construction In Clean Air Areas [Prevention Of Significant Deterioration Permitting (PSD)] as follows:

> (2)(l) *"Best Available Control Technology (BACT)" shall mean an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant which would be emitted from any proposed major stationary source or major modification which the Director, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR 60 and 61. If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice, or operation and shall provide for compliance by means which achieve equivalent results*.

Air emissions standards or emissions limitations are referenced in the definition of allowable emissions as follows:

> *(2)(p) "Allowable Emissions" shall mean the emissions rate of a stationary source calculated using the maximum rated capacity of the source (unless the source is subject to enforceable limits which restrict the operating rate, or hours of operation, or both) and the most stringent of the following:*
>
> *(2)(p)1. The applicable standards as set forth in 40 CFR 60, 61, and 63;*
>
> *(2)(p)2. The applicable State Implementation Plan emissions limitation, including those with a future compliance date; or*

(2)(p)3. The emissions rate specified as an enforceable permit condition, including those with a future compliance date.

A set of guidelines for the evaluation commonly referenced in both NSR and PSD permitting are the US Environmental Protection Agency's (USEPA's) Guidance for Determining BACT and the "New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting." Drafted to provide a consistent approach to BACT, these guidelines help to ensure that the same set of parameters measures the impacts of alternative emission control systems. BACT evaluations are determined on a case-by-case basis.

To assist applicants and regulators with the case-by-case analysis, in 1987 USEPA issued a memorandum that implemented certain program initiatives to improve the effectiveness of the PSD program within the confines of existing regulations and state implementation plans. Among the initiatives was a "top-down' approach for determining BACT. In brief, the top-down process proceeds by ranking all available control technologies in descending order of control effectiveness. The most stringent or "top" control option is the default BACT, unless the applicant demonstrates, and the permitting authority agrees, that energy, environmental, and/or economic impacts justify a conclusion that the most stringent control option is not appropriate in that case. Upon elimination of the most stringent control option based on energy, environmental, and/or economic considerations, the top-down process evaluates the next most stringent alternative in the same manner. This process continues until BACT is selected.

The top-down BACT process involves the following five steps: (1) Identify all control technologies; (2) Eliminate technically infeasible options; (3) Rank remaining control technologies by control effectiveness; (4) Evaluate the most effective controls and document the results; and (5) Select BACT.

2.1.1 STEP 1: IDENTIFICATION OF CONTROL TECHNOLOGY OPTIONS

The first step is to identify potentially "available" control options for each emission unit and for each pollutant under review. Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation. This means that the technology has progressed beyond the conceptual stage and pilot testing phase and has successfully operated on full-scale operations for a sufficient period. Theoretical, experimental, or developing technologies are not available under BACT. A control technology is neither demonstrated nor available if evaluation or research of the technology is required. Control technology must also be commercially available and for sale through commercial channels with commercial terms. The list includes lowest achievable emission rate (LAER) technologies, innovative technologies, and controls applied to similar source categories.

Reasonable available control technology (RACT) and state and federal regulations were reviewed as a starting point or BACT floor for potential BACT limits, with further review of the following information:

- USEPA's RACT/BACT/LAER Clearinghouse (RBLC) database. Typically, RBLC information is reviewed for the previous ten (10) years, and in this application Kronospan presents 10 years of RBLC data;
- USEPA's NSR website;
- In-house experts;
- Emission control technology technical books and articles;
- State permits issued for similar sources not found in the RBLC database;
- Vendor quotes and communications with control device equipment manufacturers (as available);
- Guidance documents referenced within this application; and
- Proposed and existing New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP), including Maximum Achievable Control Technology (MACT).

2.1.2 STEP 2: IDENTIFICATION OF TECHNICALLY INFEASIBLE CONTROL TECHNOLOGY OPTIONS

After identifying potential technologies, the second step is to eliminate technically infeasible options from further consideration. To be considered feasible, a technology must be both available and applicable. This step evaluates each identified control technology option to determine if it is technically feasible. Technical infeasibility rejects options based on an engineering evaluation or on chemical or physical principles. Issues with siting, compatibility with exhaust characteristics, availability of fuel or materials, equipment size, or the impact of other control technologies that must be used in series with a given control technology are all considered when determining technical feasibility. This analysis focuses on technologies demonstrated in a practice supported by recent determinations and the review of alternative and transfer technologies.

2.1.3 STEP 3: RANKING OF TECHNICALLY FEASIBLE CONTROL TECHNOLOGY OPTIONS

The third step is to rank the technologies not eliminated in the second step in descending order of control effectiveness for each pollutant of concern. If the highest ranked technology is proposed as BACT, it is not necessary to perform any further technical or economic evaluation. Potential adverse impacts must still be identified and evaluated.

2.1.4 STEP 4: EVALUATION OF MOST EFFECTIVE CONTROLS

The fourth step entails an evaluation of energy, environmental, and economic impacts for determining a final level of control. The evaluation begins with the most stringent control option and continues until a technology under consideration cannot be eliminated based on adverse energy, environmental, or economic impacts. The economic or "cost-effectiveness" analysis is conducted in a manner consistent with USEPA's Office of Air Quality Planning and Standards

Control Cost Manual, Seventh Edition, and subsequent revisions. (EPA Air Pollution Control Cost Manual, 7th Edition (currently being revised): Chapter 2 – Cost Estimation Concepts and Methodology, Research Triangle Park, NC: Office of Air Quality Planning and Standards, Clean Air Technology Center, November 2017.) When the BACT assessment has been updated and refined, site-specific data have been used for facility-specific costs (such as operator and maintenance labor rates), as well as updated cost information available from the US Energy Information Administration (EIA) and from Chemical Engineering Magazine's Chemical Engineering Plant Cost Index (CEPCI) composite value. This has resulted in revision of total cost estimates and cost effectiveness values.

2.1.5 STEP 5: SELECTION OF BACT

The fifth and final step is to select as BACT the emission limit from application of the most effective of the remaining technologies under consideration for each pollutant of concern. BACT must be no less stringent than the level of control required by the BACT floor.

2.1.6 BACT FLOOR

An example of BACT floor is an applicable limit under either an NSPS or NESHAP. BACT floor also considers an applicable State Implementation Plan (SIP), which includes general air quality rules and air permitting rules. In no event, shall the application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable federal, state, or local standard. Therefore, a BACT limit can be no less stringent than any applicable NSPS, NESHAP, or Alabama requirements. For Kronospan's proposed OSB Plant, the following regulations will be considered:

- NESHAP regulations applicable to the OSB processes (40 CFR 63, Subpart DDDD);
- NSPS and NESHAP regulations applicable to the wood-fired biomass heaters (40 CFR 60, Subpart Dc and 40 CFR 63, Subpart DDDDD);
- NSPS and NESHAP regulations applicable to the natural gas-fired thermal oil heaters (40 CFR 60 Subpart Dc and 40 CFR 63, Subpart DDDDD);
- NSPS and NESHAP regulations applicable to the diesel-fired emergency generators (40 CFR 60, Subpart IIII and 40 CFR 63, Subpart ZZZZ); and
- Alabama air quality regulations applicable to proposed emission sources.

For the Plywood and Composite Wood Products MACT, applicable sources are defined in the regulation as follows:

> *40 CFR §63.2231 Does This Subpart Apply To Me?*
>
> *This subpart applies to you if you meet the criteria in paragraphs (a) and (b) of this section.*
>
> *(a) You own or operate a PCWP manufacturing facility. A PCWP manufacturing facility is a facility that manufactures plywood and/or composite wood products by bonding wood material (fibers, particles, strands, veneers, etc.) or agricultural fiber, generally with resin*

under heat and pressure, to form a structural panel or engineered wood product. Plywood and composite wood products manufacturing facilities also include facilities that manufacture dry veneer and lumber kilns located at any facility. Plywood and composite wood products include, but are not limited to, plywood, veneer, particleboard, oriented strandboard, hardboard, fiberboard, medium density fiberboard, laminated strand lumber, laminated veneer lumber, wood I-joists, kiln-dried lumber, and glue-laminated beams.

(b) The PCWP manufacturing facility is located at a major source of HAP emissions. A major source of HAP emissions is any stationary source or group of stationary sources within a contiguous area and under common control that emits or has the potential to emit any single HAP at a rate of 9.07 megagrams (10 tons) or more per year or any combination of HAP at a rate of 22.68 megagrams (25 tons) or more per year.

40 CFR §63.2232 What Parts Of My Plant Does This Subpart Cover?

(a) This subpart applies to each new, reconstructed, or existing affected source at a PCWP manufacturing facility.

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

(c) An affected source is a new affected source if you commenced construction of the affected source after January 9, 2003, and you meet the applicability criteria at the time you commenced construction.

State regulatory requirements potentially applicable to the proposed emission sources are described below:

ADEM Admin. Code R. Chapter 335-3-4-.01, Visible Emissions – This rule restricts visible emissions from any source of particulate emissions to 20% with not more than one six-minute period of up to 40% opacity per 60-minute period. This regulation also describes monitoring requirements and work practice standards. Proposed emission sources for the OSB Plant that exhaust to atmosphere will be subject to this rule.

ADEM Admin. Code R. Chapter 335-3-4-.02, Fugitive Dust and Fugitive Emissions – This rule requires using reasonable precautions to minimize fugitive dust and fugitive emissions from sources such as roads. Kronospan will implement appropriate precautions to prevent fugitive dust from becoming airborne.

ADEM Admin. Code R. Chapter 335-3-4-.03, PM from Fuel Burning Equipment – This rule regulates PM emissions from fuel burning equipment, which is defined as

> *… any equipment, device, or contrivance and all appurtenances thereto, including ducts, breechings, fuel feeding equipment, ash removal equipment, combustion controls, stacks, and chimney, used primarily, but not exclusively, to burn any fuel for the purpose of indirect heating in which the material being heated is not contacted by and adds no substance to the products of combustion.*

ADEM Admin. Code R. Chapter 335-3-4-.04, PM from Process Industries – This rule limits particulate emissions from manufacturing processes in Class I and Class II counties. The Kronospan facility is located in Calhoun County, which is classified as a Class II county. However, pursuant to ADEM Admin. Code R. Chapter 335-3-4-.04(5), new sources shall be subject to the same requirements for facilities located in Class I counties. Accordingly, the maximum allowable PM emissions for proposed emission sources are determined using the following equations:

> $E = 3.59\ P^{0.62}$ when $P<30$ tons/hr and $E = 17.31\ P^{0.16}$ when $P>$ or $= 30$ tons/hr, where:
>
> E = allowable particulate emissions in lb/hr; and P = process weight rate in tons/hr.

This regulation applies to process emission sources that will not have a unit-specific PM or PM_{10} or $PM_{2.5}$ emission limit. Kronospan will comply with this rule through proper operation of the processes.

ADEM Admin. Code R. Chapter 335-3-5-.01, SO2 from Fuel Combustion – This rule limits emissions of SO2 from fuel burning units in Category I and Category II counties. The Kronospan facility is located in Calhoun County, which is classified as a Class II county. Therefore, SO2 emissions from the OSB Plant's fuel combustion sources will be limited to 4.0 lb/MMBtu. The biomass heaters, natural gas-fired thermal oil heaters, and diesel-fired emergency generators will be subject to this limitation. Kronospan will comply with this rule by combusting pipeline quality natural gas and ultra-low sulfur diesel (ULSD).

ADEM Admin. Code R. Chapter 335-3-6-.01 through .53, VOC Emissions – This rule addresses the control of organic emissions from specific manufacturing processes, including surface coating. Kronospan's proposed OSB Plant will not include the manufacturing processes listed in this rule, and therefore will not be subject to the emission limits or VOC standards set forth in this rule.

ADEM Admin. Code R. Chapter 335-3-10, National Standards of Performance for New Stationary Sources – This state regulation incorporates federal regulations of 40 CFR Part 60. The proposed emission sources will be subject to several NSPS standards as noted in the following sections.

ADEM Admin. Code R. Chapter 335-3-11, National Emission Standards for Hazardous Air Pollutants – This state regulation incorporates federal regulations of 40 CFR Parts 61 and 63 by

reference. The proposed emission sources will be subject to several NESHAP standards as noted in the following sections.

2.2 ECONOMIC ANALYSIS

Economic analyses are used to compare total costs (capital and annualized) for potential control technologies. Capital costs include the initial costs of the control system, and annualized costs include the operating costs for the control system on an annual basis, including overhead, maintenance, outages, raw materials, and utilities.

For this BACT analysis, costs are estimated based on EPA's Control Cost Manual, which provides guidance for the development of accurate and consistent costs for air pollution control devices. The Control Cost Manual focuses on point source and stationary area source air pollution controls for volatile organic compounds (VOCs), particulate matter (PM), oxides of nitrogen (NOx), and some acid gases (primarily SO_2 and HCl). EPA is currently updating the Control Cost Manual, and this update will be the Seventh Edition. (The economic or "cost-effectiveness" analysis is conducted in a manner consistent with USEPA's Office of Air Quality Planning and Standards Control Cost Manual, Seventh Edition, and subsequent revisions. (EPA Air Pollution Control Cost Manual, 7th Edition (currently being revised): Chapter 2 – Cost Estimation Concepts and Methodology, Research Triangle Park, NC: Office of Air Quality Planning and Standards, Clean Air Technology Center, November 2017.)

Total capital investment (TCI) includes all costs required to purchase equipment needed for the control system (purchased equipment costs), the costs of labor and materials for installing that equipment (direct installation costs), costs for site preparation and buildings, and certain other costs (indirect installation costs) as summarized below:

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

TCI also includes costs for land, working capital, and off-site facilities. Taxes, permitting costs, and other administrative costs, as well as financing costs and foregone revenue associated with facility shutdowns are also included.

Annualized costs or Total Cost (TC) refers to costs that are incurred yearly. TC has three elements: direct costs (DC), indirect costs (IC), and recovery credits (RC), which are related by the following equation: TC = DC + IC – RC and summarized below:

- Direct operating costs include labor, maintenance, replacement parts, raw materials, utilities, and waste disposal;
- Indirect operating costs include plant overhead, taxes, insurance, general administration, and capital charges;
- Recovery credits include the capital recovery factor based on the annual interest rate and equipment life in years.

The basis of direct costs and recovery credits is one year, as this period allows for seasonal variations in production (and emissions generation) and is directly usable in financial analyses.

Some indirect costs are not incurred on an annual basis. Purchase, installation, and start-up of pollution abatement capital equipment often take multiple years. To incorporate these multiyear costs with other annual costs, the capital costs are amortized and converted into capital recovery. If the timing between direct costs and indirect costs are different, then an alternative approach for estimating total cost is to calculate the present value of these costs before summing them.
For this analysis, Kronospan has utilized the following assumptions:

- Economic life of a control system as 10 to 20 years. Chapter 2, Incinerators and Oxidizers, of EPA's Control Cost Manual (November 2017, https://www.epa.gov/sites/default/files/2017-12/documents/oxidizersincinerators_chapter2_7theditionfinal.pdf) states that:
    - *"The system capital recovery cost is based on an estimated 20-year equipment life. This estimate of oxidizer equipment life is consistent with information available to EPA and is consistent with a statement by Anguil Environmental, Inc., a large vendor for incinerators and oxidizers (Chemical Engineering, 2015)"* (Chapter 2, page 2-53).
    - However, this chapter also notes that: *"Equipment life for an oxidizer is variable and depends on several factors, including the system design and materials used in its construction, composition of the waste gas stream, and the temperatures experienced by the oxidizer. In general, oxidizers that handle corrosive waste gases or higher levels of particulates will have a shorter operational life."* (Chapter 2, page 2-6).
    - Further, EPA's Incinerators and Oxidizers Calculation Spreadsheet (December 2024, https://www.epa.gov/system/files/other-files/2024-12/us-epa_oaqps_incineratorsoxidizers_calc_sheet_december_2024v.xlsm) includes the following note: "* *20 years is the typical equipment life. User should enter actual value, if known."* (from Data Inputs tab)
- EPA provided clarification regarding the set of criteria for "useful economic life" for a BACT economic analysis in "Calculating Amortized Capital Costs," from Robert D Bauman, Chief Standards Implementation Branch, to Stephen H. Rothblatt, Chief Air and Radiation Branch Region V, dated July 24, 1987, as follows:

  - Table 3.6 Guidelines for Parts and Equipment, Equipment Life for Thermal Incinerators as 5 years Low, 10 years Average, and 20 years High; and Equipment Life for Catalytic Incinerators as 5 years Low, 10 years Average, and 20 years High.

- Kronospan provided information on actual equipment life for RTOs operating in the wood industry, for which media change outs are commonly required every seven (7) to 10 years. Examples were:
  - RTO media in Simsboro had a life span of about eight (8) years for the last media change;
  - RTO media in La Grande had a life span of eight (8) years for the last media change;
  - RTO media in Clarion had a life span of six (6) years for the last media change (previously four [4] to five [5] years changeout);
  - RTO medial in Clarion with old unit had a life span of five (5) years at the time the old RTO was operating; and
  - RTO media on the PB dryer in AN is expected to be changed in 2026, which would be a lifetime of approximately seven (7) years.
- As a result, based on discussions with ADEM in September 2025, Kronospan assumes an equipment life of 10-years for cost effectiveness calculations with a media replacement every five (5) years, and an alternative approach (again based on discussions with ADEM) to include costs for one (1) ceramic media replacement during a 20-year equipment life in the RTO and WESP cost effectiveness calculations;
- Average interest rate of 8.50% based on Bank Prime Loan Rate in December 2024, (Federal Reserve Bank of St. Louis website, https://fred.stlouisfed.org/series/DPRIME) with federal prime rate at 7.50% (as of 12/19/24). As an update, the federal prime rate has been lowered to 7% (as of 10/30/25). In this revision of the BACT, cost effectiveness calculations have been updated to use the most recent prime rate of 7%.
- Labor rate: Production and Non-Supervisory Employees in the Wood Product Manufacturing Subsector, NAICS 321 in Alabama of $23.92 in September 2024 (Bureau of Labor Statistics website). US EPA's cost spreadsheet (Air Pollution Control Cost Estimation Spreadsheet For Thermal and Catalytic Oxidizers (September 2022, revised December 2024) contains the following default values, which will be used:
  - The EPA Cost Spreadsheet provides a default of $26.61 for Operator Labor hourly rates based on data for plant and System Operators – other (51-8099); and
  - The EPA Cost Spreadsheet provides a default of $27.40 for Maintenance Labor hourly rates based on data for electrical and electronics commercial and industrial equipment repairers (49-2094), from the Bureau of Labor Statistics, May 2016 National Occupational Employment and Wage Estimates – United States, May 2016 (https://www.bls.gov/oes/current/oes_nat.htm); however, in this revision, we have

incorporated labor costs from Kronospan of $42.73 for operators and $43.41 for maintenance.

- Electricity cost: Industrial Price in Alabama of $7.38 Electricity Cost for October 2024 (Cents per Kilowatt-hour) (U.S. Energy Information Administration website, https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a). In this revision, we have incorporated the updated Alabama industrial electricity cost of $8.15 in June 2025 (checked on 9/16/25) from https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a;
- Natural gas cost: Industrial Price in Alabama of $4.08 Natural Gas Price for October 2024 (Dollars per Thousand Cubic Feet) (U.S. Energy Information Administration website, Monthly Electric Power Industry Report, https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SAL_m.htm). In this revision, incorporated the updated Alabama industrial natural gas cost of $5.15 in June 2025 (checked on 9/16/25) from https://www.eia.gov/dnav/ng/ng_pri_sum_a_epg0_pin_dmcf_m.htm;
- A Chemical Engineering Plant Cost Index (CEPCI) value of 810 was used for June 2025 from Chemical Engineering Magazine (chemengonline.com); and
- Recently updated vendor quotes have been incorporated for oxidizer and scrubber costs.

2.3 BACT BACKGROUND

This analysis provides background information on potential control technologies, a summary of determinations contained in the RBLC database for similar emission units, a discussion of other potential control options that may be applicable to the emission units, and proposed BACT emission limits. The following databases and documents were used to identify potential emissions control technologies and control device efficiencies:

- USEPA's RBLC Database (available online at https://www.epa.gov/catc/ractbactlaer-clearinghouse-rblc-basic-information);
- USEPA's Clean Air Technology Center (CATC) (available online at https://www.epa.gov/catc);
- 40 CFR 60 Subpart A--General Provisions;
- 40 CFR 60 Subpart Dc--Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units;
- 40 CFR 60 Subpart IIII--Standards of Performance for Stationary Compression Ignition Internal Combustion Engines;
- 40 CFR 63 Subpart A--General Provisions;
- 40 CFR 63 Subpart DDDD--National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products (PCWP) (which is the applicable MACT standard for composite wood products);

- 40 CFR 63 Subpart ZZZZ--National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines;
- 40 CFR 63 Subpart DDDDD--National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters;
- Section 10.6.1, Waferboard/Oriented Strandboard Manufacturing (March 2002), in USEPA's AP-42 Compilation of Air Pollutant Emissions Factors from Stationary Sources, Fifth Edition, Volume I (available online at https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources) under Chapter 10: Wood Products Industry;
- "Cost, Environmental, and Energy Impacts of Regulatory Options for Subpart DDDD," Hanks and Bradfield, USEPA RTP, July 19, 2019; and
- Other BACT websites and reference documents available online.

3. BACT REVIEW

The Kronospan, LLC facility in Eastaboga, AL, proposes to construct and operate an OSB plant. BACT analyses are described in the sections below.

3.1 BACT ANALYSIS FOR OSB PLANT UNITS – FLAKERS AND STRANDERS AND CHIPPER

Kronospan is proposing an OSB plant project that includes flakers (OSB Flaker #1; OSB Flaker #2; OSB Flaker #3; and OSB Flaker #4) and stranders (OSB Strander #1; OSB Strander #2; and OSB Strander #3), which are reviewed in this section. The chipper will be located inside the Strander Building with chipping emissions, which are uncaptured and uncontrolled, exhausting inside the building. The flakers, stranders, and chipper will generate PM, PM_{10}, $PM_{2.5}$, and VOC emissions, as emissions from the Strander Building.

3.1.1 FILTERABLE $PM/PM_{10}/PM_{2.5}$ AND CPM BACT ANALYSIS FOR OSB PLANT UNITS – FLAKERS, STRANDERS, AND CHIPPER

Emissions of particulates from the OSB plant will be most apparent as brown or tan dust. Dust particles will be generated from the flakers, stranders, and chipper. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the flakers, stranders, and chipper will be discharged inside the Strander Building.

BACT Floor Kronospan is in Calhoun County, which is designated a Class I County, and the applicable state regulation for controlling particulates from process emissions is contained in Chapter 335-3-4-.04 Process Industries - General.

> *(1) Class 1 Counties: No person shall cause or permit the emission of particulate matter in any one hour from any source in a Class 1 County in excess of the amount shown in Table 4-2 for the process weight per hour allocated to such source. For sources in Class 1 Counties, interpolation of the data in Table 4-2 for the process weight per hour values up*

to 60,000 lbs/hr shall be accomplished by use of the equation: E = 3.59P0.62, where (P <30 tons/hr) and interpolation and extrapolation of the data for process weight per hour values equal to or in excess of 60,000 lbs/hr shall be accomplished by use of the equation: E = 17.31P0.16, where (P (greater than equal to) 30 tons/hr) where E = Emissions in pounds per hour and P = Process weight per hour in tons per hour.

Kronospan particulate emissions from the flakers, stranders, and chipper will meet the Process Weight Rate requirements.

Flakers, stranders, and chipper are generally covered by the Plywood and Composite Wood Products MACT, 40 CFR 63 Subpart DDDD, since the affected source includes green end operations.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Flakers and Stranders

Potentially applicable particulate controls for flakers and stranders include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, mechanical collectors (high-efficiency cyclones/multiclones), cyclofilters, high-efficiency venturi scrubbers, as well as building enclosures and good design/operations. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-1 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR FLAKERS AND STRANDERS

Control Type	Estimated Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	99 to 99.9+%
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones)	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones
Cyclofilters	80 to 99%
High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers	70 to 99%
Building Enclosures	90%
Good Design/Operation	Varies

Descriptions of these types of particulate control systems are included below:

Baghouses/Fabric Filters/Dust Collectors – Baghouses/fabric filters/dust collectors are used to control particulate matter less than or equal to 10 micrometers (µm) in aerodynamic diameter

(PM_{10}), particulate matter less than or equal to 2.5 µm in aerodynamic diameter ($PM_{2.5}$), and hazardous air pollutants (HAPs) that are in particulate form, such as most metals. (Note, however, that mercury is an exception, because a significant portion of emissions are in the form of elemental vapor.) Fabric filters can be used in a variety of processes where dust is generated and can be collected and ducted to a central location. Typical baghouse/fabric filter design efficiencies are between 99 and 99.9% depending on variables such as gas filtration velocity, particle characteristics, fabric characteristics, and cleaning mechanism. Gas temperatures up to about 260°C (500°F), with surges to about 290°C (550°F) can be accommodated provided that an appropriate fabric material is used. A major advantage of baghouse/fabric filters is that the outlet air is very clean and may be recirculated within the plant. A major disadvantage is that fabric filters have relatively high maintenance requirements (e.g., periodic bag replacement). Essentially, these types of control devices are filters, through which flue gas is passed through a tightly woven or felted fabric, causing PM in the flue gas to be collected on the fabric by sieving and other mechanisms. Fabric filters may be in the form of sheets, cartridges, or bags, with a number of the individual fabric filter units housed together in a group. Bags are most common type of fabric filter. The dust cake that forms on the filter from the collected PM can significantly increase collection efficiency. Fabric filters are frequently referred to as baghouses because the fabric is usually configured in cylindrical bags. Groups of bags are placed in isolable compartments to allow cleaning of the bags or replacement of some of the bags without shutting down the entire fabric filter. Estimated annualized cost effectiveness calculated in 2002 dollars was $42 to $266 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Fabric Filter – Pulse-Jet Cleaned Type, EPA-452/F-03-025, Washington, D.C.: Clean Air Technology Center, 2003.)

Dry Electrostatic Precipitators (DESP) and Wet Electrostatic Precipitators (WESP) – Electrostatic Precipitators (ESP) are used to control Particulate Matter (PM), including particulate matter less than or equal to 10 micrometers in aerodynamic diameter (PM_{10}), particulate matter less than or equal to 2.5 micrometers in aerodynamic diameter ($PM_{2.5}$), and hazardous air pollutants (HAPs) that are in particulate form, such as most metals (mercury is the notable exception, as a significant portion of emissions are in the form of elemental vapor). An ESP is a particulate control device that uses electrical forces to move particles entrained within an exhaust stream onto collector plates. The entrained particles are given an electrical charge when they pass through a corona, a region where gaseous ions flow. Electrodes in the center of the flow lane are maintained at high voltage and generate the electrical field that forces the particles to the collector walls. Dust resistivity is not a factor for wet ESPs, because of the high humidity atmosphere which lowers the resistivity of most materials. In addition, particle size is much less of a factor for wet ESPs, compared to dry ESPs, since much smaller particles can be efficiently collected by wet ESPs due to the lack of resistivity concerns and reduced re-entrainment. In dry ESPs, the collectors are knocked, or "rapped", by various mechanical means to dislodge the particulate, which slides downward into a hopper where they are collected. Wet ESPs are used in situations for which dry ESPs are not suited, such as when the material to be collected is wet, sticky, flammable, explosive, or has a high resistivity. For both DESP and WESP controls, typical new equipment design efficiencies are between 99 and 99.9%, while older existing equipment has a range of actual operating efficiencies of 90 to 99.9%. Dry wire-plate ESPs can operate at very

high temperatures, up to 700°C (1,300°F); operating gas temperature and chemical composition of the dust are key factors. Wet wire-pipe ESPs are limited to operating at temperatures lower than approximately 80 to 90°C (170 to 190°F). Advantages include relatively low operating costs, but one of the main disadvantages is that ESPs generally have high capital costs. Estimated annualized cost effectiveness calculated in 2002 dollars was $35 to $236 per ton of pollutant controlled for dry ESPs and $65 to $660 per ton of pollutant controlled for wet ESPs. (Air Pollution Control Technology Fact Sheet: Dry Electrostatic Precipitator – Wire-Plate Type, EPA-452/F-03-028, Washington, D.C.: Clean Air Technology Center, 2003.)

Mechanical Collectors (High-Efficiency Cyclones/Multiclones) - Cyclones are used to control PM, and primarily PM greater than 10 micrometers (µm) in aerodynamic diameter; however, high efficiency cyclones are designed to be effective for PM less than or equal to 10 µm and less than or equal to 2.5 µm in aerodynamic diameter (PM_{10} and $PM_{2.5}$). Cyclones by themselves are generally not adequate to meet stringent air pollution regulations, yet can serve an important purpose as pre-cleaners for more expensive final control devices such as baghouses/fabric filters or electrostatic precipitators (ESPs). Typical control efficiency ranges for high efficiency single cyclones are 80 to 99 percent for PM, 60 to 95 percent for PM_{10}, and 20 to 70 percent for $PM_{2.5}$, while multicyclones can achieve from 80 to 95 percent collection efficiency for 5 µm particles. Fossil-fuel and wood-waste fired industrial and commercial fuel combustion units commonly use multiple cyclones (generally upstream of a wet scrubber, ESP, or fabric filter) which collect fine PM (<2.5 µm) with greater efficiency than a single cyclone. Advantages include fewer temperature and pressure limitations (only dependent on the materials of construction); disadvantages include relatively low PM collection efficiencies, particularly for PM less than 10 µm in size. Cyclones use inertia to remove particles from the gas stream by means of centrifugal force on the gas stream, usually within a conical shaped chamber. Cyclones operate by creating a double vortex inside the cyclone body, in which the incoming gas is forced into circular motion down the cyclone near the inner surface of the cyclone tube. And at the bottom of the cyclone, the gas turns and spirals up through the center of the tube and out of the top of the cyclone. Particles in the gas stream are forced toward the cyclone walls by the centrifugal force of the spinning gas, but are opposed by the fluid drag force of the gas traveling through and out of the cyclone. For large particles, inertial momentum overcomes the fluid drag force so that the particles reach the cyclone walls and are collected. For small particles, the fluid drag force overwhelms the inertial momentum and causes these particles to leave the cyclone with the exiting gas. Gravity also causes the larger particles that reach the cyclone walls to travel down into a bottom hopper. Estimated annualized cost effectiveness calculated in 2002 dollars was $0.43 to $400 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Cyclones, EPA-452/F-03-005, Washington, D.C.: Clean Air Technology Center, 2003.)

Cyclofilters can operate under both positive and negative pressure. The particle-laden air enters the dust filter through a tangent inlet, and the particles are centrifuged down to the cone section where they are continuously collected by a pneumatic or mechanical system with an efficiency ranging from 80 to 99%. Finer dust particles are captured upward in the filtering section using filter bags, and clean air is returned to the plant or to the atmosphere. In this type of control equipment, the particle-laden filter bags can be cleaned continuously with an air-pulse jet system

controlled by a sequential timer. The concept of the cyclofilter reduces the upkeep of filter bags, since the cyclonic pre-separator reduces to a minimum the dust load on the filter bags during operation. A cyclofilter utilizes centrifugal force and filtration to separate and collect particles from gas streams. Gas enters through the inlet ductwork and is directed towards the cyclone separator. Inside, the swirling motion generates centrifugal force, causing heavier particles to collect on the cyclone's outer walls and fall into a storage hopper. The remaining gas passes through the baghouse filter, where fabric filter bags capture finer particles. Clean air is released through the exhaust stack (Development of a cyclone separator for particulate matter control …, Gutierrez, et al. Elsevier Ltd, 2024).

High-Efficiency Venturi Scrubbers (including Wet Scrubbers/Packed Beds/Spray Towers) – Venturi scrubbers are primarily used to control particulate matter (PM), including PM less than or equal to 10 micrometers (µm) in aerodynamic diameter (PM_{10}), and PM less than or equal to 2.5 µm in aerodynamic diameter ($PM_{2.5}$). Even though venturi scrubbers also are capable of some incidental control of volatile organic compounds (VOC), generally they are limited to control PM and high solubility gases. PM collection efficiencies for venturi scrubbers range from 70 to greater than 99 percent, depending upon the application. Inlet gas temperatures are usually in the range of 4 to 400°C (40 to 750°F). Venturi scrubbers are simple in design and require low maintenance (advantages), though the effluent liquid can create a waste stream with an effluent liquid that may cause water pollution problems and/or waste sludge that may be expensive to dispose (disadvantages). Estimated annualized cost effectiveness calculated in 2002 dollars was $77 to $2,400 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Venturi Scrubber, EPA-452/F-03-017, Washington, D.C.: Clean Air Technology Center, 2003.)

Building Enclosures – In some situations, process exhaust (with emissions) can be retained or routed inside buildings rather than being exhausted to atmosphere through a stack. This situation can reduce the particulate emissions to the outside air by approximately 90%. Opacity is also minimized.

Good Design/Operation - Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for flakers, stranders, and chippers at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-2 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR FLAKERS, STRANDERS, AND CHIPPERS(RBLC

PROCESS TYPE 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	7 Green Flakers 30.590	Baghouse, 99% Thermal Energy Plant DESP and Dryer RTO (Bypass of DESP and RTO allowed for up to 460 hr/yr, which is allowed by permit for start up and shutdown procedures)	FPM: 29.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant) TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16. lb/hr CMP: Little or no condensable PM FPM: 1.01 lb/hr during DESP and RTO bypass and 0.002 gr/dscf during RTO bypass TPM_{10}: 1.01 lb/hr $TPM_{2.5}$: 1.01 lb/hr CMP: Little or no condensable PM
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	7 Green Flakers 30.590	Baghouse, 99% Thermal Energy Plant DESP and Dryer RTO (Bypass of DESP and RTO allowed for up to 460 hr/yr, which is allowed by permit)	FPM: 29.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant) TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16. lb/hr CMP: Little or no condensable PM FPM: 1.01 lb/hr and 0.002 gr/dscf during RTO bypass TPM_{10}: 1.01 lb/hr $TPM_{2.5}$: 1.01 lb/hr CPM: Little or no condensable PM

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	7 Green Flakers 30.590	Baghouse, 99% Thermal Energy Plant DESP and Dryer RTO (Bypass of DESP and RTO allowed for up to 460 hr/yr, which is allowed by permit)	FPM: 29.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant) TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16. lb/hr CMP: Little or no condensable PM FPM: 1.08 lb/hr and 0.002 gr/dscf during RTO bypass TPM_{10}: 1.08 lb/hr $TPM_{2.5}$: 1.08 lb/hr CPM: Little or no condensable PM
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Flaking - 4 Flakers	Proposed BACT: Cyclones/ Cyclofilters and Building enclosure	FPM: 0.06 lb/hr,, 0.002185 gr/dscf PM_{10}: 0.044 lb/hr, 0.0016 gr/dscf $PM_{2.5}$: 0.008 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for 4 flakers)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Stranding - 3 Stranders	Proposed BACT: Cyclones/ Dust Collectors and Building Enclosure	FPM: 0.15 lb/hr, 0.002185 gr/dscf PM_{10}: 0.114 lb/hr, 0.0016 gr/dscf $PM_{2.5}$: 0.021 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for 3 stranders)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search showed the use of baghouses as BACT for particulate emissions from flakers with limits as follows:

- 1.01 lb/hr and 0.002 gr/dscf for seven (7) green flakers based on baghouse control (and during DESP and RTO bypass for up to 460 hr/yr) (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, the PM emissions collected from the flakers will be collected by cyclones and used as fuel for the wood-fired biomass heaters at the facility, and Kronospan's proposed Filterable PM emissions for flakers based on cyclones/cyclofilters controls are 0.06 lb/hr, 0.002185 gr/dscf, and 0.26 tpy (total for four [4] flakers). Proposed PM_{10} emissions are 0.044 lb/hr, 0.0016 gr/dscf, and 0.192 tpy, and $PM_{2.5}$ emissions are 0.008 lb/hr, 0.0003 gr/dscf, and 0.035 tpy. The building emissions will be routed to multiple cyclones and baghouses, then exhaust back into the building. (The building is not a control device, rather it is a structure that houses/contains process equipment. In addition, the building enclosure is not a permanent or temporary total enclosure that is designed to control emissions.) If/when stack testing is required, particulate emissions will need to be compared to the grain loading emissions from control equipment vendor.

The PM emissions collected from the stranders will be collected by cyclones and used as fuel for the wood-fired biomass heaters at the facility, and Kronospan's proposed Filterable PM emissions for stranders based on cyclones/dust collectors controls are 0.15 lb/hr, 0.002185 gr/dscf, and 0.66 tpy (total for three [3] stranders). Proposed PM_{10} emissions are 0.114 lb/hr, 0.0016 gr/dscf, and 0.47 tpy, and $PM_{2.5}$ emissions are 0.021 lb/hr, 0.0003 gr/dscf, and 0.09 tpy. The building emissions are routed to multiple cyclones and baghouses, then exhausting back into the building. (The building is not a control device it is a structure that houses/contains process equipment. In addition, the building enclosure is not a permanent or temporary total enclosure that is designed to control emissions.) If/when stack testing is required, particulate emissions will need to be compared to the grain loading emissions from control equipment vendor.

The RBLC search indicated that no PSD permits for OSB facilities with chippers are included in the RBLC database within the last 10 years. Kronospan's proposed FPM emissions for the chipper based on good design/operation with building enclosure are 0.11 lb/hr and 0.47 tpy. Proposed PM_{10} emissions are 0.05 lb/hr and 0.24 tpy, and $PM_{2.5}$ emissions are 0.03 lb/hr and 0.12 tpy.

Step 2: Eliminate Technically Infeasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Flakers and Stranders

The PM emissions collected from the flakers and stranders will be collected by cyclones and used as fuel for the wood-fired biomass heaters at the facility. The process emissions from the flakers will be routed to cyclones and cyclo-filters, while the stranders will be routed to multiple cyclones and baghouses, then those both will exhaust back into the building and mix with the indoor fugitive emissions from the chipper. The use of a WESP would cause the collected wood fuel to become unusable due to the volumes of moisture that would be added to the material streams. As a result, the use of a WESP to control flaker and strander emissions is technically infeasible. However, a WESP will be considered to be feasible for this evaluation.

Similarly, the use of a venturi scrubber would cause the collected wood fuel to become unusable due to the scrubbing liquid that would be added to the material streams. For this reason, some OSB plants have determined venturi scrubbers to be technically infeasible for controlling emissions from flakers and stranders.

Step 3: Rank Remaining Technically Feasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Flakers and Stranders

The remaining PM control technologies for the flakers and stranders were ranked, as shown in the table below.

TABLE 3-3 SUMMARY OF RANKED FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM CONTROLS FOR FLAKERS AND STRANDERS

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors
2	Dry Electrostatic Precipitator / Wet Electrostatic Precipitator
3	Mechanical Collectors (High-Efficiency Cyclones/Multiclones)
4	Cyclofilters
5	Building Enclosures
5	Good Design/Operation

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Flakers and Stranders

Cyclones will be used to collect PM emissions in granulate and/or dust forms for use as fuel in the wood-fired heaters. Kronospan also proposes to use cyclofilters to control PM emissions from the flakers. Exhaust from the cyclofilters then will be routed into the Strander Building, which will effectively control particulate emissions. Therefore, the particulate controls proposed for the flakers are cyclones/cyclofilters and building enclosure. Since fabric filters (bagfilters) are the top ranked control, no further analysis is needed for the flakers.

For the stranders, cyclones will be used, and Kronospan proposes to use dust collectors, which are the top ranked control, along with building enclosure to minimize PM emissions from the stranders. No further analysis is needed for the stranders.

The chipper emissions will be extremely small due to being exhausted inside the Strander Building, and additional controls on the chipper would not be cost effective.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for Flakers, Stranders, and Chipper

Kronospan proposes the use of cyclones/cyclofilters and building enclosure for the flakers, cyclones/dust collectors and building enclosure for the stranders, and good design/operation with building enclosure for the chipper to control particulate emissions. Kronospan's proposed limits for flakers based on cyclones/cyclofilters/building enclosure controls are:

- Filterable PM: 0.060 lb/hr, 0.002185 gr/dscf (total for four [4] flakers);
- PM_{10}: 0.044 lb/hr, 0.0016 gr/dscf;
- $PM_{2.5}$: 0.008 lb/hr, 0.0003 gr/dscf;

- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan's proposed emissions for stranders based on cyclones/dust collectors and building enclosure controls are:

- Filterable PM: 0.15 lb/hr, 0.002185 gr/dscf (total for three [3] stranders);
- PM_{10}: 0.114 lb/hr, 0.0016 gr/dscf;
- $PM_{2.5}$: 0.021 lb/hr, 0.0003 gr/dscf;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan's proposed emissions for the chipper based on good design/operation and building enclosure are:

- Filterable PM: 0.11 lb/hr, 0.47 tpy (total for chipper);
- PM_{10}: 0.05 lb/hr, 0.24 tpy;
- $PM_{2.5}$: 0.03 lb/hr, 0.12 tpy;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

This level of control is less than results from the RBLC tables and recent permits because of an assumed 90% reduction from the building enclosure. Furthermore, Kronospan will operate the control equipment and processes using good design and operations to minimize emissions.

Proposed BACT Controls: Cyclones/Dust Collectors, Good Design/Operation, and Building Enclosure for flakers; Cyclones/Dust Collectors, Good Design/Operation, and Building Enclosure for stranders; Good Design/Operation, and Building Enclosure for chipper

3.1.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS – FLAKERS, STRANDERS, AND CHIPPER

VOC emissions are contained in the emissions from the flakers, stranders, and chipper. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the flakers, stranders, and chipper will be discharged inside the Strander Building.

BACT Floor These sources will be subject to the applicable requirements of 40 CFR 63 Subpart DDDD. Flakers, stranders, and chippers are generally covered by the Plywood and Composite Wood Products MACT, 40 CFR 63 Subpart DDDD, since the affected source includes green end operations.

Step 1: Identify Potential VOC Control Technologies for Flakers and Stranders

Potentially applicable controls for flakers and stranders include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (such as packed beds, spray towers), biofilters, and good design/operation. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-4 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR FLAKERS AND STRANDERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40% to 77%
Good Design/Operation	Varies
Good Operating Practices	Varies

Descriptions of these types of VOC control systems are included below:

Direct Flame Thermal Oxidizers (TO) – A straight thermal incinerator is comprised of a combustion chamber and does not include any heat recovery of exhaust air by a heat exchanger. Thermal incinerators can be used to reduce emissions from almost all VOC sources and can handle minor fluctuations in flow; however, excess fluctuations require the use of a flare. Their fuel consumption is high, so thermal units are best suited for smaller process applications with moderate-to-high VOC loadings. Thermal incinerators are not usually as economical, on an annualized basis, as recuperative or regenerative incinerators because they do not recover waste heat energy from the exhaust gases. VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical thermal incinerator gas flow rates are 500 to 50,000 scfm, and design efficiencies range from 98 to 99.99% and above, depending on system requirements and characteristics of the contaminated stream. The typical design conditions needed to meet 98% or greater control or a 20 ppmv exit concentration are a combustion temperature of 870°C (1,600°F), residence time of 0.75 second, and proper mixing. For vent streams with VOC concentration below

approximately 2,000 ppmv, reaction rates decrease, maximum VOC destruction efficiency decreases, and an incinerator outlet VOC concentration of 20 ppmv, or lower may be achieved. Estimated annualized cost effectiveness calculated in 2002 dollars was $400 to $3,300 per ton per year of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Thermal Incinerator, EPA-452/F-03-022, Washington, D.C.: Clean Air Technology Center, 2003.)

Recuperative Thermal Oxidizers – This type of incinerator is also referred to as a thermal oxidizer, thermal incinerator, and afterburner; all "with heat exchangers." A recuperative incinerator is comprised of the combustion chamber, the waste gas preheater, and, if appropriate, a secondary energy recovery heat exchanger. VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical recuperative incinerator gas flow rates are 500 to 50,000 scfm, and design efficiencies range from 98 to 99.9999% and above, depending on system requirements and characteristics of the contaminated stream. The typical design conditions needed to meet 98% or greater control (or a 20 ppmv exit concentration) are a combustion temperature of 870°C (1,600°F), residence time of 0.75 second, and proper mixing. Recuperative incinerators usually are more economical than straight thermal incinerators because they recover about 70% of the waste heat from the exhaust gases. This heat can be used to preheat incoming air, and oftentimes, sufficient waste heat will be available for process heating, or to generate steam or hot water. However, even with recuperating waste heat energy, incinerator operating costs are relatively high due to supplemental fuel costs. Estimated annualized cost effectiveness calculated in 2002 dollars was $95 to $1,800 per ton per year of pollutant controlled. Importantly, costs can be substantially higher this when used for low to moderate VOC concentration streams (less than around 1,000 to 1,500 ppmv). (Air Pollution Control Technology Fact Sheet: Incinerator – Recuperative Type, EPA-452/F-03-020, Washington, D.C.: Clean Air Technology Center, 2003.)

Regenerative Thermal Oxidizers (RTO) - VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical regenerative incinerator design efficiencies range from 95 to 99% for RTO systems, depending on system requirements and characteristics of the contaminated stream. Lower control efficiencies are generally associated with lower concentration flows, though RTOs have been used at inlet loadings as low as 100 ppmv or less. Typical gas flow rates are 5,000 to 500,000 scfm and temperatures are 1,400°F to 1,500°F, or up to 2,000°F in cases where maximum destruction is required. A major advantage of using an RTO is lower fuel requirements because of high energy recovery, while disadvantages include high initial cost, as well as difficult and expensive installation, and high maintenance demand for moving parts. Estimated annualized cost effectiveness calculated in 2002 dollars was $100 to $17,000 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Incinerator – Regenerative Type, EPA-452/F-03-021, Washington, D.C.: Clean Air Technology Center, 2003.)

Regenerative Catalytic Oxidizers (RCO) - VOC destruction efficiency depends upon design criteria (i.e., chamber temperature, residence time, inlet VOC concentration, compound type, and degree of mixing). Typical regenerative incinerator design efficiencies range from 90 to 99% for RCO systems, depending on system requirements and characteristics of the contaminated stream.

Lower control efficiencies are generally associated with lower concentration flows, though RCOs have been used at inlet loadings as low as 1 ppmv. Typical gas flow rates are 700 to 50,000 scfm and temperatures are 600°F to 800°F before entering the catalyst bed and exhausting at temperatures of 1,000°F to 1,250°F. A major advantage of using an RCO is lower fuel requirements because of high energy recovery, while disadvantages include high initial cost, as well as potential problems with catalyst poisoning and disposal of spent catalyst. Characteristics of inlet streams should be carefully considered because particulate matter and condensable particulates can clog the incinerator's packed bed and/or poison the catalyst and effectively reduce control efficiency; therefore, a pre-cleaner, such as an internal filter, or a pretreatment technology would be required for the RCO to operate effectively. Note that RCO systems with precious metal-based catalysts also can control CO emissions by more than 98% efficiency. Estimated annualized cost effectiveness calculated in 2002 dollars was $124 to $21,000 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Incinerator – Regenerative Type, EPA-452/F-03-021, Washington, D.C.: Clean Air Technology Center, 2003; and Air Pollution Control Technology Fact Sheet: Catalytic Incinerator, EPA-452/F-03-018, Washington, D.C.: Clean Air Technology Center, 2003.)

Wet Scrubbers, including Packed Beds and Spray Towers - Venturi scrubbers are primarily used to control PM, including PM_{10} and $PM_{2.5}$; however, scrubbers also are capable of absorption control of VOCs. Removal efficiencies for gas absorbers/scrubbers will vary for each pollutant-solvent system and with the type of absorber used. According to EPA, "Most absorbers have removal efficiencies in excess of 90%, and spray tower absorbers may achieve efficiencies greater than 99% for some pollutant-solvent systems. The typical collection efficiency range is from 50 to 95%. Lower control efficiencies represent flows containing relatively insoluble compounds at low concentrations, while the higher efficiencies are for flows which contain readily soluble compounds at high concentrations" (Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, 2003.). Packed-bed wet scrubbers typically have collection efficiencies ranging from 70 to 99%, depending on the type of pollutant-solvent system and absorber used. Spray tower scrubbers have removal efficiencies from 50 to 95%. Flow rates are typically 1,500 to 100,000 scfm, inlet gas temperatures are usually in the range of 40 to 100°F, and gaseous pollutant concentrations range from 250 to 10,000 ppmv. However, spray towers have the least effective mass transfer capability and are generally limited to use with high-solubility gases. Advantages include relative low capital cost, but disadvantages include costs for water/liquid disposal. Venturi scrubbers are simple in design and require low maintenance (advantages), though the effluent liquid can create a waste stream with an effluent liquid that may cause water pollution problems and/or waste sludge that may be expensive to dispose (disadvantages). For a packed-bed wet scrubber, estimated annualized cost effectiveness calculated in 2002 dollars was $100 to $500 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Packed-Bed/Packed-Tower Wet Scrubber, EPA-452/F-03-015, Washington, D.C.: Clean Air Technology Center, 2003.) For a spray-tower wet scrubber, estimated annualized cost effectiveness calculated in 2002 dollars was $45 to $860 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Spray-

Chamber/Spray-Tower Wet Scrubber, EPA-452/F-03-016, Washington, D.C.: Clean Air Technology Center, 2003.)

Condensers – A refrigerated condenser is a control device that is used to cool an emission stream that contains VOCs (as organic vapors) by changing those vapors to a liquid form so that the VOCs can be recovered, refined, reused, or disposed and prevented from release into ambient air. This type of control device can be viable when the emission stream is saturated with VOCs with minimal air flow, only one organic compound is emitted, and the required air flow would not overload a refrigeration system with heat. Therefore, a refrigerated condenser works best on emission streams containing high concentrations of VOCs and is less effective for dilute streams. Because the control efficiency of a condenser is dynamic based on outlet temperature and inlet concentration of VOC in the exhaust stream, condensers can exhibit a wide range of VOC control efficiency from as low as 50% to as high as above 99%. Costs vary widely. (CATC Technical Bulletin: Refrigerated Condensers for Control of Organic Air Pollution, EPA-456/R-01-004, Washington, D.C.: Clean Air Technology Center, December 2001.)

Adsorbers/Adsorption Systems – Adsorbers are control devices in which a pollutant is "adsorbed" on the surface (mostly the internal surface) of a granule, bead, or crystal of adsorbent material; it is not "absorbed" by a chemical reaction. Adsorbent materials include activated carbon (sometimes referred to as "absorbent carbon"), zeolite (alumino-silicate crystals), and polymeric adsorbents. Regenerative adsorption systems are typically batch operations involving two or more fixed adsorption beds. The VOC-laden gases pass through an adsorption bed where the VOC molecules are physically bound to the pore space in the adsorbent by Van der Waals nuclear forces. The cleaned gas is discharged to the atmosphere. The batch nature of the adsorption process concludes when the adsorbent bed becomes saturated with VOC and must be regenerated. Regeneration of the adsorbent is commonly done using a thermal regeneration (thermal swing) or vacuum regeneration process. Thermal regeneration utilizes steam to displace the captured VOC molecules, and then, the VOC-laden steam must be treated separately. Vacuum regeneration utilizes lowering of the vapor pressure to remove the VOC molecules from the adsorbent. The typical VOC inlet concentration required for effective adsorption falls in the range of 400 to 2,000 ppmv, and adsorbers and their follow-up control devices (i.e., condenser or decanter) are typically capable of achieving VOC control efficiencies of 95 to 98%. Other types of adsorption control devices include vapor concentrators, such as rotary vapor concentrators and fluidized bed concentrators. Costs vary widely. (CATC Technical Bulletin: Choosing an Adsorption System for VOC: Carbon, Zeolite, or Polymers?, EPA-456/F-99-004, Washington, D.C.: Clean Air Technology Center, May 1999.)

Biofilters - Bioreactors use microbes to remove pollutants from emissions by consuming the pollutants. The concept is simple, but execution can be complicated since microbes need the right pollutant concentration, temperature, humidity, and pH. Biofilters are the most common type of bioreactor and usually use beds (media on which microbes live) made from naturally occurring organic materials (yard cuttings, peat, bark, wood chips, or compost) that are slowly consumed by the biomass (i.e., microbes). Control efficiencies can range from 40 to 77%. Advantages of using biofilters include low installation costs and usually low operating costs; disadvantages include

large land requirements for installation, bed replacement every two (2) to five (5) years (depending on bed materials), and bed replacement can take two (2) to six (6) weeks (Technical Bulletin: Using Bioreactors to Control Air Pollution, EPA-456/R-03-003, Washington, D.C.: Clean Air Technology Center, September 2003.)

Good Design/Operation – Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices, such as operator inspections and logging runtime can be used to minimize emissions.

Good Operating Practices – Good operating practices can include equipment and area inspections, good housekeeping activities, preventive maintenance inspections to check serviceability and for completing repairs, etc.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for flakers and stranders at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-5 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR FLAKERS AND STRANDERS (RBLC PROCESS TYPE 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	7 Green Flakers 30.590	RTO, 95% but 90% because of bypass, DESP and RTO (Bypass of DESP and RTO for up to 460 hr/yr, which is allowed by permit)	VOC: 7.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant) 76.0 lb/hr (during bypass of DESP and RTO)
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	7 Green Flakers 30.590	RTO 95% but 90% because of bypass, DESP and RTO (Bypass of DESP and RTO for up	VOC: 7.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					to 460 hr/yr, which is allowed by permit)	76.0 lb/hr (during bypass of DESP and RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	7 Green Flakers 30.590	RTO, 95% but 90% because of bypass, DESP and RTO 95%, (Bypass of DESP and RTO for up to 460 hr/yr, which is allowed by permit)	VOC: 7.1 lb/hr for all processes routed through RTO (green flakers, natural gas-fired rotary dryers, and thermal energy plant) 76.0 lb/hr (during bypass of DESP and RTO)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Flaking - 4 Flakers	Proposed BACT: Good design/ operation	VOC: 22.78 lb/hr, 0.123 lb/ODT, 36.69 tpy (Emissions are total for 4 flakers)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Stranding – 3 Stranders	Proposed BACT: Good design/ operation	VOC: 2.67 lb/hr, 0.022 lb/ODT, and 11.71 tpy (Emissions are total for 3 stranders)

Table Notes:
Based on approximately 10 years of RBLC records.

This search indicated that some facilities have utilized RTOs to control VOC emissions from flaker processes when combined with other emission sources, though good design/operation also has been accepted as BACT for flakers. The RBLC and recent permits listed limits vary as follows:

- 7.1 lb/hr for green flakers, natural gas-fired rotary dryers, and thermal energy plant controlled by DESP and RTO (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016); and
- 76.0 lb/hr for green flakers (when bypassing (DESP and) RTO control for up to 460 hr/yr) (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed emissions for flakers based on good design/operation and good operating practices are 22.78 lb/hr, 0.123 lb/ODT, and 36.69 tpy. (See discussion of combining emission streams for RTO control including flakers in Step 4 of this section.)

This search indicated that that no PSD permits for OSB facilities are included in the RBLC database within the last 10 years to control VOC emissions from strander processes. Kronospan's proposed emissions for three (3) stranders based on good design/operation and good operating practices are 2.67 lb/hr, 0.022 lb/ODT, and 11.71 tpy.

This search also indicated that no PSD permits for OSB facilities with chippers are included in the RBLC database within the last 10 years to control VOC emissions from chipper processes. Kronospan's proposed emissions for the chipper based on good design/operation and good operating practices are 6.50 lb/hr and 28.47 tpy.

Step 2: Eliminate Technically Infeasible VOC Control Options for Flakers, Stranders, and Chipper

The use of an RTO could be considered technically infeasible when an RTO is installed prior to particulate control equipment such as baghouses/fabric filters/dust collectors, cyclofilters, or WESPs (from Kronospan 2022 application for particle board plant). The exhaust gas temperature from the RTO would be too high for a baghouse/fabric filter/dust collector, cyclofilter, or WESP to operate in a safe and/or effective manner because high temperatures could create a fire hazard within a baghouse or cyclofilter. Elevated temperatures entering a WESP could cause the wash fluid to flash and vaporize, thus reducing the effectiveness of the control device and potentially creating a safety hazard with the build-up of flash gas pressure.

Similarly, the addition of an RTO after a filterable particulate control device(s) such as a baghouse or cyclofilter could be a technically infeasible option for safety reasons; for example, if a filter bag in a baghouse would rupture, the collected wood and dust would flow into the RTO causing a fire. Furthermore, due to the high moisture content and lower exit temperature in the exhaust streams (86°F), the use of an RTO could be unstable and has been determined to be technically infeasible in several wood products manufacturing BACT determinations (Two Rivers Lumber, 2024; Scotch Gulf, 2023; Varn Wood Products, 2020; Westervelt, 2019; Harrigan Lumber, 2019; TRMM, 2019). However, other facilities have installed RTOs for OSB plants, and Kronospan currently utilizes two (2) RTOs for controlling VOC emissions. Therefore, for this analysis, an RTO is assumed to be technically feasible.

Also, the use of an RCO could be considered technically infeasible for some wood product processes due to the level of PM/PM_{10}/$PM_{2.5}$ loading. Even with highly efficient PM/PM_{10}/$PM_{2.5}$ control, the possibility of catalyst blinding, poisoning, plugging, or masking can occur, which will significantly reduce the efficiency of the RCO. Industry practice has illustrated that RCO technology may not be successfully applied in all cases (Westervelt 2019 BACT). However, for this analysis, an RCO is assumed to be technically feasible.

Wet scrubbers could be considered technically infeasible since some of the VOCs present in the flakers and stranders emissions are slightly soluble in water (specifically alpha-pinene), but some VOCs that will be present in the exhaust stream are highly soluble in water (Westervelt 2019 BACT). Because wet scrubbers used for VOC control can provide control efficiencies of 50 to 95%, Kronospan will assume for this analysis that scrubbers for controlling VOC emissions are technically feasible.

As mentioned earlier, condensers and adsorbers/adsorption systems are often considered to be technically infeasible controls for wood products manufacturing processes. Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to be lower than the VOC concentration (Westervelt 2019 BACT). Adsorption is not feasible because of the high moisture content of the exhaust stream from the flakers, stranders, and chipper, and water vapor and VOC compounds would compete for the adsorption media's active sites (Westervelt 2019 BACT).

Biofilters require a pollutant stream to be in a steady-state condition to effectively control VOC. If there were any process upsets or changes in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the flakers, stranders, and chipper, then the living organisms within the biofilter could be rendered ineffective. Therefore, Kronospan considers the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant).

Step 3: Rank Remaining Technically Feasible VOC Control Options for Flakers, Stranders, and Chipper

The remaining VOC control options for the OSB flakers, stranders, and chipper are oxidizers, wet scrubbers, good design/operation, and good operating practices and are ranked below.

TABLE 3-6 SUMMARY OF RANKED VOC CONTROLS FOR FLAKERS, STRANDERS, AND CHIPPER

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers
2	Wet Scrubbers/Packed Beds/Spray Towers
3	Good Design/Operation
3	Good Operating Practices

Step 4: Evaluate Remaining VOC Control Technologies for Flakers, Stranders, and Chipper

A cost effectiveness evaluation for using oxidizers to control VOCs from the flakers and stranders is below. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the range of VOC reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer (RTO); a control efficiency of

98 to 99.99% for a recuperative thermal oxidizer; and a control efficiency of 90 to 99% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five years during the RTO equipment lifetime; and
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP.

Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the flakers and stranders. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers, so it would also be considered economically infeasible.

A cost effectiveness evaluation for using oxidizers to control VOCs from the flakers is based on total uncontrolled VOC emissions of 22.78 lb/hr and 36.69 tpy at a flow rate of 31,843 dscfm or 35,340 acfm for the flakers. (Note that the application included a flow rate of 31,843 scfm, but the application has been revised/corrected to 31,843 dscfm.) Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

TABLE 3-7 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR FLAKERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,627,893	34.86	$46,704
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,775,835	34.86	$50,948
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,301,850	34.86	$37,350
Recuperative Thermal Oxidizer (98 - 99.99% control, 10-yr life at 7% control) (updated based on 1/15/2026 quote)	$3,626,748	35.96 – 36.69*	$100,866 at 98% control

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	34.86–36.69**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$2,229,716	33.02 – 36.33*	$67,524 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 36.69 tpy Flakers (for 4 Flakers) Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for the four (4) flakers, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the flakers.

A cost effectiveness evaluation for using oxidizers to control VOCs from the stranders is based on total uncontrolled VOC emissions of 2.67 lb/hr and 11.71 tpy at a flow rate of 79,607 dscfm or 88,350 acfm. (Note that the application included a flow rate of 79,607 scfm, but the application has been revised/corrected to 79,607 dscfm.) Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

TABLE 3-8 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR STRANDERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$2,850,909	11.12	$256,322
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$3,355,117	11.12	$301,655
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$2,498,820	11.12	$224,667

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Recuperative Thermal Oxidizer (98 - 99.99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$6,701,520	11.47 – 11.71*	$584,083 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99%)	$Not Available	11.48– 11.71**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest (updated based on 1/15/2026 quote)	$4,419,792	10.54 – 11.59*	$419,456 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 11.71 tpy Stranders (for 3 Stranders) Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for the three (3) stranders, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the stranders. Similarly, costs for controls on the chipper would not be cost effective because the VOC emissions from the chipper are small.

Note that combining emission streams from multiple emission sources has been done in Kronospan's other plants (MDF and PB), which route all other sources to an RTO; however, if this is done for the OSB plant, then the resulting RTO would be so large that it couldn't be cost effective. Combining flakers, stranders, and chipper with other emission sources in the OSB plant, considering all possible combinations, is untenable and not realistic; costs will be larger and not cost effective (as shown in previous version of this BACT analysis).

If Kronospan would combine all emission streams for RTO control within the OSB plant, then an RTO would be required to be significantly large for the combined flow, such that it wouldn't be cost effective. Combining emission streams with other sources in multiple possible combinations is untenable and not realistic -- costs will be larger and not cost effective.

The remaining control options for the flakers and stranders are wet scrubbers/packed beds/spray towers and good design/operation, which are assumed to not have any significant adverse impacts.

For these cost analyses, the range of VOC reduction for each emissions control technology is used: a control efficiency of 70 to 99% for a packed-bed scrubber; a control efficiency of 50 to 95% for spray towers; and a control efficiency of 50 to 95% for wet scrubbers (venturi scrubbers). Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of wet scrubbers/packed beds/spray towers as BACT for the flakers and stranders. Note that the current EPA Cost Estimation

Spreadsheet for Wet and Dry Scrubbers does not include calculations of costs for spray tower scrubbers or venturi scrubbers, but for this analysis, assume that costs are approximately the same. A cost effectiveness evaluation for using wet scrubbers/packed beds/spray towers and good design/operation to control VOCs from the flakers is based on total uncontrolled VOC emissions of 22.78 lb/hr and 36.69 tpy at a flow rate of 31,843 dscfm or 35,340 acfm for the flakers. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Wet and Dry Scrubbers for Acid Gas Control Cost Calculation Spreadsheet, updated 1/26/2023 (EPA Air Pollution Control Cost Manual, Section 5, Chapter 1 – Wet and Dry Scrubbers for Acid Gas Control, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, April 2021), the cost of applying wet scrubber control is shown below.

TABLE 3-9 SUMMARY OF WET SCRUBBER COSTS FOR FLAKERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Packed Bed Scrubber (70 – 99% control, 10 yr life at 7% interest) (updated based on 1/21/2026 quote)	$1,540,906	25.68 – 36.33* 31.19 at 85%	$49,409 at 85% control
Spray Tower Scrubber (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available
Wet Scrubber (Venturi Scrubber) (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 36.69 tpy Flakers (for 4 Flakers) Total x % reduction for Cost Analysis.*
*** Spray tower scrubber and venturi scrubber calculations not included in EPA cost spreadsheet. Assume cost similar to packed bed scrubber.*

Based on the costs shown above for the four (4) flakers, the economic impacts of these controls are considered excessive. These costs support elimination of wet scrubbers (packed bed) as BACT for the flakers.

A cost effectiveness evaluation for using wet scrubbers/packed beds/spray towers and good design/operation to control VOCs from the stranders is based on total uncontrolled VOC emissions of 2.67 lb/hr and 11.71 tpy at a flow rate of 79,607 dscfm or 88,350 acfm for the stranders. (Note that the flow rate for each strander is 26,538 dscfm, which totals to a flow rate of 79,607 dscfm for three [3] stranders.) Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Wet and Dry Scrubbers for Acid Gas Control Cost Calculation Spreadsheet, updated 1/26/2023 (EPA Air Pollution Control Cost Manual, Section 5, Chapter 1 – Wet and Dry Scrubbers for Acid Gas Control, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, April 2021), the cost of applying wet scrubber control is shown below.

TABLE 3-10 SUMMARY OF WET SCRUBBER COSTS FOR STRANDERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Packed Bed Scrubber (70 – 99% control, 10-yr life at 7% interest) (updated based on 1/21/2026 quote)	$1,636,191	8.20 – 11.60* 9.95 at 85%	$164,384 at 85% control
Spray Tower Scrubber (50 – 95% control)	$Not Available	5.86 – 11.12**	$Not Available
Wet Scrubber (Venturi Scrubber) (50 – 95% control)	$Not Available	5.86 – 11.12**	$Not Available

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 11.71 tpy Stranders (for 3 stranders) Total x % reduction for Cost Analysis.*
*** Spray tower scrubber and venturi scrubber calculations not included in EPA cost spreadsheet. Assume cost similar to packed bed scrubber.*

Based on the costs shown above for the three (3) stranders, the economic impacts of these controls are considered excessive. These costs support elimination of wet scrubbers (packed bed) as BACT for the stranders. Similarly, costs for controls on the chipper would not be cost effective because the VOC emissions from the chipper are small.

The remaining control options for the flakers and stranders are good design/operation and good operating practices, which are assumed to not have any significant adverse impacts. Kronospan will route flaker and strander emissions into the Strander Building.

Step 5: Selection of BACT for VOC for Flakers, Stranders, and Chipper

Kronospan proposes the use of good design/operation and good operating practices as BACT for VOC emissions from the flakers, stranders, and chipper.

Kronospan's proposed BACT VOC emission limits for flakers based on good design/operation and good operating practice controls are:

- VOC: 22.78 lb/hr, 0.123 lb/ODT, and 36.69 tpy VOC (total for four [4] flakers).

Kronospan's proposed BACT VOC emission limits for stranders based on good design/operation and good operating practice controls are:

- VOC: 2.67 lb/hr, 0.022 lb/ODT, and 11.71 tpy VOC (total for three [3] stranders).

Kronospan's proposed BACT VOC emission limits for the chipper based on good design/operation and good operating practices for the chipper to control VOC emissions are:

- VOC: 6.50 lb/hr and 28.47 tpy VOC (total for chipper).

This level of control is consistent with results from the RBLC tables and recent permits.

Proposed BACT Controls: Good Design/Operation and Good Operating Practices

3.2 BACT ANALYSIS FOR OSB PLANT UNITS – BLENDING/GLUING AND SIFTER/SCREENING

Kronospan is proposing an OSB plant project that includes blending/gluing (EP 2.1, Blending/Gluing) and sifter/screening (EP 2.2, Sifter/Screening), which are reviewed in this section. The OSB plant blending/gluing and sifter/screening processes will generate PM, PM_{10}, $PM_{2.5}$, and VOC emissions.

3.2.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ AND CPM BACT ANALYSIS FOR OSB PLANT UNITS - BLENDING/GLUING AND SIFTER/SCREENING

Particulates and dust will be generated from blending/gluing and sifter/screening. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from blending/gluing and sifter/screening will be discharged to atmosphere.

BACT Floor Kronospan's particulate emissions from blending/gluing and sifter/screening will meet the Process Weight Rate requirements.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Blending/Gluing and Sifter/Screening

Potentially applicable controls for particulate emissions from OSB blending/gluing and sifter/screening include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, mechanical collectors (cyclones/multiclones), cyclofilters, high-efficiency venturi scrubbers, as well as building enclosures, and good design/operations. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-11 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BLENDING/GLUING AND SIFTER/SCREENING

Control Type	Estimated Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Efficiency
Baghouse/Fabric Filters/Dust Collectors	99 to 99.9+%.
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones).	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones.
Cyclofilters	80 to 99%
High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers	70 to 99%

Control Type	Estimated Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Efficiency
Building Enclosures	90%
Good Design/Operation	Varies

Descriptions of these types of particulate control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for blending/gluing and sifter/screening processes at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-12 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BLENDING/GLUING AND SIFTER/SCREENING (RBLC PROCESS TYPES (RBLC PROCESS TYPES 30.510, BOARD MANUFACTURING MATERIAL HANDLING, 30.540, BOARD PRODUCT FINISHING, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls heavy particle sifter exhaust), 301-0079-X069, F-06 30.520	Baghouse Exhausts to atmosphere	FPM: 0.95 lb/hr, 0.003 gr/dscf TPM_{10}: Not listed $TPM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Blending 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.41 lb/hr and 0.002 gr/dscf TPM_{10}: 0.41 lb/hr $TPM_{2.5}$: 0.41 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Sifter/ Shaker 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.41 lb/hr and 0.002 gr/dscf TPM_{10}: 0.41 lb/hr $TPM_{2.5}$: 0.41 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Blending 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.41 lb/hr and 0.002 gr/dscf TPM_{10}: 0.41 lb/hr $TPM_{2.5}$: 0.41 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Sifters 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.41 lb/hr and 0.002 gr/dscf TPM_{10}: 0.41 lb/hr $TPM_{2.5}$: 0.41 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Blending 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.99 lb/hr and 0.002 gr/dscf TPM_{10}: 0.99 lb/hr $TPM_{2.5}$: 0.99 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Sifter 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.33 lb/hr and 0.002 gr/dscf TPM_{10}: 0.33 lb/hr $TPM_{2.5}$: 0.33 lb/hr CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Blending/ Gluing	Proposed BACT: Dust Collector, Good Design/ Operation	FPM: 0.60 lb/hr, 0.002185 gr/dscf, PM_{10}: 0.45 lb/hr, 0.00165 gr/dscf, $PM_{2.5}$: 0.08 lb/hr, 0.0003 gr/dscf, CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0%
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Sifter/ Screening	Proposed BACT: Dust Collector, Good Design/ Operation	FPM: 0.80 lb/hr, 0.002185 gr/dscf, PM_{10}: 0.60 lb/hr, 0.00165 gr/dscf, $PM_{2.5}$: 0.11 lb/hr, 0.0003 gr/dscf, CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0%

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search showed baghouses as BACT for particulate emissions from blending/gluing with limits varying as follows:

- 0.41 lb/hr and 0.002 gr/dscf for blending based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017); and
- 0.99 lb/hr and 0.002 gr/dscf for blending based on baghouse control (MI-0421, 8/26/2016).

For comparison, Kronospan's proposed Filterable PM emissions are 0.60 lb/hr, 0.002185 gr/dscf, and 2.68 tpy for blending/gluing based on dust collector controls. Proposed PM_{10} emissions are 0.45 lb/hr, 0.00165 gr/dscf, and 1.97 tpy, and $PM_{2.5}$ emissions are 0.08 lb/hr, 0.0003 gr/dscf, and 0.35 tpy.

The RBLC and recent permits search showed baghouses as BACT for particulate emissions from sifter/screening with limits varying as follows:

- 0.33 lb/hr and 0.002 gr/dscf for sifters based on baghouse control (MI-0421, 8/26/2016).

For comparison, Kronospan's proposed Filterable PM emissions are 0.80 lb/hr, 0.002185 gr/dscf, and 3.50 tpy for sifter/screening based on dust collector controls. Proposed PM_{10} emissions are 0.60 lb/hr, 0.00165 gr/dscf, and 2.68 tpy, and $PM_{2.5}$ emissions are 0.11 lb/hr, 0.0003 gr/dscf, and 0.48 tpy.

Step 2: Eliminate Technically Infeasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Blending/Gluing and Sifter/Screening

The PM emissions collected from blending/gluing and sifter/screening will be used as fuel for the wood-fired heaters at the facility. The use of a WESP would cause the collected wood fuel to become unusable due to the volumes of moisture that would be added to the material stream. As a result, the use of a WESP to control these emissions could be technically infeasible. However, note that for this analysis, a WESP with RTO is assumed to be technically feasible.

Similarly, the use of a venturi scrubber would cause the collected wood fuel to become unusable due to the scrubbing liquid that would be added to the material stream. For this reason, some OSB plants have determined venturi scrubbers to be technically infeasible for controlling emissions from blending/gluing and sifter/screening.

Step 3: Rank Remaining Technically Feasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Blending/Gluing and Sifter/Screening

The remaining PM control technologies for the blending/gluing and sifter/screening processes are ranked, as shown in the table below.

TABLE 3-13 SUMMARY OF RANKED FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM CONTROLS FOR BLENDING/GLUING AND SIFTER/SCREENING

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors
2	Dry Electrostatic Precipitators
3	Mechanical Collectors (High-Efficiency Cyclones/Multiclones)
4	Cyclofilters
5	High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers
6	Building Enclosures
7	Good Design/Operation

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Blending/Gluing and Sifter/Screening

Baghouses/fabric filters/dust collectors do not have any significant adverse impacts and are not considered economically infeasible. Therefore, Kronospan proposes to utilize dust collectors to control particulate emissions from the blending/gluing and sifter/screening processes. The blending/gluing and sifter/screening exhausts will be controlled by dust collectors, which are the top ranked control device. Therefore, no further analysis for the reduction of particulates is necessary.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for Blending/Gluing and Sifter/Screening

Kronospan proposes the use of dust collectors for controlling particulate emissions from blending/gluing and sifter/screening operations. Kronospan also proposes BACT limits as follows in addition to implementing good design/operation for blending/gluing:

- Filterable PM: 0.60 lb/hr, 0.002185 gr/dscf;
- PM_{10}: 0.45 lb/hr, 0.00165 gr/dscf;
- $PM_{2.5}$: 0.08 lb/hr, 0.0003 gr/dscf;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan also proposes BACT limits as follows in addition to implementing good design/operation for sifter/screening:

- Filterable PM: 0.80 lb/hr, 0.002185 gr/dscf;
- PM_{10}: 0.60 lb/hr, 0.00165 gr/dscf;
- $PM_{2.5}$: 0.11 lb/hr, 0.0003 gr/dscf;

- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan proposes to minimize visible emissions from these processes using good design/operation. The RBLC does not include any visible emissions or opacity limits for this type of process or equipment. Therefore, Kronospan proposes an opacity limit of 0% as BACT for blending/gluing and sifter/screening processes.

Proposed BACT Controls: Dust Collectors and Good Design/Operation

3.2.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS - BLENDING/GLUING AND SIFTER/SCREENING

The blending/gluing and sifter/screening processes will generate VOC emissions. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the blending/gluing and sifter/screening operations will be discharged to atmosphere.

BACT Floor These sources will be subject to the applicable requirements of 40 CFR 63 Subpart DDDD.

Step 1: Identify Potential VOC Control Technologies for Blending/Gluing and Sifter/Screening

Potentially applicable controls for VOC emissions from OSB blending/gluing and sifter/screening include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (such as packed beds, spray towers), biofilters, and good design/operation. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-14 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR BLENDING/GLUING AND SIFTER/SCREENING

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%

Control Type	Estimated VOC Control Efficiency
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40 to 77%.
Good Design/Operation	Varies

Descriptions of these types of VOC control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for blending/gluing and sifter/screening processes at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-15 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR BLENDING/GLUING AND SIFTER/SCREENING (RBLC PROCESS TYPES 30.510, BOARD MANUFACTURING MATERIAL HANDLING, 30.540, BOARD PRODUCT FINISHING, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls heavy particle sifter exhaust), 301-0079-X069, F-06 30.520	Baghouse Exhausts to atmosphere no VOC control	VOC: 2.14 lb/hr and 0.033 lb/MSF ¾" basis
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Blending 30.590	Good design and operation practices (Wet scrubber and RTO not cost effective)	VOC: 17.3 lb/hr
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Sifter/ Shaker	Good design and operation	VOC: 18.0 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
				30.590	practices (Wet scrubber and RTO not cost effective)	
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Blending 30.590	Good design and operation practices (RTO not cost effective)	VOC: 2.43 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Sifters 30.590	Not listed	VOC: Not listed in RBLC
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Core and Surface Blending 30.590	Good design and operation practices (RTO not cost effective)	VOC: 2.43 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Core and Surface Sifter/ Shaker 30.590	Not listed	VOC: Not listed in RBLC
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Blending/ Gluing	Proposed BACT: Good design/ operation	VOC: 20.05 lb/hr, 0.165 lb/ODT
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Sifter/ Screening	Proposed BACT: Good design/ operation	VOC: 17.62 lb/hr, 0.145 lb/ODT

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search showed good design and operating practices as BACT controls for VOC emissions from blending/gluing with limits varying as follows:

- 2.43 lb/hr for blending based on good design and operating practice controls (MI-0425, 5/19/2017; MI-0421, 8/26/2016); and
- 17.3 lb/hr for blending based on good design and operating practice controls (MI-0448, 12/18/2020).

For comparison, Kronospan's proposed VOC emissions are 20.05 lb/hr, 0.165 lb/ODT, and 87.83 tpy for blending/gluing based on good design/operation control.

The RBLC and recent permits search indicated that wet scrubbers and RTOs were not cost effective, and as a result, good design/operation controls were selected as BACT for VOC emissions from sifter/screening with limits as follows:

- 18.0 lb/hr for sifters based on good design and operating practice controls (MI-0448, 12/18/2020).

For comparison, Kronospan's proposed VOC emissions are 17.62 lb/hr, 0.145 lb/ODT, and 77.18 tpy for sifter/screening based on good design/operation controls.

Step 2: Eliminate Technically Infeasible VOC Control Options for Blending/Gluing and Sifter/Screening

The use of an RTO could be considered technically infeasible when an RTO is installed prior to particulate control equipment such as baghouses/fabric filters/dust collectors, cyclofilters, or WESPs (from Kronospan 2022 application for particle board plant). The exhaust gas temperature from the RTO would be too high for a baghouse/fabric filter/dust collector, cyclofilter, or WESP to operate in a safe and/or effective manner because high temperatures could create a fire hazard within a baghouse or cyclofilter. Elevated temperatures entering a WESP could cause the wash fluid to flash and vaporize, thus reducing the effectiveness of the control device and potentially creating a safety hazard with the build-up of flash gas pressure.

The addition of an RTO after a filterable particulate control device(s) such as a baghouse or cyclofilter also could be a technically infeasible option for safety reasons; for example, if a filter bag in a baghouse would rupture, the collected wood and dust would flow into the RTO causing a fire. Furthermore, due to the high moisture content and lower exit temperature in the exhaust streams (86°F), the use of an RTO could be unstable and has been determined to be technically infeasible in several wood products manufacturing BACT determinations (Two Rivers Lumber, 2024; Scotch Gulf, 2023; Varn Wood Products, 2020; Westervelt, 2019; Harrigan Lumber, 2019; TRMM, 2019). However, other facilities have installed RTOs for OSB plants, and Kronospan currently utilizes two (2) RTOs for controlling VOC emissions. Therefore, for this analysis, an RTO is assumed to be technically feasible.

The use of an RCO could be considered technically infeasible for some wood product processes due to the level of PM/PM_{10}/$PM_{2.5}$ loading. Even with highly efficient PM/PM_{10}/$PM_{2.5}$ control, the possibility of catalyst blinding, poisoning, plugging, or masking can occur, which will significantly reduce the efficiency of the RCO. Industry practice has illustrated that RCO technology may not be successfully applied in all cases (Westervelt 2019 BACT). However, for this analysis, an RCO is assumed to be technically feasible.

Wet scrubbers could be technically infeasible since some of the VOCs present in the blending/gluing and sifter/screening emissions are slightly soluble in water (Westervelt 2019 BACT).

Also as mentioned earlier, condensers and adsorbers/adsorption systems are often considered to be technically infeasible controls for wood products manufacturing processes. Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to

be lower than the VOC concentration (Westervelt 2019 BACT). Adsorption is not feasible because of the high moisture content of the exhaust stream from the blending/gluing and sifter/screening processes, and water vapor and VOC compounds would compete for the adsorption media's active sites (Westervelt 2019 BACT).

Biofilters require a pollutant stream to be in a steady-state condition to effectively control VOC emissions. If there were any process upsets or change in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the blending/gluing and sifter/screening processes, then the living organisms within the biofilter could be rendered ineffective. Therefore, Kronospan considers the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant).

Step 3: Rank Remaining Technically Feasible VOC Control Options for Blending/Gluing and Sifter/Screening

The remaining VOC add-on control technologies for the OSB blending/gluing and sifter/screening processes are good design/operation as ranked below.

TABLE 3-16 SUMMARY OF RANKED VOC CONTROLS FOR BLENDING/GLUING AND SIFTER/SCREENING

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers
2	Good Design/Operation

Step 4: Evaluate Remaining VOC Control Technologies for Blending/Gluing and Sifter/Screening

Cost effectiveness evaluations for using oxidizers to control VOCs from blending/gluing and/or sifter/screening are below. Total uncontrolled VOC emissions will be:

- 20.05 lb/hr and 87.83 tpy at a flow rate of 31,843 dscfm or 35,340 acfm for blending/gluing. (Note that the application included a flow rate of 31,843 scfm, but the application has been revised/corrected to 31,843 dscfm); and
- 17.62 lb/hr and 77.18 tpy at a flow rate of 42,457 dscfm or 47,120 acfm for sifter/screening. (Note that the application included a flow rate of 42,457 scfm, but the application has been revised/corrected to 42,457 dscfm).

Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the costs of applying thermal or catalytic oxidation are shown below.

For these cost analyses, the range of VOC reduction for each emissions control technology is used: a control efficiency of 95 to 99% for a regenerative thermal oxidizer; a control efficiency of 98 to 99.99% for a recuperative thermal oxidizer; and a control efficiency of 90 to 99% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five (5) years during the RTO equipment lifetime; and
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP.

Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for blending/gluing and/or sifter/screening. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers, so it would also be considered economically infeasible.

Cost effectiveness evaluations for using oxidizers to control VOCs from blending/gluing are shown in the table below.

TABLE 3-17 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BLENDING/GLUING (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$2,304,611	83.43	$27,624
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$3,129,294	83.43	$37,500
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,978,567	83.43	$23,716
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$3,729,833	86.06 – 87.82*	$43,339 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	86.06– 87.82**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)(updated based on 1/15/2026 quote)	$3,139,914	79.04 – 86.95*	$39,727 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 87.83 tpy Blending/Gluing Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Cost effectiveness evaluations for using oxidizers to control VOCs from sifter/screening are shown in the table below.

TABLE 3-18 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR SIFTER/SCREENING (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,862,097	73.32	$25,398
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$2,211,532	73.32	$30,164
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$1,530,266	73.32	$20,872
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$4,151,983	75.63 – 77.17*	$54,897 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	75.63– 77.17**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$2,851,343	69.46 – 76.40*	$41,051 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 93.43 tpy for Sifter/Screening Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*
**** Not technically feasible; see discussion in text below.*

Based on the costs shown above for blending/gluing and sifter/screening, the economic impacts of these controls are considered excessive. As an aside, the blending/gluing process for the Particle Board (PB) plant is located in the PB press hall, so that it is possible to route the VOC emissions through the PB press hall to the PB RTO. However, blending/gluing for the OSB plant will not be

located in the OSB press hall because resin application and type of resin are different than that used in the PB plant. Therefore, the separation of buildings is driven by the process.

These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for any combination of blending/gluing, sifter/screening, and blending/gluing and sifter/screening.

The remaining control options for the blending/gluing and sifter/screening processes are good design/operation, which are assumed to not have any significant adverse impacts.

Step 5: Selection of BACT for VOC for Blending/Gluing and Sifter/Screening

Kronospan proposes the use of good design/operation as BACT for VOC emissions from the OSB blending/gluing and sifter/screening processes. Kronospan also proposes BACT limits as follows in addition to implementing good design/operation for blending/gluing and sifter/screening:

- VOC: 20.05 lb/hr, 0.165 lb/ODT (blending/gluing); and
- VOC: 17.62 lb/hr, 0.145 lb/ODT (sifter/screening).

This BACT proposal is consistent with other entries in the RBLC database for VOC emissions from similar units at OSB manufacturing facilities.

Proposed BACT Controls: Good Design/Operation

3.3 BACT ANALYSIS FOR OSB PLANT UNITS – OSB PRESS HALL SOURCES

Kronospan is proposing an OSB plant project that includes emissions routed to the Press Hall as follows:

- Forming line (EP 3.1, Forming Line – Vents to Press Hall), and a mat saw (EP 3.2, Mat Saw – Vents to Press Hall). The forming line and mat saw will generate Filterable PM, PM_{10}, and $PM_{2.5}$ emissions, as well as VOC emissions; emissions of CPM (condensable particulate matter) are not expected;
- Press for the manufacture of oriented strand boards (EP 4.1, Press). The OSB press will generate PM, PM_{10}, $PM_{2.5}$, and VOC emissions, as well as CO and NOx emissions, though the OSB press itself does not include combustion, since the biomass heaters and natural gas-fired thermal oil heaters will provide indirect heat to the press via a hot oil loop; and
- Diagonal saw (EP 5.1, Diagonal Saw – Vents to Press Hall), cut-to-size saw (EP 5.2, Cut-to-Size Saw – Vents to Press Hall), three (3) tongue and groove (T&G) lines (EP 6.1, T&G Line #1, EP 6.2, T&G Line #2, and EP 6.3, T&G Line #3 – Vents to Press Hall), and sanding (EP 7.1, OSB Sanding – Vents to Finishing Building and then to Press Hall). The OSB diagonal saw, cut-to-size saw, tongue and groove lines, and sanding operations will generate PM, PM_{10}, $PM_{2.5}$, and VOC emissions

In the OSB Press Hall, the Press Scrubber System is an integral part of the press operation. The collection part of the Press Scrubber System is ductwork for collecting wood dust particles, as well as vapor emissions directly from many points along the length of the press. Water is sprayed into this ductwork to aid in the removal of this wood dust. This water and air stream is routed through a cyclone to separate the water / wood dust from the air stream. Without the collection part of the system the dust would build up in various areas of the press creating a fire hazard. Therefore, Kronospan press installations are designed with the Press Scrubber System from the beginning. The MDF and Particle Board Plants at the Eastaboga site are both examples of this integral design feature, in which a scrubber system (located prior to the RTO) is integral to the press system. Note that an RTO was necessary for the MDF and PB plants to meet the MACT standard requirements; however, the OSB plant can meet MACT requirements without RTO control.

The Press Scrubber System serves as both fire prevention and emissions collection / control. Further, the scrubber water will be disposed of off-site.

3.3.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS FOR OSB PLANT UNITS – OSB PRESS HALL SOURCES

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Particulates will be generated from the forming line activities to prepare the surface and core layers for forming, as well as from the mat saw process. Emissions from the forming line and mat saw will be discharged inside the Press Hall Building and routed through the wet scrubber. Emissions from the OSB press will be routed through the wet

scrubber according to Kronospan's Press Scrubber System. Emissions from the diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding will be discharged inside the Press Hall Building and routed through the wet scrubber. Exhaust from the wet scrubber then will be discharged to belt dryer #3 stack. (The scrubber water will be disposed of off-site.)

BACT Floor Kronospan particulate emissions from the OSB Press Hall sources (forming line and mat saw, OSB press, and from the diagonal saw, cut-to-size saw, tongue and groove lines, and sanding processes) will meet the Process Weight Rate requirements.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for OSB Press Hall

Potentially applicable controls for the OSB Press Hall include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, mechanical collectors (cyclones/multiclones), cyclofilters, high-efficiency venturi scrubbers, and good design/operation, as well as building enclosures and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-19 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR PRESS HALL

Control Type	Estimated Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	99 to 99.9+%
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones)	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones
Cyclofilters	80 to 99%
High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers	70 to 99%
Building Enclosures	90%
Good Design/Operation	Varies

Descriptions of these types of particulate control systems are included in a previous section.

RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for the forming line and mat saw at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit

issuance and may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-20 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR OSB PRESS HALL SOURCES (FORMING LINE AND MAT SAW) (RBLC PROCESS TYPES 30.540, BOARD PRODUCT FINISHING, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls surface and core layer exhaust), 301-0079-X069, F-04 30.520	Baghouse Exhausts to atmosphere	FPM: 0.9400 lb/hr, 0.0030 gr/dscf FPM10: Not listed FPM2.5: Not listed CPM: Not listed Opacity: 0%
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls Hammermills #1-#4 exhaust), 301-0079-X069, F-05 30.520	Baghouse Exhausts to atmosphere	FPM: 1.2500 lb/hr, 0.0030 gr/dscf FPM_{10}: Not listed $FPM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls heavy particle sifter exhaust), 301-0079-X069, F-06 30.520	Baghouse Exhausts to atmosphere	FPM: 0.9500 lb/hr, 0.0030 gr/dscf FPM_{10}: Not listed $FPM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Forming 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 1.05 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) and 0.002 gr/dscf TPM_{10}: 1.05 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) $TPM_{2.5}$: 1.058 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Core and Surface Forming 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 1.05 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) and 0.002 gr/dscf TPM_{10}: 1.05 lb/hr (1st stack) and

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
						0.66 lb/hr (2nd stack) $TPM_{2.5}$: 1.058 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Core and Surface Forming 30.590	Baghouse/ Fabric Filters, 99% (0-50% for condensable, 99+% for filterable)	FPM: 0.33 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) and 0.002 gr/dscf TPM_{10}: 0.33 lb/hr (1st stack) and 0.66 (2nd stack) $TPM_{2.5}$: 0.33 lb/hr (1st stack) and 0.66 lb/hr (2nd stack) CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Forming Line	Proposed BACT: Cyclone/ Dust Collector and Cyclone/ Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Mat Saw	Proposed BACT: Cyclone/ Dust Collector and Cyclone/ Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and permit search showed baghouses as BACT for particulate emissions from the forming line and mat saw with limits varying as follows:

- 0.99 lb/hr and 0.33 lb/hr for core and surface forming and 0.002 gr/dscf based on baghouse control (MI-0421, 8/26/2016); and
- 1.71 lb/hr and 0.002 gr/dscf for core and surface forming based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017).

For comparison, Kronospan's proposed Filterable PM emissions are 0.075 lb/hr and 0.33 tpy for the forming line based on cyclone/dust collector and cyclone/wet scrubber controls. Proposed FPM_{10} emissions are 0.075 lb/hr and 0.33 tpy, and $FPM_{2.5}$ emissions are 0.061 lb/hr and 0.26 tpy.

For comparison, Kronospan's proposed Filterable PM emissions are 0.03 lb/hr and 0.13 tpy for the mat saw based on cyclone/dust collector and cyclone/wet scrubber controls. Proposed FPM_{10} emissions are 0.03 lb/hr and 0.13 tpy, and $FPM_{2.5}$ emissions are 0.025 lb/hr and 0.11 tpy.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for OSB presses at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-21 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR OSB PRESS HALL SOURCES (OSB PRESS) (RBLC PROCESS TYPE 30.520, BOARD PRESSES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Press #1 160.00 Msqf/hr 30.520	Wet Scrubber	FPM: 10.00 lb/hr, 0.0630 lb/Msqf TPM_{10}: 10.00 lb/hr, 0.0630 lb/Msqf $TPM_{2.5}$: 10.00 lb/hr, 0.0630 lb/Msqf CPM: Not listed Opacity: Not listed
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Press (press, edge trim saw exhaust to Filter #9, board cooler), 301-0079-X070, F-09 30.520	Baghouse Exhausts to atmosphere, not to Press Hall	FPM: 0.7600 lb/hr, 0.0030 gr/dscf FPM_{10}: Not listed $FPM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590	Wet Scrubber, 70-90%	FPM: 4.74 lb/hr (applies to total emissions from press and board cooler, PCWP) TPM_{10}: 4.74 lb/hr $TPM_{2.5}$: 4.74 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
				(Press and Board Cooler exhaust through same stack to comply with PCWP MACT)		CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Wet Scrubber, 90% (50-90% condensable PM, 84-90% filterable PM10)	FPM: 12.2 lb/hr (applies to total emissions from press and board cooler, PCWP) TPM_{10}: 2.2 lb/hr $TPM_{2.5}$: 2.2 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Wet Scrubber, 90% (50-90% condensable PM, 84-90% filterable PM10)	FPM: 12.2 lb/hr (applies to total emissions from press and board cooler, PCWP) TPM_{10}: 2.2 lb/hr $TPM_{2.5}$: 2.2 lb/hr CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	OSB Press	Proposed BACT: Cyclone/ Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that some facilities utilize wet scrubbers, while others use good design/operation and/or good operating practices as BACT. A few facilities have installed an RTO, RCO, or thermal catalytic oxidizer (TCO) associated with an OSB press, but these control devices were mainly installed for reducing VOC emissions. Other facilities have installed WESPs, but these control devices were installed primarily to control emissions from energy/dryer systems, which included wood-fired heaters. The RBLC and recent permits search showed BACT controls for particulate emissions from OSB presses with limits varying as follows:

- 4.74 lb/hr for OSB press based on wet scrubber control (MI-0448, 12/18/2020);
- 8.2 lb/hr for OSB presses based on RTO/RCO control (WI-0223, 6/17/2024); and

- 12.2 lb/hr for OSB press based on wet scrubber control (MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed Filterable PM emissions for the OSB press based on cyclone and wet scrubber controls are 0.92 lb/hr and 4.04 tpy. Proposed FPM_{10} emissions are 0.92 lb/hr and 4.04 tpy, and $FPM_{2.5}$ emissions are 0.862 lb/hr and 3.78 tpy.

RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for a diagonal saw, cut-to-size saw, tongue and groove lines, and sanding processes at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-22 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR OSB PRESS HALL SOURCES (DIAGONAL SAW, CUT-TO-SIZE SAW, TONGUE AND GROOVE LINES, AND SANDING) (RBLC PROCESS TYPE 30.540, BOARD PRODUCT FINISHING)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Press (final cutting exhausting Filter #11, exhausting to Press Hall), 301-0079-X070, F-11 30.520	Baghouse Exhausts to Press Hall	FPM: Not listed FPM_{10}: Not listed $FPM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Cut to Panel Saw Line 30.540	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.44 lb/hr and 0.002 gr/dscf TPM_{10}: 0.44 lb/hr $TPM_{2.5}$: 0.44 lb/hr CPM: Not listed
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Flying Cutoff Saw 30.540	Baghouse/ Fabric Filter, 99%	FPM: 0.55 lb/hr and 0.002 gr/dscf TPM_{10}: 0.55 lb/hr $TPM_{2.5}$: 0.55 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Sanding Operations 30.540	Baghouse/ Fabric Filter, 99%	FPM: 1.43 lb/hr and 0.002 gr/dscf TPM_{10}: 1.43 lb/hr $TPM_{2.5}$: 1.43 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Cut to Panel Saw Line 30.540	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.44 lb/hr and 0.002 gr/dscf TPM_{10}: 0.44 lb/hr $TPM_{2.5}$: 0.44 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Flying Cutoff Saw 30.540	Baghouse/ Fabric Filter, 99%	FPM: 0.55 lb/hr and 0.002 gr/dscf TPM_{10}: 0.55 lb/hr $TPM_{2.5}$: 0.55 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Sanding Operations 30.540	Baghouse/ Fabric Filter, 99%	FPM: 1.43 lb/hr and 0.002 gr/dscf TPM_{10}: 1.43 lb/hr $TPM_{2.5}$: 1.43 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Cut to Panel Saw Line 30.540	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.56 lb/hr and 0.002 gr/dscf TPM_{10}: 0.56 lb/hr $TPM_{2.5}$: 0.56 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Flying Cutoff Saw 30.540	Baghouse/ Fabric Filter, 99%	FPM: 0.50 lb/hr and 0.002 gr/dscf TPM_{10}: 0.50 lb/hr $TPM_{2.5}$: 0.50 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Sanding Operations 30.540	Baghouse/ Fabric Filter, 99%	FPM: 1.27 lb/hr and 0.002 gr/dscf TPM_{10}: 1.27 lb/hr $TPM_{2.5}$: 1.27 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
						CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Diagonal Saw	Proposed BACT: Cyclone/ Dust Collector and Cyclone/ Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Cut-to-Size Saw	Proposed BACT: Cyclone/ Dust Collector and Cyclone/Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	3 Tongue and Groove Lines	Proposed BACT: Cyclone/ Dust Collector and Cyclone/ Wet Scrubber (in Press Hall)	See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Sanding	Proposed BACT: Dust Collector and Building Enclosure (vented to Finishing Building, then routed to Press Hall)	See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

For diagonal saws, this search indicated that most facilities utilize baghouses (or cyclones plus baghouses, or dust collectors) as BACT controls for particulate emissions from diagonal saws (or other OSB saws) with limits varying as follows:

- 0.44 lb/hr and 0.002 gr/dscf for cut to panel saw based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 0.50 lb/hr and 0.002 gr/dscf for flying cutoff saw based on baghouse control (MI-0421, 8/26/2016);
- 0.55 lb/hr and 0.002 gr/dscf for flying cutoff saw based on baghouse control (MI-0448, 12/18/2020); and

- 0.56 lb/hr and 0.002 gr/dscf for cut to panel saw based on baghouse control (MI-0421, 8/26/2016).

For comparison, Kronospan's proposed Filterable PM emissions are 0.03 lb/hr and 0.12 tpy, with cyclone/dust collector and cyclone/wet scrubber controls for the diagonal saw. PM_{10} emissions are proposed as 0.03 lb/hr and 0.12 tpy, and $PM_{2.5}$ emissions are proposed as 0.023 lb/hr and 0.10 tpy.

For cut-to-size saws, this search indicated that most facilities utilize baghouses as BACT controls for particulate emissions from cut-to-size saws (or other OSB saws) with limits varying as follows:

- 0.44 lb/hr and 0.002 gr/dscf for cut to panel saw based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 0.50 lb/hr and 0.002 gr/dscf for flying cutoff saw based on baghouse control (MI-0421, 8/26/2016);
- 0.55 lb/hr and 0.002 gr/dscf for flying cutoff saw based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017); and
- 0.56 lb/hr and 0.002 gr/dscf for cut to panel saw based on baghouse control (MI-0421, 8/26/2016).

For comparison, Kronospan's proposed Filterable PM emissions for the cut-to-size saw are 0.015 lb/hr and 0.07 tpy, with cyclone/dust collector and cyclone/wet scrubber controls. PM_{10} emissions are proposed as 0.015 lb/hr and 0.07 tpy, and $PM_{2.5}$ emissions are proposed as 0.012 lb/hr and 0.05 tpy.

For tongue and groove lines, this search indicated that no PSD permits for OSB facilities are included in the RBLC database within the last 10 years for particulate emissions from tongue and groove lines, Kronospan's proposed Filterable PM emissions for the three (3) tongue and groove lines are 0.02 lb/hr and 0.09 tpy, with cyclone/dust collector and cyclone/wet scrubber controls. PM_{10} emissions are proposed as 0.02 lb/hr and 0.09 tpy, and $PM_{2.5}$ emissions are proposed as 0.016 lb/hr and 0.07 tpy.

For sanding operations, this search indicated that most facilities utilize baghouses or dust collectors as BACT controls for particulate emissions from sanding (or other finishing operations) with limits varying as follows:

- 1.27 lb hr and 0.002 gr/dscf for sanding operations based on baghouse control (MI-0421, 8/26/2016); and
- 1.43 lb/hr and 0.002 gr/dscf for sanding operations based on baghouse control (MI-0448, 12/18/2020; MI-0425, 5/19/2017).

For comparison, Kronospan's proposed Filterable PM emissions for the sanding operations are 0.07 lb/hr and 0.31 tpy, with dust collector control, followed by exhausting into the Finishing Building and then routed to the Press Hall. PM_{10} emissions are proposed as 0.07 lb/hr and 0.31 tpy, and $PM_{2.5}$ emissions are proposed as 0.057 lb/hr and 0.25 tpy.

Step 2: Eliminate Technically Infeasible PM Control Options for OSB Press Hall

Even though baghouses can remove up to 99% of PM/PM_{10}, the resins and waxes used to fabricate the boards can potentially blind baghouse filters. This blinding could cause lower airflow rates, greater pressure drops, and reduced PM/PM_{10}/$PM_{2.5}$ control efficiencies. Therefore, baghouses could be effective only for a short period of time until the filters become blinded. So, baghouses and cyclofilters could be considered to be technically infeasible (Huber). However, baghouses and cyclofilters are considered to be technically feasible for this evaluation.

Also, a dry ESP used for an OSB press can collect resin and wax particles in the press exhaust, but the cleaning process for the DESP would require modifications to the process that are considered to be technically infeasible (Huber). Therefore, a DESP is considered to be technically infeasible for controlling emissions from the OSB Press Hall.

Step 3: Rank Remaining Technically Feasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for OSB Press Hall

The remaining technically feasible control options for controlling Filterable PM, PM_{10}, and $PM_{2.5}$ from the OSB Press Hall are ranked in the table below.

TABLE 3-23 SUMMARY OF RANKED FILTERABLE PM/PM_{10}/$PM_{2.5}$ AND CPM CONTROLS FOR OSB PRESS HALL SOURCES

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors
2	Mechanical Collectors (High-Efficiency Cyclones/Multiclones)
2	Cyclofilters
3	High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers
4	Building Enclosures
5	Good Design/Operation

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for OSB Press Hall

Mechanical collectors (high-efficiency cyclones/multiclones) do not have any significant adverse impacts and are not considered economically infeasible. Additionally, the remaining control options are not mutually exclusive, so some of the items can be effectively implemented in combination (cyclone plus high-efficiency venturi scrubber, for example). Therefore, Kronospan proposes to utilize control equipment in series as follows:

- Cyclone/dust collectors and cyclone/wet scrubber to control particulate emissions from the forming line and mat saw processes.
- Cyclone/wet scrubber to control particulate emissions from the OSB press;
- Cyclone/dust collectors and cyclone/wet scrubber to control particulate emissions from the diagonal saw, cut-to-size saw, and tongue and groove lines; and

- Dust collectors and cyclone/wet scrubber to control emissions from sanding processes.

Wet scrubber control is included in this process since it's integral to the OSB press process. As air flow from the scrubber exhausts from the press hall building and water is recirculated, the press hall will meet negative air pressure requirements that are included in the MACT.

Also, Kronospan will incorporate good design/operation as generally accepted practices.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for OSB Press Hall

Kronospan proposes the use of dust collectors, which are the top ranked control devices, to reduce PM emissions from the Press Hall sources, including the forming line and mat saw. In addition, Kronospan will add cyclones to collect wood waste for reuse and a wet scrubber for additional particulate control efficiency. The forming line and mat saw emissions will be combined with emissions from other processes prior to being emitted from the wet scrubber in the Press Hall, and a BACT emission limit is proposed for all Press Hall sources.

To control particulate emissions, Kronospan proposes the use of dust collectors and cyclones, which are the top ranked control devices, to reduce PM emissions from the OSB press. The OSB press emissions will be combined with emissions from other processes prior to being routed to the wet scrubber, and a BACT emission limit is proposed for all Press Hall sources.

Kronospan proposes the use of dust collectors, which are the top ranked control devices, to reduce particulate emissions from the diagonal saw, cut-to-size saw, tongue and groove lines, and sanding processes. In addition, Kronospan will add cyclones to collect wood waste for reuse and a wet scrubber for additional particulate control efficiency for the diagonal saw, cut-to-size saw, and tongue and groove lines. The diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding will be combined with emissions from other processes prior to being routed to the wet scrubber, and a BACT emission limit is proposed for all Press Hall sources below.

Therefore, Kronospan proposes an overall BACT based on combining emissions from the forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding as follows:

- Filterable PM: 2.92 lb/hr, 0.0206 lb/MSF 3/8”;
- PM_{10}: 5.26 lb/hr, 0.0371 lb/MSF 3/8”;
- $PM_{2.5}$: 5.15 lb/hr, 0.0363 lb/MSF 3/8”;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 15%.

Kronospan proposes an opacity limit of 15% as BACT for the combined emissions from the Press Hall wet scrubber (forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, and three (3) tongue and groove lines, and sanding processes). One (1) Continuous Opacity Monitoring System (COMS) unit will be added in the outlet duct from the press hall scrubber prior to venting to the belt dryer #3 stack (as discussed in the application.)

A COMS unit in wet conditions requires a system able to differentiate between stack gas moisture and actual particulate matter opacity. This often requires locating the monitor in a section of the stack where the gas is not saturated, or using heated components to evaporate moisture droplets.

The COMS unit will be installed based on 40 CFR 60, Appendix B, Performance Specification 1, specifically with respect to location in an area "where condensed water vapor is not present," pursuant to Section 8.1(2)(i)(3). (Reference: 40 CRF 60 Appendix B, Performance Specification 1, Section 2.0 - Basic Requirements of PS-1, and Section 2.2, which points to section 8.1(2) for guidance on locating the COMS.)

Proposed BACT Controls: Cyclone/Dust Collector and Cyclone/Wet Scrubber for Press Hall Sources (Forming Line, Mat Saw); Cyclone/Wet Scrubber for OSB Press; Cyclone/Dust Collector and Cyclone/Wet Scrubber for Press Hall Sources (Diagonal Saw, Cut-to-Size Saw, 3 Tongue and Groove Lines); Dust Collector and Cyclone/Wet Scrubber for Sanding; Good Design/Operation

3.3.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS – OSB PRESS HALL

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. VOC emissions will occur from the off-gassing of newly dried wood and from the cutting, sawing, chipping, grinding, and handling of wood and mats, which contain glue and resins that emit VOC when cut, sawed, or chipped. Emissions from the sources discharged into the Press Hall (forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding (through Finishing Hall and then discharged inside the Press Hall Building) will be routed through the wet scrubber and discharged to belt dryer #3 stack.

BACT Floor The OSB press (and Press Hall sources) will be subject to the applicable requirements of 40 CFR 63 Subpart DDDD (Plywood MACT). The OSB Press (as a "reconstituted wood product press") will control emissions with a wet scrubber and will meet the requirements of Table 1(B)(2) as follows:

Limit emissions of total HAP, measured as THC (as carbon), to 20 ppmvd (may choose to subtract methane from THC as carbon measurements); and

Table 2(4) as follows:

If using a control device other than a thermal oxidizer, catalytic oxidizer, or biofilter, Maintain the 3-hour block average THC concentration in the control device exhaust below the maximum concentration established during the performance test.

To ensure compliance with MACT Subpart DDDD, Kronospan will monitor and collect data (pressure drop across scrubber and liquid flow rate to scrubber) by using a continuous monitor according to section 40 CFR 63.2270(b) as follows:

… conduct all monitoring in continuous operation at all times that the process unit is operating. For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out-of-control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance ….

Step 1: Identify Potential VOC Control Technologies for OSB Press Hall

Potentially applicable controls for the OSB Press Hall sources include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (including venturi and other types of wet scrubbers such as packed beds, spray towers), biofilters, and good design/operation. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below.

In the OSB Press Hall, the Press Scrubber System is an integral part of the press operation. The collection part of the Press Scrubber System is ductwork for collecting wood dust particles, as well as vapor emissions directly from many points along the length of the press. Water is sprayed into this ductwork to aid in the removal of this wood dust. This water and air stream is routed through a cyclone to separate the water / wood dust from the air stream. Without the collection part of the system the dust would build up in various areas of the press creating a fire hazard. Therefore, Kronospan press installations are designed with the Press Scrubber System from the beginning. The MDF and Particle Board Plants at the Eastaboga site are both examples of this integral design feature, in which a scrubber system (located prior to the RTO) is integral to the press system. Note that an RTO was necessary for the MDF and PB plants to meet the MACT standard requirements. For example, stack testing conducted on the MDF and PB processes post-wet scrubber and pre-RTO showed formaldehyde emissions greater than 40 lb/hr. However, for the OSB press, the MACT standard can be met with a scrubber and without an RTO (because a formaldehyde-based resin will not be used). Stack testing conducted on an MDF Press post-wet scrubber for Kronospan's Clarion facility showed total hydrocarbon emissions less than 20 ppm and averaging 1.1 lb/hr (a copy of the test report is included in Appendix B). Therefore, the OSB Press Scrubber System will provide both fire prevention and emissions collection / control. Waste scrubber water will be disposed of off-site.

TABLE 3-24 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR OSB PRESS HALL

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40% to 77%
Good Design/Operation	Varies

Descriptions of these types of VOC control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for the forming line and mat saw at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-25 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR PRESS HALL SOURCES (FORMING LINE AND MAT SAW) (RBLC PROCESS TYPES 30.540, BOARD PRODUCT FINISHING, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls surface and core layer exhaust), 301-0079-X069, F-04 30.520	Baghouse Exhausts to atmosphere, no VOC control	VOC: 22.6100 lb/hr, 0.3510 LB/MSF (3/4" basis)
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls Hammermills #1-#4 exhaust), 301-0079-X069, F-05 30.520	Baghouse Exhausts to atmosphere, no VOC control	VOC: 19.2500 lb/hr, 0.3000 LB/MSF (3/4" basis)
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Pre-Press (controls heavy particle sifter exhaust), 301-0079-X069, F-06 30.520	Baghouse Exhausts to atmosphere, no VOC control	VOC: 2.14 lb/hr, 0.033 LB/MSF (3/4" basis)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Core and Surface Forming 30.590	Good design and operation practices (RTO not cost effective)	VOC: 9.34 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Core and Surface Forming 30.590	Good design and operation practices (RTO not cost effective)	VOC: 9.34 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Core and Surface Forming 30.590	Good design and operation practices (RTO not cost effective)	VOC: 9.34 lb/hr
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Forming Line	Proposed BACT: Wet Scrubber (in Press Hall) and Good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Mat Saw	Proposed BACT: Wet Scrubber (in Press Hall) and Good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicates that wet scrubbers and RTOs were not cost effective, and as a result, good design/operation was selected as BACT for VOC emissions from the forming line and mat saw with limits as follows:

- 9.34 lb/hr for core and surface forming based on good design and operating practice controls since RTO control was not cost effective (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed emissions for the forming line based on wet scrubber control and good design/operation controls are 1.30 lb/hr and 5.69 tpy, while proposed emissions for the mat saw based on wet scrubber and good design/operation controls are 0.55 lb/hr and 2.42 tpy.

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for presses at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may

not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-26 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR OSB PRESS HALL SOURCES (OSB PRESS) (RBLC PROCESS TYPE 30.520, BOARD PRESSES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Press #1 160.00 Msqf/hr 30.520	RTO	VOC: 10.56 lb/hr, 0.0660 lb/Msqf
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Press (press, edge trim saw exhaust, board cooler), 301-0079-X070, F-09 30.520	Baghouse Exhausts to atmosphere, no VOC control	VOC: 0.9300 lb/hr, 0.0140 LB/MSF (3/4" basis)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required to avoid fouling oxidizer with sticky, resin coated PM)	VOC: 49.5 lb/hr (applies to total emissions from press and board cooler, PCWP) and 216.8 tpy and 0.728 lb/1000ft2, 3/4 inch basis, on an hourly basis
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required to avoid fouling oxidizer with sticky, resin coated PM)	VOC: 49.5 lb/hr (applies to total emissions from press and board cooler, PCWP) and 216.8 tpy and 0.728 lb/1000ft2, 3/4 inch basis, on an hourly basis
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required	VOC: 49.5 lb/hr (applies to total emissions from press and board cooler, PCWP) and 216.8 tpy and 0.728 lb/1000ft2, 3/4 inch basis, on an hourly basis

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
				through same stack to comply with PCWP MACT)	to avoid fouling oxidizer with sticky, resin coated PM)	
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	OSB Press	Proposed BACT: Wet Scrubber (in Press Hall) and good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and permits search indicated that generally facilities utilize either RTO/RCO control devices, wet scrubbers, biofilters, or good design/operation and/or good operating practices as BACT. For the facilities that have installed an RTO, RCO, or thermal catalytic oxidizer (TCO) associated with an OSB press, these control devices are also used to control emissions from energy/dryer systems, which include wood-fired heaters. The RBLC and recent permits search showed emissions from OSB presses with limits varying as follows:

- 6.66 lb/hr for OSB presses based on RTO/RCO control (WI-0223, 6/17/2024); and
- 49.5 lb/hr and 0.728 lb/MSF for OSB press based on wet scrubber control (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed VOC emissions for the OSB press based on wet scrubber control are 5.50 lb/hr and 24.09 tpy.

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOC established for other Press Hall sources (a diagonal saw, cut-to-size saw, tongue and groove lines, and sanding processes) at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-27 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR OSB PRESS HALL SOURCES (DIAGONAL SAW, CUT-TO-SIZE SAW, TONGUE AND GROOVE LINES, AND SANDING) (RBLC PROCESS TYPE 30.540, BOARD PRODUCT FINISHING)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Cut to Panel Saw 30.540	Good design and operation practices (Wet scrubber and RTO not cost effective)	VOC: 3.0 lb/hr
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Flying Cutoff Saw 30.540	Good design and operation practices (Wet scrubber and RTO not cost effective)	VOC: 10.3 lb/hr
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Sanding Operations 30.540	Good design and operation practices (Control cost for sanding is $70,000 per ton for wet scrubber followed by RTO, not cost effective. Not technically feasible to use RTO on dryers to control sanding)	VOC: 6.9 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Cut to Panel Saw Line 30.540	Good design and operation practices (Control equipment not cost effective)	VOC: 1.4 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Flying Cutoff Saw 30.540	Good design and operation practices (Control	VOC: 2.4 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					equipment not cost effective)	
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Sanding Operations 30.540	Good design and operation practices (Control cost for sanding is $16,000 per ton, not cost effective)	VOC: 3.32 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Cut to Panel Saw Line 30.540	Good design and operation practices (Control equipment not cost effective)	VOC: 1.4 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Flying Cutoff Saw 30.540	Good design and operation practices (Control equipment not cost effective)	VOC: 1.4 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Sanding Operations 30.540	Good design and operation practices (Control cost for sanding is $16,000 per ton, not cost effective)	VOC: 3.32 lb/hr
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Diagonal Saw	Proposed BACT: Wet Scrubber (in Press Hall) and good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Cut-to-Size Saw	Proposed BACT: Wet Scrubber (in Press Hall) and good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	3 Tongue and Groove Lines	Proposed BACT: Wet Scrubber (in Press Hall) and good design/ operation	VOC: See proposed BACT emission limit for all Press Hall sources
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Sanding	Proposed BACT: Wet Scrubber (in Press Hall) and good design/ operation (vented to Finishing Building and Press Hall)	VOC: See proposed BACT emission limit for all Press Hall sources

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that most facilities utilize good design/operation (and no add-on controls) as BACT for VOC emissions from diagonal saws (or other OSB saws) with limits varying as follows:

- 1.4 lb/hr and 1.4 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operating practices controls (MI-0421, 8/26/2016);
- 1.4 lb/hr and 2.4 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operating practices controls (MI-0425, 5/19/2017); and
- 3.0 lb/hr and 10.3 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operating practices controls (MI-0448, 12/18/2020).

For comparison, Kronospan's proposed VOC emissions are 0.83 lb/hr and 3.63 tpy, with good design/operation control for the diagonal saw.

The RBLC and recent permits search indicated that most facilities utilize good design/operation (and no add-on controls) as BACT controls for VOC emissions from cut-to-size (or other OSB saws) with limits varying as follows:

- 1.4 lb/hr and 1.4 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operation practice controls (MI-0421, 8/26/2016);

- 1.4 lb/hr and 2.4 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operation practice controls (MI-0425, 5/19/2017); and
- 3.0 lb/hr and 10.3 lb/hr for cut to panel saw and flying cutoff saw, respectively, based on good design and operation practice controls (MI-0448, 12/18/2020).

For comparison, Kronospan's proposed VOC emissions are 0.55 lb/hr and 2.41 tpy, with wet scrubber and good design/operation controls for the cut-to-size saw.

For tongue and groove lines, this search indicated that no PSD permits for PSB facilities are included in the RBLC database within the last 10 years for VOC emissions from tongue and groove lines. Kronospan's proposed VOC emissions are 0.15 lb/hr and 0.60 tpy, with wet scrubber and good design/operation controls for the three (3) tongue and groove lines.

For sanding operations, this search indicated that most facilities utilize baghouses as BACT controls for particulate emissions from sanding (or other finishing operations) with limits as follows:

- 3.32 lb hr for sanding operations based on good design and operation practices controls (MI-0421, 8/26/2016); and
- 6.9 lb/hr for sanding processes based on good design and operation practices control (MI-0448, 12/18/2020; MI-0425, 5/19/2017).

For comparison, Kronospan's proposed VOC emissions are 1.45 lb/hr and 6.35 tpy, with good design/operation controls for the sanding operations.

Step 2: Eliminate Technically Infeasible VOC Control Options for OSB Press Hall

The use of an RTO could be considered technically infeasible when an RTO is installed prior to particulate control equipment such as baghouses/fabric filters/dust collectors, cyclofilters, or WESPs (from Kronospan 2022 application for particle board plant). The exhaust gas temperature from the RTO would be too high for a baghouse/fabric filter/dust collector, cyclofilter, or WESP to operate in a safe and/or effective manner because high temperatures could create a fire hazard within a baghouse or cyclofilter. Elevated temperatures entering a WESP could cause the wash fluid to flash and vaporize, thus reducing the effectiveness of the control device and potentially creating a safety hazard with the build-up of flash gas pressure.

The addition of an RTO after a filterable particulate control device(s) such as a baghouse or cyclofilter could be a technically infeasible option for safety reasons; for example, if a filter bag in a baghouse would rupture, the collected wood and dust would flow into the RTO causing a fire. Furthermore, due to the high moisture content and lower exit temperature in the exhaust streams (86°F), the use of an RTO could be unstable and has been determined to be technically infeasible in several wood products manufacturing BACT determinations (Two Rivers Lumber, 2024; Scotch Gulf, 2023; Varn Wood Products, 2020; Westervelt, 2019; Harrigan Lumber, 2019; TRMM, 2019). However, other facilities have installed RTOs for OSB plants, and Kronospan currently utilizes two (2) RTOs for controlling VOC emissions. Therefore, for this analysis, an RTO is assumed to be technically feasible.

The use of an RCO could be considered technically infeasible for some wood product processes (including OSB presses) due to the level of PM/PM_{10}/$PM_{2.5}$ loading. Even with highly efficient PM/PM_{10}/$PM_{2.5}$ control, the possibility of catalyst blinding, poisoning, plugging, or masking can occur, which will significantly reduce the efficiency of the RCO. Industry practice has illustrated that RCO technology may not be successfully applied in all cases (Westervelt 2019 BACT). However, other facilities have installed RCOs for OSB Plants. Therefore, for this analysis, an RCO is assumed to be technically feasible.

Also as mentioned earlier, condensers and adsorbers/adsorption systems are often considered to be technically infeasible controls for wood products manufacturing processes and are seldom considered for controlling VOC emissions from OSB plants. Adsorption technology is infeasible for controlling the exhaust streams from the blending/gluing and sifter/screening processes due to the VOC compounds present. The liquid pMDI resin to be used contains the following: 50-70% diphenylmethane diisocyanate, polymeric; 30-50% 4,4-methylenediphenyl diisocyanate; and 5-10% 2,4'-methylenediphenyl diisocyanate. Carbon beds (or canisters) are designed to treat vapors and gases, and if the exhaust stream contains any pMDI liquid droplets, solid resin aerosols, or other particulates, these droplets and particles can quickly coat and plug the carbon such that the carbon will lose its ability to remove additional VOCs. Carbon canisters saturated with isocyanates will become unusable and must be disposed of according to hazardous waste regulations. Based on this, adsorption technology is not considered feasible. This is consistent with other BACT assessments reviewed by Kronospan; adsorption technology is not considered as a feasible BACT alternative for blending/gluing and sifting/screening processes.

Biofilters require a pollutant stream to be in a steady-state condition to effectively control VOC. If there were any process upsets or changes in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the Press Hall sources, then the living organisms within the biofilter could be rendered ineffective. Although a biofilter has been demonstrated as a technically feasible control option in some OSB press applications, Kronospan considered the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant); however, a biofilter will be included in this BACT analysis.

Step 3: Rank Remaining Technically Feasible VOC Control Options for OSB Press Hall

The remaining technically feasible control options for controlling VOC from the OSB Press Hall are ranked in the table below.

TABLE 3-28 SUMMARY OF RANKED VOC CONTROLS FOR OSB PRESS HALL

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers

Rank	Technology
2	Wet Scrubbers/Packed Beds/Spray Towers
3	Biofilters
4	Good Design/Operation

Step 4: Evaluate Remaining VOC Control Technologies for OSB Press Hall

A cost effectiveness evaluation for using oxidizers after the wet scrubber is included here based on control of VOCs from all Press Hall sources (forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding). Total VOC emissions from the outlet of the wet scrubber will be 10.33 lb/hr and 45.25 tpy at a flow rate of 101,138 dscfm or 117,800 acfm for the OSB press hall emission sources. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the following VOC reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer; a control efficiency of 98 to 99.99% for a recuperative thermal oxidizer; and a control efficiency of 90% to 99% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five years during the RTO equipment lifetime;
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP; and
- Wet scrubber to control emissions from press hall emission source processes. Wet scrubber control is included in this process since it's integral to the OSB press process. As air flow from the scrubber exhausts from the press hall building and water is recirculated, the press hall will meet negative air pressure requirements that are included in the MACT.

Wet scrubbers primarily remove VOCs that are soluble in the scrubbing liquid (usually water, though chemical additives could be used). OSB press emissions contain various VOCs, including terpenes, aldehydes (like formaldehyde and acetaldehyde), methanol, and phenol, which have varying solubilities. Control efficiency will depend on system design and operation, including contact time, liquid-to-gas ratio and liquid flow rate, pH, and chemical composition of scrubbing liquid.

For comparison, based on testing data from Kronospan's Clarion facility in Shippenville, PA, and literature data, a wet scrubber used in processes can achieve up to 90% removal with an optimized design system, including enhanced scrubbing solutions, higher liquid to gas ratios, and

turbulence. Also, studies have shown that a substantial majority of the terpenes (alpha-pinenes) are removed at the dryer, where water escaping from the wood in the dryer helps to mobilize the terpenes to the surface for evaporation.

Wet scrubber control is included in the OSB press hall process since it's integral to the OSB press process. As air flow from the scrubber exhausts from the press hall building and water is recirculated, the press hall will meet negative air pressure requirements that are included in the MACT.

TABLE 3-29 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR OSB PRESS HALL EMISSION SOURCES (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest)	$3,469,867	42.98	$80,732
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest)	$3,175,651	42.98	$73,887
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest)	$2,147,003	42.98	$49,954
Recuperative Thermal Oxidizer (98 – 99,99% control, 10-yr life at 7% interest)	$8,474,597	44.35 – 45.25*	$191,125 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	44.35 – 45.25**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)	$5,632,618	40.73 – 44.80*	$138,323 at 90% control

Table Notes:
** VOC reduction is based on VOC emissions exhausted through the wet scrubber: 45.25 tpy Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for using oxidizers to control the OSB Press Hall emissions, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT. Another consideration with respect to installing oxidizers to control VOC emissions is environmental impacts since the use of combustion in oxidizer systems introduces NOx impacts, which have a higher correlation with ground-level ozone formation than VOC emissions in the southeastern United States.

Upon elimination of the most stringent control option based on energy, environmental, and/or economic considerations, the top-down process evaluates the next most stringent alternative in the same manner. This process continues until BACT is selected. Since thermal oxidizers are not cost effective, the next most stringent control is a wet scrubber to control VOC emissions from OSB press hall emission source processes. Wet scrubbers remove VOCs that are soluble in the scrubbing liquid (usually water, though chemical additives could be used). OSB press emissions contain various VOCs, including terpenes, aldehydes (like formaldehyde and acetaldehyde), methanol, and phenol, which have varying solubilities. Control efficiency depends on system design and operation, including contact time, liquid-to-gas ratio and liquid flow rate, pH, and chemical composition of scrubbing liquid.

A cost effectiveness evaluation for using wet scrubbers/packed beds/spray towers and good design/operation to control VOCs from the OSB press hall is based on total uncontrolled VOC emissions of 10.33 lb/hr and 45.25 tpy at a flow rate of 101,138 dscfm or 117,880 acfm for the OSB press hall sources. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Wet and Dry Scrubbers for Acid Gas Control Cost Calculation Spreadsheet, updated 1/26/2023 (EPA Air Pollution Control Cost Manual, Section 5, Chapter 1 – Wet and Dry Scrubbers for Acid Gas Control, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, April 2021), the cost of applying wet scrubber control is shown below.

TABLE 3-30 SUMMARY OF WET SCRUBBER COSTS FOR OSB PRESS HALL (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Packed Bed Scrubber (70 – 99% control, 10-yr life at 7% interest) (updated based on 1/29/2026 quote)	$4,573,646	31.67 – 44.79* 38.46 at 85%	$118,924 at 85% control
Spray Tower Scrubber (50 – 95% control)	$Not Available	31.67 – 44.79**	$Not Available
Wet Scrubber (Venturi Scrubber) (50 – 95% control)	$1,522,850	31.67 – 44.79**	$39,597 at 85% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 45.25 tpy Press Hall Source x Total x % reduction for Cost Analysis.*
*** Spray tower scrubber and venturi scrubber calculations not included in EPA cost spreadsheet. Cost for wet scrubber based on information from Kronospan.*

Based on the costs shown above for the wet scrubber for the OSB press hall, the economic impacts of these controls are outweighed by the process benefits.

Wet scrubber control will be utilized in the OSB press hall process because it is considered integral to the OSB press process. Based on testing data from the Clarion (Kronospan) plant in Shippenville, PA (a copy of the test report is included in Appendix B), and literature data, a wet scrubber used in processes handling southern yellow pine can achieve up to 90% removal with an

optimized design system, including enhanced scrubbing solutions, higher liquid to gas ratios, and turbulence.

Other studies have shown that a substantial majority of the terpenes [alpha-pinenes] are removed at the dryer, where water escaping from the wood in the dryer helps to mobilize the terpenes to the surface for evaporation. Therefore, a wet scrubber and good design/operation is selected as BACT. As air flow from the scrubber exhausts from the press hall building and water is recirculated, the press hall will meet negative air pressure requirements that are included in the MACT.

Step 5: Selection of BACT for VOC for OSB Press Hall

Kronospan proposes a wet scrubber and good design/operation for controlling VOC emissions from the Press Hall sources, including the forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, tongue and groove lines, and sanding processes. Kronospan also proposes BACT limits as follows:

- VOC: 10.33 lb/hr, 0.073 lb/MSF 3/8".

Proposed BACT CONTROLS: Wet Scrubber and Good Design/Operation

3.3.3 NOX BACT ANALYSIS FOR OSB PLANT UNITS – OSB PRESS HALL

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions of NOx from the OSB press will be routed through the wet scrubber and discharged to belt dryer #3 stack. NOx emissions are not expected from the other Press Hall sources.

BACT Floor These sources will be subject to applicable requirements, but are not subject to the Plywood MACT for NOx emissions.

Step 1: Identify Potential NOx Control Technologies for OSB Press Hall

Potentially applicable NO_x controls for the OSB press include resin reformulation, which means changing the materials used by replacing nitrogen containing materials to non-nitrogen containing materials and utilizing good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

Emissions of NOx from the OSB press (without any form of add-on control) result from the resin formulation used during the board-making process. So, the only method to reduce NO_x emitted directly from the OSB press would be to reformulate the resins used. NOx control technologies designed for combustion control are not appropriate for reducing NOx emissions from the OSB press and are not considered in this analysis.

TABLE 3-31 CONTROL TYPES AND EFFICIENCIES FOR NOX FOR OSB PRESS HALL

Control Type	Estimated NO_x Control Efficiency
Resin Reformulation/Material Usage	Varies
Good Design/Operation	Varies

Resin Reformulation/Material Usage - Resin reformulation means changing the materials used by replacing nitrogen containing materials to non-nitrogen containing materials and utilizing good design/operation.

Good Design/Operation - Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NOx established for OSB presses. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-32 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR NOX FOR OSB PRESS HALL SOURCES (OSB PRESS) (RBLC PROCESS TYPE 30.520, BOARD PRESSES, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Press #1 160.00 Msqf/hr 30.520	None listed	NOx: 43.20 lb/hr, 0.2700 lb/Msqf

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (There is no combustion associated with the press, but there are NOx emission factors; all control options would be combustion controls)	NOx: 2.5 lb/hr and 11.0 tpy and 0.04 lb/MSF, 3/4 inch basis, on an hourly basis
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (There is no combustion associated with the press, but there are NOx emission factors; all control options would be combustion controls)	NOx: 2.5 lb/hr and 11.0 tpy and 0.04 lb/MSF, 3/4 inch basis, on an hourly basis
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (There is no combustion associated with the press, but there are NOx emission factors; all control options would be combustion controls)	NOx: 2.5 lb/hr and 11.0 tpy and 0.04 lb/MSF, 3/4 inch basis, on an hourly basis
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	OSB Press	Proposed BACT: Good design/ operation	NOx: 6.24 lb/hr, 0.044 lb/MSF 3/8”

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC query results were reviewed for presses at OSB and particleboard manufacturing facilities, and the search indicated that most facilities utilize good design/operation and/or good operating practices as BACT. A few facilities have RTOs/RCOs associated with an OSB press, but the related NOx controls typically have been installed to control emissions from RTOs/RCOs and/or energy/dryer systems, which include wood-fired heaters. Some of the RTOs/RCOs have been equipped with low-NOx burners. The RBLC and recent permit search showed various controls as good design/operation or low-NOx burners for RTOs/RCOs as BACT for NOx emissions from the OSB press with limits varying as follows:

- 2.5 lb/hr and 0.04 lb/1000 ft2 for OSB press based on good design/operation control (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016); and
- 15.7 lb/hr for OSB presses based on RTO/RCO control (WI-0223, 6/17/2024).

For comparison, Kronospan's proposed NOx emissions for the OSB press based on good design/operation and good operating practices are 6.24 lb/hr, 0.044 lb/MSF 3/8", and 27.34 tpy.

Step 2: Eliminate Technically Infeasible NOx Control Options for OSB Press Hall

Kronospan's resin technology uses nitrogen-containing resins to manufacture OSB products, and there are no non-nitrogen resins that are technically feasible for Kronospan's OSB press process. Therefore, resin reformulation/material usage is determined to be technically infeasible. (For a similar analysis, see Kronospan 2022 application).

Step 3: Rank Remaining Technically Feasible NOx Control Options for OSB Press Hall

The remaining NOx control for the OSB press is good design/operation including good operating practices.

TABLE 3-33 SUMMARY OF RANKED NOX CONTROLS FOR OSB PRESS HALL

Rank	Technology
1	Good design/operation

Step 4: Evaluate Remaining NOx Control Technologies for OSB Press Hall

Kronospan proposes to use good design/operations as BACT for controlling emissions of NOx from the OSB press. This control option includes efficiently utilizing resins to reduce NOx emissions, as well as to maintain lower operating expenses. This BACT selection of good design/operations for the OSB press does not have any significant adverse impacts and is economically feasible.

Step 5: Selection of BACT for NOx for OSB Press Hall

Kronospan proposes the use of good design/operation as BACT for NOx emissions from the OSB press. Kronospan also proposes BACT limits as follows in addition to implementing good design/operation controls for the OSB press (note that these limits will be combined with other emissions from Press Hall into an overall BACT):

- NOx: 6.24 lb/hr, 0.044 lb/MSF 3/8".

This BACT is consistent with other entries in the RBLC database for presses at OSB manufacturing facilities. Note that the OSB press emissions will be combined with emissions from other processes prior to being routed to the wet scrubber (emissions from the forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding).

Proposed BACT CONTROLS: Good Design/Operation

3.3.4 CO BACT ANALYSIS FOR OSB PLANT UNITS – OSB PRESS HALL

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions of CO from the OSB press will be routed through the wet scrubber and discharged to belt dryer #3 stack. CO emissions are not expected from the other Press Hall sources.

BACT Floor These sources will be subject to applicable requirements, but are not subject to the Plywood MACT for CO emissions.

Step 1: Identify Potential CO Control Technologies for OSB Press Hall

Potentially applicable controls for the OSB press include RTOs, RCOs, biofilters, and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

Emissions of CO from the OSB press (without any form of add-on control) result from the resin formulation used during the board-making process. Even though the CO is not generated from combustion processes, CO control technologies (designed for combustion control) could be effective for reducing CO emissions from the OSB press.

TABLE 3-34 CONTROL TYPES AND EFFICIENCIES FOR CO FOR OSB PRESS HALL

Control Type	Estimated CO Control Efficiency
Direct Flame Thermal Oxidizers	75 to 95%
Recuperative Thermal Oxidizers	75 to 95%
Regenerative Thermal Oxidizers	75 to 95%
Regenerative Catalytic Oxidizers	75 to 95%
Biofilters	40 to 77%
Good Design/Operation	Varies
Good Operating Practices	Varies

Descriptions of these types of CO control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO established for OSB presses at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-35 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR CO FOR OSB PRESS HALL SOURCES) (OSB PRESS) (RBLC PROCESS TYPE 30.520, BOARD PRESSES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Press #1 160.00 Msqf/hr 30.520	RTO	CO: 35.20 lb/hr, 0.220 lb/Msqf
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required to avoid fouling oxidizer with sticky, resin coated PM)	CO: 2.85 lb/hr and 12.5 tpy and 0.042 lb/MSF, 3/4 inch basis, on an hourly basis

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required to avoid fouling oxidizer with sticky, resin coated PM)	CO: 2.85 lb/hr and 12.5 tpy and 0.042 lb/MSF, 3/4 inch basis, on an hourly basis
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Continuous Press System 30.520 Board Cooling System 30.590 (Press and Board Cooler exhaust through same stack to comply with PCWP MACT)	Good design and operation practices (RCO not cost effective, even when not including cost of PM pre-control required to avoid fouling oxidizer with sticky, resin coated PM)	CO: 2.85 lb/hr and 12.5 tpy and 0.042 lb/MSF, 3/4 inch basis, on an hourly basis
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	OSB Press	Proposed BACT: Good design/ operation and Good operating practices	CO: 12.77 lb/hr, 0.09 lb/MSF 3/8”

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search showed various controls as good design/operation or RTOs/RCOs as BACT for CO emissions from the OSB press with limits varying as follows:

- 2.85 lb/hr and 0.42 lb/1000 ft2 for OSB press based on good design/operation control (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016); and
- 30.0 lb/hr for OSB presses based on RTO/RCO control (WI-0223, 6/17/2024).

For comparison, Kronospan’s proposed CO emissions for the OSB press based on good design/operation and good operating practices are 12.77 lb/hr, 0.09 lb/MSF 3/8”, and 55.91 tpy.

Step 2: Eliminate Technically Infeasible CO Control Options for OSB Press Hall

For the OSB press, an RCO could be determined to be technically infeasible for OSB presses due to the level of $PM/PM_{10}/PM_{2.5}$ loading. Even with highly efficient $PM/PM_{10}/PM_{2.5}$ control, catalyst

blinding, poisoning, plugging, or masking can occur in this type of application, which could significantly reduce the efficiency of the control device. Industry practice has illustrated that RCO technology has not been successfully applied to OSB presses. However, other facilities have installed RCOs for OSB plants. Therefore, for this analysis, an RCO is assumed to be technically feasible in this process; however, an RCO will be included in this BACT analysis.

A wet scrubber will be included in the OSB press hall process since it's integral to the OSB press process, but it is not considered to be a technically feasible control for CO emissions. Biofilters require a pollutant stream to be in a steady-state condition to effectively control CO. If there were any process upsets or changes in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the Press Hall sources, then the living organisms within the biofilter could be rendered ineffective. Kronospan considered the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant); however, a biofilter will be included in this BACT analysis.

Step 3: Rank Remaining Technically Feasible CO Control Options for OSB Press Hall

The remaining technically feasible control options for controlling CO from the OSB press are ranked in the table below.

TABLE 3-36 SUMMARY OF RANKED CO CONTROLS FOR OSB PRESS

Rank	Technology
1	Direct Flame Thermal Oxidizer
1	Recuperative Thermal Oxidizer
1	Regenerative Thermal Oxidizer
1	Regenerative Catalytic Oxidizer
2	Biofilters
3	Good Design/Operation
3	Good Operating Practices

Step 4: Evaluate Remaining CO Control Technologies for OSB Press Hall

A cost effectiveness evaluation for using oxidizers to control CO from the OSB press is below. Total uncontrolled CO emissions will be 12.77 lb/hr and 55.91 tpy at a flow rate of 101,138 dscfm or 117,800 acfm for the OSB press. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the range of CO reduction for each emissions control technology is used: a control efficiency of 75 to 95% for a regenerative thermal oxidizer, a recuperative thermal oxidizer, and a regenerative catalytic oxidizer (fixed bed). Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of

regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the OSB press. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers.

TABLE 3-37 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR OSB PRESS HALL EMISSION SOURCES (TOTAL CO)

Scenario	Annualized Cost	Estimated CO Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (90% control, 10-yr life with media replacement at 7% interest)	$3,469,867	50.34	$68,930
Regenerative Thermal Oxidizer with WESP (90% control, 20-yr life with media replacement at 7% interest)	$3,175,651	50.34	$63,085
Regenerative Thermal Oxidizer without WESP (90% control, 20-yr life with media replacement at 7% interest)	$2,147,003	50.34	$42,651
Recuperative Thermal Oxidizer (75 – 95% control, 10-yr life at 7% interest)	$8,474,597	41.95 – 53.14*	$202,019 at 75% control
Direct Flame Thermal Oxidizer (Afterburner) (75 - 95%)	$Not Available	41.95 – 53.14**	$Not Available
Catalytic Oxidizer (Fixed Bed) (75 - 95% control, 10-yr life at 7% interest)	$5,632,618	41.95 – 53.14*	$134,272 at 75% control

Table Notes:
** CO reduction is based on uncontrolled CO emissions: 55.93 tpy OSB Press Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume similar to RTO.*

Upon elimination of the most stringent control option based on energy, environmental, and/or economic considerations, the top-down process evaluates the next most stringent alternative in the same manner. The next most stringent control options for CO from the OSB press is:

- Biofilters, with a range of control efficiencies for CO from 40% to 85%.

Estimated cost effectiveness calculations for biofilter control are shown in the table below. Based on the costs for using biofilters to control the OSB Press Hall emissions exhausted from the wet scrubber, the economic impacts of these controls (biofilters) are considered excessive. Therefore, these costs support elimination of biofilters as BACT.

TABLE 3-38 SUMMARY OF BIOFILTER COSTS FOR OSB PRESS HALL EMISSION SOURCES (TOTAL CO)

Scenario	Annualized Cost	Estimated CO Reduction (tpy)	Cost per Ton Removed
Biofilter (77% control, 10-yr life with biofilter bed replacement at 7% interest)	$1,762,278	43.07	$40,918

Table Notes:
** CO reduction is based on uncontrolled CO emissions: 55.93 tpy OSB Press Total x % reduction for Cost Analysis and a biofilter with a 10-year equipment life. See Appendix A for cost effectiveness calculations.*

The remaining control options for CO from the OSB press are:

- Good design/operation, which is assumed to not have any significant adverse impacts.

According to the BACT top-down approach, all available control technologies are ranked in descending order of control effectiveness. The most stringent or "top" control option is the default BACT, unless the applicant demonstrates, and the permitting authority agrees, that energy, environmental, and/or economic impacts justify a conclusion that the most stringent control option is not appropriate in that case. Upon elimination of the most stringent control option based on energy, environmental, and/or economic considerations, the top-down process evaluates the next most stringent alternative in the same manner. This process continues until BACT is selected. Therefore, good design/operation will be selected as BACT.

The remaining control options for the OSB press are good design/operation and good operating practices, which are assumed to not have any significant adverse impacts. Good design/operation will be selected as BACT along with good operating practices.

Step 5: Selection of BACT for CO for OSB Press Hall

Kronospan proposes the use of good design/operation with good operating practices as BACT for CO from the OSB press. Kronospan also proposes BACT limits as follows in addition to implementing good design/operation and good operating practices controls for the emissions from the forming line, mat saw, OSB press, diagonal saw, cut-to-size saw, three (3) tongue and groove lines, and sanding:

- CO: 12.77 lb/hr, 0.09 lb/MSF 3/8".

Proposed BACT CONTROLS: Good Design/Operation and Good Operating Practices

3.4 BACT ANALYSIS FOR OSB PLANT UNITS – DUST AND GRANULATE HANDLING

Kronospan is proposing an OSB Plant project that includes various dust and granulate handling operations, including multiple flows (16 process streams) from various collection points. as follows:

- EP 8.1, HP Dust Dryers #1, #2, and #3 (Dryer Dust Collectors to OSB Dust Silo);

- EP 9.1, HP Dust Sifter/Gluing/Forming (Sifter, Screen, Blending, Gluing, Mat Forming, and Mat Trimming Dust Collectors to OSB Dust Silo);
- EP10.1, HP Dust Sanding (Sanding Dust Collector to OSB Dust Silo);
- EP 11.1, HP Granulate Forming Line (Mat Forming Cyclone to OSB Granulate Silo);
- EP 12.1, HP OSB Dust to Boiler Dust (Dust from OSB Dust Silo to OSB Boiler Dust Silo);
- EP 12.2, HP Boiler Dust to MDF Dust (Dust from OSB Boiler Dust Silo to MDF Dust Silo);
- EP 13.1, HP MDF Dust to Boiler Dust (Dust from MDF Dust Silo to OSB Boiler Dust Silo);
- EP 13.2, HP MDF Dust to PB Dust (Dust from MDF Dust Silo to PB Dust Silo [existing]);
- EP 14.1, HP Dust Strander to Dust Silo (Strander Dust Collectors and Flaker Cyclofilters to OSB Dust Silo);
- EP 15.1, HP MDF Granulate to Boiler Granulate (MDF Granulate Silo to OSB Boiler Granulate Silo);
- EP 16.1, HP Granulate From PB to OSB (PB Core Layer Silo to OSB Core Layer Silo);
- EP 16.2, HP Granulate From OSB to PB Flaker Silo (OSB Granulate Silo to PB Flaker Silo);
- EP 18.1, HP Granulate Saws (Diagonal Saw, Cut-to-Size Saw, and Tongue and Groove Dust Collectors to OSB Granulate Silo);
- EP 18.2, HP Dust From Saw Filter to Dust Filter (Diagonal Saw, Cut-to-Size Saw, and Tongue and Groove Dust Collectors to OSB Dust Silo);
- EP 19.1, HP Granulate Screening to Granulate Silo (OSB Sifting/Screening Granulate to OSB Granulate Silo); and
- EP 19.2, HP Granulate Screening Dust to Dust Silo (OSB Sifting/Screening Dust to OSB Dust Silo).

The dust and granulate handling operations will collect and recover PM, PM_{10}, $PM_{2.5}$, and a small quantity of VOC will be emitted during the conveyance of dust and granulate wood materials from control devices on 16 process streams to various OSB plant and facility silos for reuse. This section will analyze BACT and the RBLC tables to ensure that the proposed control equipment meets the BACT requirements for the dust and granulate handling operations.

3.4.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS – DUST AND GRANULATE HANDLING OPERATIONS

Particulate emissions are generated from process operations and dust and wood particles (granulate) are collected by dust collectors, cyclones, and cyclofilters and transferred to storage silos. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the dust and granulate handling operations will be exhausted to atmosphere.

BACT Floor Kronospan particulate emissions from the OSB dust and granulate handling operations will meet the Process Weight Rate requirements.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Dust and Granulate Handling

Potentially applicable controls for dust and granulate handling operations include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, mechanical collectors (high-efficiency cyclones/multicyclones), cyclofilters, high-efficiency venturi scrubbers, as well as building enclosures and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-39 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR OSB DUST AND GRANULATE HANDLING OPERATIONS

Control Type	Estimated Combined Filterable PM, PM_{10}, $PM_{2.5}$, and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	99 to 99.9+%
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones).	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones
Cyclofilters	80 to 99%.
High-Efficiency Venturi Scrubbers. Wet Scrubbers/Packed Beds/Spray Towers	70 to 99%
Building Enclosures	90%.
Good Design/Operation	Varies

Descriptions of these types of particulate control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for dust and granulate handling operations at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-40 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR DUST AND GRANULATE HANDLING OPERATIONS (RBLC PROCESS TYPES 30.510, BOARD MANUFACTURING MATERIAL HANDLING, 30.540, BOARD PRODUCT FINISHING, AND 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Dust and Chip Handling, DHF#2, 301-0079-X067 30.510	Baghouse	TPM: 7.72 lb/hr, 0.1200 lb/msf (3/4" basis) TPM10: 5.71 lb/hr, 0.0890 lb/msf (3/4" basis) TPM2.5: 5.00 lb/hr, 0.0780 lb/msf (3/4" basis) CPM: 4.19 lb/hr, 0.065 lb/MSF (3/4" basis) Opacity: 15%
Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Reject Dust Handling and Wood Dust Handling 30.510	Baghouses/ Fabric Filters	FPM: 0.003 gr/dscf and lb/hr as: DHF#1: 0.04 DHF#2: 0.07 DHF#3: 0.04 DHF#4: 0.05 DHF#5: 0.08 DHF#6: 0.08 RF#1: 0.05 FH#2: 0.04 PM10: Not listed PM2.5: Not listed CPM: Not listed Opacity: 0%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Conveying of Material to Bark Storage 30.510	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.06 lb/hr and 0.002 gr/dscf TPM_{10}: 0.06 lb/hr $TPM_{2.5}$: 0.06 lb/hr CPM: Not listed
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	3 Overs Mills in Material Handling 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.61 lb/hr and 0.002 gr/dscf TPM_{10}: 0.61 lb/hr $TPM_{2.5}$: 0.61 lb/hr CPM: Not listed
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.03 lb/hr and 0.002 gr/dscf TPM_{10}: 0.03 lb/hr $TPM_{2.5}$: 0.03 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Raw Material Sawdust Silo 30.540	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.06 lb/hr and 0.002 gr/dscf TPM_{10}: 0.06 lb/hr $TPM_{2.5}$: 0.06 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Conveying of Material to Bark Storage 30.510	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.06 lb/hr and 0.002 gr/dscf TPM_{10}: 0.06 lb/hr $TPM_{2.5}$: 0.06 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	3 Overs Mills in Material Handling 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.61 lb/hr and 0.002 gr/dscf TPM_{10}: 0.61 lb/hr $TPM_{2.5}$: 0.61 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.03 lb/hr and 0.002 gr/dscf TPM_{10}: 0.03 lb/hr $TPM_{2.5}$: 0.03 lb/hr CPM: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Raw Material Sawdust Silo 30.540	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.06 lb/hr and 0.002 gr/dscf TPM_{10}: 0.06 lb/hr $TPM_{2.5}$: 0.06 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Conveying of Material to Bark Storage 30.510	Baghouse/ Fabric Filter, 99% (1-50% for condensable, 99+% for filterable)	FPM: 0.12 lb/hr and 0.002 gr/dscf TPM_{10}: 0.12 lb/hr $TPM_{2.5}$: 0.12 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	3 Overs Mills in Material Handling 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.59 lb/hr and 0.002 gr/dscf TPM_{10}: 0.59 lb/hr $TPM_{2.5}$: 0.59 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Baghouse/ Fabric Filter, 99%	FPM: 0.03 lb/hr and 0.002 gr/dscf TPM_{10}: 0.03 lb/hr $TPM_{2.5}$: 0.03 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Raw Material Sawdust Silo 30.540	Baghouse/ Fabric Filter, 99%	FPM: 0.12 lb/hr and 0.002 gr/dscf TPM_{10}: 0.12 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					(1-50% for condensable, 99+% for filterable)	$TPM_{2.5}$: 0.12 lb/hr CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	Dust and Granulate Handling Operations	Proposed BACT: Cyclofilters	FPM: 0.78 lb/hr, 0.002185 gr/dscf PM_{10}: 0.59 lb/hr, 0.00165 gr/dscf $PM_{2.5}$: 0.112 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for dust and granulate sources)

Table Notes:
Based on approximately 10 years of RBLC records.

For dust and granulate handling, this search indicated that most facilities utilize baghouses as BACT controls for particulate emissions with limits as follows:

- 0.03 lb/hr and 0.002 gr/dscf to 0.59 lb/hr and 0.002 gr/dscf for dust handling and silos based on baghouse controls (MI-0421, 8/26/2016); and
- 0.03 lb/hr and 0.002 gr/dscf to 0.61 lb/hr and 0.002 gr/dscf for dust handling and silos based on baghouse controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017);

For comparison, Kronospan's proposed Filterable PM emissions are 0.78 lb/hr, 0.002185 gr/dscf, and 3.24 tpy, with cyclofilter controls for dust and granulate handling (total). PM_{10} emissions are proposed as 0.59 lb/hr, 0.00165 gr/dscf, and 2.58 tpy, and $PM_{2.5}$ emissions are proposed as 0.112 lb/hr, 0.0003 gr/dscf, and 0.49 tpy.

Step 2: Eliminate Technically Infeasible Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Options for Dust and Granulate Handling Operations

Dust and granulate generated by various processes will be collected by cyclones and used as fuel for the wood-fired biomass heaters at the facility. The use of a WESP would cause the collected wood fuel to become unusable due to the volumes of moisture that would be added to the material streams. As a result, the use of a WESP to control dust and granulate handling operations is considered to be technically infeasible.

Similarly, the use of a venturi scrubber would cause the collected wood fuel to become unusable due to the scrubbing liquid that would be added to the material streams. For this reason, some OSB plants have determined venturi scrubbers to be technically infeasible for controlling emissions from dust and granulate handling operations.

Step 3: Rank Remaining Technically Feasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Dust and Granulate Handling Operations

The remaining PM control technologies for dust and granulate handling operations are ranked below.

TABLE 3-41 SUMMARY OF RANKED FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM CONTROLS FOR DUST AND GRANULATE HANDLING OPERATIONS

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors
2	Dry Electrostatic Precipitators / Wet Electrostatic Precipitators
3	Mechanical Collectors (High-Efficiency Cyclones/Multiclones)
4	Cyclofilters
5	High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers
6	Building Enclosures
6	Good Design/Operation

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Dust and Granulate Handling Operations

Kronospan proposes the use of cyclofilters, which are essentially a combination of dust collectors (which are the top ranked control devices) with cyclones to reduce particulate emissions from the dust and granulate handling operations. A cyclofilter utilizes centrifugal force (in the cyclone portion) and filtration to separate and collect particles from gas streams (in the dust collector portion). A cost effectiveness calculation could be done for baghouses/fabric filters/dust collectors as the top ranked control device; however, cyclofilters are essentially a combination of dust collectors and cyclones. Furthermore, because the total emissions from the dust and granulate handling operations are less than 5 tons of Filterable PM overall, a cost effectiveness analysis for dust collector control or DESP control would not show these individual controls as cost effective.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ for Dust and Granulate Handling Operations

Kronospan proposes the use of cyclofilters, which are essentially a combination of dust collectors (which are the top ranked control devices) with cyclones to reduce particulate emissions from the dust and granulate handling operations. The dust and granulate handling operations include multiple flows (16 process streams) from various collection points. In addition, Kronospan is proposing BACT limits (total for emission sources) as follows:

- Filterable PM: 0.78 lb/hr, 0.002185 gr/dscf;
- PM_{10}: 0.57 lb/hr, 0.00165 gr/dscf;
- $PM_{2.5}$: 0.11 lb/hr, 0.0003 gr/dscf;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan proposes an opacity limit of 0% as BACT for the dust and granulate handling operations.

Proposed BACT Controls: Cyclofilters

3.4.2 VOC BACT ANALYSIS – DUST AND GRANULATE HANDLING OPERATIONS

VOC emissions can be generated by granulate and dust handling operations, as granulate (wood particles) and dust are collected and transferred to storage silos. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the dust and granulate handling operations will be exhausted to atmosphere.

BACT Floor These sources will be generally subject to the applicable requirements of 40 CFR 63 Subpart DDDD.

Step 1: Identify Potential VOC Control Technologies for Dust and Granulate Handling Operations

Potentially applicable controls for dust and granulate handling operations include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (including packed beds, spray towers), biofilters, and good design/operation. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-42 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR DUST AND GRANULATE HANDLING OPERATIONS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)

Control Type	Estimated VOC Control Efficiency
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40 to 77%.
Good Design/Operation	Varies
Good Operating Practices	Varies

Descriptions of these types of particulate control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOC established for dust and granulate handling operations at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-43 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR DUST AND GRANULATE HANDLING OPERATIONS (RBLC PROCESS TYPE 30.510, BOARD MANUFACTURING MATERIAL HANDLING)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Reject Dust Handling and Wood Dust Handling 30.510	RTO and Good design/ operation	VOC: lb/hr as: DHF#1: 0.58 DHF#2: 1.45 DHF#3: 1.50 DHF#4: 1.05 DHF#5: 0.09 DHF#6: 0.35 RF#1: 1.01 FH#2: 0.58
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Conveying of Material to Bark Storage 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.55 lb/hr
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	3 Overs Mills in Material Handling 30.510	Good design/ operating practices (Wet scrubber + RTO not cost effective; RTO on dryers	VOC: 20.6 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					not technically feasible)	
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 1.93 lb/hr
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Raw Material Sawdust Silo 30.540	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.54 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Conveying of Material to Bark Storage 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.55 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	3 Overs Mills in Material Handling 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.75 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Good design/ operating practices (Add-on controls not cost effective	VOC: 1.93 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Raw Material Sawdust Silo 30.540	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.54 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Conveying of Material to Bark Storage 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.55 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	3 Overs Mills in Material Handling 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.75 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Conveying of Fines from Screening to Energy Plant Dust Silo 30.510	Good design/ operating practices (Add-on controls not cost effective)	VOC: 1.93 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Raw Material Sawdust Silo 30.540	Good design/ operating practices (Add-on controls not cost effective)	VOC: 0.54 lb/hr
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	Dust and Granulate Handling Operations	Proposed BACT: Good design/ operation	VOC: 9.60 lb/hr, 0.0045 lb/MSF 3/8” (Emissions are total for 16 dust and granulate sources)

Table Notes:
Based on approximately 10 years of RBLC records.

For dust and granulate handling operations, this search indicated that most facilities utilize good design/operation controls with no add-on controls as BACT controls for VOC emissions with limits as follows:

- 0.54 lb/hr to 1.93 lb/hr for dust handling and silos based on good design and operating practice controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan’s proposed VOC emissions are 9.60 lb/hr and 42.05 tpy, with good design/operation controls for dust and granulate handling operations. Emissions are higher because this total represents 16 dust and granulate sources summed together.

Step 2: Eliminate Technically Infeasible VOC Control Options for Dust and Granulate Handling Operations

The use of an RTO is technically infeasible when an RTO is installed prior to particulate control equipment such as baghouses/fabric filters/dust collectors, cyclofilters, or WESPs (from Kronospan 2022 application for particle board plant). The exhaust gas temperature from the RTO would be too high for a baghouse/fabric filter/dust collector, cyclofilter, or WESP to operate in a safe and/or effective manner because high temperatures could create a fire hazard within a baghouse or cyclofilter. Elevated temperatures entering a WESP could cause the wash fluid to flash and vaporize, thus reducing the effectiveness of the control device and potentially creating a safety hazard with the build-up of flash gas pressure.

The addition of an RTO after a filterable particulate control device(s) such as a baghouse or cyclofilter also could be a technically infeasible option for safety reasons; for example, if a filter

bag in a baghouse would rupture, the collected wood and dust would flow into the RTO causing a fire. Furthermore, due to the high moisture content and lower exit temperature in the exhaust streams (86°F), the use of an RTO could be unstable and has been determined to be technically infeasible in several wood products manufacturing BACT determinations (Two Rivers Lumber, 2024; Scotch Gulf, 2023; Varn Wood Products, 2020; Westervelt, 2019; Harrigan Lumber, 2019; TRMM, 2019). However, for this analysis, an RTO is assumed to be technically feasible, and a WESP / RTO control combination is also considered to be technically feasible.

Similarly, the use of an RCO could be technically infeasible for some wood product processes due to the level of PM/PM_{10}/$PM_{2.5}$ loading. Even with highly efficient PM/PM_{10}/$PM_{2.5}$ control, the possibility of catalyst blinding, poisoning, plugging, or masking can occur, which will significantly reduce the efficiency of the RCO. Industry practice has illustrated that RCO technology may not be successfully applied in all cases (Westervelt 2019 BACT). However, for this analysis, an RCO is assumed to be technically feasible.

The use of a wet scrubber would cause the collected wood fuel to become unusable due to the scrubbing liquid that would be added to the material streams. For this reason, some OSB plants have determined wet scrubbers to be technically infeasible for controlling emissions from dust and granulate handling operations.

As mentioned earlier, condensers and adsorbers/adsorption systems are often considered to be technically infeasible controls for wood products manufacturing processes. Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to be lower than the VOC concentration (Westervelt 2019 BACT). Adsorption is not feasible because of the high moisture content of the exhaust stream from the dust and granulate handling, and water vapor and VOC compounds would compete for the adsorption media's active sites (Westervelt 2019 BACT).

Biofilters require a pollutant stream to be in a steady-state condition to effectively control VOC. If there were any process upsets or change in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the dust and granulate handling, then the living organisms within the biofilter could be rendered ineffective. Therefore, Kronospan considers the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant).

Step 3: Rank Remaining Technically Feasible VOC Control Options for Dust and Granulate Handling Operations

The remaining available control technologies are listed in the table below.

TABLE 3-44 SUMMARY OF RANKED VOC CONTROLS FOR DUST AND GRANULATE HANDLING OPERATIONS

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers

Rank	Technology
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers
1	WESP / Regenerative Thermal Oxidizer
2	Wet Scrubbers/Packed Beds/Spray Towers
3	Good Design/Operation
3	Good Operating Practices

The remaining control technologies listed in the RBLC are good design/operation, as well as good operating practices.

Step 4: Evaluate Remaining VOC Control Technologies for Dust and Granulate Handling Operations

A cost effectiveness evaluation for using oxidizers to control VOCs from the dust and granulate handling operations is included below. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the following VOC reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer (RTO); a control efficiency of 98 to 99.99% for a recuperative thermal oxidizer; and a control efficiency of 90 to 99% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five years during the RTO equipment lifetime; and
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP.

Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the dust and granulate handling operations. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers, so it would also be considered economically infeasible.

TABLE 3-45 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR DUST AND GRANULATE HANDLING OPERATIONS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest)	$1,762,173	39.95	$44,114
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest)	$1,670,253	39.95	$41,813
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest)	$1,094,316	39.95	$27,395
Recuperative Thermal Oxidizer (98 - 99.99% control, 10-yr life at 7% interest)	$2,778,860	41.25 – 42.08*	$67,4374
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99%)	$Not Available	41.25– 42.05**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)	$2,172,758	37.85 – 41.63*	$57,415

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 42.05 tpy Dust and Granulate Handling Operations Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

None of the remaining control options for the dust and granulate handling operations have any significant adverse impacts, and none are considered economically infeasible. Additionally, the remaining control options are not mutually exclusive, so some of the items can be effectively implemented in combination (good design/operation plus good operating practices).

Step 5: Selection of BACT for VOC for Dust and Granulate Handling Operations

Kronospan proposes the use of good design/operation as BACT for VOC from the dust and granulate handling operations, which is consistent with other entries in the RBLC database for similar units at OSB manufacturing facilities, and with BACT limits as follows:

- VOC: 9.60 lb/hr, 0.068 lb/MSF 3/8".

Proposed BACT Controls: Good Design/Operation and Good Operating Practices

3.5 BACT ANALYSIS FOR OSB PLANT UNITS – BELT DRYERS

Kronospan is proposing an OSB plant project that includes three (3) belt dryers (EP 20.1, Belt Dryer #1; EP 20.2, Belt Dryer #2; EP 20.3, Belt Dryer #3), which are reviewed in this section. The belt dryers will be heated by thermal oil.

The OSB belt dryers will generate PM, PM_{10}, $PM_{2.5}$, and VOC emissions, as well as CO and NOx emissions, though the belt dryers themselves do not include combustion since they are heated by thermal oil. This section will analyze BACT and the RBLC tables to ensure that the proposed control equipment meets the BACT requirements for the belt dryers.

3.5.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS FOR OSB PLANT UNITS - BELT DRYERS

The OSB belt dryers will generate PM, PM_{10}, $PM_{2.5}$ from the drying process, not from a combustion process, since they are heated by thermal oil. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the three (3) belt dryers exhaust to atmosphere except for zones 1, 2, 3, and 16, which provide combustion air to the two (2) biomass heaters.

BACT Floor Kronospan particulate emissions from the OSB press will meet the Process Weight Rate requirements.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Belt Dryers

Potentially applicable controls for belt dryers include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, mechanical collectors (high-efficiency cyclones/multiclones), cyclofilters, high-efficiency venturi scrubbers, as well as building enclosures and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. The control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-46 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BELT DRYERS

Control Type	Estimated Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	99 to 99.9+%
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones)	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones.
Cyclofilters	80 to 99%.
High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers	70 to 99%
Building Enclosures	Varies
Good Design/Operation	Varies

Descriptions of these types of particulate control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for belt dryers at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance and may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-47 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BELT DRYERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Furnace Dryers #1 and #2 each 40 ODT/hr 30.530	WESP and RTO	FPM: 9.03 lb/hr, 0.2300 lb/ODT TPM_{10}: 9.03 lb/hr, 0.2300 lb/ODT $TPM_{2.5}$: 9.03 lb/hr, 0.2300 lb/ODT
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Wood Chip Sorting, 301-0079-X068 30.530	Baghouse	TPM: 7.72 lb/hr, 0.1200 lb/msf (3/4" basis) TPM_{10}: 5.71 lb/hr, 0.0890 lb/msf (3/4" basis) $TPM_{2.5}$: 5.00 lb/hr, 0.0780 lb/msf (3/4" basis) CPM: 4.19 lb/hr, 0.065 lb/msf (3/4" basis) Opacity: 15%
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	RTO 70%-90% Good combustion practices during bypass (dryers bypass RTO up to 500 hr/yr, flakers bypass RTO up to 460 hr/yr) (dryers also have product	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					recovery cyclones not considered to be pollution control equipment)	
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices, RTO 70%-90% (flakers bypass RTO up to 460 hr/yr) (dryers also have product recovery cyclones not considered to be pollution control equipment)	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices, RTO 70%-90% (flakers bypass RTO up to 460 hr/yr) (dryers also have product recovery cyclones not considered to be pollution control equipment)	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Energy Systems/ Dryers and RTO Burners	Not listed	PM: Not listed PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	3 Belt Dryers	Proposed BACT: Dust collector for each belt dryer and good design/ operation	FPM: 12.80 lb/hr, 0.002185 gr/dscf, PM_{10}: 9.66 lb/hr, 0.0016 gr/dscf $PM_{2.5}$: 1.76 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 10% (Emissions for each belt dryer)

Table Notes:

Based on approximately 10 years of RBLC records.

Based on information found in the RBLC database and available permits, BACT limits for dryers are generally established for either (1) the dryers/boilers/heaters/furnaces alone, or for (2) energy systems (typically exhausting through a shared stack), which include dryers, presses, and RTOs as well.

Examples of BACT emissions and controls for dryers, some including energy systems (heaters/furnaces), have been established as follows:

- Thermal Energy Plant, FPM: 29.1 lb/hr with DESP, RTO, and good combustion practice controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed FPM emissions are 12.80 lb/hr and 56.05 tpy with dust collector control for each of the belt dryers.

Step 2: Eliminate Technically Infeasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Belt Dryers

No potentially available control options are technically infeasible.

Step 3: Rank Remaining Technically Feasible Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Belt Dryers

The remaining PM control technologies for the belt dryers were ranked, as shown in the table below.

TABLE 3-48 SUMMARY OF RANKED FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM CONTROLS FOR BELT DRYERS

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors
2	Dry Electrostatic Precipitators
3	Wet Electrostatic Precipitators
4	Mechanical Collectors (High-Efficiency Cyclones/Multiclones)
5	Cyclofilters
6	Building Enclosures
7	Good Design/Operation

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Belt Dryers

Baghouses/fabric filters/dust collectors do not have any significant adverse impacts and are not considered economically infeasible. Therefore, Kronospan proposes to utilize dust collectors to

control particulate emissions from the belt dryers, which are the top ranked control device. Therefore, no further analysis for the reduction of particulates is necessary.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for Belt Dryers

Kronospan proposes the use of dust collectors, which are the top ranked control devices, to reduce particulate emissions from the belt dryers. Kronospan is proposing BACT limits for dust collectors as follows, for each of the belt dryers:

- Filterable PM: 12.80 lb/hr, 0.002185 gr/dscf;
- PM_{10}: 9.66 lb/hr, 0.00165 gr/dscf;
- $PM_{2.5}$: 1.76 lb/hr, 0.0003 gr/dscf;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 10%.

The RBLC does not include any opacity limits for this type of process or equipment.

BACT Controls: Dust Collectors and Good Design/Operation

3.5.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS - BELT DRYERS

The OSB belt dryers will generate VOC emissions from the drying process, not from a combustion process, since they are heated by thermal oil. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the three (3) belt dryers will exhaust to atmosphere including zones 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15; except for zones 1, 2, 3, and 16, which provide combustion air to the two (2) biomass heaters.

BACT Floor The three (3) belt dryers will be subject to the applicable requirements of 40 CFR 63 Subpart DDDD (Plywood MACT). The OSB belt dryers (as "*conveyor strand dryer zones one and two (at new affected sources)*") will be vented to the combustion chamber flame zone of biomass thermal oil heaters (K7 and K8) or to the MDF Dryer and RTO-1, which will act as control devices and will meet the requirements of Table 1(B) by utilizing one of the six compliance options listed in Table 1(B), for example Table 1(B)(1) or 1(B)(2) as follows:

> *Reduce emissions of total HAP, measured as THC (as carbon), by 90 percent (may choose to subtract methane from THC as carbon measurements);* or

Limit emissions of total HAP, measured as THC (as carbon) a, to 20 ppmvd; or …, and Table 2(4) as follows:

> *If using a control device other than a thermal oxidizer, catalytic oxidizer, or biofilter, Maintain the 3-hour block average THC concentration in the control device exhaust below the maximum concentration established during the performance test*.

To ensure compliance with MACT Subpart DDDD, Kronospan will monitor and collect data (K7 and K8 firebox temperature) by using a continuous monitor according to section 40 CFR 63.2270(b) as follows:

… conduct all monitoring in continuous operation at all times that the process unit is operating. For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out-of-control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance ….

The remaining zones of the OSB belt dryers (zones 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15) will be vented through the belt dryer stacks to atmosphere and are not specifically addressed in the requirements of Table 1(B) and Table 2; Kronospan will monitor daily operation and implement corrective action as required.

Step 1: Identify Potential VOC Control Technologies for Belt Dryers

Potentially applicable controls for belt dryers include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (including packed beds, spray towers), biofilters, and good design/operation. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-49 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR BELT DRYERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40 to 77%
Good Design/Operation	Varies

Descriptions of these types of VOC control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOC established for belt dryers at OSB plants. The RBLC searches were

conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-50 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR BELT DRYERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Furnace Dryers #1 and #2 each 40 ODT/hr 30;530	RTO	VOC: 25.9 lb/hr, 0.7000 lb/ODT
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Wood Chip Sorting, 301-0079-X068 30.530	RTO-2	VOC: 55.39 lb/hr, 0.8600 lb/msf (3/4" basis)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers, 139.9 MMBtu/hr 30.530	Dryers have product recovery cyclones (not considered pollution control equipment) RTO1. 95% Good combustion practices during bypass (dryers bypass RTO up to 500 hr/yr, flakers bypass RTO up to 460 hr/yr) (add-on control not cost effective)	VOC: 7.1 lb/hr and 0.43 lb/oven dried ton (ODT)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019 Other Case-by-Case	#1 and #2 Wood Fuel Fired Boilers 12.120	Multi-vane scrubber each boiler (VOC increases were above the PSD significance level, but #1 Wood Fuel Fired Boiler was affected instead of new or modified, so a BACT evaluation was not applied)	VOC: 10.0 lb/hr and 43.8 tpy each boiler
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018	McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	VOC: Not listed in RBLC
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Wood Fired Energy System, 149.25 MMBtu/hr	Proper design and operating practices	VOC: 0.028 lb/MMBtu
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr	Not listed	VOC: Not listed
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 95% (flakers bypass RTO up to 460 hr/yr)	VOC: 7.1 lb/hr (total emissions from all processes that exhaust through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 95% (flakers bypass RTO up to 460 hr/yr)	VOC:7.1 lb/hr (total emissions from all processes that exhaust through RTO)
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Energy Systems/ Dryers and RTO Burners	Not listed	VOC: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and Good operating practices	VOC: 30.38 lb/hr, 0.75 lb/ODT (Emissions for each belt dryer)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize RTOs, though these controls were primarily installed for wood-fired heaters in an energy system that also included natural gas-fired burners. The belt dryers will be heated by thermal oil and will not include combustion for the drying process.

Step 2: Eliminate Technically Infeasible VOC Control Options for Belt Dryers

The use of an RTO could be considered technically infeasible when an RTO is installed prior to particulate control equipment such as baghouses/fabric filters/dust collectors, cyclofilters, or WESPs (from Kronospan 2022 application for particle board plant). The exhaust gas temperature from the RTO would be too high for a baghouse/fabric filter/dust collector, cyclofilter, or WESP to operate in a safe and/or effective manner because high temperatures could create a fire hazard within a baghouse or cyclofilter. Elevated temperatures entering a WESP could cause the wash fluid to flash and vaporize, thus reducing the effectiveness of the control device and potentially creating a safety hazard with the build-up of flash gas pressure.

The addition of an RTO after a filterable particulate control device(s) such as a baghouse or cyclofilter could be a technically infeasible option for safety reasons; for example, if a filter bag in a baghouse would rupture, the collected wood and dust would flow into the RTO causing a fire. Furthermore, due to the high moisture content and lower exit temperature in the exhaust streams (86°F), the use of an RTO could be unstable and has been determined to be technically infeasible in several wood products manufacturing BACT determinations (Two Rivers Lumber, 2024; Scotch Gulf, 2023; Varn Wood Products, 2020; Westervelt, 2019; Harrigan Lumber, 2019; TRMM, 2019). However, other facilities have installed RTOs for OSB plants, and Kronospan currently utilizes two (2) RTOs for controlling VOC emissions. However, for this analysis, an RTO is assumed to be technically feasible, and a WESP / RTO control combination is also considered to be technically feasible.

The use of an RCO could be technically infeasible for some wood product processes due to the level of PM/PM_{10}/$PM_{2.5}$ loading. Even with highly efficient PM/PM_{10}/$PM_{2.5}$ control, the possibility of catalyst blinding, poisoning, plugging, or masking can occur, which will significantly reduce the efficiency of the RCO. Industry practice has illustrated that RCO technology may not be

successfully applied in all cases (Westervelt 2019 BACT). However, for this analysis, an RCO is assumed to be technically feasible.

As mentioned earlier, condensers and adsorbers/adsorption systems are often considered to be technically infeasible controls for wood products manufacturing processes. Condensation requires that the exhaust stream be cooled to a low enough temperature for the vapor pressure to be lower than the VOC concentration (Westervelt 2019 BACT). Adsorption is not feasible because of the high moisture content of the exhaust stream from the belt dryers, and water vapor and VOC compounds would compete for the adsorption media's active sites (Westervelt 2019 BACT).

Biofilters require a pollutant stream to be in a steady-state condition to effectively control VOC. If there were any process upsets or change in the character of the waste gas stream (temperature, humidity, and/or pressure variance) from the belt dryers, then the living organisms within the biofilter could be rendered ineffective. Therefore, Kronospan considers the use of a biofilter to be technically infeasible (from Kronospan 2022 application for particle board plant).

Step 3: Rank Remaining Technically Feasible VOC Control Options for Belt Dryers

The remaining available control technologies are listed in the table below.

TABLE 3-51 SUMMARY OF RANKED VOC CONTROLS FOR BELT DRYERS

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers
2	Good Design/Operation
3	Good Operating Practices

The remaining control technologies listed in the RBLC are good design/operation, as well as good operating practices.

Step 4: Evaluate Remaining VOC Control Technologies for Belt Dryers

This section contains cost effectiveness evaluations for using oxidizers to control VOCs from the belt dryers. Total uncontrolled VOC emissions for each belt heater will be 30.39 lb/hr and 133.08 tpy at a flow rate of 683,240 dscfm (for belt dryers 1, 2, and 3), and 912,950 acfm (for belt dryers 1, 2, and 3). (Note that an estimated 50% of emissions from the belt dryers will be routed as combustion air to the biomass thermal oil heaters K7 and K8.) Also, because of the extremely large air volume exhausted from each belt dryer, a cost analysis has been done assuming a control device for each belt dryer (rather than a combined exhaust from all three belt dryers). Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the lower VOC reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer; a control efficiency of 98% for a recuperative thermal oxidizer; and a control efficiency of 90% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five years during the RTO equipment lifetime; and
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP.

Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the belt dryers. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers, so it would also be considered economically infeasible.

TABLE 3-52 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BELT DRYER #1 (VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest)	$13,262,085	126.41	$104,912
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest)	$16,972,057	126.41	$134,261
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest)	$11,284,040	126.41	$89,265
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest)	$38,629,730	130.42 – 133.06*	$296,233
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	130.42 – 133.07**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)	$24,300,376	119.77 – 131.76*	$202,912

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 133.08 tpy Belt Dryer #1 Total x % reduction for Cost Analysis. Flow rates for each belt dryer based on flow rate of 683,240 dscfm for belt dryers 1, 2, and 3 and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for belt dryer #1, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for belt dryers #1, #2, and #3.

TABLE 3-53 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BELT DRYER #2 (VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest)	$13,163,284	126.41	$104,132
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest)	$16,950,406	126.41	$134,091
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life at 7% interest)	$11,262,389	126.41	$89,094
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest)	$26,428,018	130.42 – 133.07*	$202,644 - $198,616
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99% control)	$Not Available	130.42 – 133.06**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)	$16,594,593	119.77 – 131.76*	$139,398 – 125,949

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 133.08 tpy Belt Dryer #2 Total x % reduction for Cost Analysis. Flow rates for each belt dryer based on flow rate of 683,240 dscfm for belt dryers 1, 2, and 3 and 912,950 acfm and 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for belt dryer #2, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for belt dryer #2.

TABLE 3-54 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BELT DRYER #3 (VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest)	$13,163,284	126.41	$104,132
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest)	$16,950,406	126.41	$134,091
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life at 7% interest)	$11,262,389	126.41	$89,094
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest)	$26,428,018	130.42 – 133.07	$202,644 - $198,616
Direct Flame Thermal Oxidizer (Afterburner) (98 - 99% control)	$Not Available	130.42 – 133.06**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest)	$16,594,593	119.77 – 131.76	$139,398 – $125,949

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 133.08 tpy Belt Dryer #3 x % reduction for Cost Analysis. Flow rate based on flow rate of 683.240 dscfm for Belt Dryer 3 flow rate and 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume cost similar to RTO.*

Based on the costs shown above for belt dryer #3, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for belt dryer #3.

None of the remaining control options for the belt dryers have any significant adverse impacts, and none are considered economically infeasible. Additionally, the remaining control options are not mutually exclusive, so some of the items can be effectively implemented in combination (good design/operation plus good operating practices).

Step 5: Selection of BACT for VOC for Belt Dryers

Kronospan proposes the use of good design/operation and good operating practices as BACT for VOC from the belt dryers, and with BACT limits as follows:

- VOC: 30.38 lb/hr, 0.75 lb/ODT (for each belt dryer).

Proposed BACT Controls: Good Design/Operation and Good Operating Practices

3.5.3 NOX BACT ANALYSIS FOR OSB PLANT UNITS - BELT DRYERS

The OSB belt dryers will generate NOx emissions from the drying process, not from a combustion process, since they are heated by thermal oil. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the three (3) belt dryers exhaust to atmosphere except for zones 1, 2, 3, and 16, which provide combustion air to the two (2) biomass thermal oil heaters.

BACT Floor These sources will be subject to applicable requirements, but are not subject to the Plywood MACT.

Step 1: Identify Potential NOx Control Technologies for Belt Dryers

Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-55 CONTROL TYPES AND EFFICIENCIES FOR NOX FOR BELT DRYERS

Control Type	Estimated NO_x Control Efficiency
Selective Catalytic Reduction	70 to 95%
Selective Non-Catalytic Reduction	40 to 75%
Non-Selective Catalytic Reduction	90 to 98%
Water/Steam Injection (WSI)	60 to 80%
Low-NOx Burners/Ultra Low-NOx Burners	80 to 90%
Staged Combustion/Controlled Burn	40%
Flue Gas Recirculation (FGR)	40%
Low Excess Air	10%
Good Design/Operations	Varies
Good Operating Practices	Varies

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NOx established for belt dryers at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-56 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR NOX FOR BELT DRYERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Furnace Dryers #1 and #2 each 40 ODT.hr 30.530	FGR	NOx: 45.23 lb/hr, 1.13 lb/ODT
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Wood Chip Sorting, 301-0079-X068 30.530	SNCR	NOx: 96.50 lb/hr, 1.500 lb/msf (3/4" basis)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 170.0 lb/hr and 2.0 lb/oven dried ton (ODT)
AR-0164 Georgia-Pacific Wood Products LLC	Gurdon Plywood & Lumber Complex	Gurdon, Clark County, AR	11/22/2019	#1 and #2 Wood Fuel Fired Boilers 12.120	Not listed	NOx: Not listed in RBLC
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018	McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	NOx: Not listed in RBLC
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Wood Fired Energy System, 149.25 MMBtu/hr	Not listed	NOx: Not listed
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr	FGR and SNCR only required if facility cannot meet 0.15 lb/MMBtu emission limit within 365 days	NOx: 25.1 lb/hr and 0.15 lb/MMBtu
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal	NOx: 95.0 lb/hr and 1.1 ODT

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					energy plant exhaust)	
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 95.0 lb/hr and 1.1 ODT
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Energy Systems/ Dryers and RTO Burners	Not listed	NOx: Not listed in RBLC
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and Good operating practices	NOx: 0.31 lb/hr, 0.0062 lb/MSF 3/8" (Emissions for each belt dryer)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize add-on controls, though these controls were primarily installed for wood-fired heaters in an energy system that also included natural gas-fired burners. BACT controls established for belt dryers include good design and operation.

Step 2: Eliminate Technically Infeasible NOx Control Options for Belt Dryers

Potentially applicable controls for controlling NOx emissions include good design/operation and good operating practices since add-on controls are not suitable for controlling NOx emissions from the belt dryers (since no combustion is involved). For the belt dryers, all of the add-on control technologies are technically infeasible for controlling NOx emissions. The belt dryers will be heated by thermal oil with no combustion involved, so expected NOx emissions are quite small. The low level of NOx emissions combined with the large exhaust gas volume results in very low concentrations of NOx in the belt heaters exhaust. Therefore, removal of NOx emissions from the belt heaters is not technically feasible and would not provide any significant degree of emission reduction for the belt heaters exhaust.

Step 3: Rank Remaining Technically Feasible NOx Control Options for Belt Dryers

The remaining available control technologies are listed in the table below.

TABLE 3-57 SUMMARY OF RANKED NOX CONTROLS FOR BELT DRYERS

Rank	Technology
1	Good Design/Operation
1	Good Operating Practices

The remaining control technologies are good design/operation, as well as good operating practices.

Step 4: Evaluate Remaining NOx Control Technologies for Belt Dryers

None of the remaining control options for the belt dryers have any significant adverse impacts, and none are considered economically infeasible. Additionally, the remaining control options are not mutually exclusive, so some of the items can be effectively implemented in combination (good design/operation plus good operating practices).

Step 5: Selection of BACT for NOx for Belt Dryers

Kronospan proposes the use of good design/operation and good operating practices as BACT for NOx from the belt dryers, and with BACT limits as follows:

- NOx: 0.31 lb/hr, 0.0066 lb/MSF 3/8" (for each belt dryer).

Proposed BACT Controls: Good Design/Operation and Good Operating Practices

3.5.4 CO BACT ANALYSIS FOR OSB PLANT UNITS - BELT DRYERS

The OSB belt dryers will generate CO emissions from the drying process, not from a combustion process, since they are heated by thermal oil. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the three (3) belt dryers exhaust to atmosphere except for zones 1, 2, 3, and 16, which provide combustion air to the two (2) biomass heaters.

BACT Floor These sources will be subject to the applicable requirements of 40 CFR 63 Subpart DDDD for VOC/HAP emissions, but there are no specific requirements for controlling CO emissions.

Step 1: Identify Potential CO Control Technologies for Belt Dryers

Potentially applicable controls for belt dryers include regenerative thermal oxidizers or regenerative catalytic oxidizers (typically in combination with a baghouse or dry or wet electrostatic precipitator), good combustion practices and maintenance, and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-58 CONTROL TYPES AND EFFICIENCIES FOR CO FOR BELT DRYERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	75 to 95%
Recuperative Thermal Oxidizers	75 to 95%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Biofilters	40 to 77%
Good Design/Operation	Varies
Good Operating Practices	Varies

Descriptions of these types of CO control systems are included in previous sections.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO established for belt dryers at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-59 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR CO FOR BELT DRYERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
ME-0048 Godfrey Forest Arizona, LLC	OSB Plant	Franklin County, ME	12/3/2024 BACT-PSD	Furnace Dryers #1 and #2 each 40 ODT/hr 30.530	RTO	CO: 27.5 lb/hr, 0.69 lb/ODT
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Wood Chip Sorting, 301-0079-X068 30.530	RTO-2	CO: 95.90 lb/hr, 1.4900 lb/msf (3/4" basis)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 lb/oven dried ton (ODT)
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019	#1 and #2 Wood Fuel Fired Boilers 12.120	Not listed	CO: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018 BACT-PSD	McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	CO: 279.12 lb/hr
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Wood Fired Energy System, 149.25 MMBtu/hr	Proper design and operating practices	CO: 0.5050 lb/MMBtu
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr	Not listed	CO: 50.2 lb/hr and 0.30 lb/MMBtu
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 ODT (total emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 ODT (total emissions from all processes exhausted through RTO)
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Energy Systems/ Dryers and RTO Burners	Not listed	CO: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and Good operating practices	CO: 3.84 lb/hr, 0.0812 lb/MSF 3/8" (Emissions for each belt dryer)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize add-on controls, though these controls were primarily installed for wood-fired heaters in an energy system that also included natural gas-fired burners. BACT controls established for belt dryers include good design and operation.

Step 2: Eliminate Technically Infeasible CO Control Options for Belt Dryers

For the belt dryers, all of the add-on control technologies are technically infeasible for controlling CO emissions. The belt dryers will be heated by thermal oil with no combustion involved, so expected CO emissions are quite small. The low level of CO emissions combined with the large exhaust gas volume results in very low concentrations of CO in the belt heaters exhaust.

Therefore, removal of CO from emissions from the belt heaters is not technically feasible and would not provide any significant degree of emission reduction for the belt heaters exhaust.

Step 3: Rank Remaining Technically Feasible CO Control Options for Belt Dryers

The only control technology listed in the RBLC is good design/operation; therefore, this will be the primary control technology considered.

TABLE 3-60 SUMMARY OF RANKED CO CONTROLS FOR BELT DRYERS

Rank	Technology
1	Good Design/Operation
1	Good Operating Practices

Step 4: Evaluate Remaining CO Control Technologies for Belt Dryers

None of the remaining control options for the belt dryers have any significant adverse impacts, and none are considered economically infeasible. Additionally, the remaining control options are not mutually exclusive, so some of the items can be effectively implemented in combination (good design/operation plus good operating practices).

Step 5: Selection of BACT for CO for Belt Dryers

Kronospan proposes the use of good design/operation and good operating practices as BACT for CO from the belt dryers, and with BACT limits as follows:

- CO: 3.84 lb/hr, 0.0812 lb/MSF 3/8" (for each belt dryer).

Proposed BACT Controls: Good Design/Operation and Good Operating Practices

3.6 BACT ANALYSIS FOR OSB PLANT UNITS – BIOMASS HEATERS

Kronospan proposes to operate two (2) wood-fired biomass heaters (EP 24, OSB Biomass Heater #1, K7 and EP 24, Biomass Heater #2, K8), which are reviewed in this section. The biomass heaters will be rated at 204.73 MMBtu/hr each and will generate Filterable PM, PM_{10}, $PM_{2.5}$, CPM, VOC, NOx, CO, and GHG emissions. (The biomass heaters also will emit SO_2, HCl, and mercury, though BACT analyses are not required for these pollutants.)

The heaters are required to meet the EPA's emission requirements for process heaters as specified in 40 CFR Part 63, Subpart DDDDD, Boiler MACT. This will require the heaters to comply with emission limits and work practice standards for the size and category of the heaters. Since BACT cannot be less stringent than an applicable NSPS or NESHAP, the Subpart DDDDD emission limits represent the BACT floor for the applicable pollutants.

3.6.1 FILTERABLE $PM/PM_{10}/PM_{2.5}$ BACT ANALYSIS FOR OSB PLANT UNITS - BIOMASS HEATERS

Wood granulate (wet wood, primarily bark) and wood dust will be used as fuel for the biomass heaters, which will be used to heat thermal oil for providing heat to the belt dryers. This section

reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the two (2) biomass heaters will exhaust to the Thermal Oil Heater stack TOH-1.

BACT Floor Kronospan will meet the applicable Subpart DDDDD emission limits for Filterable PM (FPM) as required by the Boiler MACT standard and applicable Subpart Db emission limits for Filterable PM (FPM) as required by the NSPS standard.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Biomass Heaters

Potentially applicable controls for biomass heaters include baghouses/fabric filters/dust collectors, dry or wet electrostatic precipitators, high-efficiency cyclones/multiclones, cyclofilters, high-efficiency venturi scrubbers, good combustion practices and maintenance, and good design/operation. Other controls include Hybrid Filters, which are electrified filter/gravel beds (essentially a combined DESP and baghouse) and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. The control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-61 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BIOMASS HEATERS

Control Type	Estimated Combined Filterable PM, PM_{10}, $PM_{2.5}$, and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	95 to 99.9+%
Dry Electrostatic Precipitators	95 to 99.9%
Hybrid Filters (Electrified Filter/Gravel Bed)	95 to 99.9%
Wet Electrostatic Precipitators	90 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones)	80 to 99% high-efficiency single cyclones 80 to 95% multiple cyclones or multiclones
Cyclofilters	80 to 99%
High-Efficiency Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers	70 to 90%
Building Enclosures	90%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of some of these types of particulate control systems are included in a previous section, and descriptions of additional particulate control systems are included below:

Hybrid Filters (Electrified Filter/Gravel Beds similar to combined DESP and Baghouse) – Hybrid Filters (Electrified filter/gravel beds) are used to control PM emissions including fine dust and smoke particles from wood waste-fired boilers and wood products dryers. These control devices contain three sections: (1) an ionizer (corona charger), which is used to charge fine dust particles, (2) a filter/gravel bed composed of an electrically polarized bed of pea gravel, upon which dust particles are deposited, and (3) a gravel cleaning and recirculation system, which removes dust (by collection with a fabric filter) prior to the gravel being returned to the filter/gravel bed. For proper operation, the gravel must be continuously removed, cleaned, and returned to the filter bed or periodically replaced. Advantages of this control technology include high collection efficiencies (95 to 99.9%), low power, easy installation, durable equipment, and fire resistance. Disadvantages include the buildup of glaze on the ionizer and/or gravel from the combination of dust, condensed hydrocarbons, condensed moisture and other contaminants, which interfere with corona charging of the ionizer and charging the filter bed. Also, the Hybrid Filter (electrified filter/gravel bed) has a relatively narrow temperature operating range, such that the temperature must be low enough to allow condensable hydrocarbons to liquify for removal and high enough to ensure that water condensation does not occur (EPA CAM Technical Guidance Document, B.10 Electrified Filter Bed, 4/2002).

Good Combustion Practices and Maintenance – Consistent with manufacturers' recommendations, good combustion practices can be used to successfully optimize the operation of burners and minimize particulate emissions. Specifically, good combustion practices mean the operation of combustion equipment at the best combustion efficiency, by reducing the products of incomplete combustion, and more broadly, by minimizing the emissions of criteria or any other regulated air pollutants. Good combustion practices also include maintenance and preventive maintenance activities as recommended by the manufacturer. Good combustion practices include proper design, proper combustion techniques, and performing recommended maintenance and operation to promote efficient combustion and reduced emissions of CO and other pollutants.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for biomass heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Industrial-Size Boiler/Furnaces >100 MMBtu/hr and <250 MMBtu/hr (Process Type category 12.000). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance and may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-62 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR BIOMASS HEATERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS, AND 12.120, BIOMASS INDUSTRIAL-SIZE BOILERS/FURNACES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood-Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices, RTO 70% DESP and RTO (Bypass of DESP and RTO allowed for up to 460 hr/yr, which is allowed by permit)	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019	#1 and #2 Wood Fuel-Fired Boilers (262,800 tons of wood fuel per 12 mo period) 12.120	Not listed	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018	Wood Residue-Fired McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018	Biomass Wood-Fired Energy System, 149.25 MMBtu/hr 12.120	Not listed	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr 12.120	DESP	PM: Not listed TPM_{10}: 7.9 lb/hr $TPM_{2.5}$: 7.9 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices, RTO 70% DESP and RTO (Can bypass RTO for up to 460 hrs/yr but not DESP)	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices, RTO 70% DESP and RTO (Can bypass RTO for up to 460 hrs/yr but not DESP)	FPM: 29.1 lb/hr TPM_{10}: 28.4 lb/hr $TPM_{2.5}$: 16.55 lb/hr CPM: Not listed
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Biomass Fired Energy Systems/ Dryers and RTO Burners 64.36 ODT/hr 12.120	Not listed	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD	2-204.73 MMBtu/hr	Proposed BACT: Hybrid	FPM: 2.66 lb/hr, 0.013 lb/MMBtu,

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
			(see Section 3.7 of this document)	Biomass Heaters	Filters (Electrified filter unit, combined DESP and baghouse) for each heater, and good combustion practices and main-tenance	PM_{10}: 6.14 lb/hr, 0.03 lb/MMBtu $PM_{2.5}$: 5.87 lb/hr, 0.0287 lb/MMBtu CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 10% (Emissions for each biomass heater)

Table Notes:
Based on approximately 10 years of RBLC records.

Based on information found in the RBLC database and available permits, BACT limits for biomass-fired equipment are generally established for either: (1) the boilers/heaters/furnaces alone; or for (2) energy systems (typically exhausting through a shared stack), which include dryers, presses, and RTOs as well.

BACT controls for biomass-fired boilers/heaters/furnaces alone have been established as follows, ranging from either a DESP or WESP to other combinations of control equipment. Examples include the following:

- 167.3 MMBtu/hr Biomass Boiler, TPM_{10}: 7.9 lb/hr with DESP control (ME-0040, 6/30/2017).

BACT controls for energy systems (typically exhausting through a shared stack) have been established as follows, ranging from either a DESP or WESP to other combinations of control equipment. Examples include the following:

- Thermal Energy Plant, FPM: 29.1 lb/hr with DESP, RTO, and good combustion practice controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed FPM emissions are 2.66 lb/hr, 0.013 lb/MMBtu, and 11.65 tpy with Hybrid Filters (electrified filter unit) control, consisting of a combined baghouse/DESP, for each biomass heater. PM_{10} emissions are proposed as 6.14 lb/hr, 0.03 lb/MMBtu, and 26.89 tpy, and $PM_{2.5}$ emissions are proposed as 5.87 lb/hr, 0.0287 lb/MMBtu, and 25.71 tpy. CPM emissions are included in PM_{10} and $PM_{2.5}$ emissions.

Step 2: Eliminate Technically Infeasible PM Control Options for Biomass Heaters

For the biomass heaters, a baghouse/fabric filter alone is determined to be technically infeasible because efficiency is limited to dry exhaust streams with temperatures less than 1,000°F. The biomass heaters are expected to have an exhaust temperature of approximately 338°F, and the exhaust will likely (may) contain a significant amount of moisture. This moisture in combination with condensable PM can cause "blinding" of the fabric filter, which will likely result in lower airflows, greater pressure drops, and reduced control efficiencies. Therefore, a standalone

baghouse is not considered technically feasible for the wood-fired biomass heaters exhaust. However, Kronospan proposes to install Hybrid Filters (electrified field/gravel beds), which are a combination dry electrostatic precipitator prior to a baghouse/fabric filter, which should aid in eliminating the problems with "blinding" as described above. Therefore, a baghouse/fabric filter will be considered technically feasible for the biomass heaters when used after another control device.

Step 3: Rank Remaining Technically Feasible PM/PM_{10}/$PM_{2.5}$ and CPM Control Options for Biomass Heaters

The remaining available control technologies are listed in the table below.

TABLE 3-63 SUMMARY OF RANKED FILTERABLE PM/PM_{10}/$PM_{2.5}$ AND CPM CONTROLS FOR BIOMASS HEATERS

Rank	Technology
1	Baghouses/Fabric Filters/Dust Collectors (after another control device)
1	Dry Electrostatic Precipitators
1	Hybrid Filters (Electrified Filter/Gravel Beds)
2	Wet Electrostatic Precipitators
3	Mechanical Collectors (High-Efficiency Cyclones/Multiclones) + Baghouse/Fabric Filters/Dust Collectors
4	Venturi Scrubbers Wet Scrubbers/Packed Beds/Spray Towers
5	Good Design/Operation
5	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ Control Technologies for Biomass Heaters

As noted above, baghouses/fabric filters/dust collectors are technically infeasible as a standalone control device; however, including another control device prior to a baghouse/fabric filter/dust collector can provide sufficient control to resolve the problems with using a baghouse/fabric filter/dust collector alone. Kronospan proposes to use Hybrid Filters (an electrified filter unit), which combine a dry electrostatic precipitator with baghouse to achieve an overall control efficiency of >96% for PM. In addition, Kronospan will employ good design/operation and good combustion practices and maintenance to minimize particulate emissions. Because this combination of controls results in the use of the top ranked control technologies, this combination of controls is proposed to be BACT. Thus, no further analysis is required.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ for Biomass Heaters

Kronospan proposes the use of Hybrid Filters, specifically called "Hybrid ESP Sock Filtering Units" (electrified filter/gravel beds), to reduce particulate emissions from the biomass heaters. Kronospan is proposing BACT limits for each of the biomass heaters as follows:

- Filterable PM: 2.66 lb/hr, 0.013 lb/MMBtu, and 11.65 tpy;
- PM_{10}: 6.14 lb/hr, 0.03 lb/MMBtu;
- $PM_{2.5}$: 5.87 lb/hr, 0.0287 lb/MMBtu;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 10%.

Kronospan will also implement good combustion practices and maintenance for both biomass heaters.

Kronospan proposes an opacity limit of 10% as BACT for the biomass heaters.

Proposed BACT CONTROLS: Hybrid Filters (Electrified Filter/Gravel Bed) (for each biomass heater), Good Design/Operation, and Good Combustion Practices and Maintenance

3.6.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS - BIOMASS HEATERS

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the two (2) biomass heaters will exhaust to the Thermal Oil Heater stack TOH-1.

BACT Floor Kronospan will meet the applicable Subpart DDDDD emission limits for VOC/HAP as required by the Boiler MACT standard and applicable Subpart Db emission limits for Filterable PM (FPM) as required by the NSPS standard.

Kronospan will meet the applicable Subpart DDDD emission limits for VOC/HAP as required by the MACT standard (Plywood MACT). The OSB belt dryers (as "*conveyor strand dryer zones one and two (at new affected sources)*") will be vented to the combustion chamber flame zone of biomass thermal oil heaters (K7 and K8) or to the MDF Dryer and RTO-1, which will act as control devices and will meet the requirements of Table 1(B) by utilizing one of the six compliance options listed in Table 1(B), for example Table 1(B)(1) or 1(B)(2) as follows:

> *Reduce emissions of total HAP, measured as THC (as carbon), by 90 percent (may choose to subtract methane from THC as carbon measurements);* or
>
> *Limit emissions of total HAP, measured as THC (as carbon) a, to 20 ppmvd; or …, and*

Table 2(4) as follows:

> *If using a control device other than a thermal oxidizer, catalytic oxidizer, or biofilter, Maintain the 3-hour block average THC concentration in the control device exhaust below the maximum concentration established during the performance test*.

To ensure compliance with MACT Subpart DDDD, Kronospan will monitor and collect data (K7 and K8 firebox temperature) by using a continuous monitor according to section 40 CFR 63.2270(b) as follows:

… conduct all monitoring in continuous operation at all times that the process unit is operating. For purposes of calculating data averages, you must not use data recorded during monitoring malfunctions, associated repairs, out-of-control periods, or required quality assurance or control activities. You must use all the data collected during all other periods in assessing compliance ….

Step 1: Identify Potential VOC Control Technologies for Biomass Heaters

Potentially applicable controls for biomass heaters include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (including packed beds, spray towers), biofilters, good design/operation, and good combustion practices and maintenance. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-64 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR BIOMASS HEATERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 99% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40 to 77%.
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of these types of VOC control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOC established for biomass heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Industrial-Size Boiler/Furnaces >100 MMBtu/hr and <250 MMBtu/hr (Process Type category 12.000). The limits and information presented below were established per

local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-65 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR BIOMASS HEATERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS, AND 12.120, BIOMASS INDUSTRIAL-SIZE BOILERS/FURNACES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood-Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices and RTO1, 95%	VOC: 7.1 lb/hr and 0.43 lb/ODT
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019 Other Case-by-Case	#1 and #2 Wood Fuel Fired Boilers (262800.00 tons of wood fuel per 12 mo period) 12.120	Multi-vane scrubber	VOC: 10.0 lb/hr and 43.8 tpy
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018	Wood Residue-Fired McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	VOC: Not listed in RBLC
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Biomass Wood Fired Energy System, 149.25 MMBtu/hr 12.120	Proper design and operating practices	VOC: 0.028 lb/MMBtu
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017	Biomass Boiler #3, 167.3 MMBtu/hr 12.120	Not listed	VOC: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup) 12.120	Good combustion practices and RTO1, 95%	VOC: 7.1 lb/hr (total emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup) 12.120	Good combustion practices and RTO1, 95%	VOC:7.1 lb/hr (total emissions from all process exhausted through RTO)
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Biomass-Fired Energy Systems/ Dryers and RTO Burners 64.36 ODT/hr 12.120	Not listed	VOC: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: Good design/ operation, Good design/ operation, and Good combustion practices and main-tenance	VOC: 7.32 lb/hr, 0.0135 lb/MMBtu and 32.06 tpy (Emissions for each biomass heaters)

Table Notes:
Based on approximately 10 years of RBLC records.

Based on information found in the RBLC database and available permits, BACT limits for biomass-fired equipment are generally established for either (1) the boilers/heaters/furnaces alone, or for (2) energy systems (typically exhausting through a shared stack), which include dryers, presses, and RTOs as well.

BACT controls for biomass-fired boilers/heaters/furnaces alone have been established as follows, ranging from either an RTO, TO, or good combustion practices and maintenance to other combinations of control equipment. Examples include the following:

- 2-Biomass Boilers, VOC: 10.0 lb/hr and 43.8 tpy with multi-vane scrubber control (AR-0164, 11/22/2019);
- 149.25 MMBtu/hr Biomass Boiler, VOC: 0.028 lb/MMBtu with proper design and good operating practice controls (TX-0842, 6/15/2018);

BACT controls for energy systems (typically exhausting through a shared stack) have been established as follows, ranging from either an RTO, TO, or good combustion practice or combinations of control equipment. Examples include the following:

- Thermal Energy Plant, VOC: 7.1 lb/hr with RTO and good combustion practice controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed VOC emissions are 7.32 lb/hr, 0.0135 lb/MMBtu, and 32.06 tpy with good combustion practices and maintenance, for each biomass heater.

Step 2: Eliminate Technically Infeasible VOC Control Options for Biomass Heaters

For the biomass heaters, an RCO is determined to be technically infeasible for wood-fired biomass heater applications due to the level of PM/PM_{10} loading. Even with highly efficient PM/PM_{10} control, catalyst blinding, poisoning, plugging, or masking can occur in this type of application, which will significantly reduce the efficiency of the control device. Industry practice has illustrated that RCO technology has not been successfully applied to wood-fired biomass heaters or dryers. However, for this analysis, an RCO will be considered technically feasible.

Although a biofilter has been demonstrated as a technically feasible control option in OSB press applications, exhaust temperatures from the wood-fired biomass heaters are considerably higher (at 338°F) than the press exhaust temperature (at 113°F). Exhaust temperatures in the range of the wood-fired biomass heaters would result in the death of significant portions of the active microorganisms in the biofilter. Biofilter control is therefore deemed technically infeasible on this exhaust stream and is not considered further in this BACT analysis for the wood-fired biomass heaters.

Step 3: Rank Remaining Technically Feasible VOC Control Options for Biomass Heaters

The remaining available control technologies are listed in the table below.

TABLE 3-66 SUMMARY OF RANKED VOC CONTROLS FOR BIOMASS HEATERS

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizers
1	Regenerative Catalytic Oxidizers
2	Wet Scrubbers/Packed Beds/Spray Towers
3	Good Design/Operation
3	Good Combustion Practices and Maintenance
3	Good Operating Practices

Step 4: Evaluate Remaining VOC Control Technologies for Biomass Heaters

An RTO control device is the highest technology available for VOC control on the biomass heaters. RTO technology is widely used in the reduction of VOC emissions at wood products facilities.

A cost effectiveness evaluation for using oxidizers to control VOCs from the two biomass heaters is below. Total uncontrolled VOC emissions will be 14.64 lb/hr and 64.12 tpy at a flow rate of 147,250 dscfm or 245,243 acfm for the biomass heaters; the belt dryer zones 1, 2, 3, and 16 exhaust from each of the three (3) dryers will be utilized as combustion air. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the following VOC reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer; a control efficiency of 98% for a recuperative thermal oxidizer; and a control efficiency of 90% for a regenerative catalytic oxidizer (fixed bed). Further, two cases have been added:

- RTO with 95% control and an equipment life of 10 years, including costs for one media change at five years during the RTO equipment lifetime; and
- RTO with 95% control preceded by a wet electrostatic precipitator (WESP) and an RTO equipment life of 20 years, including costs for one media change at 10 years during the RTO equipment lifetime. An additional scenario has been added that does not include a WESP.

Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the biomass heaters. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers, so it would also be considered economically infeasible.

TABLE 3-67 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BIOMASS HEATERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$4,720,378	60.92	$77,489
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$5,083,241	60.92	$83,445
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$3,714,044	60.92	$60,969
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$6,866,224	62.84 – 64.12*	$109,264 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99%)	$Not Available	62.84 – 64.12**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$4,422,557	57.71 – 63.48*	$76,633 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 64.12 tpy for two (2) Biomass Thermal Oil Heaters Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume similar to RTO.*

For comparison, a cost effectiveness analysis was done for the thermal oil heaters (TOH exhausting from TOH-1), which is presented in the table below. This scenario considers emissions from two (2) biomass heaters and four (4) natural gas-fired thermal oil heaters and results in a similar conclusion of being considered economically infeasible.

TABLE 3-68 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR THERMAL OIL HEATERS (BIOMASS HEATERS & NATURAL GAS-FIRED THERMAL OIL HEATERS) (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (95% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$4,164,871	62.91	$66,202
Regenerative Thermal Oxidizer with WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$5,171,127	62.91	$82,197
Regenerative Thermal Oxidizer without WESP (95% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$3,522,197	62.91	$55,987
Recuperative Thermal Oxidizer (98 – 99.99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$9,305,299	$64.90 – 66.21*	$143,384 at 98% control
Direct Flame Thermal Oxidizer (Afterburner) (98 – 99.99%)	$Not Available	64.90 – 66.21**	$Not Available
Catalytic Oxidizer (Fixed Bed) (90 – 99% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$5,949,941	59.60 – 65.56*	$99,831 at 90% control

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 66.22 tpy for two (2) Biomass Thermal Oil Heaters and four (4) Natural Gas-Fired Thermal Oil Heaters Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume similar to RTO.*

The remaining control options for the two (2) biomass heaters are wet scrubbers/packed beds/spray towers and good design/operation, which are assumed to not have any significant adverse impacts.

For these cost analyses, the range of VOC reduction for each emissions control technology is used: a control efficiency of 70 to 99% for a packed-bed scrubber; a control efficiency of 50 to 95% for spray towers; and a control efficiency of 50 to 95% for wet scrubbers (venturi scrubbers). Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of wet scrubbers/packed beds/spray

towers as BACT for the biomass heaters. Note that the current EPA Cost Estimation Spreadsheet for Wet and Dry Scrubbers does not include calculations of costs for spray tower scrubbers or venturi scrubbers, but for this analysis, assume that costs are approximately the same. A cost effectiveness evaluation for using wet scrubbers/packed beds/spray towers and good design/operation to control VOCs from the biomass heaters is based on total uncontrolled VOC emissions of 14.64 lb/hr and 64.12 tpy at a flow rate of 147,250 dscfm or 245,250 acfm for the biomass heaters. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Wet and Dry Scrubbers for Acid Gas Control Cost Calculation Spreadsheet, updated 1/26/2023 (EPA Air Pollution Control Cost Manual, Section 5, Chapter 1 – Wet and Dry Scrubbers for Acid Gas Control, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, April 2021), the cost of applying wet scrubber control is shown below.

TABLE 3-69 SUMMARY OF WET SCRUBBER COSTS FOR BIOMASS HEATERS (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Packed Bed Scrubber (70 – 99% control, 10 yr life at 7% interest) (updated based on 1/21/2026 quote)	$4,388,949	44.88 – 63.48* 54.50 at 85%	$80,524 at 85% control
Spray Tower Scrubber (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available
Wet Scrubber (Venturi Scrubber) (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 64.12 tpy Biomass Heaters (for 2 Biomass Heaters) Total x % reduction for Cost Analysis.*
*** Spray tower scrubber and venturi scrubber calculations not included in EPA cost spreadsheet. Assume cost similar to packed bed scrubber.*

Based on the costs shown above for the two (2) biomass heaters, the economic impacts of these controls are considered excessive. These costs support elimination of wet scrubbers (packed bed) as BACT for the biomass heaters.

For comparison, a cost effectiveness analysis was done for the thermal oil heaters (TOH exhausting from TOH-1), which is presented in the table below. This scenario considers emissions from two (2) biomass heaters and four (4) natural gas-fired thermal oil heaters and results in a similar conclusion of being considered economically infeasible.

TABLE 3-70 SUMMARY OF WET SCRUBBER COSTS FOR THERMAL OIL HEATERS (BIOMASS HEATERS & NATURAL GAS-FIRED THERMAL OIL HEATERS) (TOTAL VOCS)

Scenario	Annualized Cost	Estimated VOC Reduction (tpy)	Cost per Ton Removed
Packed Bed Scrubber (70 – 99% control, 10 yr life at 7% interest) (updated based on 1/21/2026 quote)	$4,475,082	46.35 – 65.56* 56.29 at 85%	$75,505 at 85% control
Spray Tower Scrubber (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available
Wet Scrubber (Venturi Scrubber) (50 – 95% control, 10-yr life at 7% interest)	$Not Available	18.35 – 34.86**	$Not Available

Table Notes:
** VOC reduction is based on uncontrolled VOC emissions: 66.22 tpy Thermal Oil Heaters (for 2 Biomass Heaters and 4 Natural Gas-Fired Thermal Oil Heaters) Total x % reduction for Cost Analysis.*
*** Spray tower scrubber and venturi scrubber calculations not included in EPA cost spreadsheet. Assume cost similar to packed bed scrubber.*

The remaining control options for the biomass heaters are good design/operation and good combustion practices and maintenance, which are assumed to not have any significant adverse impacts. Good design/operation and good combustion practices and maintenance will be selected as BACT.

Step 5: Selection of BACT for VOC for Biomass Heaters

Good design/operation, along with good combustion practices and maintenance, and good operating practices are selected as VOC BACT for the biomass heaters, and with BACT limits for both biomass heaters including combustion air from zones 1, 2, 3, and 16 from three (3) belt dryers as follows:

- VOC: 7.32 lb/hr, 0.036 lb/MMBtu (for each biomass heater, which should meet MACT requirements, for example, either 90% control or 20 ppm limit).

Proposed BACT CONTROLS: Good Design/Operation, Good Combustion Practices and Maintenance, and Good Operating Practices

3.6.3 NOX BACT ANALYSIS FOR OSB PLANT UNITS - BIOMASS HEATERS

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the two (2) biomass heaters will exhaust to the Thermal Oil Heater stack TOH-1.

BACT Floor These sources will be subject to applicable requirements, but are not subject to the Plywood MACT.

Step 1: Identify Potential NOx Control Technologies for Biomass Heaters

Potentially applicable controls for biomass heaters include SNCR, water injection, ULNB or LNB, staged combustion, overfire air, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

Potentially available control technologies for controlling NOx emissions include SCR, SNCR, ULNB, and LNB. Controls also include good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-71 CONTROL TYPES AND EFFICIENCIES FOR NOX FOR BIOMASS HEATERS

Control Type	Estimated NO_x Control Efficiency
Selective Catalytic Reduction	70 to 95%
Selective Non-Catalytic Reduction	40 to 75%
Non-Selective Catalytic Reduction	90 to 98%
Water/Steam Injection (WSI)	60 to 80%
Low-NOx Burners/Ultra Low-NOx Burners	80 to 90%
Staged Combustion/Controlled Burn	40%
Flue Gas Recirculation (FGR)	40%
Low Excess Air	10%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

There are three (3) mechanisms for NOx formation from combustion:

1. Thermal NOx is generated during combustion and influenced by N_2 and O_2 molar concentrations and temperature of combustion, such that larger concentrations of NOx occur at temperatures higher than 1,300°C (2,370°F);
2. Fuel NOx results from oxidation of already-ionized nitrogen present in the fuel; and
3. Prompt NOx is formed from N_2 present in air as it combines with fuel during combustion.

Control technologies for NOx are discussed below.

Selective Catalytic Reduction (SCR) - SCR involves the injection of a nitrogen-based reagent (such as ammonia or urea) into combustion flue gases and then reaction within a module containing a metal oxide catalyst, in which the reagent reacts selectively within a specific temperature range and the presence of catalyst and oxygen to reduce NOx to N_2 and H_2O. The optimum operating

temperature of this technology is between 250°C and 427°C (480°F and 800°F). Typical removal efficiencies are between 75 and 90%, with reduction efficiencies as low as 20 ppm in some cases. A disadvantage to SCR control is ammonia slip, which refers to emissions of unreacted ammonia that result from incomplete reaction of NOx and the reagent. Costs are significantly higher than other types of NOx controls due to the large volumes of catalyst required, catalyst replacement, reagent usage, and higher electricity usage. Estimated annualized cost effectiveness calculated om 1999 dollars was $2,000 to $5,000 per ton of pollutant controlled. (Air Pollution Control Technology Fact Sheet: Selective Catalytic Reduction, EPA-452/F-03-032, Washington, D.C.: Clean Air Technology Center, 2003).

Selective Non-Catalytic Reduction (SNCR) – SNCR uses similar techniques as SCR where chemical additions of ammonia or urea are exposed to hot exhaust gases; however, the reactions take place at higher temperatures without the presence of a catalyst. SNCR is based on the chemical reduction of NOx into molecular nitrogen (N_2) and water vapor (H_2O). A nitrogen-based reagent (such as ammonia or urea) is injected into the post-combustion flue gas, where the reduction reaction with NOx is favored over other chemical reaction processes at temperatures ranging between 870°C and 1,150°C (1,600°F and 2,100°F). NOx reductions range from 30 to 50%, and in combination with other controls, such as low NOx burners, reductions of 65 to 75% can be achieved. Advantages include lower capital and operating costs than other NOx reduction methods, though disadvantages include lower control efficiencies than SCR and ammonia in the waste gas stream. Estimated annualized cost effectiveness calculated in 1999 dollars was $300 to $500 per MMBtu. (Air Pollution Control Technology Fact Sheet: Selective Non-Catalytic Reduction, EPA-452/F-03-031, Washington, D.C.: Clean Air Technology Center, 2003).

Non-Selective Catalytic Reduction (NSCR) –NSCR systems utilize a catalyst without injecting a chemical reagent (such as anhydrous ammonia, NH3) to reduce NOx emissions because this technique uses unburned hydrocarbons as a reducing agent. These types of controls are typically used on the exhausts of automobiles and rich-burn combustion environments in which the exhaust contains minimal oxygen concentrations of less than 0.5%. The NOx reduction reaction occurs at temperatures between 700°F and 1,500°F and control efficiencies of 90 to 98% can be achieved. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Water/Steam Injection – Water or steam can be added to the combustion air flow to lower combustion temperatures to less than 1,400°F and to limit NOx generation to as low as 40 ppm; however, lower combustion temperatures can result in higher concentrations of CO and unburned hydrocarbons (VOC). This type of control is advantageous because of moderate capital costs, but disadvantages include higher fan power and an efficiency penalty. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Low-NOx Burners (LNB) – Low-NOx burners are types of burners designed to control the air and fuel mixing rate at each burner. This creates larger branched flames which reduces the flame temperature and the amount of NOx that is formed in the combustion process. Control efficiencies can be as high as 80%. Advantages include low operating cost, but moderately high

capital costs are a disadvantage. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Ultra-Low NOx Burners (ULNB) – Ultra-low NOx burners are types of burners designed to control the air and fuel mixing rate at each burner. This creates larger branched flames which reduces the flame temperature and the amount of NOx that is formed in the combustion process.

Staged Combustion/Controlled Burn - Air staging is based on dividing combustion air into two streams, in which the first stream is mixed with fuel in a ratio to produce a reducing flame, while the second stream is injected downstream of the flame to achieve slightly excess air. Control efficiencies can reach 99%. Fuel staging is based on dividing combustion fuel into two streams, in which the first stream feeds primary combustion in a reducing fuel to air ratio, while the second stream oxidizes the fuel while reducing NOx to N_2. Control efficiencies are estimated to be 50%. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Flue Gas Recirculation – Flue gas recirculation is used to reduce temperature by diluting the oxygen content of combustion air and by diluting heat in a greater volume of flue gas and thereby reducing NOx generation. If the combustion temperature is kept to less than 1,400°F, the thermal NOx formation will be negligible. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Low Excess Air – Excess air flow for combustion has been correlated to the quantity of NOx generated, so limiting excess air flow can greatly reduce NOx concentrations in flue gas. (CATC Technical Bulletin: Nitrogen Oxides (NOx), Why and How They Are Controlled, EPA-456/F-99-006R, Washington, D.C.: Clean Air Technology Center, November 1999.)

Good Design/Operation – Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing recommended maintenance and operation to promote efficient combustion and reduced emissions of NOx. Consistent with the manufacturer's recommendations, good combustion practices and maintenance can be used to successfully optimize the operation of burners and minimize emissions. Good operating practices include maintaining equipment according to manufacturer/industry specifications and/or recommendations, which may include activities such as recordkeeping when equipment is operating.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NOx established for biomass heaters. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Industrial-Size Boiler/Furnaces >100 MMBtu/hr and <250 MMBtu/hr (Process Type category 12.000). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-72 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR NOX FOR BIOMASS HEATERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS, AND 12.120, BIOMASS INDUSTRIAL-SIZE BOILERS/FURNACES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood-Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 170.0 lb/hr and 2.0 lb/ODT
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019 Other Case-by-Case	#1 and #2 Wood Fuel Fired Boilers (262800.00 tons of wood fuel per 12 mo period) 12.120	Not listed	NOx: Not listed in RBLC
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018	Wood Residue-Fired McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	NOx: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018	Wood-Fired Energy System, 149.25 MMBtu/hr 12.120	Not listed	NOx: Not listed in RBLC
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr 12.120	FGR and SNCR only required if facility cannot meet 0.15 lb/MMBtu emission limit within 365 days	NOx: 25.1 lb/hr and 0.15 lb/MMBtu
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 95.0 lb/hr and 1.1 ODT

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 95.0 lb/hr and 1.1 ODT
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Biomass-Fired Energy Systems/ Dryers and RTO Burners 64.36 ODT/hr 12.120	Not listed	NOx: Not listed in RBLC
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: SNCR, Good design/ operation, and Good combustion practices and main-tenance	NOx: 36.65 lb/hr. 0.18 lb/MMBtu (Emissions for each biomass heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize SNCR or low-NOx burners and most implement good combustion practices and maintenance. Based on information found in the RBLC database and available permits, BACT limits for biomass-fired equipment are generally established for either (1) the boilers/heaters/furnaces alone, or for (2) energy systems (typically exhausting through a shared stack), which can include dryers, presses, and RTOs as well.

BACT controls for biomass-fired boilers/heaters/furnaces alone have been established as follows:

- 167.3 MMBtu/hr Biomass Boiler, NOx: 25.1 lb/hr and 0.15 lb/MMBtu, and if after one year if 0.15 lb/MMBtu cannot be met, then FGR and SNCR controls (ME-0040, 6/30/2017).

BACT controls for energy systems (typically exhausting through a shared stack) have been established as follows:

- Thermal Energy Plant, NOx: 170.0 lb/hr with low NOx burners and good combustion practice controls (MI-0448, 12/18/2020); and
- Thermal Energy Plant, NOx: 95.0 lb/hr with low NOx burners and good combustion practice controls (MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed NOx emissions are 36.65 lb/hr, 0.18 lb/MMBtu, and 160.53 tpy with SNCR control and good combustion practices with maintenance controls for each biomass heater.

Step 2: Eliminate Technically Infeasible NOx Control Options for Biomass Heaters

Although SCR is a potential control technology for the biomass heaters, the use of such a system is not technically feasible for the wood-fired furnace/dryer exhaust based on the following:

- The high particulate loading associated with the proper temperature range in the wood-fired furnace reduces the number of active catalyst sites available for the reaction to occur and reduces the NOx removal efficiency (i.e., blinds the catalyst); and
- The alkalinity of wood ash can contaminate the catalyst and significantly reduce NOx removal efficiency.

In wood-fired operations, NOx control efficiency and amount of ammonia slip are adversely affected due to catalyst blinding or poisoning, which is caused by high particulate loading. Wood-fired furnace fuel mixing and firing rate changes frequently to accommodate the biomass heaters heat demand and conditions of the fuel. This would make it very difficult to optimize the ammonia injection rate. As a result, significant ammonia slip or more NOx emissions will occur, which results in adverse environmental impacts. Therefore, the use of SCR on the wood-fired biomass heaters exhaust is not technically feasible, and as a result, SCR will not be considered for the remainder of this analysis.

Similarly, although SNCR has been determined to be technically infeasible for some biomass burning facilities, SNCR controls have been established as BACT at a few facilities with biomass boilers and will be considered technically feasible for this analysis. NSCR control technology (which is typically used on the exhausts of automobiles and rich-burn combustion environments in which the exhaust contains minimal oxygen concentrations) has not been used as a control for biomass heaters/boilers at other OSB plants and will be assumed to be technically infeasible.

Step 3: Rank Remaining Technically Feasible NOx Control Options for Biomass Heaters

The remaining available control technologies are listed in the table below.

TABLE 3-73 SUMMARY OF RANKED NOX CONTROLS FOR BIOMASS HEATERS

Rank	Technology
1	Selective Non-Catalytic Reduction
2	Low-NOx Burners/Ultra Low-NOx Burners
3	Good Design/Operation
3	Good Combustion Practices and Maintenance

The remaining control technologies listed in the RBLC are SNCR, low-NOx burners/ultra low-NOx burners, good design/operation, as well as good combustion practices and maintenance; therefore, SNCR will be the primary control technology considered.

Step 4: Evaluate Remaining NOx Control Technologies for Biomass Heaters

SNCR controls are the highest technology available for NOx control on the biomass heaters and have been used effectively at OSB facilities. Therefore, Kronospan will equip the biomass heaters with SNCR control. Because this control results in the use of the top ranked control technology, this control is proposed to be BACT. Therefore, no further analysis is required for NOx.

Step 5: Selection of BACT for NOx for Biomass Heaters

SNCR, along with good design/operation and good combustion practices and maintenance are selected as NOx BACT for the biomass heaters, and with BACT limits for each biomass heater as follows:

- NOx: 36.65 lb/hr, 0.18 lb/MMBtu (for each biomass heater).

Proposed BACT CONTROLS: SNCR, Good Design/Operation, and Good Combustion Practices and Maintenance

3.6.4 CO BACT ANALYSIS FOR OSB PLANT UNITS - BIOMASS HEATERS

Carbon monoxide is formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO_2 cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the combustion chamber is too short. The rate of CO emissions depends on the efficiency of combustion. Improperly tuned heaters operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. In some cases, the addition of NOx control systems such as low-NOx burners and flue gas recirculation (FGR) may also reduce combustion efficiency, resulting in higher CO emissions relative to uncontrolled heaters.

This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the two (2) biomass heaters will exhaust to the Thermal Oil Heater stack TOH-1.

BACT Floor Kronospan will meet the applicable Subpart DDDDD emission limits for CO as required by the MACT standard.

Step 1: Identify Potential CO Control Technologies for Biomass Heaters

Potentially applicable controls for biomass heaters include regenerative thermal oxidizers or regenerative catalytic oxidizers (typically in combination with a baghouse or dry or wet electrostatic precipitator), good combustion practices and maintenance, and good design/operation. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-74 CONTROL TYPES AND EFFICIENCIES FOR CO FOR BIOMASS HEATERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	75 to 95%
Recuperative Thermal Oxidizers	75 to 95%
Regenerative Thermal Oxidizers	90 to 99%
Regenerative Catalytic Oxidizers	75 to 95%
Biofilters	40 to 85%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of these types of CO control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO established for biomass heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Industrial-Size Boiler/Furnaces >100 MMBtu/hr and <250 MMBtu/hr (Process Type category 12.000). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-75 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR CO FOR BIOMASS HEATERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS, AND 12.120, BIOMASS INDUSTRIAL-SIZE BOILERS/FURNACES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019	#1 and #2 Wood Fuel Fired Boilers (262800.00 tons of wood fuel per 12 mo period) 12.120	Not listed	CO: Not listed in RBLC
LA-0335 West Fraser Timber Co.	Lumber Joyce Mill	Winn Parish, LA	10/4/2018 BACT-PSD	Wood Residue-Fired McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	CO: 279.12 lb/hr
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Biomass Wood-Fired Energy System, 149.25 MMBtu/hr 12.120	Proper design and operating practices	CO: 0.5050 lb/MMBtu
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017 BACT-PSD	Biomass Boiler #3, 167.3 MMBtu/hr 12.120	Not listed	CO: 50.2 lb/hr and 0.30 lb/MMBtu

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 ODT (total emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup) 12.120	Good combustion practices and RTO1, 80%	CO: 95.0 lb/hr and 1.1 ODT
OK-0174 Huber Engr'd Woods	Broken Bow OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016	Biomass-Fired Energy Systems/ Dryers and RTO Burners 64.36 ODT/hr 12.120	Not listed	CO: Not listed in RBLC
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD	2-204.73 MMBtu/hr	Proposed BACT: Good design/	CO: 36.65 lb/hr, 0.18 lb/MMBtu

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
			(see Section 3.9 of this document)	Biomass Heaters	operation and good combustion practices and main-tenance	(Emissions for each biomass heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search results were reviewed for biomass heaters at OSB and particleboard manufacturing facilities. The RBLC searches indicated that several facilities utilize wet ESPs and RTOs or cyclones and RTOs, though these controls were primarily installed for wood-fired heaters in an energy system that also included natural gas-fired burners.

Based on information found in the RBLC database and available permits, BACT limits for biomass-fired equipment are generally established for either (1) the boilers/heaters/furnaces alone, or for (2) energy systems (typically exhausting through a shared stack), which can include dryers, presses, and RTOs as well.

BACT controls for biomass-fired boilers/heaters/furnaces alone have been established as follows, ranging from either RTO, good design/operation, and/or good combustion practice control. Examples include the following:

- 154.2 MMBtu/hr Biomass Boiler, CO: 279.12 lb/hr and no control specified in RBLC (LA-0335, 10/4/2018);
- 149.25 MMBtu/hr Biomass Boiler, CO: 0.5050 lb/MMBtu with proper design and good operating practice controls (TX-0842, 6/15/2018); and
- 167.3 MMBtu/hr Biomass Boiler, CO: 50.2 lb/hr and 0.30 lb/MMBtu and no controls specified in RBLC (ME-0040, 6/30/2017).

BACT controls for energy systems (typically exhausting through a shared stack) have been established as follows, ranging from either RTO or good combustion practice controls. Examples include the following:

- Thermal Energy Plant, CO: 36.3 lb/hr with RTO (80%) and good combustion practice controls (MI-0448, 12/18/2020);
- Thermal Energy Plant, CO: 36.3 lb/hr with RTO (80%) and good combustion practice controls (MI-0425, 5/19/2017); and
- Thermal Energy Plant, CO: 95.0 lb/hr with RTO (80%) and good combustion practice controls (MI-0421, 8/26/2016).

For comparison, Kronospan's proposed CO emissions are 36.65 lb/hr, 0.18 lb/MMBtu, and 160.53 tpy with good design/operation and good combustion practice controls for each biomass heater.

Step 2: Eliminate Technically Infeasible CO Control Options for Biomass Heaters

For the biomass heaters, an RCO could be determined to be technically infeasible for wood-fired biomass heater applications due to the level of PM/PM_{10} loading. Even with highly efficient PM/PM_{10} control, catalyst blinding, poisoning, plugging, or masking can occur in this type of application, which will significantly reduce the efficiency of the control device. Industry practice has illustrated that RCO technology has not been successfully applied to wood-fired biomass heaters or dryers. However, other facilities have installed RCOs for OSB plants. Therefore, for this analysis, an RCO is assumed to be technically feasible in this process.

Although a biofilter has been demonstrated as a technically feasible control option in OSB press applications, exhaust temperatures from the wood-fired biomass heater are considerably higher (at 338°F) than the press exhaust temperature (at 113°F). Exhaust temperatures in the range of the wood-fired biomass heater would result in the death of significant portions of the active microorganisms in the biofilter. Biofilter control is therefore deemed technically infeasible on this exhaust stream and is not considered further in this BACT analysis for the wood-fired biomass heaters.

Step 3: Rank Remaining Technically Feasible CO Control Options for Biomass Heaters

The control technology listed in the RBLC is good combustion practices and maintenance; therefore, this will be the primary control technology considered.

TABLE 3-76 SUMMARY OF RANKED CO CONTROLS FOR BIOMASS HEATERS

Rank	Technology
1	Direct Flame Thermal Oxidizers
1	Recuperative Thermal Oxidizers
1	Regenerative Thermal Oxidizer
1	Regenerative Catalytic Oxidizer
2	Good Design/Operation
2	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining CO Control Technologies for Biomass Heaters

A cost effectiveness evaluation for using oxidizers to control CO from the biomass heaters is below. Total CO emissions will be 73.30 lb/hr and 321.05 tpy at a flow rate of 147,250 dscfm or 245,243 acfm for the biomass heaters. Using the EPA Air Pollution Control Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers (EPA Air Pollution Control Cost Manual, Section 3, Chapter 2 - Incinerators and Oxidizers, Washington, D.C.: Air Economics Group, Office of Air Quality Planning and Standards, September 2022), the cost of applying thermal or catalytic oxidation is shown below.

For these cost analyses, the following CO reduction for each emissions control technology is used: a control efficiency of 95% for a regenerative thermal oxidizer and 75% for a recuperative thermal

oxidizer (and direct flame thermal oxidizer); and a control efficiency of 90% for a regenerative catalytic oxidizer (fixed bed), even though an RCO may not be technically feasible. Based on the costs shown below, the economic impacts of these controls are considered excessive. These costs support elimination of regenerative thermal oxidizers, recuperative thermal oxidizers, and regenerative catalytic oxidizers (fixed bed) as BACT for the biomass heaters. Note that the current EPA Cost Estimation Spreadsheet for Thermal and Catalytic Oxidizers does not include calculations of costs for a direct flame thermal oxidizer, but this control method is less energy efficient than regenerative thermal oxidizers.

TABLE 3-77 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR BIOMASS HEATERS (TOTAL CO)

Scenario	Annualized Cost	Estimated CO Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (90% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$5,190,477	288.95	$17,963
Regenerative Thermal Oxidizer with WESP (90% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$5,553,340	288.95	$19,219
Regenerative Thermal Oxidizer without WESP (90% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 quote)	$4,184,143	288.95	$14,481
Recuperative Thermal Oxidizer (75% - 95% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$11,995,546	240.79 – 305.00*	$49,817 at 75% control
Direct Flame Thermal Oxidizer (Afterburner) (75% - 95%)	$Not Available	240.79 – 305.00**	$Not Available
Catalytic Oxidizer (Fixed Bed) (75% - 95% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$8,552,636	240.79 – 305.00*	$35,519

Table Notes:
** CO reduction is based on uncontrolled CO emissions: 321.05 tpy for two (2) Biomass Thermal Oil Heaters Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume similar to RTO.*

For comparison, a cost effectiveness analysis was done for the thermal oil heaters (TOH exhausting from TOH-1), which is presented in the table below. This scenario considers emissions from two (2) biomass heaters and four (4) natural gas-fired thermal oil heaters and results in a similar conclusion of being considered economically infeasible.

TABLE 3-78 SUMMARY OF THERMAL AND CATALYTIC OXIDIZER COSTS FOR THERMAL OIL HEATERS (BIOMASS HEATERS & NATURAL GAS-FIRED THERMAL OIL HEATERS) (TOTAL CO)

Scenario	Annualized Cost	Estimated CO Reduction (tpy)	Cost per Ton Removed
Regenerative Thermal Oxidizer (90% control, 10-yr life with media replacement at 7% interest) (updated based on 1/15/2026 RTO quote)	$6,820,612	293.11	$23,270
Regenerative Thermal Oxidizer with WESP (90% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 RTO quote)	$7,299,550	293.11	$24,904
Regenerative Thermal Oxidizer without WESP (90% control, 20-yr life with media replacement at 7% interest) (updated based on 1/15/2026 RTO quote)	$5,481,956	293.11	$18,703
Recuperative Thermal Oxidizer (75% - 95% control, 10-yr life at 7% interest) (updated based on 1/15/2026 quote)	$15,770,484	244.26 – 309.40*	$64,564 at 75% control
Direct Flame Thermal Oxidizer (Afterburner) (75% - 95% control)	$Not Available	244.26 – 305.40**	$Not Available
Catalytic Oxidizer (Fixed Bed) (75% - 95% control, 10-yr life w at 7% interest) (updated based on 1/15/2026 quote)	$10,241,021	244.26 – 305.40*	$41,927 at 75% control

Table Notes:
** CO reduction is based on uncontrolled CO emissions: 321.05 tpy for two (2) Biomass Thermal Oil Heaters Total x % reduction for Cost Analysis and an RTO with a 10-year equipment life. A second analysis is based on an RTO with a 20-year equipment life if preceded by a WESP. Additional analyses are included for recuperative thermal oxidizer and catalytic oxidizer, and without a WESP. See Appendix A for cost effectiveness calculations.*
*** Direct flame thermal oxidizer calculation no longer included in EPA cost spreadsheet. Assume similar to RTO.*

The remaining control options for the biomass heaters are good design/operation and good combustion practices and maintenance, which are assumed to not have any significant adverse impacts. After review of the RBLC tables for the process type of Particle and Strandboard Manufacturing dryers (30.530) specifically for biomass heaters, the only control types for CO available are good design/operation and good combustion practices and maintenance. Therefore, no further analysis is required for CO.

Step 5: Selection of BACT for CO for Biomass Heaters

Good design/operation and combustion practices and maintenance are selected as CO BACT for the biomass heaters. The limit for each heater is referenced from the PTE calculations as:

- CO: 36.65 lb/hr, 0.18 lb/MMBtu (for each biomass heater).

Proposed BACT CONTROLS: Good Design/Operation and Combustion Practices and Maintenance

3.6.5 GHG BACT ANALYSIS FOR OSB PLANT UNITS - BIOMASS HEATERS

GHG is emitted from the heaters when hydrocarbons present in the fuel are not fully oxidized in the combustion chamber of the heater. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the combustion chamber is too short. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the two (2) biomass heaters will exhaust to the Thermal Oil Heater stack TOH-1.

BACT Floor There is not a general regulatory limit for GHG emissions.

Step 1: Identify Potential GHG Control Technologies for Biomass Heaters

Potentially applicable controls for biomass heaters include carbon capture and sequestration and good combustion control practices. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-79 CONTROL TYPES AND EFFICIENCIES FOR GHG FOR BIOMASS HEATERS

Control Type	Estimated GHG Control Efficiency
Carbon Capture and Sequestration	Varies
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for GHGs established for biomass heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Industrial-Size Boiler/Furnaces >100 MMBtu/hr and <250 MMBtu/hr (Process Type category 12.000). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-80 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR GHG FOR BIOMASS HEATERS (RBLC PROCESS TYPES 30.530, BOARD MANUFACTURING DRYERS, AND 12.120, BIOMASS INDUSTRIAL-SIZE BOILERS/FURNACES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood-Derived Fuel and Biomass Fired Thermal Energy Plant 12.120 (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup)	Good operating and maintenanc e practices, natural gas only (Control cost for carbon capture and sequestra-tion determined to be $102 per ton, which is not cost effective. This cost is based on controlling total GHG emissions from the facility.)	CO_2e: 257,292 tpy 12-month rolling total (emissions from all processes exhausted through RTO)
AR-0164 Georgia-Pacific Wood Products LLC	GURDON PLYWOOD & LUMBER COMPLEX	Gurdon, Clark County, AR	11/22/2019	#1 and #2 Wood Fuel Fired Boilers (262800.00 tons of wood fuel per 12 mo period) 12.120	Not listed	GHG: Not listed in RBLC
LA-0335 West Fraser Timber Co.	Joyce Lumber Mill	Winn Parish, LA	10/4/2018	Wood Residue-Fired McBurney Boiler #4, 154.2 MMBtu/hr 12.120	Not listed	GHG: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
TX-0842 West Fraser Wood Products	Henderson Lumber Mill	Rusk County, TX	6/15/2018 BACT-PSD	Biomass Wood Fired Energy System, 149.25 MMBtu/hr 12.120	Fuel cell or hybrid suspension grate unit design, firing biomass as the only fuel source, and the operation of several energy efficiency options	CO_2e: 206.8 lb/MMBtu
ME-0040 Robbins Lumber, Inc.	Sawmill	Waldo County, ME	6/30/2017	Biomass Boiler #3, 167.3 MMBtu/hr 12.120	Not listed	GHG: Not listed in RBLC
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup) 12.120	Good operating and mainte-nance practices, natural gas only (Control cost for carbon capture and sequestra-tion determined to be $102 per ton, which is not cost effective. This cost is based on controlling total GHG emissions from the facility.)	CO_2e: 205,655 tpy 12-month rolling total (emissions from all processes exhausted through RTO)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530 Wood- Derived Fuel and Biomass Fired Thermal Energy Plant (One thermal energy plant that combusts wood-derived fuel, clean cellulosic biomass, and natural gas. Natural gas is primarily used for startup) 12.120	Good operating and maintenance practices, natural gas only (Control cost for carbon capture and sequestration determined to be $102 per ton, which is not cost effective. This cost is based on controlling total GHG emissions from the facility.)	CO_2e: 205,655 tpy 12-month rolling total (emissions from all processes exhausted through RTO)
OK-0174 Huber Engr'd Woods	OSB Mill	Broken Bow, McCurtain County, OK	2/18/2016 BACT-PSD	Biomass- Fired Energy Systems/ Dryers and RTO Burners 64.36 ODT/hr 12.120	Use of biomass fuel, good combustion/ operating practices in accordance with manufacturer's guidance, and energy efficiency	CO_2e: 792.44 lb/ODT and 117.1 lb/MMBtu
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: Good design/ operation and Good combustion practices and maintenance	GHG: 45,903 lb/hr, 224.464 CO_2e lb/MMBtu, 201,055 tpy (Emissions for each biomass heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that CCS is not cost effective for Particle and Strandboard Manufacturing dryers (30.530) and specifically for wood-fired heaters in an energy system that also included natural gas-fired burners. (BACT controls established for natural gas-fired heaters include good combustion practices and maintenance and use of natural gas fuel.)

Based on information found in the RBLC database and available permits, BACT limits for biomass-fired equipment are generally established for either (1) the boilers/heaters/furnaces alone, or for (2) energy systems (typically exhausting through a shared stack), which can include dryers, presses, and RTOs as well.

BACT controls for biomass-fired boilers/heaters/furnaces alone have been established as good design/operation and/or good combustion practice controls. Examples include the following:

- 149.25 MMBtu/hr Biomass Boiler, CO_2e: 206.8 lb/MMBtu firing biomass with proper design and good operating practice controls (TX-0842, 6/15/2018).

BACT controls for energy systems (typically exhausting through a shared stack) have been established as good operating practice and/or good combustion practice controls. Examples include the following:

- Thermal Energy Plant, CO_2e: 257,292 tpy with (natural gas fuel only for RTOs and) good operating and maintenance practice controls (MI-0448, 12/18/2020);
- Thermal Energy Plant, CO_2e: 205,655 tpy with (natural gas fuel only for RTOs) and good operating and maintenance practice controls (MI-0425, 5/19/2017);
- Thermal Energy Plant, CO_2e: 205,655 tpy with (natural gas fuel only for RTOs) and good operating and maintenance practice controls (MI-0421, 8/26/2016); and
- Energy Systems/Dryers, CO_2e: 117.1 lb/MMBtu firing biomass fuel with good operating practices in accordance with manufacturer's guidance and good combustion practice controls (OK-0174, 2/18/2016).

For comparison, Kronospan's proposed CO_2e emissions are 45,903 lb/hr, 224.464 CO_2e lb/MMBtu, and 201,055 tpy with good design/operation and good combustion practice controls (for each biomass heater).

Step 2: Eliminate Technically Infeasible GHG Control Options for Biomass Heaters

Carbon capture and sequestration (CCS) is an available add-on control technology; however, this technology presents technical and major economic challenges. Factors to be considered in selecting CCS include technical feasibility, implementation costs, facility size, source location, and availability and accessibility to transportation and storage Since there is no local customer or use for captured CO_2 near the facility, CCS would require off-site sequestration, involving utilization of a CO_2 pipeline to transport CO_2 to a suitable storage location. Due to the fact that there are no proven CO_2 storage locations close to the facility, the use of add-on controls for CCS is considered to be technically infeasible. The remaining control options of good design/operation and good combustion practices and maintenance have no significant adverse impacts and are not considered technically infeasible.

Step 3: Rank Remaining Technically Feasible GHG Control Options for Biomass Heaters

The technically feasible control options identified are good design/operation and good combustion practices, which are ranked below. Both control technologies will be considered, though the only control technology listed in the RBLC is good combustion practices and maintenance.

TABLE 3-81 SUMMARY OF RANKED GHG CONTROLS FOR THE BIOMASS HEATERS

Rank	Technology
1	Good Design/Operation
2	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining GHG Control Technologies for Biomass Heaters

After review of the RBLC tables for the process type of Particle and Strandboard Manufacturing dryers (30.530) specifically for biomass heaters, the only control type for GHG available is good combustion practices and maintenance. Therefore, no further analysis is required for GHG.

Step 5: Selection of BACT for GHG for Biomass Heaters

Good design/operation and good combustion practices and maintenance are selected as GHG BACT for the biomass heaters, and with BACT limits as follows:

- GHG: 45,903 lb/hr, 224.464 CO_2e lb/MMBtu (for each biomass heater).

Proposed BACT CONTROLS: Good Design/Operation and Good Combustion Practices and Maintenance

3.7 BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

Kronospan proposes to operate four (4) natural gas-fired thermal oil heaters (EP 25, Thermal Oil Heater K9; EP 26, Thermal Oil Heater K10; EP 27, Thermal Oil Heater K11; and EP 28, Thermal Oil Heater K12) that are subject to BACT review for this project. The natural gas-fired heaters will be rated at 56.2 MMBtu/hr each and will use pipeline quality natural gas as fuel.

Per ADEM regulation, Chapter 335-3-4-.01 Visible Emissions. (1) Visible Emissions Restrictions for Stationary Sources. (1)(a) Except as provided …, no person shall discharge into the atmosphere from any source of emission, particulate of an opacity greater than that designated as twenty percent (20%) opacity, as determined by a six (6) minute average.

3.7.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

Emissions of PM from natural gas-fired thermal oil heaters are most apparent as white and/or and black smoke. Filterable PM emissions are typically low from natural gas combustion. Particulate matter from natural gas combustion has been estimated to be less than 1 micrometer in size and has filterable and condensable fractions. Particulate matter in natural gas combustion is usually larger molecular weight hydrocarbons that are not fully combusted. Increased PM emissions may result from poor air/fuel mixing or maintenance problems. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the four (4) natural gas-fired thermal oil heaters will exhaust to Thermal Oil Heater stack TOH-1 or the MDF dryer RTO-1 stack.

BACT Floor The heaters will be required to meet the USEPA's emission requirements for process heaters as specified in 40 CFR Part 63, Subpart DDDDD, Boiler MACT. This will require the heaters to comply with work practice standards for the size and category of the heaters. Since BACT cannot be less stringent than an applicable NSPS or NESHAP, the Subpart DDDDD emission limits represent the BACT floor for the applicable pollutants.

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Natural Gas-Fired Thermal Oil Heaters

Potentially applicable controls for natural gas-fired thermal oil heaters include baghouses/fabric filters, multiple cyclones, venturi scrubbers, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-82 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Control Type	Estimated Combined Filterable PM, PM_{10}, $PM_{2.5}$, and CPM Control Efficiency
Baghouses/Fabric Filters/Dust Collectors	99 to 99.9+%
Dry Electrostatic Precipitators	99 to 99.9%
Wet Electrostatic Precipitators	99 to 99.9%
Mechanical Collectors (High-Efficiency Cyclones/Multiclones)	80 to 99% for high-efficiency cyclones and 80 to 95% for multiclones
Cyclofilters	80 to 99%
High-Efficiency Venturi Scrubbers. Wet Scrubbers/Packed Beds/Spray Towers	70 to 96%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of these types of particulate control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM established for natural gas-fired thermal oil heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Commercial/Institutional-Size Boilers/Furnaces <100 MMBtu/hr (Process Type category 13.310). The limits and information presented below were established per local and state BACT regulations

at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-83 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR NATURAL GAS-FIRED THERMAL OIL HEATERS (RBLC PROCESS TYPE 30.530, BOARD MANUFACTURING DRYERS, AND RBLC PROCESS TYPE 13.310, COMMERCIAL/INSTITUTIONAL-SIZE BOILERS/FURNACES <100 MMBTU/HR)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	Particle Board Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Natural Gas-Fired Thermal Oil Heaters, K5 and K6, 301-0079-X072 30.530	Exhaust to Thermal Oil Heater stack TOH-1 or to RTO-1 stack via the MDF dryer.	PM: 0.15 lb/hr and 0.00267 lb/MMBtu PM10: Not listed PM2.5: Not listed CPM: Not listed Opacity: 5% (For each thermal oil heater)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good combustion practices, RTO 70%	PM: 29.1 lb/hr PM_{10}: 28.4 lb/hr $PM_{2.5}$: 16.55 lb/hr
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices, RTO 70%	PM: 29.1 lb/hr PM_{10}: 28.4 lb/hr $PM_{2.5}$: 16.55 lb/hr
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices, RTO 70%	PM: 29.1 lb/hr PM_{10}: 28.4 lb/hr $PM_{2.5}$: 16.55 lb/hr
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good design/ operation, Good combustion practices and maint-enance, and Use of natural gas fuel	FPM: 0.15 lb/hr, 0.00267 lb/MMBtu PM_{10}: 0.47 lb/hr, 0.00837 lb/MMBtu $PM_{2.5}$: 0.47 lb/hr, 0.00837 lb/MMBtu CPM: (Included in PM10 & PM2.5) Opacity: 0% (Emissions for each natural gas-fired thermal oil heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize natural gas-fired thermal oil heaters, and BACT controls established for these natural gas-fired heaters include good combustion practices and maintenance and use of natural gas fuel. BACT controls for natural gas-fired thermal oil heaters alone have been established in older PSD permits.

Other facilities utilize natural gas-fired dryers, which include emissions from natural gas combustion, as well as from the drying process, so emissions are higher than those for natural gas-fired thermal oil heaters as follows (so not considered in this BACT determination for natural gas-fired thermal oil heaters):

- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, PM: 29.1 lb/hr (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed FPM emissions for each natural gas-fired thermal oil heater are 0.15 lb/hr, 0.66 tpy, and 0.00267 lb/MMBtu, while PM_{10} and $PM_{2.5}$ emissions for each natural gas-fired thermal oil heater are 0.47 lb/hr, 2.06 tpy, and 0.00837 lb/MMBtu with good combustion practices and maintenance and use of natural gas fuel as controls. CPM emissions are included in PM_{10} and $PM_{2.5}$ emissions.

Step 2: Eliminate Technically Infeasible Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Options for Natural Gas-Fired Thermal Oil Heaters

For the natural gas-fired thermal oil heaters, all the add-on control technologies are technically infeasible for filterable particulates. Natural gas-fired heaters generate relatively low levels of particulate emissions in comparison to other wood product industry sources or other fuel types. In addition, heaters operate with large exhaust flow rates. The low level of particulate emissions combined with the large exhaust gas volume results in very low concentrations of particulate in natural gas-fired thermal oil heater exhaust (approximately 0.005 gr/scf). Therefore, removal of particulate from the thermal oil heaters with a fabric filter, dry ESP, wet ESP, mechanical collector, wet scrubber, or mechanical collector, is not technically feasible and would not provide any significant degree of emission reduction for the natural gas-fired thermal oil heaters.

Step 3: Rank Remaining Technically Feasible Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Options for Natural Gas-Fired Thermal Oil Heaters

Good design/operation and good combustion practices and maintenance are the remaining technically feasible control options for Filterable PM, PM_{10}, $PM_{2.5}$, and CPM from the natural gas-fired thermal oil heaters.

TABLE 3-84 SUMMARY OF RANKED FILTERABLE $PM/PM_{10}/PM_{2.5}$ CONTROLS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Rank	Technology
1	Good Design/Operation
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Natural Gas-Fired Thermal Oil Heaters

As noted, add-on controls are not feasible for the natural gas-fired thermal oil heaters. Therefore, the remaining available control types for PM are good design/operation and good combustion practices and maintenance, and thus no further analysis is required. Good design/operation and good combustion practices and maintenance are applicable, economical, and will be employed for the natural gas-fired thermal oil heaters. Good combustion practices and maintenance include activities such as maintaining combustion equipment according to manufacturer's instructions and adjusting the air-to-fuel ratio per manufacturer's recommendations.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for Natural Gas-Fired Thermal Oil Heaters

The results from the RBLC provided BACT for natural gas-fired thermal oil heaters to be the use of good design/operation and good combustion and maintenance practices. Kronospan is proposing BACT limits for each natural gas-fired thermal oil heater as follows:

- Filterable PM: 0.15 lb/hr, 0.00267 lb/MMBtu;
- PM_{10}: 0.47 lb/hr, 0.00837 lb/MMBtu;
- $PM_{2.5}$: 0.47 lb/hr, 0.00837 lb/MMBtu;
- CPM: (Included in PM_{10} and $PM_{2.5}$); and
- Opacity: 0%.

Kronospan will also use clean fuel (natural gas) for the natural gas-fired thermal oil heaters.

In addition, Kronospan is proposing a BACT opacity limit of 0%, which is consistent with the information obtained from the RBLC. One (1) COMS (Continuous Opacity Monitoring System) unit will be added in the shared common outlet duct from the four (4) natural gas-fired heaters to monitor all four heaters (at the same time) prior to venting to the Thermal Oil Heater stack TOH-1 or the MDF dryer RTO-1 stack.

Proposed BACT CONTROLS: Good Design/Operation, Good Combustion Practices and Maintenance, and Use of Clean Fuel (Natural Gas)

3.7.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

VOC is emitted from the natural gas-fired thermal oil heaters when hydrocarbons present in the fuel are not fully oxidized in the combustion chamber of the heater. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the combustion chamber is too short. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the four (4) natural gas-fired thermal oil heaters will exhaust to Thermal Oil Heater stack TOH-1 or the MDF dryer RTO-1 stack.

BACT Floor Kronospan will meet the applicable Subpart DDDDD emission limits for VOC/HAP as required by the Boiler MACT standard and applicable Subpart Db emission limits for Filterable PM (FPM) as required by the NSPS standard.

Step 1: Identify Potential VOC Control Technologies for Natural Gas-Fired Thermal Oil Heaters

Potentially applicable controls for natural gas-fired thermal oil heaters include regenerative thermal oxidizers, regenerative catalytic oxidizers, wet scrubbers (including packed beds, spray towers), biofilters, good design/operation, and good combustion practices and maintenance. Other available control devices for VOCs include condensers and adsorbers, although these types of controls are not widely used in wood products manufacturing processes because they are often considered technically infeasible for controlling emissions from wood products manufacturing. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-85 CONTROL TYPES AND EFFICIENCIES FOR VOCS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Control Type	Estimated VOC Control Efficiency
Direct Flame Thermal Oxidizers	98 to 99.99%
Recuperative Thermal Oxidizers	98 to 99.99%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Wet Scrubbers/Packed Beds/Spray Towers	70 to 99% (Packed Beds) 50 to 95% (Spray Towers)
Condensers	50 to 99%
Adsorbers/Adsorption Systems	95 to 98%
Biofilters	40 to 77%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies
Use of Clean Fuel (Natural Gas)	Varies

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for natural gas-fired thermal oil heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Commercial/Institutional-Size Boilers/Furnaces <100 MMBtu/hr (Process Type category 13.310). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-86 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR NATURAL GAS-FIRED THERMAL OIL HEATERS (RBLC PROCESS TYPE 30.530, BOARD MANUFACTURING DRYERS, AND RBLC PROCESS TYPE 13.310, COMMERCIAL/INSTITUTIONAL-SIZE BOILERS/FURNACES <100 MMTU/HR)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	Particle Board Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Natural Gas-Fired Thermal Oil Heaters, K5 and K6, 301-0079-X072 30.530	Exhaust to Thermal Oil Heater stack TOH-1 or to RTO-1 via the MDF dryer. Good combustion practices control for VOCs	VOC: 0.031 lb/hr and 0.00095 lb/MMBtu (For each thermal oil heater)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good combustion practices and RTO1, 95%	VOC: 7.1 lb/hr and 0.43 lb/ODT
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 95%	VOC: 7.1 lb/hr (total emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 95%	VOC:7.1 lb/hr (total emissions from all process exhausted through RTO)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good design/ operation, Good combustion practices and main-tenance, and Use of clean fuel (natural gas)	VOC: 0.031 lb/hr, 0.00095 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize natural gas-fired thermal oil heaters, and BACT controls established for natural gas-fired heaters include good

combustion practices and maintenance and use of natural gas fuel. BACT controls for natural gas-fired thermal oil heaters alone have been established in older PSD permits.

Other facilities utilize natural gas-fired dryers, which include emissions from natural gas combustion, as well as from the drying process, so emissions are higher than those for natural gas-fired thermal oil heaters as follows (so not considered in this BACT determination for natural gas-fired thermal oil heaters):

- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, VOC: 7.1 lb/hr and 0.43 lb/ODT (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed VOC emissions for each natural gas-fired thermal oil heater are 0.031 lb/hr, 0.00095 lb/MMBtu, and 0.13 tpy, with good design/operation, good combustion practices and maintenance, and use of natural gas fuel as controls.

Step 2: Eliminate Technically Infeasible VOC Control Options for Natural Gas-Fired Thermal Oil Heaters

For the natural gas-fired thermal oil heaters, all of the add-on control technologies are technically infeasible for VOC. Natural gas-fired heaters generate relatively low levels of VOC emissions in comparison to other wood product industry sources or other fuel types. In addition, heaters operate with large exhaust flow rates. The low level of VOC emissions combined with the large exhaust gas volume results in very low concentrations of VOC in natural gas-fired thermal oil heater exhaust. Therefore, removal of VOC from the thermal oil heaters with add-on controls is not technically feasible and would not provide any significant degree of emission reduction for the natural gas-fired thermal oil heaters.

The remaining control options have no significant adverse impacts and are not considered technically infeasible.

Step 3: Rank Remaining Technically Feasible VOC Control Options for Natural Gas-Fired Thermal Oil Heaters

The only control technology listed in the RBLC is good combustion practices and maintenance; therefore, this will be the primary control technology considered. The technically feasible control options identified are good design/operation, good combustion practices and maintenance, and use of clean fuel, which are ranked below.

TABLE 3-87 SUMMARY OF RANKED VOC CONTROLS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Rank	Technology
1	Good Design/Operation
1	Good Combustion Practices and Maintenance
1	Use of Clean Fuel (Natural Gas)

Step 4: Evaluate Remaining VOC Control Technologies for Natural Gas-Fired Thermal Oil Heaters

After review of the RBLC tables for the process type of Particle and Strandboard Manufacturing dryers (30.530) specifically for natural gas-fired thermal oil heaters, the only control type for VOC available is good combustion practices and maintenance and good design/operation. Therefore, no further analysis is required for VOC.

Step 5: Selection of BACT for VOC for Natural Gas-Fired Thermal Oil Heaters

Kronospan proposes a BACT limit as follows:

- VOC: 0.031 lb/hr, 0.00095 lb/MMBtu (for each natural gas-fired thermal oil heater).

Kronospan will utilize good design/operation, good combustion practices and maintenance, as well as use of clean fuel (natural gas) for the thermal oil heaters. Kronospan expects these units to achieve this emission limit because similar units are in operation at the facility (K5 and K6).

Proposed BACT Controls: Good Design/Operation, Good Combustion Practices and Maintenance, and Use of Clean Fuel (natural gas)

3.7.3 NOX BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

Nitrogen oxide formation from natural gas combustion occurs through the thermal NOx mechanism and the fuel NOx mechanism. Thermal NOx is the thermal dissociation and subsequent reaction of N_2 and O_2 molecules in the combustion air. Most thermal NOx is formed in the high temperature region of the flame from dissociated molecular nitrogen in the combustion air. Also, some prompt NOx is formed in the early part of the flame from the reaction of nitrogen intermediary species, and hydrocarbon radicals in the flame. Prompt NOx is usually negligible when compared to the amount of NOx formed through the thermal NOx mechanism, however prompt NOx levels may become significant with ultra-low-NOx burners. The second mechanism, fuel NOx, occurs between a reaction of fuel-bound nitrogen compounds with oxygen. Natural gas has no chemically-bound fuel N_2 and essentially all NOx formed is thermal NOx. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the four (4) natural gas-fired thermal oil heaters will exhaust to Thermal Oil Heater stack TOH-1 or the MDF dryer RTO-1 stack.

BACT Floor These sources will be subject to applicable requirements, but are not subject to the Plywood MACT.

Step 1: Identify Potential NOx Control Technologies for Natural Gas-Fired Thermal Oil Heaters

Potentially applicable controls for natural gas-fired thermal oil heaters include SCR, SNCR, LNB, ULNB, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-88 CONTROL TYPES AND EFFICIENCIES FOR NOX FROM NATURAL GAS-FIRED THERMAL OIL HEATERS

Control Type	Estimated NO_x Control Efficiency
Selective Catalytic Reduction	70 to 95%
Selective Non-Catalytic Reduction	40 to 75%
Low-NOx Burners/Ultra Low-NOx Burners	80% to 90%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of these types of NOx control systems are included in a previous section.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NOx established for natural gas-fired thermal oil heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Commercial/Institutional-Size Boilers/Furnaces <100 MMBtu/hr (Process Type category 13.310). The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-89 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR NOX FOR NATURAL GAS-FIRED THERMAL OIL HEATERS (RBLC PROCESS TYPE 30.530, BOARD MANUFACTURING DRYERS, AND RBLC PROCESS TYPE 13.310, COMMERCIAL/INSTITUTIONAL-SIZE BOILERS/FURNACES <100 MMBTU/HR)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	Particle Board Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Natural Gas-Fired Thermal Oil Heaters, K5 and K6, 301-0079-X072 30.530	Low NOx Burners and good combustion practices and maintenance Exhaust to Thermal Oil Heater stack TOH-1 or to RTO-1 via the MDF dryer.	NOx: 2.50 lb/hr and 0.0445 lb/MMBtu (For each thermal oil heater)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 170.0 lb/hr and 2.0 lb/ODT
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 95.0 lb/hr and 1.1 ODT
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and low NOx burners, 50% (SNCR not feasible for thermal energy plant exhaust)	NOx: 95.0 lb/hr and 1.1 ODT
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Low-NOx burners, Good design/ operation, Good combustion practices and maintenance, and Use of clean fuel (natural gas)	NOx: 2.50 lb/hr, 0.0445 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize natural gas-fired thermal oil heaters, and BACT controls established for natural gas-fired heaters include good combustion practices and maintenance and use of natural gas fuel. BACT controls for natural gas-fired thermal oil heaters alone have been established in older PSD permits.

Other facilities utilize natural gas-fired dryers, which include emissions from natural gas combustion, as well as from the drying process, so emissions are higher than those for natural

gas-fired thermal oil heaters as follows (so not considered in this BACT determination for natural gas-fired thermal oil heaters):

- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, NOx: 170.0 lb/hr and 2.0 lb/ODT (MI-0448, 12/18/2020); and
- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, NOx: 95.0 lb/hr and 1.1 lb/ODT (MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed NOx emissions for each natural gas-fired thermal oil heater are 2.50 lb/hr, 0.0445 lb/MMBtu, and 10.95 tpy, with low-NOx burners, good design/operation, good combustion practices and maintenance, and use of natural gas fuel as controls.

Step 2: Eliminate Technically Infeasible NOx Control Options for Natural Gas-Fired Thermal Oil Heaters

None of the NOx control technologies for the heaters are technically infeasible; therefore, each of the technologies will be considered.

Step 3: Rank Remaining Technically Feasible NOx Control Options for Natural Gas-Fired Thermal Oil Heaters

The remaining NOx control technologies for natural gas-fired thermal oil heaters are ranked, as shown below.

TABLE 3-90 SUMMARY OF RANKED NOX CONTROLS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Rank	Technology
1	Low-NOx Burners/Ultra Low-NOx Burners
2	Selective Non-Catalytic Reduction
3	Good Design/Operation
4	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining NOx Control Technologies for Natural Gas-Fired Thermal Oil Heaters

The RBLC tables for heaters and boilers within the wood products industry list low-NOx burners and good combustion practices as BACT. This aligns with Kronospan's current approach and will use the RBLC results of low-NOx burners for the natural gas-fired heaters. Since this option represents the best control option available as listed in the RBLC tables, no further analysis is needed.

Step 5: Selection of BACT for NOx for Natural Gas-Fired Thermal Oil Heaters

Low-NOx burners are selected as NOx BACT for the natural gas-fired thermal oil heaters. Kronospan proposes a BACT limit as:

- NOx: 2.50 lb/hr, 0.0445 lb/MMBtu (for each natural gas-fired thermal oil heater).

Kronospan will also implement low-NOx burners, good design/operation, good combustion practices and maintenance, as well as use of clean fuel (natural gas).

Proposed BACT Controls: Low-NOx Burners, Good Design/Operation, Good Combustion Practices and Maintenance, and Use of Clean Fuel (natural gas)

3.7.4 CO BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

Carbon monoxide is formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO_2 cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the combustion chamber is too short. The rate of CO emissions depends on the efficiency of combustion. Improperly tuned heaters operating at off-design levels decrease combustion efficiency resulting in increased CO emissions. In some cases, the addition of NOx control systems such as low-NOx burners and flue gas recirculation (FGR) may also reduce combustion efficiency, resulting in higher CO emissions relative to uncontrolled heaters. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the four (4) natural gas-fired thermal oil heaters will exhaust to Thermal Oil Heater stack TOH-1.

BACT Floor Kronospan will meet the applicable Subpart DDDDD emission limits for Filterable PM (FPM) as required by the MACT standard.

Step 1: Identify Potential CO Control Technologies for Natural Gas-Fired Thermal Oil Heaters

Potentially applicable controls for natural gas-fired thermal oil heaters include RTOs, RCOs, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-91 CONTROL TYPES AND EFFICIENCIES FOR CO FROM NATURAL GAS-FIRED THERMAL OIL HEATERS

Control Type	Estimated CO Control Efficiency
Direct Flame Thermal Oxidizers	75 to 95%
Recuperative Thermal Oxidizers	75 to 95%
Regenerative Thermal Oxidizers	95 to 99%
Regenerative Catalytic Oxidizers	90 to 99%
Biofilters	40 to 85%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO established for natural gas-fired thermal oil heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Commercial/Institutional-Size Boilers/Furnaces <100 MMBtu/hr (Process Type category 13.310). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-92 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR CO FOR THERMAL OIL HEATERS (RBLC PROCESS TYPE 30.530, BOARD MANUFACTURING DRYERS, AND RBLC PROCESS TYPE 13.310, COMMERCIAL/INSTITUTIONAL-SIZE BOILERS/FURNACES <100 MMBTU/HR)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	Particle Board Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Natural Gas-Fired Thermal Oil Heaters, K5 and K6, 301-0079-X072 30.530	Good combustion practices and maintenance Exhaust to Thermal Oil Heater stack TOH-1 or to RTO-1 via the MDF dryer.	CO: 0.265 lb/hr and 0.00472 lb/MMBtu (For each thermal oil heater)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 lb/oven dried ton (ODT)
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 lb/ODT (total emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good combustion practices and RTO1, 80%	CO: 36.3 lb/hr and 0.43 lb/ODT
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good combustion practices and maintenance and use of natural gas fuel	CO: 0.265 lb/hr, 0.00472 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize natural gas-fired thermal oil heaters, and BACT controls established for natural gas-fired heaters include good combustion practices and maintenance and use of natural gas fuel. BACT controls for natural gas-fired thermal oil heaters alone have been established in older PSD permits.

Other facilities utilize natural gas-fired dryers, which include emissions from natural gas combustion, as well as from the drying process, so emissions are higher than those for natural gas-fired thermal oil heaters as follows (so not considered in this BACT determination for natural gas-fired thermal oil heaters):

- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, CO: 36.30 lb/hr and 0.43 lb/ODT (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed CO emissions for each natural gas-fired thermal oil heater are 0.265 lb/hr, 0.00472 lb/MMBtu, and 1.156 tpy, with good combustion practices and maintenance and use of natural gas fuel as controls.

Step 2: Eliminate Technically Infeasible CO Control Options for Natural Gas-Fired Thermal Oil Heaters

For the natural gas-fired thermal oil heaters, all of the add-on control technologies are technically infeasible for CO. Natural gas-fired heaters generate relatively low levels of CO emissions in comparison to other wood product industry sources or other fuel types. In addition, heaters operate with large exhaust flow rates. The low level of CO emissions combined with the large exhaust gas volume results in very low concentrations of CO in natural gas-fired thermal oil heater exhaust. Therefore, removal of CO from the thermal oil heaters with add-on controls is not technically feasible and would not provide any significant degree of emission reduction for the natural gas-fired thermal oil heaters.

Step 3: Rank Remaining Technically Feasible CO Control Options for Natural Gas-Fired Thermal Oil Heaters

The only control technology listed in the RBLC is good combustion practices and maintenance; therefore, this will be the primary control technology considered.

TABLE 3-93 SUMMARY OF RANKED CO CONTROLS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Rank	Technology
1	Good Design/Operation
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining CO Control Technologies for Natural Gas-Fired Thermal Oil Heaters

After review of the RBLC tables for the process type of Particle and Strandboard Manufacturing dryers (30.530) specifically for thermal oil heaters, the control type for CO available is good combustion practices and maintenance, as well as good design/control. Therefore, no further analysis is required for CO.

Step 5: Selection of BACT for CO for Natural Gas-Fired Thermal Oil Heaters

Good design/operation, as well as good combustion practices and maintenance, and use of clean fuel (natural gas) are selected as CO BACT for the thermal oil heaters. The limit for each heater is referenced from the PTE calculations as:

- CO: 0.265 lb/hr, 0.00472 lb/MMBtu (for each natural gas-fired thermal oil heater).

Proposed BACT Controls: Good Design/Operation; Good Combustion Practices and Maintenance; Use of Clean Fuel (natural gas)

3.7.5 GHG BACT ANALYSIS FOR OSB PLANT UNITS – NATURAL GAS-FIRED THERMAL OIL HEATERS

Thermal oil heaters produce CO_2 from the combustion of the hydrocarbons present in the fuel. Methane (CH_4) emissions are produced during incomplete combustion of the diesel fuel, and N_2O emissions are solely a by-product of combustion. These three components are all considered GHGs. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the four (4) natural gas-fired thermal oil heaters will exhaust to Thermal Oil Heater stack TOH-1 or the MDF dryer RTO-1 stack.

BACT Floor There is not a general regulatory limit for GHG emissions.

Step 1: Identify Potential GHG Control Technologies for Natural Gas-Fired Thermal Oil Heaters

Potentially applicable controls for natural gas-fired thermal oil heaters include carbon capture and sequestration, good design/operation, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below.

TABLE 3-94 CONTROL TYPES AND EFFICIENCIES FOR GHG FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Control Type	Estimated VOC Control Efficiency
Carbon Capture and Sequestration (CCS)	Varies
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for GHG established for natural gas-fired thermal oil heaters at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500) and Commercial/Institutional-Size Boilers/Furnaces <100 MMBtu/hr (Process Type category 13.310). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-95 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR GHG FOR THERMAL OIL HEATERS (RBLC PROCESS TYPE 30.530, BOARD MANUFACTURING DRYERS, AND RBLC PROCESS TYPE 13.310, COMMERCIAL/INSTITUTIONAL-SIZE BOILERS/FURNACES <100 MMBTU/HR)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	Particle Board Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Natural Gas-Fired Thermal Oil Heaters, K5 and K6, 301-0079-X072 30.530	Good design/ operation, Good combustion practices and maintenance and Use of clean fuel (natural gas) Exhaust to Thermal Oil Heater stack TOH-1 or to RTO-1 via the MDF dryer.	GHG: 6,785 lb/hr and 120.734 lb/MMBtu (For each thermal oil heater)
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139,9 MMBtu/hr 30.530	Good operating and maintenance practices, natural gas only (CCS not cost effective)	GHG: 257,292 tpy 12-month rolling total (emissions from all processes exhausted through RTO)
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good operating and maintenance practices, natural gas only (CCS not cost effective)	GHG: 205,655 tpy 12-month rolling total (emissions from all processes exhausted through RTO)
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	2 Natural Gas-Fired Rotary Dryers 139.9 MMBtu/hr 30.530	Good operating and maintenance practices, natural gas only (CCS not cost effective)	GHG: 205,655 tpy 12-month rolling total (emissions from all processes exhausted through RTO)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good combustion practices and maintenance and use of natural gas fuel	GHG: 6,785 lb/hr, 120.734 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that several facilities utilize natural gas-fired thermal oil heaters, and the RBLC showed the following requirements for natural gas-fired thermal oil heaters:

Other facilities utilize natural gas-fired dryers, which include emissions from natural gas combustion, as well as from the drying process, so emissions are higher than those for natural gas-fired thermal oil heaters as follows (so not considered in this BACT determination for natural gas-fired thermal oil heaters):

- 2-139.9 MMBtu/hr Natural Gas-Fired Rotary Dryers, GHG: 36.30 lb/hr and 0.43 lb/ODT (MI-0448, 12/18/2020; MI-0425, 5/19/2017; MI-0421, 8/26/2016).

For comparison, Kronospan's proposed GHG emissions for each natural gas-fired thermal oil heater are 6,785 lb/hr, 120.734 lb/MMBtu, and 29,718 tpy, with good combustion practices and maintenance, good design/operation, and use of natural gas fuel as controls.

Step 2: Eliminate Technically Infeasible GHG Control Options for Natural Gas-Fired Thermal Oil Heaters

Due to the limited use of the technology, the size of the units, the large economies of scale needed for CCS and the amount of CO_2 generated from the heaters, CCS is deemed technically infeasible as a control method.

Step 3: Rank Remaining Technically Feasible GHG Control Options for Natural Gas-Fired Thermal Oil Heaters

Since add-on controls are deemed technically infeasible for heaters, the remaining options are to implement good design/operation and good combustion and maintenance practices and maintenance.

TABLE 3-96 SUMMARY OF RANKED GHG CONTROLS FOR NATURAL GAS-FIRED THERMAL OIL HEATERS

Rank	Technology
1	Good Design/Operation

Rank	Technology
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining GHG Control Technologies for Natural Gas-Fired Thermal Oil Heaters

In the marketplace, there are currently no available add-on controls for methane or N_2O for heaters. Fuel selection is also not an option as that would fundamentally redefine the proposed source. A search of the RBLC revealed only proper operation and good combustion practices and maintenance as BACT.

Step 5: Selection of BACT for GHG for Natural Gas-Fired Thermal Oil Heaters

BACT is selected to be good combustion practices and maintenance for the natural gas-fired thermal oil heaters with emission limits of:

- GHG: 6,785 lb/hr, 120.734 CO_2e lb/MMBtu (for each natural gas-fired thermal oil heater).

Proposed BACT Controls: Good Design/Operation, Good Combustion Practices and Maintenance, and Use of Clean Fuel (natural gas)

3.8 BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

Kronospan proposes to install three (3) emergency Reciprocating Internal Combustion Engines (RICE) (Emergency Generator #6; Emergency Generator #7; and Emergency Generator #8) that are subject to BACT review for this project. These emergency generators will be installed to provide backup power in the event of an emergency or power outage. The diesel-fired engines will be rated at 1,220 brake-horsepower (bhp) (910 kW) each and will use ultra-low-sulfur diesel (ULSD) as fuel. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor The 40 CFR 60 Subpart IIII emission limits represent the BACT floor for the applicable pollutants.

The engines will be required to meet the USEPA's emission requirements for emergency RICE as specified in 40 CFR Part 60, Subpart IIII and 40 CFR Part 63, Subpart ZZZZ. These regulations will require the engines to comply with PM, NMHC (non-methane hydrocarbons) + NOx, and CO limits for the manufactured date, size, and category of the engines, as well as complying with limitations on non-emergency operating hours. Based on their limited operation, emergency engines are subject to Tier 2 requirements. Since BACT cannot be less stringent than an applicable NSPS or NESHAP, the 40 CFR 60 Subpart IIII emission limits represent the BACT floor for the applicable pollutants.

The engines will be certified by the manufacturer to the standards in NSPS Subpart IIII. Compliance with Subpart IIII requirements will be achieved by:

- Purchasing an engine that has been certified by EPA; and

- Installing, configuring, operating, and maintaining the engine per the manufacturer's instructions.

Kronospan proposes BACT for the emergency generators to be use of engines certified to meet the NSPS Subpart IIII Tier 2 standards. Emissions from the emergency generators will be minimal because of limited operating hours (<500 hr/yr), and as a result, the addition of control devices cannot be cost-effective. The emergency generators will meet BACT through the NSPS Subpart IIII emission limits for PM, NMHC + NOx, and CO based on Tier 2 certified engine requirements, which are 0.20 g/kW-hr (0.15 g/bhp-hr) for PM, 6.4 g/kW-hr (4.8 g/bhp-hr) for NMHC + NOx, and 3.5 g/kW-hr (2.6 g/bhp-hr) for CO.

3.8.1 FILTERABLE PM/PM_{10}/$PM_{2.5}$ BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

Emissions of particulates from internal combustion engines are most apparent as white, blue, and black smoke. White smoke is a result of liquid particulates that appear in the exhaust during an engine cold start, idling, or low load operation. These are formed in the quench layer adjacent to the cylinder walls, where the temperature is not high enough to ignite the fuel. Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. Proper maintenance is the most effective method of preventing blue smoke emissions from all types of RICE. The primary constituent of black smoke is agglomerated carbon particles (soot) formed in regions of the combustion mixtures that are oxygen deficient. All particulate from RICE is assumed to be less than one (1) micrometer in size. Sulfates are also a contributing factor to PM emissions and are a function of only the sulfur content in the fuel, not combustion variables. During the combustion process, nearly all the sulfur in the fuel is oxidized to SO_2. The oxidation of SO_2 forms sulfur trioxide (SO_3), which reacts with water to produce sulfuric acid (H_2SO_4), a contributor to acid precipitation. Sulfuric acid reacts with basic substances resulting in sulfates. Further, the use of ULSD fuel (with sulfur concentration of <15 ppm) will limit emissions of SO_2. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor The emergency generators will be subject to NSPS Subpart IIII emission limits for PM based on Tier 2 certified engine requirements. The Tier 2 PM emission limit is 0.20 g/kW-hr (0.15 g/bhp-hr).

Step 1: Identify Potential Filterable PM/PM_{10}/$PM_{2.5}$ and CPM Control Technologies for Diesel-Fired Emergency Generators

Potentially applicable controls for diesel engines include high-efficiency diesel particulate filters, flow-through filters, diesel oxidation catalysts, selective catalytic reduction, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-97 CONTROL TYPES AND EFFICIENCIES FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR DIESEL-FIRED EMERGENCY GENERATORS

Control Type	Estimated Combined Filterable PM, PM_{10}, $PM_{2.5}$, and CPM Control Efficiency
High-Efficiency Diesel Particulate Filters/Particulate Traps	80 to 99%
Flow-Through Filters	30 to 70%
Diesel Oxidation Catalysts	20 to 50%
Selective Catalytic Reduction	20 to 30%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Descriptions of these types of particulate control systems are included below: *High-Efficiency Diesel Particulate Filters or Particulate Traps* - Diesel particulate filters are devices that are designed to remove particulate and soot from the exhaust gas stream. The use of these systems trap and capture soot particles and significantly reduce particulate emissions, though they can decrease fuel efficiency and reliability of the engine. These filter systems can reduce PM emissions by 80 to greater than 90%. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Flow-Through Filters - Flow-through filter technology is a relatively new method of reducing diesel particulate emissions that, unlike a high-efficiency DPF, does not physically "trap" and accumulate particulates. Rather, exhaust flows through a catalyzed wire mesh or a sintered metal sheet that includes a torturous flow path, giving rise to turbulent flow conditions. Any particles that are not oxidized within the flow-through filter travel out with the rest of the exhaust. Flow-through systems can achieve PM reduction of about 30 to 70%. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Diesel Oxidation Catalysts (DOCs) – Diesel oxidation catalysts are a type of control device designed primarily to reduce CO emissions from engines but have the added benefit of removing PM and VOC emissions as well. These units typically use a platinum catalyst, which can convert much of the CO and organic material in the engine exhaust to CO_2 and water. Oxidation catalysts require elevated temperatures to operate, and a properly operated system can achieve conversion rates of up to 70% for VOC emissions and 90% for CO emissions. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Selective Catalytic Reduction - SCR systems use a wash-coated or homogeneous extruded catalyst and a chemical reagent to convert NOx to molecular nitrogen and oxygen in the exhaust

stream. As the engine exhaust passes over the SCR catalyst, chemical reactions occur that reduce NOx emissions by 75 to 90%, VOC emissions by up to 80%, and PM emissions by 20 to 30%. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Good Design/Operation - Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing manufacturer's recommended operation and maintenance to promote efficient combustion and reduced emissions of PM. Required maintenance practices are described in 40 CFR 60 Subpart IIII.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for Filterable PM, $PM_{10,}$ $PM_{2.5}$, and CPM established for emergency engines at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500), Large Internal Combustion Engines >500 hp (Process Type category 17.110), and Misc. Internal Combustion Engines (Process Type category 19.800). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-98 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR FILTERABLE PM, PM_{10}, $PM_{2.5}$, AND CPM FOR DIESEL-FIRED EMERGENCY GENERATORS (RBLC PROCESS TYPES 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD

OPERATIONS, 17.110, LARGE INTERNAL COMBUSTION ENGINES >500 HP, AND 19.800, MISC. INTERNAL COMBUSTION ENGINES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
IN-1031 Wabash Valley Resources, LLC	Ammonia Plant	Vigo County, IN	1/11/2024	Diesel-Fired Emergency Generator. 400 kW/619 HP 17.110 Diesel-Fired Emergency Generator, 2000 kW 17.110 Diesel-Fired Emergency Generator, 1000 kW 17.110 Diesel-Fired Emergency Generator, 500 kW 17.110	Exhausts through Dryer to Wet ESP (6) and RTOs (4)	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
IL-0134 Cronus Chemicals, LLC	Ammonia Chemical Plant	Douglas County, IL	12/21/2023 BACT-PSD	Diesel-Fired Emergency Generator, 3985 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	PM: Not listed in RBLC PM_{10}: 0.2 g/kw-hr 3-hr avg $PM_{2.5}$: 0.2 g/kw-hr 3-hr avg 75 hr/yr limit CPM: Not listed
LA-0401 Koch Methanol St. James, LLC	Methanol Facility	St. James Parish, LA	12/20/2023 BACT-PSD	2 Diesel-Fired Emergency Engines, 2923 HP 17.110 Diesel-Fired Emergency Generator, 3634 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	PM: Not listed in RBLC PM_{10}: 0.84 lb/hr $PM_{2.5}$: 0.84 lb/hr CPM: Not listed PM: Not listed in RBLC PM_{10}: 1.19 lb/hr $PM_{2.5}$: 1.19 lb/hr CPM: Not listed
LA-0394 Shell Chemical LP, Geismar Plant	Chemical Plant	Ascension Parish, LA	12/12/2023 BACT-PSD	2 Diesel-Fired Emergency Generators, 670.50 HP 17.110	Use of good combustion practices and compliance with 40 CFR 60 Subpart IIII	PM: Not listed in RBLC PM_{10}: 0.22 lb/hr $PM_{2.5}$: 0.22 lb/hr CPM: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #1, 510 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	FPM: 0.15 g/hp-hr, 0.17 lb/hr, and 0.20 g/kw-hr PM_{10}: Not listed PM2.5: Not listed CPM: Not listed Opacity: 0%
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #2, 460 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.210	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	FPM: 0.40 g/hp-hr, 0.41 lb/hr, and 0.54 g/kw-hr PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #4, 1,220 bhp (910 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	FPM: 0.15 g/hp-hr, 0.40 lb/hr, and 0.54 g/kw-hr PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #5, 1,257 bhp (938 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	FPM: 0.15 g/hp-hr, 0.42 lb/hr, and 0.54 g/kw-hr PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed Opacity: 0%
LA-0390 CSP DeRidder LLC	DeRidder Sawmill	Beauregard Parish, LA	5/10/2022	3 Diesel-Fired Emergency Generators, 750 HP 17.110	Not listed	PM: Not listed in RBLC PM_{10}: Not listed $PM_{2.5}$: Not listed CPM: Not listed
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	1-1500 KW Diesel-Fired	Certified engines, good design,	FPM: 0.66 lb/hr and 0.2 g/KW-hr TPM_{10}: 0.66 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
				Emergency Generator 17.110 1-500 KW Diesel-Fired Emergency Generator 17.110	operation, and combustion practices, operational restrictions/ limited use (no technically feasible add on controls)	$TPM_{2.5}$: 0.66 lb/hr CPM: Not listed FPM: 0.22 lb/hr and 0.2 g/KW-hr TPM_{10}: 0.22 lb/hr $TPM_{2.5}$: 0.22 lb/hr CPM: Not listed 500 hr/yr operation
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Emergency Generator, 1500 kW 17.110 Emergency Generator, 1500 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use.	PM: 0.22 lb/hr PM_{10}: 0.22 lb/hr $PM_{2.5}$: 0.22 lb/hr CPM: Not listed 500 hr/yr operation PM: 0.66 lb/hr PM_{10}: 0.66 lb/hr $PM_{2.5}$: 0.66 lb/hr CPM: Not listed 500 hr/yr operation
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Emergency Generator, 1600 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use (no technically feasible add on control identified).	PM: 1.41 lb/hr and 0.2 g/KW-hr PM_{10}: 1.41 lb/hr $PM_{2.5}$: 1.41 lb/hr CPM: Not listed 500 hr/yr operation
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Good design/ operation - Tier 2 certified engine, Good combustion practices and maintenance, and Use of ULSD fuel	FPM: 0.40 lb/hr, 0.15 g/bhp-hr, and 0.10 tpy based on 500 hr/yr FPM_{10}: 0.40 lb/hr, 0.15 g/bhp-hr, and 0.10 tpy $FPM_{2.5}$: 0.40 lb/hr, 0.15 g/bhp-hr, and 0.10 tpy CPM: 0.06 lb/hr and 0.015 tpy Opacity: 0% (Emissions for each emergency generator)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that facilities utilize good design (certified engines), and good operation, and good combustion practices and maintenance, including recommended maintenance practices. BACT controls for diesel-fired emergency generators have been established as follows (based on NSPS Subpart IIII requirements):

- 0.20 g/kW-hr or 0.15 g/bhp-hr, and limited operating hours.

For comparison, Kronospan's proposed FPM, FPM_{10}, and $FPM_{2.5}$ emissions for each diesel-fired emergency generator are 0.40 lb/hr, 0.10 tpy (based on 500 hr/yr), and 0.15 g/bhp-hr with certified engines, good combustion practices and maintenance, and use of ULSD fuel as controls. Proposed CPM emissions are 0.06 lb/hr and 0.015 tpy.

Step 2: Eliminate Technically Infeasible Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Options for Diesel-Fired Emergency Generators

Any form of add-on control technology (such as diesel particulate filters/particulate traps and oxidation catalysts) would not be very effective based on the limited operation of the proposed engines and the small quantity of $PM/PM_{10}/PM_{2.5}$ emissions that result from engine operation. The use of a diesel particulate filter (or particulate trap) has the potential to reduce the reliability of an engine, which is not acceptable for engines in emergency service. The use of an oxidation catalyst or selective reduction catalyst requires a sustained high inlet temperature, which would not be feasible for much of the operating time of an emergency engine because use will be intermittent. Therefore, these technologies are deemed technically infeasible for use on emergency generator engines.

Step 3: Rank Remaining Technically Feasible Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Options for Diesel-Fired Emergency Generators

Since add-on controls are deemed technically infeasible for limited use of emergency engines, the remaining options are use of EPA certified engines in compliance with Tier 2 emission limits (0.20 g/kW-hr or 0.15 g/bhp-hr) and NSPS performance standards and to implement good combustion practices and maintenance, including use of ULSD as fuel.

TABLE 3-99 SUMMARY OF RANKED FILTERABLE $PM/PM_{10}/PM_{2.5}$ AND CPM CONTROLS FOR DIESEL-FIRED EMERGENCY GENERATORS

Rank	Technology
1	Good Design/Operation (Compliance with NSPS Subpart IIII)
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining Filterable $PM/PM_{10}/PM_{2.5}$ and CPM Control Technologies for Diesel-Fired Emergency Generators

Diesel-fired emergency generators will be installed to provide backup power in the event of an emergency. Emissions from the engines will be minimal because of limited operating hours (<500 hr/yr). As a result, the addition of control devices cannot be cost-effective.

Kronospan proposes BACT for the emergency generators to be use of engines certified to meet the standards of NSPS Subpart IIII for PM emissions. The remaining options of good combustion practices and maintenance and good design/operation (compliance with NSPS Subpart IIII requirements) do not have significant adverse impacts and are not considered economically infeasible.

Step 5: Selection of BACT for Filterable PM/PM_{10}/$PM_{2.5}$ and CPM for Diesel-Fired Emergency Generators

BACT for emergency engines is compliance with applicable NSPS Subpart IIII requirements. The emergency generator engines installed at Kronospan will meet the required PM emission limits found in 40 CFR 60 Subpart IIII, which also requires use of ULSD fuel and good combustion practices and maintenance activities. Therefore, Kronospan proposes PM BACT limits as follows:

- Filterable PM: 0.40 lb/hr, 0.15 g/bhp-hr (and 0.10 tpy based on 500 hr/yr);
- PM_{10}: 0.46 lb/hr, 0.15 g/bhp-hr (and 0.25 tpy based on 500 hr/yr);
- $PM_{2.5}$: 0.46 lb/hr, 0.15 g/bhp-hr (and 0.25 tpy based on 500 hr/yr);
- CPM: (Included in PM_{10} & $PM_{2.5}$); and
- Opacity: 0%.

These limits are consistent with good combustion practices and maintenance and the emission standards required under NSPS Subpart IIII.

In addition, Kronospan is requesting a BACT opacity limit of 0%. This compares with results obtained from the RBLC for emergency generators. Kronospan also requests an operational limit of 500 hours per year for each engine.

Proposed BACT Controls: Tier 2 Certified Engine, Good Design/Operation, Good Combustion Practices and Maintenance, Use of ULSD Fuel, and Operating Hours <500 hr/yr

3.8.2 VOC BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

VOCs are emitted from internal combustion engines when hydrocarbons present in the fuel are not fully oxidized in the combustion chamber of the engine. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, and/or if the residence time in the combustion chamber is too short. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor The emergency generators will be subject to NSPS Subpart IIII emission limits for NMHC + NOx based on Tier 2 certified engine requirements. The Tier 2 NMHC + NOx emission limit is 6.4 g/kW-hr (4.8 g/bhp-hr).

Step 1: Identify Potential VOC Control Technologies for Diesel-Fired Emergency Generators

Potentially applicable controls for emergency engines include diesel oxidation catalysts, selective catalytic reduction, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-100 CONTROL TYPES AND EFFICIENCIES FOR VOC FOR DIESEL-FIRED EMERGENCY GENERATORS

Control Type	Estimated VOC Control Efficiency
Diesel Oxidation Catalysts	Up to 70%
Selective Catalytic Reduction	Up to 80%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Diesel Oxidation Catalysts (DOCs) – Diesel oxidation catalysts are a type of control device designed primarily to reduce CO emissions from engines but have the added benefit of removing PM and VOC emissions as well. These units typically use a platinum catalyst, which can convert much of the CO and organic material in the engine exhaust to CO_2 and water. Oxidation catalysts require elevated temperatures to operate, and a properly operated system can achieve conversion rates of up to 70% for VOC emissions and 90% for CO emissions. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Selective Catalytic Reduction - SCR systems use a wash-coated or homogeneous extruded catalyst and a chemical reagent to convert NOx to molecular nitrogen and oxygen in the exhaust stream. As the engine exhaust passes over the SCR catalyst, chemical reactions occur that reduce NOx emissions by 75 to 90%, VOC emissions by up to 80%, and PM emissions by 20 to 30%. (MECA Clean Air Fact Sheet: Emission Controls for Diesel Engines, Washington, D.C.: Manufacturers of Emission Controls Association, undated, www.meca.org.)

Good Design/Operation - Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing recommended operation and maintenance to promote efficient

combustion and reduced emissions of VOC. Required maintenance practices are described in 40 CFR 60 Subpart IIII.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for VOCs established for emergency engines at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500), Large Internal Combustion Engines >500 hp (Process Type category 17.110), and Misc. Internal Combustion Engines (Process Type category 19.800). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-101 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR VOC FOR DIESEL-FIRED EMERGENCY GENERATORS (RBLC PROCESS TYPES 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS, 17.110, LARGE INTERNAL COMBUSTION ENGINES >500 HP, AND 19.800, MISC. INTERNAL COMBUSTION ENGINES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
IN-1031 Wabash Valley Resources, LLC	Ammonia Plant	Vigo County, IN	1/11/2024	Diesel-Fired Emergency Generator. 400 kW 619 HP 17.110 Diesel-Fired Emergency Generator, 2000 kW 17.110 Diesel-Fired Emergency Generator, 1000 kW 17.110 Diesel-Fired Emergency Generator, 500 kW 17.110	Exhausts through Dryer to Wet ESP (6) and RTOs (4)	VOC: Not listed in RBLC
IL-0134 Cronus Chemicals, LLC	Ammonia Chemical Plant	Douglas County, IL	12/21/2023 BACT-PSD	Diesel-Fired Emergency Generator, 3985 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	VOC: Not listed in RBLC
LA-0401 Koch	Methanol Facility	St. James Parish, LA	12/20/2023 BACT-PSD	2 Diesel-Fired Emergency	Compliance with 40 CFR	VOC: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Methanol St. James, LLC				Engines, 2923 HP 17.110 Diesel-Fired Emergency Generator, 3634 HP 17.110	60 Subpart IIII	VOC: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0394 Shell Chemical LP, Geismar Plant	Chemical Plant	Ascension Parish, LA	12/12/2023 BACT-PSD	2 Diesel-Fired Emergency Generators, 670.50 HP 17.110	Use of good combustion practices and compliance with 40 CFR 60 Subpart IIII	VOC: Not listed in RBLC
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #1, 510 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	VOC: 0.34 g/hp-hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #2, 460 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.210	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	VOC: 0.79 lb/hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #4, 1,220 bhp (910 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	VOC: 1.29 lb/hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #5, 1,257 bhp (938 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	VOC: 1.33 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0390 CSP DeRidder LLC	DeRidder Sawmill	Beauregard Parish, LA	5/10/2022 BACT-PSD	3 Diesel-Fired Emergency Generators, 750 HP 17.110	Good combustion practices and maintenance and compliance with applicable 40 CFR 60 Subpart JJJJ limitation for VOC	VOC: 1.98 lb/hr and 0.08 tpy
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020	1-1500 KW Diesel-Fired Emergency Generator 17.110 1-500 KW Diesel-Fired Emergency Generator 17.110	Certified engines, good design, operation, and combustion practices, operational restrictions/ limited use (not technically feasible add on controls)	VOC: Not listed in RBLC VOC: Not listed in RBLC 500 hr/yr operation
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Emergency Generator, 1500 kW 17.110 Emergency Generator, 500 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use.	VOC: Not listed in RBLC 500 hr/yr operation VOC: Not listed in RBLC 500 hr/yr operation

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016	Emergency Generator, 1600 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use (no technically feasible add on control identified).	VOC: Not listed in RBLC 500 hr/yr operation
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Good design/ operation - Tier 2 certified engine, Good combustion practices and main-tenance	VOC: 1.29 lb/hr, 4.8 g/bhp-hr for NMHC + NOx, and 500 hr/yr (Emissions for each emergency generator)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that facilities utilize good combustion practices and maintenance, good design (certified engines), and good operation, including recommended maintenance practices. BACT controls for diesel-fired emergency generators have been established as follows (based on NSPS Subpart IIII requirements):

- 750 HP Diesel-Fired Emergency Generator, VOC: 1.98 lb/hr and 0.08 tpy with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (LA-0390, 5/10/2022); and
- Certified engines, good design, operation and combustion practices, operational restrictions/ limited operating hours and 6.4 g/kW-hr (4.8 g/bhp-hr) for NMHC + NOx.

For comparison, Kronospan's proposed VOC emissions for each diesel-fired emergency generator are 1.29 lb/hr, 0.32 tpy (500 hr/yr), and 4.8 g/bhp-hr for NMHC + NOx with certified engines, good combustion practices and maintenance.

Step 2: Eliminate Technically Infeasible VOC Control Options for Diesel-Fired Emergency Generators

Any form of add-on control technology (such as diesel oxidation catalysts, selective catalytic reduction) would not be effective based on the limited operation of the proposed engines and the small quantity of VOC emissions that result from engine operation. The use of an oxidation catalyst requires a sustained high inlet temperature, which would not be feasible for much of the operating time of an emergency engine since use will be intermittent. Therefore, a diesel oxidation catalyst or selective catalytic reduction is considered technically infeasible for the emergency generator engines.

Step 3: Rank Remaining Technically Feasible VOC Control Options for Diesel-Fired Emergency Generators

Since add-on controls are deemed technically infeasible for limited use of emergency engines, the remaining options are to implement good combustion practices and maintenance and use of EPA certified engines in compliance with Tier 2 emission limits (6.4 g/kW-hr or 4.8 g/bhp-hr for NMHC + NOx) and NSPS performance standards.

TABLE 3-102 SUMMARY OF RANKED VOC CONTROLS FOR EMERGENCY ENGINES

Rank	Technology
1	Good Design/Operation (Compliance with NSPS Subpart IIII)
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining VOC Control Technologies for Diesel-Fired Emergency Generators

Diesel-fired emergency generators will be installed to provide backup power in the event of an emergency. Emissions from the engines will be minimal because of limited operating hours (<500 hr/yr). As a result, the addition of control devices cannot be cost-effective.

Kronospan proposes BACT for the emergency generators to be use of engines certified to meet the standards of NSPS Subpart IIII for PM emissions. The remaining options of good combustion practices and maintenance and good design/operation (compliance with NSPS Subpart IIII requirements) do not have any significant adverse impacts and are not considered economically infeasible.

Step 5: Selection of BACT for VOC for Diesel-Fired Emergency Generators

BACT for emergency engines is compliance with applicable NSPS Subpart IIII requirements. The emergency generator engines installed at Kronospan will meet the required VOC emission limits found in 40 CFR 60 Subpart IIII, which also requires good combustion practices and maintenance activities. Therefore, Kronospan proposes VOC BACT limits as follows:

- VOC: 1.29 lb/hr, along with 4.8 g/bhp-hr for NMHC + NOx, and 500 hr/yr.

These limits are consistent with good combustion practices and maintenance and the emission standards required under NSPS Subpart IIII. Kronospan also requests an operational limit of 500 hours per year for each engine.

Proposed BACT Controls: Tier 2 Certified Engine, Good Design/Operation, Good Combustion Practices and Maintenance, and Operating Hours <500 hr/yr

3.8.3 NOX BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

Nitrogen oxide formation from internal combustion engines occurs through the thermal NOx mechanism and the fuel NOx mechanism. Thermal NOx is the thermal dissociation and subsequent reaction of N_2 and O_2 molecules in the combustion air. Most thermal NOx is formed in the high-temperature region of the flame from dissociated molecular nitrogen in the combustion air. Also, some prompt NOx is formed in the early part of the flame from reaction of nitrogen intermediary species, and hydrocarbon radicals in the flame. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor The emergency generators will be subject to NSPS Subpart IIII emission limits for NMHC + NOx based on Tier 2 certified engine requirements. The Tier 2 NMHC + NOx emission limit is 6.4 g/kW-hr (4.8 g/bhp-hr).

Step 1: Identify Potential NOx Control Technologies for Diesel-Fired Emergency Generators

Potentially applicable controls for diesel engines include exhaust gas recirculation, selective catalytic reduction, retarding ignition timing, and good combustion practices and maintenance. Control efficiencies for potentially applicable technologies are shown in the table below. Note that the control efficiencies are provided for informational and ranking purposes only and are not to be used as emission limits or a request for enforceable restrictions (unless specifically stated).

TABLE 3-103 CONTROL TYPES AND EFFICIENCIES FOR NOX FOR DIESEL-FIRED EMERGENCY GENERATORS

Control Type	Estimated NOx Control Efficiency
Exhaust Gas Recirculation	50 to 90%
Selective Catalytic Reduction	50 to 90%
Lean NOx catalysts	20 to 30%
Retarding Ignition Timing	20 to 30%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Exhaust Gas Recirculation - Exhaust gas recirculation (EGR) is an effective strategy to control NOx emissions from diesel engines. The EGR reduces NOx through lowering the oxygen concentration in the combustion chamber, as well as through heat absorption; however, this type of control also

results in increases in fuel consumption, higher emissions of PM, HC, and CO, engine wear, and reductions in engine durability. Cooled EGR control technology has been used in Tier 3 and Tier 4 engines. (DieselNet Technology Guide: Exhaust Gas Recirculation by Hannu Jääskeläinen, Magdi K. Khair, Mississauga ON, Canada: 2022, www.dieselnet.com).

Selective Catalytic Reduction (SCR) reduces NOx emissions by injecting ammonia into the exhaust gas prior to the catalyst. NOx and O_2 react with NH3 on the surface of the catalyst to form N_2 and H_2O.

Lean NOx Catalysts - Several types of catalysts have been known to promote the reduction of NOx with hydrocarbons under lean exhaust conditions—including copper exchanged zeolites, platinum/alumina, and silver/alumina catalysts. However, lean NOx catalyst (known as HC-SCR catalysts) tends to have narrow operating temperature windows with a limited NOx reduction efficiency, along with other problems. Active HC-SCR systems with HC enrichment must be used to achieve meaningful levels of NOx conversion efficiency. Lean NOx catalysts have found only limited commercial use. (DieselNet Technology Guide: Lean NOx Catalysts (HC-SCR) by W. Addy Majewski, Mississauga ON, Canada: 2025, www.dieselnet.com).

Retarding Ignition Timing - Ignition timing retard delays initiation of combustion to later in the power cycle, which increases the volume of the combustion chamber and reduces the residence time of the combustion products. This increased volume and reduced residence time offers the potential for reduced NOx formation. However, along with NOx reductions, injection timing retard increases both black smoke and cold smoke (white smoke during start-up) emissions, increases exhaust temperatures, and can make starting the engine at cold temperatures more difficult. Brake-specific fuel consumption also increases with timing retard. The expected range for NOx reductions using injection timing retard in diesel engines is 20 to 30%. (Alternative Control Techniques Document: NOx Emissions from Stationary Reciprocating Internal Combustion Engines, EPA-453/R-93-032, Washington, D.C.: Office of Air Quality Planning and Standards, July 1993.)

Good Design/Operation – Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing recommended operation and maintenance to promote efficient combustion and reduced emissions of NOx.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for NOx established for emergency engines at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500), Large Internal Combustion Engines >500 hp (Process Type

category 17.110), and Misc. Internal Combustion Engines (Process Type category 19.800). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-104 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR NOX FOR DIESEL-FIRED EMERGENCY GENERATORS (RBLC PROCESS TYPES 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS, 17.110, LARGE INTERNAL COMBUSTION ENGINES >500 HP, AND 19.800, MISC. INTERNAL COMBUSTION ENGINES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
IN-1031 Wabash Valley Resources, LLC	Ammonia Plant	Vigo County, IN	1/11/2024	Diesel-Fired Emergency Generator. 400 kW 619 HP 17.110 Diesel-Fired Emergency Generator, 2000 kW 17.110 Diesel-Fired Emergency Generator, 1000 kW 17.110 Diesel-Fired Emergency Generator, 500 kW 17.110	Exhausts through Dryer to Wet ESP (6) and RTOs (4)	NOx: Not listed
IL-0134 Cronus Chemicals, LLC	Ammonia Chemical Plant	Douglas County, IL	12/21/2023 BACT-PSD	Diesel-Fired Emergency Generator, 3985 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	NOx: Not listed 75 hr/yr limit
LA-0401 Koch Methanol St. James, LLC	Methanol Facility	St. James Parish, LA	12/20/2023 BACT-PSD	2 Diesel-Fired Emergency Engines, 2923 HP 17.110 Diesel-Fired Emergency Generator, 3634 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	NOx: Not listed NOx: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0394 Shell Chemical LP, Geismar Plant	Chemical Plant	Ascension Parish, LA	12/12/2023 BACT-PSD	2 Diesel-Fired Emergency Generators, 670.50 HP 17.110	Use of good combustion practices and compliance with 40 CFR 60 Subpart IIII	NOx: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #1, 510 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	NOx: 3.00 g/hp-hr, 3.04 lb/hr, and 4.0 g/kw-hr (NOx = NOX + NMHC)
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #2, 460 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	NOx: 7.80 g/hp-hr, 7.12 lb/hr, and 10.5 g/kw-hr (NOx = NOX + NMHC)
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #4, 1,220 bhp (910 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	NOx: 4.80 g/hp-hr and 11.62 lb/hr (NOx = NOX + NMHC)
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #5, 1,257 bhp (938 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	NOx: 4.80 g/hp-hr and 11.97 lb/hr (NOx = NOX + NMHC)
LA-0390 CSP DeRidder LLC	DeRidder Sawmill	Beauregard Parish, LA	5/10/2022	3 Diesel-Fired Emergency Generators750 HP 17.110	Not listed	NOx: Not listed in RBLC
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	1-1500 KW Diesel-Fired	Certified engines, good design,	NOx: 21.2 lb/hr 500 hr/yr operation

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
				Emergency Generator 17.110 1-500 KW Diesel-Fired Emergency Generator 17.110	operation, and combustion practices, operational restrictions/ limited use (no technically feasible add on controls)	NOx: 4.4 lb/hr 500 hr/yr operation
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Emergency Generator, 1500 kW 17.110 Emergency Generator, 500 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use	NOx: 21.2 lb/hr 500 hr/yr operation NOx: 4.4 lb/hr 500 hr/yr operation
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016	Emergency Generator, 1600 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use (no technically feasible add on control identified)	NOx: 22.6 lb/hr 500 hr/yr operation
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Good design/ operation - Tier 2 certified engine, Good combustion practices and maintenance	NOx: 11.62 lb/hr, 4.8 g/bhp-hr for NMHC + NOx, and 500 hr/yr (Emissions for each emergency generator)

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that facilities utilize good design (certified engines) and good operation, and good combustion practices and maintenance, including recommended maintenance practices. BACT controls for diesel-fired emergency generators have been established as follows (based on NSPS Subpart IIII requirements):

- 500 KW Diesel-Fired Emergency Generator, NOx: 4.4 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 1500 KW Diesel-Fired Emergency Generator, NOx: 21.2 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 1600 KW Diesel-Fired Emergency Generator, NOx: 22.6 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0421, 8/26/2016); and
- Certified engines, good design, operation and combustion practices, operational restrictions/ limited operating hours and 6.4 g/kW-hr (4.8 g/bhp-hr) for NMHC + NOx.

For comparison, Kronospan's proposed NOx emissions for each diesel-fired emergency generator are 11.62 lb/hr, 2.91 tpy (based on 500 hr/yr), and 4.8 g/bhp-hr for NMHC + NOx with certified engines, good combustion practices and maintenance.

Step 2: Eliminate Technically Infeasible NOx Control Options for Diesel-Fired Emergency Generators

Any form of add-on control technology (such as diesel oxidation catalysts, selective catalytic reduction) would not be effective based on the limited operation of the proposed engines and the small quantity of VOC emissions that result from engine operation. The retarding of the timing is considered technically infeasible due to the reduction of peak power which may be required in emergency situations. SCR is also considered technically infeasible for limited use engines, as the control system must come up to temperature before effective control is realized. Since the engines must be operated at a moment's notice for safety purposes, it is not feasible to utilize an SCR control system. Therefore, the retarding of the timing or selective catalytic reduction is considered technically infeasible for the emergency generator engines.

Step 3: Rank Remaining Technically Feasible NOx Control Options for Diesel-Fired Emergency Generators

Since add-on controls are deemed technically infeasible for limited use of emergency engines, the remaining options are to implement good design/operation, use of EPA certified engines in compliance with Tier 2 emission limits (6.4 g/kW-hr or 4.8 g/bhp-hr for NMHC + NOx) and NSPS performance standards, and good combustion practices and maintenance.

TABLE 3-105 SUMMARY OF RANKED NOX CONTROLS FOR DIESEL-FIRED EMERGENCY GENERATORS

Rank	Technology
1	Good Design/Operation (Compliance with NSPS Subpart IIII)
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining NOx Control Technologies for Diesel-Fired Emergency Generators

Diesel-fired emergency generators will be installed to provide backup power in the event of an emergency. Emissions from the engines will be minimal because of limited operating hours (<500 hr/yr). As a result, the addition of control devices cannot be cost-effective. The remaining options of good combustion practices and maintenance and good design/operations (compliance with NSPS Subpart IIII requirements) do not have any significant adverse impacts and are not considered economically infeasible.

Step 5: Selection of BACT for NOx for Diesel-Fired Emergency Generators

BACT for emergency engines is compliance with applicable NSPS Subpart IIII requirements. The emergency generator engines installed at Kronospan will meet the required NOx emission limits found in 40 CFR 60 Subpart IIII, which also requires good combustion practices and maintenance activities. Therefore, Kronospan proposes NOx BACT limits as follows:

- NOx: 11.62 lb/hr, along with 4.8 g/bhp-hr for NMHC + NOx, and 500 hr/yr.

These limits are consistent with good combustion practices and maintenance and the emission standards required under NSPS Subpart IIII. Kronospan also requests an operational limit of 500 hours per year for each engine.

Proposed BACT Controls: Tier 2 Certified Engine, Good Design/Operation, Good Combustion Practices and Maintenance, and Operating Hours <500 hr/yr

3.8.4 CO BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

Carbon monoxide is formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO_2 cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, and/or if the residence time in the combustion chamber is too short. The oxidation rate of CO is limited by reaction kinetics and, consequently, can be accelerated only to a certain extent by improvements in air and fuel mixing during the combustion process. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor The emergency generators will be subject to NSPS Subpart IIII emission limits for CO based on Tier 2 certified engine requirements. The Tier 2 CO emission limit is 3.5 g/kW-hr (2.6 g/bhp-hr).

Step 1: Identify Potential CO Control Technologies for Diesel-Fired Emergency Generators

The RBLC provides some methods for controlling emissions of CO. The controls are listed top-down in the table below.

TABLE 3-106 CONTROL TYPES AND EFFICIENCIES FOR CO FOR DIESEL-FIRED EMERGENCY GENERATORS

Control Type	Estimated CO Control Efficiency
Oxidation Catalysts	Up to 90%
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Oxidation Catalysts – Oxidation catalysts are a type of control device designed primarily to reduce CO emissions from engines but have the added benefit of removing PM and VOC as well. These units typically use a platinum catalyst, which can convert much of the CO and organic material in the engine exhaust to CO_2 and water. Oxidation catalysts require elevated temperatures to operate, and a properly operated system can achieve up to 90% conversion rates.

Good Design/Operation – Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing recommended operation and maintenance to promote efficient combustion and reduced emissions of CO.

- RBLC AND PERMIT SEARCH

The RBLC, recent permits, and other relevant documents were reviewed to identify the most stringent BACT limits for CO established for emergency engines at OSB plants. The RBLC searches were conducted using RBLC process types under Particle Board and OSB Manufacturing (Process Type category 30.500), Large Internal Combustion Engines >500 hp (Process Type category 17.110), and Misc. Internal Combustion Engines (Process Type category 19.800). The limits and information presented below were established per local and state BACT regulations at the time of permit issuance. The limits and information presented below may not represent the current status of the described facilities. A summary of available BACT findings is shown in the table below.

TABLE 3-107 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR CO FOR DIESEL-FIRED EMERGENCY GENERATORS (RBLC PROCESS TYPES 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS, 17.110, LARGE INTERNAL COMBUSTION ENGINES >500 HP, AND 19.800, MISC. INTERNAL COMBUSTION ENGINES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
IN-1031 Wabash Valley Resources, LLC	Ammonia Plant	Vigo County, IN	1/11/2024	Diesel-Fired Emergency Generator. 400 kW 619 HP 17.110 Diesel-Fired Emergency Generator, 2000 kW 17.110 Diesel-Fired Emergency Generator, 1000 kW 17.110 Diesel-Fired Emergency Generator, 500 kW 17.110	Exhausts through Dryer to Wet ESP (6) and RTOs (4)	CO: Not listed
IL-0134 Cronus Chemicals, LLC	Ammonia Chemical Plant	Douglas County, IL	12/21/2023 BACT-PSD	Diesel-Fired Emergency Generator, 3985 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	CO: Not listed 75 hr/yr limit
LA-0401 Koch Methanol St. James, LLC	Methanol Facility	St. James Parish, LA	12/20/2023 BACT-PSD	2 Diesel-Fired Emergency Engines, 2923 HP 17.110 Diesel-Fired Emergency Generator, 3634 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	CO: Not listed CO: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0394 Shell Chemical LP, Geismar Plant	Chemical Plant	Ascension Parish, LA	12/12/2023 BACT-PSD	2 Diesel-Fired Emergency Generators, 670.50 HP 17.110	Use of good combustion practices and compliance with 40 CFR 60 Subpart IIII	CO: Not listed
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #1, 510 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	CO: 2.6 g/hp-hr, 2.92 lb/hr, and 3.5 g/kw-hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #2, 460 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.210	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	CO: 2.6 g/hp-hr, 2.64 lb/hr, and 3.5 g/kw-hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #4, 1,220 bhp (910 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	CO: 2.6 g/hp-hr and 6.99 lb/hr
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #5, 1,257 bhp (938 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	CO: 2.6 g/hp-hr and 7.21 lb/hr

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
LA-0390 CSP DeRidder LLC	DeRidder Sawmill	Beauregard Parish, LA	5/10/2022	3 Diesel-Fired Emergency Generators 750 HP 17.110	Not listed	CO: Not listed in RBLC
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	1-1500 KW Diesel-Fired Emergency Generator 17.110 1-500 KW Diesel-Fired Emergency Generator 17.110	Certified engines, good design, operation, and combustion practices, operational restrictions/ limited use (no technically feasible add on controls, oxidation catalyst not cost effective)	CO: 11.6 lb/hr and 3.5 g/KW-hr 500 hr/yr operation CO: 3.9 lb/hr and 3.5 g/KW-hr 500 hr/yr operation
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Emergency Generator, 1500 kW 17.110 Emergency Generator, 500 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use	CO: 11.6 lb/hr and 3.5 g/KW-hr 500 hr/yr operation CO: 3.9 lb/hr and 3.5 g/KW-hr 500 hr/yr operation
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Emergency Generator, 1600 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use (no technically feasible add on control identified)	CO: 12.35 lb/hr and 3.5 g/KW-hr 500 hr/yr operation
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Good design/ operation - Tier 2 certified engine, good combustion	CO: 6.99 lb/hr, 2.6 g/bhp-hr for CO and 500 hr/yr (Emissions for each emergency generator)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					practices and main-tenance	

Table Notes:
Based on approximately 10 years of RBLC records.

The RBLC and recent permits search indicated that facilities utilize good design (certified engines) and good operation, and good combustion practices and maintenance, including recommended maintenance practices. BACT controls for diesel-fired emergency generators have been established as follows (based on NSPS Subpart IIII requirements):

- 500 KW Diesel-Fired Emergency Generator, CO: 3.9 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 1500 KW Diesel-Fired Emergency Generator, CO: 11.6 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0448, 12/18/2020; MI-0425, 5/19/2017);
- 1600 KW Diesel-Fired Emergency Generator, CO: 12.35 lb/hr with good combustion practice and maintenance and compliance with NSPS Subpart IIII as controls (MI-0421, 8/26/2016); and
- Certified engines, good design, operation and combustion practices, operational restrictions/ limited operating hours and 3.5 g/kW-hr (2.6 g/bhp-hr) for CO.

For comparison, Kronospan's proposed CO emissions for each diesel-fired emergency generator are 6.99 lb/hr, 1.75 tpy (based on 500 hr/yr), and 2.6 g/bhp-hr for CO with certified engines, good combustion practices and maintenance.

Step 2: Eliminate Technically Infeasible CO Control Options for Diesel-Fired Emergency Generators

The use of an oxidation catalyst requires a sustained high inlet temperature, which would not be feasible for much of the operating time of an emergency engine because use will be intermittent. Additionally, they are prohibitive due to their cost for the small amount of CO that results from the emergency engine operation. Therefore, an oxidation catalyst is technically infeasible for the emergency generator engines.

Step 3: Rank Remaining Technically Feasible CO Control Options for Diesel-Fired Emergency Generators

Since add-on controls are deemed technically infeasible for limited use of emergency engines, the remaining options are to implement good combustion practices and maintenance (including use of ULSD as fuel) and use of EPA certified engines in compliance with Tier 2 emission limits (3.5 g/kW-hr or 2.6 g/bhp-hr) and NSPS performance standards.

TABLE 3-108 SUMMARY OF RANKED CO CONTROLS FOR DIESEL-FIRED EMERGENCY GENERATORS

Rank	Technology
1	Good Design/Operation (Compliance with NSPS Subpart IIII)
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining CO Control Technologies for Diesel-Fired Emergency Generators

Diesel-fired emergency generators will be installed to provide backup power in the event of an emergency. Emissions from the engines will be minimal because of limited operating hours (<500 hr/yr). As a result, the addition of control devices cannot be cost-effective.

The remaining control options, good design/operation and implementing good combustion practices and maintenance, do not have any significant adverse impacts, and are not considered economically infeasible.

Step 5: Selection of BACT for CO for Diesel-Fired Emergency Generators

BACT for emergency engines is compliance with applicable NSPS Subpart IIII requirements. The emergency generator engines installed at Kronospan will meet the required CO emission limits found in 40 CFR 60 Subpart IIII, which also requires use of good combustion practices and maintenance activities. Therefore, Kronospan proposes CO BACT limits as follows:

- CO: 6.99 lb/hr and 2.6 g/bhp-hr and 500 hr/yr (for each emergency engine).

These limits are consistent with good combustion practices and maintenance and the emission standards required under NSPS Subpart IIII. Further, Kronospan requests an operational limit of 500 hours per year for each engine.

Proposed BACT Controls: Tier 2 Certified Engine, Good Design/Operation, Good Combustion Practices and Maintenance, and Operating Hours <500 hr/yr

3.8.5 GHG BACT ANALYSIS FOR OSB PLANT UNITS – DIESEL-FIRED EMERGENCY GENERATORS

Diesel-fired engines produce CO_2 from the combustion of the hydrocarbons present in the diesel fuel. Methane emissions are produced during incomplete combustion of the fuel, and N_2O emissions are solely a by-product of combustion. These three components are all considered GHGs. This section reviews the RBLC tables, relevant permits, and existing technologies to determine controls that meet BACT requirements. Emissions from the diesel-fired emergency generators will be exhausted to atmosphere through individual stacks.

BACT Floor There is not a general regulatory limit for GHG emissions.

Step 1: Identify Potential GHG Control Technologies for Diesel-Fired Emergency Generators

The RBLC provides some methods for controlling emissions of GHG. The controls are listed top-down in the table below.

TABLE 3-109 CONTROL TYPES AND EFFICIENCIES FOR GHG FOR DIESEL-FIRED EMERGENCY GENERATORS

Control Type	Estimated GHG Control Efficiency
Carbon Capture and Sequestration (CCS)	Varies
Good Design/Operation	Varies
Good Combustion Practices and Maintenance	Varies

Carbon Capture and Sequestration (CCS) - is a relatively new technology that has only been proven on large combustion sources. This is typically achieved through an adsorption unit that captures CO2 in the exhaust stream into a solute, from which the CO_2 is then extracted.

Good Design/Operation - Good design and operation are based on effective equipment designs and efficient operation of equipment to minimize emissions. Good operating practices include operating and maintaining control equipment following practices consistent with the manufacturer/industry specifications and/or recommendations to control emissions. For example, operator inspections and activities, such as recordkeeping to log when equipment is operating can assist in minimizing emissions.

Good Combustion Practices and Maintenance - include proper design, proper combustion techniques, and performing recommended operation and maintenance to promote efficient combustion and reduced emissions of CO_2.

TABLE 3-110 SUMMARY OF RBLC AND PERMIT SEARCH FOR BACT LIMITS FOR GHG FOR DIESEL-FIRED EMERGENCY GENERATORS (RBLC PROCESS TYPES 30.590, MISCELLANEOUS PARTICLE AND STRAND BOARD OPERATIONS, 17.110, LARGE INTERNAL COMBUSTION ENGINES >500 HP, AND 19.800, MISC. INTERNAL COMBUSTION ENGINES)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
IN-1031 Wabash Valley Resources, LLC	Ammonia Plant	Vigo County, IN	1/11/2024	Diesel-Fired Emergency Generator. 400 kW 619 HP 17.110 Diesel-Fired Emergency Generator, 2000 kW 17.110 Diesel-Fired Emergency Generator, 1000 kW 17.110 Diesel-Fired Emergency Generator, 500 kW 17.110	Exhausts through Dryer to Wet ESP (6) and RTOs (4)	GHG:
IL-0134 Cronus Chemicals, LLC	Ammonia Chemical Plant	Douglas County, IL	12/21/2023 BACT-PSD	Diesel-Fired Emergency Generator, 3985 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	GHG: Not listed
LA-0401 Koch Methanol St. James, LLC	Methanol Facility	St. James Parish, LA	12/20/2023 BACT-PSD	2 Diesel-Fired Emergency Engines, 2923 HP 17.110 Diesel-Fired Emergency Generator, 3634 HP 17.110	Compliance with 40 CFR 60 Subpart IIII	GHG: Not listed GHG: Not listed
LA-0394 Shell Chemical LP, Geismar Plant	Chemical Plant	Ascension Parish, LA	12/12/2023 BACT-PSD	2 Diesel-Fired Emergency Generators, 670.50 HP 17.110	Use of good combustion practices and compliance with 40 CFR	GHG: Not listed

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
					60 Subpart IIII	
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #1, 510 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	GHG: 549.82 lb/hr and 162.19 lb/MMBtu
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Fire Pump #2, 460 bhp Clark Fire Protection Products Compression Ignition Diesel-fired Fire Pump Engine, 301-0079-X074 17.210	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	GHG: 495.98 lb/hr and 162.19 lb/MMBtu
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #4, 1,220 bhp (910 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	GHG: 1,150 lb/hr and 162.19 lb/MMBtu
AL-0337 Kronospan, LLC	PB Plant	Eastaboga, Calhoun County, AL	9/22/2022 BACT-PSD	Emergency Generator #5, 1,257 bhp (938 kWm) Caterpillar Compression Ignition Diesel-fired Reciprocating Internal Combustion Engine, 301-0079-X073 17.110	Catalyst (limited to less than 500 hours during any consecutive 12-month period)	GHG: 1,222 lb/hr and 162.19 lb/MMBtu
LA-0390 CSP DeRidder LLC	DeRidder Sawmill	Beauregard Parish, LA	5/10/2022	3 Diesel-Fired Emergency Generators 750 HP 17.110	Not listed	GHG: Not listed in RBLC

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
MI-0448 Arauco North America	Grayling Particle-board	Crawford County, MI	12/18/2020 BACT-PSD	Diesel-Fired Emergency Generator, 1500 KW 17.110 Diesel-Fired Emergency Generator, 500 KW 17.110	Certified engines, good design, operation, and combustion practices, operational restrictions/ limited use (no technically feasible add on controls, no cost effective add on controls)	GHG: 590 tpy 12-mo rolling period 500 hr/yr operation GHG: 209 tpy 12-mo rolling period 500 hr/yr operation
MI-0425 Arauco North America	Grayling Particle-board	Crawford County, MI	5/19/2017 BACT-PSD	Emergency Generator, 1500 kW 17.110 Emergency Generator, 500 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use	GHG: 209 tpy 12-mo rolling period 500 hr/yr operation GHG: 70 tpy 12-mo rolling period 500 hr/yr operation
MI-0421 Arauco North America	Grayling Particle-board	Crawford County, MI	8/26/2016 BACT-PSD	Emergency Generator, 1600 kW 17.110	Certified engines; good design, operation and combustion practices; operational restrictions/ limited use (no technically feasible add on control identified).	GHG: 223 tpy 12-mo rolling period 200 hr/yr operation
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.9 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Good design/ operation - Tier 2 certified engine, Good combustion practices and main-tenance	GHG: 1.150 lb/hr, 162.10 lb/MMBtu, and 287.5 tpy based on 500 hr/yr (Emissions for each emergency generator)

Table Notes:
Based on approximately 10 years of RBLC records.

Step 2: Eliminate Technically Infeasible GHG Control Options for Diesel-Fired Emergency Generators

Due to the high cost and large economies of scale needed, CCS is a method for reducing large amounts of GHG emissions. Within the United States, there are only a few examples of facilities using CCS. Because of the high cost relative to the amount emitted from the natural gas engines, CCS is deemed technically infeasible. Therefore, CCS is considered impractical and technically infeasible in this application.

Step 3: Rank Remaining Technically Feasible GHG Control Options for Diesel-Fired Emergency Generators

Since add-on controls are deemed technically infeasible for the engines, the remaining options are to implement good design/operation and good combustion practices and maintenance.

TABLE 3-111 SUMMARY OF RANKED GHG CONTROLS FOR DIESEL-FIRED EMERGENCY GENERATORS

Rank	Technology
1	Good Design/Operation (Compliance with NSPS Subpart IIII)
1	Good Combustion Practices and Maintenance

Step 4: Evaluate Remaining GHG Control Technologies for Diesel-Fired Emergency Generators

In the marketplace, there are currently no available add on controls for methane or N_2O for internal combustion engines. Fuel selection is also not an option that would fundamentally redefine the proposed source. A search of the RBLC revealed only proper operation and good combustion practices and maintenance as BACT. In complying with NSPS IIII, the engines must undergo proper maintenance and operation per the manufacturer's instructions to perform at a proper efficiency to meet the criteria pollutant emission rates.

The remaining control options, good design/operation and implementing good combustion practices and maintenance, do not have any significant adverse impacts, and are not considered economically infeasible.

Step 5: Selection of BACT for GHG for Diesel-Fired Emergency Generators

BACT is selected to be good design/operation and good combustion practices and maintenance for the diesel-fired emergency engines. Therefore, Kronospan proposes GHG BACT limits as follows:

- GHG: 1,150 lb/hr and 162.10 lb/MMBtu (and 287.5 tpy based on 500 hr/yr) for each engine.

These limits are consistent with BACT limits established for other diesel-fired emergency generators at the facility. Further, Kronospan requests an operational limit of 500 hours per year for each engine.

Proposed BACT Controls: Tier 2 Certified Engine, Good Design/Operation, Good Combustion Practices and Maintenance, and Operating Hours <500 hr/yr

4. BACT SUMMARY

A summary of proposed BACT controls and emission limits is shown in the table below.

TABLE 4-1 SUMMARY OF BACT CONTROLS AND EMISSION LIMITS FOR PROPOSED KRONOSPAN OSB PLANT IN EASTABOGA, AL

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Emissions from Flakers, Stranders, and Chipper will be discharged to atmosphere (PM) or inside the Strander Building (VOC).						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Flaking - 4 Flakers	Proposed BACT**:** Cyclones/ Cyclofilters, Good design/ operation, and Building enclosure	FPM: 0.06 lb/hr, 0.002185 gr/dscf PM_{10}: 0.044 lb/hr, 0.0016 gr/dscf $PM_{2.5}$: 0.008 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for 4 flakers)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Flaking - 4 Flakers	Proposed BACT: Good design/ operation and Good operating practices	VOC: 0.123 lb/ODT, 36.69 tpy (Emissions are total for 4 flakers)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Stranding - 3 Stranders	Proposed BACT: Cyclones/ Dust Collectors, Good design operation, and Building enclosure	FPM: 0.15 lb/hr, 0.002185 gr/dscf PM_{10}: 0.114 lb/hr, 0.0016 gr/dscf $PM_{2.5}$: 0.021 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0%. (Emissions are total for 3 stranders)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Stranding - 3 Stranders	Proposed BACT: Good design/ operation and Good Operating practices	VOC: 2.67 lb/hr, 0.022 lb/ODT (Emissions are total for 3 stranders)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Chipper	Proposed BACT: Good design/ operation, Good operating practices, and Building enclosure	FPM: 0.11 lb/hr, 0.47 tpy PM_{10}: 0.05 lb/hr, 0.24 tpy $PM_{2.5}$: 0.03 lb/hr, 0.12 tpy CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for chipper)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	(see Section 3.1 of this document)	Chipper	Proposed BACT: Good design/ operation and Good operating practices	VOC: 6.50 lb/hr, 28.47 tpy (Emissions are total for chipper)
Emissions from Blending/Gluing and Sifter/Screening will be discharged to atmosphere.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Blending/ Gluing	Proposed BACT: Dust collector and Good design/ operation	FPM: 0.60 lb/hr, 0.002185 gr/dscf PM_{10}: 0.45 lb/hr, 0.00165 gr/dscf $PM_{2.5}$: 0.08 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0%
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Blending/ Gluing	Proposed BACT: Good design/ operation	VOC: 20.05 lb/hr, 0.165 lb/ODT

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Sifter/ Screening	Proposed BACT: Dust collector and Good design/ operation	FPM: 0.80 lb/hr, 0.002185 gr/dscf PM_{10}: 0.60 lb/hr, 0.00165 gr/dscf $PM_{2.5}$: 0.11 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0%
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.2 of this document)	Sifter/ Screening	Proposed BACT: Good design/ operation	VOC: 17.62 lb/hr, 0.145 lb/ODT
Emissions from the OSB Press Hall sources include: Forming Line, Mat Saw, Press, Diagonal Saw, Cut-to-Size Saw, 3 Tongue and Groove Lines, and Sanding will be discharged to the Press Hall Building and routed through the Wet Scrubber before being discharged to Belt Dryer #3 stack.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Press Hall	Proposed BACT: Cyclone/ Dust collector, Cyclone/ Wet scrubber, and Good design/ operation	FPM: 2.92 lb/hr, 0.0206 lb/MSF 3/8” PM_{10}: 5.26 lb/hr, 0.0371 lb/MSF 3/8” $PM_{2.5}$: 5.15 lb/hr, 0.0363 lb/MSF 3/8” CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 15%
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Press Hall	Proposed BACT: Wet scrubber (in Press Hall) and Good design/ operation	VOC: 10.33 lb/hr, 0.073 lb/MSF 3/8”
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Press Hall	Proposed BACT**:** Good design/ operation	NOx: 6.24 lb/hr, 0.044 lb/MSF 3/8”
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.3 of this document)	Press Hall	Proposed BACT**:** Good design/ operation and Good operating practices	CO: 12.77 lb/hr, 0.09 lb/MSF 3/8”
Emissions from Dust and Granulate Handling operations will be exhausted to atmosphere.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Dust and Granulate Handling Operations	Proposed BACT: Cyclofilters	FPM: 0.78 lb/hr, 0.002185 gr/dscf, PM_{10}: 0.57 lb/hr, 0.00165 gr/dscf, $PM_{2.5}$: 0.11 lb/hr, 0.0003 gr/dscf

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
						CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions are total for dust and granulate sources)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.4 of this document)	Dust and Granulate Handling Operations	Proposed BACT: Good design/ operation and Good operating practices	VOC: 9.60 lb/hr, 0.068 lb/MSF 3/8” (Emissions are total for dust and granulate sources)
Emissions from the three (3) Belt Dryers will exhaust to atmosphere except for zones 1, 2, 3, and 16, which will provide combustion air to the two (2) Biomass Heaters.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	3 Belt Dryers	Proposed BACT: Dust collector for each belt dryer and Good design/ operation	FPM: 12.80 lb/hr, 0.002185 gr/dscf PM_{10}: 9.66 lb/hr, 0.00165 gr/dscf $PM_{2.5}$: 1.76 lb/hr, 0.0003 gr/dscf CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 10% (Emissions for each belt dryer)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and Good operating practices	VOC: 30.38 lb/hr, 0.75 lb/ODT (Emissions for each belt dryer)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and good operating practices	NOx: 0.31 lb/hr, 0.0066 lb/MSF 3/8” (Emissions for each belt dryer)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.5 of this document)	3 Belt Dryers	Proposed BACT: Good design/ operation and Good operating practices	CO: 3.84 lb/hr, 0.0812 lb/MSF 3/8” (Emissions for each belt dryer)
Emissions from the two (2) Biomass Heaters will exhaust to the Thermal Oil Heater stack TOH-1 or to RTO-1 via the MDF Dryer.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD	2-204.73 MMBtu/hr	Proposed BACT: Hybrid Filter	FPM: 2.66 lb/hr, 0.013 lb/MMBtu

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
			(see Section 3.6 of this document)	Biomass Heaters	(Electrified filter unit combined DESP and baghouse) for each heater, Good design/ operation, and Good combustion practices and main-tenance	PM_{10}: 6.14 lb/hr, 0.03 lb/MMBtu $PM_{2.5}$: 5.87 lb/hr, 0.0287 lb/MMBtu CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 10% (Emissions for each biomass heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: Good design/ operation and good combustion practices and main-tenance	VOC: 7.32 lb/hr, 0.036 lb/MMBtu (Emissions for each biomass heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: SNCR, Low-NOx burners, Good design/ operation, and Good combustion practices and main-tenance	NOx: 36.65 lb/hr, 0.18 lb/MMBtu (Emissions for each biomass heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: Good design/ operation and Good combustion practices and main-tenance	CO: 36.65 lb/hr, 0.18 lb/MMBtu (Emissions for each biomass heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.6 of this document)	2-204.73 MMBtu/hr Biomass Heaters	Proposed BACT: Good design/ operation, and Good combustion practices and main-tenance	GHG: 45,903 lb/hr, 224.464 CO_2e lb/MMBtu (Emissions for each biomass heater)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Emissions from the four (4) Natural Gas-Fired Thermal Oil Heaters will exhaust to Thermal Oil Heater stack TOH-1 or the MDF Dryer.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.7 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good design/ operation, Good combustion practices and maint-enance, and Use of clean fuel (natural gas)	FPM: 0.15 lb/hr, 0.00267 lb/MMBtu PM_{10}: 0.47 lb/hr, 0.00837 lb/MMBtu $PM_{2.5}$: 0.47 lb/hr, 0.00837 lb/MMBtu CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions for each natural gas-fired thermal oil heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.7 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good combustion practices and main-tenance and Use of clean fuel (natural gas)	VOC: 0.031 lb/hr, 0.00095 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.7 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Low NOx burners, Good design/ operation, Good combustion practices and main-tenance, and Use of clean fuel (natural gas)	NOx: 2.50 lb/hr, 0.0445 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.7 of this document)	4-56.2 MMBtu/hr Natural Gas-Fired Thermal Oil Heaters	Proposed BACT: Good design/ operation, Good combustion practices and main-tenance and Use of clean fuel (natural gas)	CO: 0.265 lb/hr, 0.00472 lb/MMBtu (Emissions for each natural gas-fired thermal oil heater)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD	4-56.2 MMBtu/hr Natural Gas-	Proposed BACT: Good design/	GHG: 6,785 lb/hr, 120.734 lb/MMBtu

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
			(see Section 3.7 of this document)	Fired Thermal Oil Heaters	operation, Good combustion practices and main-tenance, and Use of clean fuel (natural gas)	(Emissions for each natural gas-fired thermal oil heater)
Emissions from the three (3) Diesel-Fired Emergency Generators will be exhausted to atmosphere through individual stacks.						
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Tier 2 certified engine, Good design/ operation, Good combustion practices and main-tenance, and Use of ULSD fuel	FPM: 0.40 lb/hr, 0.15 g/bhp-hr, and 0.10 tpy based on 500 hr/yr PM_{10}: 0.46 lb/hr, 0.15 g/bhp-hr, and 0.115 tpy $PM_{2.5}$: 0.46 lb/hr, 0.15 g/bhp-hr, and 0.115 tpy CPM: (Included in PM_{10} & $PM_{2.5}$) Opacity: 0% (Emissions for each emergency generator)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Tier 2 certified engine, Good design/ operation, Good combustion practices and main-tenance, and Operating hours <500 hr/yr	VOC: 1.29 lb/hr, 4.8 g/bhp-hr, for NMHC + NOx, and 500 hr/yr Emissions for each emergency generator)

Facility Name	Industry	Location	Date of BACT Determination or Permit Issuance	Emission Source Type	Control Type	BACT Limits
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Tier 2 certified engine, Good design/ operation, Good combustion practices and main-tenance, and Operating hours <500 hr/yr	NOx: 11.62 lb/hr, 4.8 g/bhp-hr for NMHC + NOx, and 500 hr/yr (Emissions for each emergency generator)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT: Tier 2 certified engine, Good design/ operation, Good combustion practices and main-tenance, and Operating hours <500 hr/yr	CO: 6.99 lb/hr, 2.6 g/bhp-hr, for CO, and 500 hr/yr (Emissions for each emergency generator)
Kronospan, LLC	OSB Plant	Eastaboga, Calhoun County, AL	BACT-PSD (see Section 3.8 of this document)	3-1,220 bhp Diesel-Fired Emergency Generators	Proposed BACT**:** Tier 2 certified engine, Good design/ operation, Good combustion practices and main-tenance, and Operating hours <500 hr/yr	GHG: 1,150 lb/hr, 162.10 lb/MMBtu, and 287.5 tpy based on 500 hr/yr (Emissions for each emergency generator)

APPENDIX A COST EFFECTIVENESS CALCULATIONS

Supporting Documentation for Table 3-13, Summary of Thermal and Catalytic Oxidizer Costs for Flakers (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Flakers, RTO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$3,000,000		Replace with TANN RTO cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$3,000,000		
	Instrumentation = 0.10 x A	$300,000		
	Sales tax = 0.03 x A	$90,000		
	Freight = 0.05 x A	$150,000		
Purchased Equipment Costs	PEC = B	$3,540,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200		
	Handling/erection = 0.14 x B	$495,600		
	Electrical = 0.04 x B	$141,600		
	Piping = 0.02 x B	$70,800		
	Insulation for ductwork = 0.01 x B	$35,400		
	Painting = 0.01 x B	$35,400		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$1,062,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$4,602,000		
Indirect Costs	Engineering = 0.10 x B	$354,000		
	Construction/field expenses = 0.05 x B	$177,000		
	Contractor fees = 0.10 x B	$354,000		
	Start-up = 0.02 x B	$70,800		
	Performance test = 0.01 x B	$35,400		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$991,200		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980		
TOTAL CAPITAL INVESTMENT		$6,432,180		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$84,229		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$173,477		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$332,144		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm (annual)	$43,258	$43,258	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)	$138,187	$138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)	$35,448	$35,448	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$173,634 $34,727	$173,634 $34,727	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$410,129		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644		
	Property tax = 1% of TCI	$64,322		
	Insurance charges = 1% of TCI	$64,322		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$915,814		
Total Indirect Costs for RTO		$1,217,764		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,627,893		RTO and Including media replacement costs
OSB Flakers, RTO Only	RTO w/ 10 yr life - Total Annual Control Cost	$1,627,893	per year	
	VOC/HAP Pollutants Destroyed	34.86	tpy	
	CONTROL COST EFFECTIVENESS	$46,704	per ton	

OSB Flakers, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	*Cost Estimate*		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan estimate)*	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available
			$3,000,000	RTO equipment cost			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	RTO equipment = A	$3,000,000			ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$300,000			Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$90,000			Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$150,000			Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$3,540,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200			Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$495,600			Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$141,600			Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$70,800			Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$35,400			Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$35,400			Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,062,000				$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$4,602,000			DC = 1.67 x B + SP + Bldgs	$947,167		
Indirect Costs	Engineering = 0.10 x B	$354,000			Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$177,000			Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$354,000			Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$70,800			Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$35,400			Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		$991,200			TOTAL INDIRECT COSTS	$306,270		
Contingency Cost (15%)		$838,980			Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		$6,432,180			TOTAL CAPITAL INVESTMENT	$1,441,452		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$84,229		From EPA cost spreadsheet	Electricity (estimated)	$17,909	$17,909	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$173,477	$0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs	From EPA Cost Spreadsheet	$332,144			Total Direct Costs	$192,347		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm	$43,258	$43,258	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$43,258	$43,258	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm	$138,187	$138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm	$35,448	$33,645	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm				
	Costs for 1 replacement every 10 years	$173,634	$171,832	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$17,363	$17,183	Annual cost = media + replacement costs / 10 yrs				
Total Direct Costs for WESP	Add WESP costs	$235,605						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$628,371			Updated Total Direct Costs	$235,605		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644			Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$64,322			Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$64,322			Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$607,133			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$136,059		
Total Indirect Costs for RTO		$909,084						
Total Indirect Costs for WESP	Add WESP costs	$238,380			Total Indirect Costs for WESP	$238,380		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,775,835		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$473,985	$473,985	WESP costs added to RTO costs for 20 yr life
OSB Flakers, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$1,775,835	per year					
	Pollutant to be removed	34.86	tpy					
	CONTROL COST EFFECTIVENESS	$50,948	per ton					

RTO w/ 20 yr life and no WESP - Annual Control Cost	$1,301,850	per year	= $1,775,835 - $235,605 - $238,380
Pollutant to be removed	34.86	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$37,350	per ton	

Kronospan - Eastaboga, AL

OSB Flakers, Recuperative TO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Recuperative TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Recuperative Thermal Oxidizer	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$5,600,000		Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		
	Instrumentation = 0.10 x A	$560,000		
	Sales tax = 0.03 x A	$168,000		
	Freight = 0.05 x A	$280,000		
Purchased Equipment Costs	PEC = B	$6,608,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		
	Handling/erection = 0.14 x B	$528,640		
	Electrical = 0.04 x B	$925,120		
	Piping = 0.02 x B	$264,320		
	Insulation for ductwork = 0.01 x B	$132,160		
	Painting = 0.01 x B	$66,080		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$2,444,960		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$9,052,960		
Indirect Costs	Engineering = 0.10 x B	$660,800		
	Construction/field expenses = 0.05 x B	$330,400		
	Contractor fees = 0.10 x B	$660,800		
	Start-up = 0.02 x B	$132,160		
	Performance test = 0.01 x B	$66,080		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$1,850,240		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,635,480		
TOTAL CAPITAL INVESTMENT		$12,538,680		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$84,229		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,136,614		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,295,281		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm (annual)		$43,258	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)		$138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)		$35,448	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0 $0	$173,634 $34,727	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,295,281		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$250,774		
	Property tax = 1% of TCI	$125,387		
	Insurance charges = 1% of TCI	$125,387		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,785,257		
Total Indirect Costs for Recup TO	From EPA Cost Spreadsheet	$2,331,467		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,626,748		Recup TO and Including media replacement costs
OSB Flakers, Recuperative TO Only	Recup TO w/ 10 yr life - Total Annual Control Cost	$3,626,748	per year	
	VOC/HAP Pollutants Destroyed	35.96	tpy	
	CONTROL COST EFFECTIVENESS	$100,866	per ton	

OSB Flakers, Recuperative with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	Recuperative 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	Recuperative Thermal Oxidizer Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available
Direct Costs		*(Kronospan)*						
		$5,600,000		Recup TO equipment cost			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000			ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$560,000			Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$168,000			Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$280,000			Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$6,608,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640			Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$528,640			Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$925,120			Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$264,320			Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$132,160			Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$66,080			Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$2,444,960				$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$9,052,960			DC = 1.67 x B + SP + Bldgs	$947,167		
Indirect Costs	Engineering = 0.10 x B	$660,800			Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$330,400			Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$660,800			Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$132,160			Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$66,080			Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		$1,850,240			TOTAL INDIRECT COSTS	$306,270		
Contingency Cost (15%)		$1,635,480			Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		$12,538,680			TOTAL CAPITAL INVESTMENT	$1,441,452		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$84,229		From EPA cost spreadsheet	Electricity (estimated)	$17,909	$17,909	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm = total Recup TO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,136,614	$0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				Assume natural gas cost by same approach as PB	Water Usage (estimated)	$50,000		
				$1,000,000 / 530,000 dscfm x 31,843 dscfm	Chemical Usage (estimated)	$50,000		
Total Direct Costs	From EPA Cost Spreadsheet	$1,295,281			Total Direct Costs	$192,347		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maint./cleaning same as Recup TO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 31,843 dscfm		$43,258	$720,000 / 530,000 dscfm x 31,843 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$43,258	$43,258	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 31,843 dscfm		$138,187	$2,300,000 / 530,000 dscfm x 31,843 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 31,843 dscfm		$33,645	$590,000 / 530,000 x 31,843 dscfm				
	Costs for 1 replacement every 10 years	$0	$171,832	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$0	$17,183	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$235,605						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,530,886			Updated Total Direct Costs	$235,605		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$250,774			Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$125,387			Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$125,387			Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$1,183,526			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$136,059		
Total Indirect Costs for Recup TO		$1,729,736						
Total Indirect Costs for WESP	Add WESP costs	$238,380			Total Indirect Costs for WESP	$238,380		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,499,002		Recup TO & Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$473,985	$473,985	WESP costs added to Recup TO costs for 20 yr life
OSB Flakers, Recuperative with WESP	Recup w/ 20 yr life and WESP - Annual Control Cost	$3,499,002	per year					
	Pollutant to be removed	35.96	tpy					
	CONTROL COST EFFECTIVENESS	$97,313	per ton					

Recup TO w/ 20 yr life and no WESP - Annual Control Cost	$3,025,017	per year	= $3,499,002 - $235,605 - $238,380
Pollutant to be removed	35.96	tpy	
CONTROL COST EFFECTIVENESS	$84,131	per ton	
w/o WESP			

Kronospan - Eastaboga, AL

OSB Flakers, RCO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$4,050,000		Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$4,050,000		
	Instrumentation = 0.10 x A	$405,000		
	Sales tax = 0.03 x A	$121,500		
	Freight = 0.05 x A	$202,500		
Purchased Equipment Costs	PEC = B	$4,779,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		
	Handling/erection = 0.14 x B	$669,060		
	Electrical = 0.04 x B	$191,160		
	Piping = 0.02 x B	$95,580		
	Insulation for ductwork = 0.01 x B	$47,790		
	Painting = 0.01 x B	$47,790		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$1,433,700		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$6,212,700		
Indirect Costs	Engineering = 0.10 x B	$477,900		
	Construction/field expenses = 0.05 x B	$238,950		
	Contractor fees = 0.10 x B	$477,900		
	Start-up = 0.02 x B	$95,580		
	Performance test = 0.01 x B	$47,790		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$1,338,120		
Contingency Cost (15%)	Total Capital Investment x 0.15	$200,718		
TOTAL CAPITAL INVESTMENT		$7,751,538		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$101,962		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$585,129		From EPA cost spreadsheet
Catalyst replacement cost	Catalyst replacement	$9,798		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$771,327		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 31,843 dscfm (annual)		$43,258	$720,000 / 530,000 dscfm x 31,843 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)		$138,187	$2,300,000 / 530,000 dscfm x 31,843 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 31,843 dscfm (5 yrs)		$35,448	$590,000 / 530,000 x 31,843 dscfm
	Total costs for 1 replacement every 5 years	$0	$173,634	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$0	$34,727	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$771,327		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$155,031		
	Property tax = 1% of TCI	$77,515		
	Insurance charges = 1% of TCI	$77,515		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,103,664		
Total Indirect Costs for RCO	From EPA Cost Spreadsheet	$1,458,389		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,229,716		RCO and Including media replacement costs
OSB Flakers, RCO Only	RCO w/ 10 yr life - Total Annual Control Cost	$2,229,716	per year	
	VOC/HAP Pollutants Destroyed	33.02	tpy	
	CONTROL COST EFFECTIVENESS	$67,524	per ton	

OSB Flakers, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
			(Kronospan				*(Kronospan*	Convert $8MM WESP cost from PB, since updated
Direct Costs							*estimate)*	spreadsheet from EPA is not available
			$4,050,000	RCO equipment cost			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	RCO equipment = A	$4,050,000			ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$405,000			Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$121,500			Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$202,500			Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$4,779,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320			Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$669,060			Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$191,160			Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$95,580			Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$47,790			Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$47,790			Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,433,700				$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$6,212,700			DC = 1.67 x B + SP + Bldgs	$947,167		
Indirect Costs	Engineering = 0.10 x B	$477,900			Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$238,950			Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$477,900			Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$95,580			Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$47,790			Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		$1,338,120			TOTAL INDIRECT COSTS	$306,270		
Contingency Cost (15%)		$200,718			Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		$7,751,538			TOTAL CAPITAL INVESTMENT	$1,441,452		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$101,962		From EPA cost spreadsheet	Electricity (estimated)	$102,138	$102,138	$1,700,000 / 530,000 dscfm x 31,843 dscfm = WESP electricity costs
	Auxiliary Fuel - Natural Gas	$585,129		From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$9,798		From EPA cost spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs	From EPA Cost Spreadsheet	$771,327			Total Direct Costs	$276,576		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 31,843 dscfm		$43,258	$720,000 / 530,000 dscfm x 31,843 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$43,258	$43,258	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 31,843 dscfm		$138,187	$2,300,000 / 530,000 dscfm x 31,843 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 31,843 dscfm		$33,645	$590,000 / 530,000 x 31,843 dscfm				
	Costs for 1 replacement every 10 years	$0	$171,832	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$0	$17,183	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$319,834						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,091,161			Updated Total Direct Costs	$319,834		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$155,031			Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$77,515			Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$77,515			Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$731,668			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$136,059		
Total Indirect Costs for RCO		$1,086,392						
Total Indirect Costs for WESP	Add WESP costs	$238,380			Total Indirect Costs for WESP	$238,380		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,415,933		RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$558,214	$558,214	WESP costs added to RCO costs for 20 yr life

OSB Flakers, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$2,415,933	per year
	Pollutant to be removed	33.02	tpy
	CONTROL COST EFFECTIVENESS	$73,164	per ton

	RCO w/ 20 yr life and no WESP - Annual Control Cost	$1,857,719	per year	= $2,415,933 - $319,834 - $238,380
	Pollutant to be removed	33.02	tpy	
	CONTROL COST EFFECTIVENESS	$56,259	per ton	
	w/o WESP			

Supporting Documentation for Table 3-14, Summary of Thermal and Catalytic Oxidizer Costs for Stranders (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Stranders, RTO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$3,000,000		Replace with TANN RTO cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$3,000,000		
	Instrumentation = 0.10 x A	$300,000		
	Sales tax = 0.03 x A	$90,000		
	Freight = 0.05 x A	$150,000		
Purchased Equipment Costs	PEC = B	$3,540,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200		
	Handling/erection = 0.14 x B	$495,600		
	Electrical = 0.04 x B	$141,600		
	Piping = 0.02 x B	$70,800		
	Insulation for ductwork = 0.01 x B	$35,400		
	Painting = 0.01 x B	$35,400		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,062,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$4,602,000		
Indirect Costs	Engineering = 0.10 x B	$354,000		
	Construction/field expenses = 0.05 x B	$177,000		
	Contractor fees = 0.10 x B	$354,000		
	Start-up = 0.02 x B	$70,800		
	Performance test = 0.01 x B	$35,400		
TOTAL INDIRECT COSTS		$991,200		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980		
TOTAL CAPITAL INVESTMENT		$6,432,180		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$210,572		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$445,633		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$730,643		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm (annual)	$108,145	$108,145	Convert $720,000 maintenance/cleaning from PB RTO; included here $720,000 / 530,000 dscfm x 79,607 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm (5 yrs)	$345,464	$345,464	Convert $2.3 MM media cost from PB RTO; included here $2,300,000 / 530,000 dscfm x 79,607 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm (5 yrs)	$88,619	$88,619	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$434,083 $86,817	$434,083 $86,817	Total costs for 1 replacement every 5 years; included annualized cost below Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$925,605		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644		
	Property tax = 1% of TCI	$64,322		
	Insurance charges = 1% of TCI	$771,862		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$915,814		
Total Indirect Costs for RTO		$1,925,304		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,850,909		RTO and Including media replacement costs
OSB Stranders, RTO Only	RTO w/ 10 yr life - Total Annual Control Cost	$2,850,909	per year	
	VOC/HAP Pollutants Destroyed	11.12	tpy	
	CONTROL COST EFFECTIVENESS	$256,322	per ton	

OSB Stranders, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan)*	Assume WESP cost by using same approach as PB
			$3,000,000	RTO equipment cost		$1,201,615		$8,000,000 / 530,000 dscfm x 79,607 dscfm
Purchased Equipment Costs	RTO equipment = A	$3,000,000			ESP + auxiliary equipment = A	$1,201,615		
	Instrumentation = 0.10 x A	$300,000			Instrumentation = 0.10 x A	$120,162		
	Sales tax = 0.03 x A	$90,000			Sales tax = 0.03 x A	$36,048		
	Freight = 0.05 x A	$150,000			Freight = 0.05 x A	$60,081		
Purchased Equipment Costs	PEC = B	$3,540,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,417,906		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200			Foundation/supports = 0.04 x B	$56,716		
	Handling/erection = 0.14 x B	$495,600			Handling/erection = 0.50 x B	$708,953		
	Electrical = 0.04 x B	$141,600			Electrical = 0.08 x B	$113,432		
	Piping = 0.02 x B	$70,800			Piping = 0.01 x B	$14,179		
	Insulation for ductwork = 0.01 x B	$35,400			Insulation for ductwork = 0.02 x B	$28,358		
	Painting = 0.01 x B	$35,400			Painting = 0.02 x B	$28,358		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,062,000				$949,997		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$4,602,000			DC = 1.67 x B + SP + Bldgs	$2,367,903		
Indirect Costs	Engineering = 0.10 x B	$354,000			Engineering = 0.20 x B	$283,581		
	Construction/field expenses = 0.05 x B	$177,000			Construction/field expenses = 0.20 x B	$283,581		
	Contractor fees = 0.10 x B	$354,000			Contractor fees = 0.10 x B	$141,791		
	Start-up = 0.02 x B	$70,800			Start-up = 0.01 x B	$14,179		
	Performance test = 0.01 x B	$35,400			Performance test = 0.01 x B	$14,179		
					Model Study = 0.02 x B	$28,358		
TOTAL INDIRECT COSTS		$991,200			TOTAL INDIRECT COSTS	$765,669		
Contingency Cost (15%)		$838,980			Contingency Cost (15%)	$470,036		
TOTAL CAPITAL INVESTMENT		$6,432,180			TOTAL CAPITAL INVESTMENT	$3,603,608		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 79,604 dscfm = RTO
Utilities	Electricity	$210,572		From EPA Cost Spreadsheet	Electricity (estimated)	$44,762	$44,762	+ WESP electricity costs
	Auxiliary Fuel - Natural Gas	$445,633		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$730,643			Total Direct Costs	$219,200		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm	$108,145	$108,145	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$108,145	$108,145	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm	$345,464	$345,464	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm				
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm	$88,619	$88,619	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm				
	Costs for 1 replacement every 10 years	$434,083	$434,083	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$43,408	$43,408	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$327,345						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,209,542			Updated Total Direct Costs	$327,345		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644			Administrative = 2% of TCI	$72,072		
	Property tax = 1% of TCI	$64,322			Property tax = 1% of TCI	$36,036		
	Insurance charges = 1% of TCI	$771,862			Insurance charges = 1% of TCI	$36,036		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$607,133			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$340,145		
Total Indirect Costs for RTO		$1,616,623						
Total Indirect Costs for WESP	Add WESP costs	$528,952			Total Indirect Costs for WESP	$528,952		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,355,117		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$856,297	$856,297	WESP costs added to RTO costs for 20 yr life
OSB Stranders, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$3,355,117	per year					
	Pollutant to be removed	11.12	tpy					
	CONTROL COST EFFECTIVENESS	$301,655	per ton					
	RTO w/ 20 yr life and no WESP - Annual Control Cost	$2,498,820	per year	= $3,355,117 - $327,345 - $528,952				
	Pollutant to be removed	11.12	tpy					
	CONTROL COST EFFECTIVENESS w/o WESP	$224,667	per ton					

Kronospan - Eastaboga, AL

OSB Stranders, Recup TO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Recup TO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$5,600,000		Replace with TANN Recup TO cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		
	Instrumentation = 0.10 x A	$560,000		
	Sales tax = 0.03 x A	$168,000		
	Freight = 0.05 x A	$280,000		
Purchased Equipment Costs	PEC = B	$6,608,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		
	Handling/erection = 0.14 x B	$925,120		
	Electrical = 0.04 x B	$264,320		
	Piping = 0.02 x B	$132,160		
	Insulation for ductwork = 0.01 x B	$66,080		
	Painting = 0.01 x B	$66,080		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,982,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$8,590,400		
Indirect Costs	Engineering = 0.10 x B	$660,800		
	Construction/field expenses = 0.05 x B	$330,400		
	Contractor fees = 0.10 x B	$660,800		
	Start-up = 0.02 x B	$132,160		
	Performance test = 0.01 x B	$66,080		
TOTAL INDIRECT COSTS		$1,850,240		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,566,096		
TOTAL CAPITAL INVESTMENT		$12,006,736		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$210,572		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$2,861,318		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,146,328		
				Convert $720,000 maintenance/cleaning from PB RTO; included here
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm (annual)		$108,145	$720,000 / 530,000 dscfm x 79,607 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO; included here
Media costs	$2,300,000 / 530,000 dscfm x 79,607 dscfm (5 yrs)		$345,464	$2,300,000 / 530,000 dscfm x 79,607 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 79,607 dscfm (5 yrs)		$88,619	$590,000 / 530,000 x 79,607 dscfm
				Total costs for 1 replacement every 5 years; included
	Total costs for 1 replacement every 5 years	$0	$434,083	annualized cost below
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$0	$86,817	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,146,328		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135		
	Property tax = 1% of TCI	$120,067		
	Insurance charges = 1% of TCI	$1,440,808		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,709,519		
Total Indirect Costs for Recup TO		$3,555,192		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,701,520		Recup TO and Including media replacement costs
OSB Stranders, Recup TO Only	Recup TO w/ 10 yr life - Total Annual Control Cost	$6,701,520	per year	
	VOC/HAP Pollutants Destroyed	11.47	tpy	
	CONTROL COST EFFECTIVENESS	$584,083	per ton	

OSB Stranders, Recup TO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
						(Kronospan	
Direct Costs		*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
		$5,600,000	Recup TO equipment cost			$1,201,615	$8,000,000 / 530,000 dscfm x 79,607 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		ESP + auxiliary equipment = A	$1,201,615		
	Instrumentation = 0.10 x A	$560,000		Instrumentation = 0.10 x A	$120,162		
	Sales tax = 0.03 x A	$168,000		Sales tax = 0.03 x A	$36,048		
	Freight = 0.05 x A	$280,000		Freight = 0.05 x A	$60,081		
Purchased Equipment Costs	PEC = B	$6,608,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,417,906		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		Foundation/supports = 0.04 x B	$56,716		
	Handling/erection = 0.14 x B	$925,120		Handling/erection = 0.50 x B	$708,953		
	Electrical = 0.04 x B	$264,320		Electrical = 0.08 x B	$113,432		
	Piping = 0.02 x B	$132,160		Piping = 0.01 x B	$14,179		
	Insulation for ductwork = 0.01 x B	$66,080		Insulation for ductwork = 0.02 x B	$28,358		
	Painting = 0.01 x B	$66,080		Painting = 0.02 x B	$28,358		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$1,982,400			$949,997		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$8,590,400		DC = 1.67 x B + SP + Bldgs	$2,367,903		
Indirect Costs	Engineering = 0.10 x B	$660,800		Engineering = 0.20 x B	$283,581		
	Construction/field expenses = 0.05 x B	$330,400		Construction/field expenses = 0.20 x B	$283,581		
	Contractor fees = 0.10 x B	$660,800		Contractor fees = 0.10 x B	$141,791		
	Start-up = 0.02 x B	$132,160		Start-up = 0.01 x B	$14,179		
	Performance test = 0.01 x B	$66,080		Performance test = 0.01 x B	$14,179		
				Model Study = 0.02 x B	$28,358		
TOTAL INDIRECT COSTS		$1,850,240		TOTAL INDIRECT COSTS	$765,669		
Contingency Cost (15%)		$1,566,096		Contingency Cost (15%)	$470,036		
TOTAL CAPITAL INVESTMENT		$12,006,736		TOTAL CAPITAL INVESTMENT	$3,603,608		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395	From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509	From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767	From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767	From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
							Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$210,572	From EPA Cost Spreadsheet	Electricity (estimated)	$44,762	$44,762	$1,700,000 / 530,000 dscfm x 79,604 dscfm = Recup + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$2,861,318	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		$3,146,328		Total Direct Costs	$219,200		
	Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 79,607 dscfm	$108,145	$720,000 / 530,000 dscfm x 79,607 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$108,145	$108,145	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO		Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 79,607 dscfm	$345,464	$2,300,000 / 530,000 dscfm x 79,607 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)		Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 79,607 dscfm	$88,619	$590,000 / 530,000 x 79,607 dscfm				
	Costs for 1 replacement every 10 years	$0 $434,083	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$0 $43,408	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$327,345					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$3,473,673		Updated Total Direct Costs	$327,345		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135		Administrative = 2% of TCI	$72,072		
	Property tax = 1% of TCI	$120,067		Property tax = 1% of TCI	$36,036		
	Insurance charges = 1% of TCI	$1,440,808		Insurance charges = 1% of TCI	$36,036		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$1,133,316		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$340,145		
Total Indirect Costs for Recup TO		$2,978,989					
Total Indirect Costs for WESP	Add WESP costs	$528,952		Total Indirect Costs for WESP	$528,952		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,981,614	Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$856,297	$856,297	WESP costs added to Recup TO costs for 20 yr life
OSB Stranders, Recup TO w/ WESP	Recup w/ 20 yr life and WESP - Annual Control Cost	$6,981,614 per year					
	Pollutant to be removed	11.47 tpy					
	CONTROL COST EFFECTIVENESS	$608,495 per ton					

Recup TO w/ 20 yr life and no WESP - Annual Control Cost	$6,125,317 per year	= $6,981,614 - $327,345 - $528,592
Pollutant to be removed	11.47 tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$533,863 per ton	

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OSB Stranders, RCO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$4,050,000		Replace with TANN RCO cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$4,050,000		
	Instrumentation = 0.10 x A	$405,000		
	Sales tax = 0.03 x A	$121,500		
	Freight = 0.05 x A	$202,500		
Purchased Equipment Costs	PEC = B	$4,779,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		
	Handling/erection = 0.14 x B	$669,060		
	Electrical = 0.04 x B	$191,160		
	Piping = 0.02 x B	$95,580		
	Insulation for ductwork = 0.01 x B	$47,790		
	Painting = 0.01 x B	$47,790		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,433,700		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$6,212,700		
Indirect Costs	Engineering = 0.10 x B	$477,900		
	Construction/field expenses = 0.05 x B	$238,950		
	Contractor fees = 0.10 x B	$477,900		
	Start-up = 0.02 x B	$95,580		
	Performance test = 0.01 x B	$47,790		
TOTAL INDIRECT COSTS		$1,338,120		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623		
TOTAL CAPITAL INVESTMENT		$8,683,443		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$254,903		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,482,426		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$24,497		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,836,264		
				Convert $720,000 maintenance/cleaning from PB RTO; included here
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm (annual)		$108,145	$720,000 / 530,000 dscfm x 79,607 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO; included here
Media costs	$2,300,000 / 530,000 dscfm x 79,607 dscfm (5 yrs)		$345,464	$2,300,000 / 530,000 dscfm x 79,607 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 79,607 dscfm (5 yrs)		$88,619	$590,000 / 530,000 x 79,607 dscfm
				Total costs for 1 replacement every 5 years; included
	Total costs for 1 replacement every 5 years	$0	$434,083	annualized cost below
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$0	$86,817	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,836,264		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		
	Property tax = 1% of TCI	$86,834		
	Insurance charges = 1% of TCI	$1,042,013		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,236,349		
Total Indirect Costs for RCO		$2,583,528		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,419,792		RCO and Including media replacement costs

OSB Stranders, RCO Only	RCO w/ 10 yr life - Total Annual Control Cost	$4,419,792	per year
	VOC/HAP Pollutants Destroyed	10.54	tpy
	CONTROL COST EFFECTIVENESS	$419,456	per ton

OSB Stranders, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
						(Kronospan	
Direct Costs		*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
		$4,050,000	RCO equipment cost			$1,201,615	$8,000,000 / 530,000 dscfm x 79,607 dscfm
Purchased Equipment Costs	RCO equipment = A	$4,050,000		ESP + auxiliary equipment = A	$1,201,615		
	Instrumentation = 0.10 x A	$405,000		Instrumentation = 0.10 x A	$120,162		
	Sales tax = 0.03 x A	$121,500		Sales tax = 0.03 x A	$36,048		
	Freight = 0.05 x A	$202,500		Freight = 0.05 x A	$60,081		
Purchased Equipment Costs	PEC = B	$4,779,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,417,906		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		Foundation/supports = 0.04 x B	$56,716		
	Handling/erection = 0.14 x B	$669,060		Handling/erection = 0.50 x B	$708,953		
	Electrical = 0.04 x B	$191,160		Electrical = 0.08 x B	$113,432		
	Piping = 0.02 x B	$95,580		Piping = 0.01 x B	$14,179		
	Insulation for ductwork = 0.01 x B	$47,790		Insulation for ductwork = 0.02 x B	$28,358		
	Painting = 0.01 x B	$47,790		Painting = 0.02 x B	$28,358		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$1,433,700			$949,997		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$6,212,700		DC = 1.67 x B + SP + Bldgs	$2,367,903		
Indirect Costs	Engineering = 0.10 x B	$477,900		Engineering = 0.20 x B	$283,581		
	Construction/field expenses = 0.05 x B	$238,950		Construction/field expenses = 0.20 x B	$283,581		
	Contractor fees = 0.10 x B	$477,900		Contractor fees = 0.10 x B	$141,791		
	Start-up = 0.02 x B	$95,580		Start-up = 0.01 x B	$14,179		
	Performance test = 0.01 x B	$47,790		Performance test = 0.01 x B	$14,179		
				Model Study = 0.02 x B	$28,358		
TOTAL INDIRECT COSTS		$1,338,120		TOTAL INDIRECT COSTS	$765,669		
Contingency Cost (15%)		$1,132,623		Contingency Cost (15%)	$470,036		
TOTAL CAPITAL INVESTMENT		$8,683,443		TOTAL CAPITAL INVESTMENT	$3,603,608		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395	From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509	From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767	From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767	From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
							Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$254,903	From EPA Cost Spreadsheet	Electricity (estimated)	$255,334	$255,334	$1,700,000 / 530,000 dscfm x 79,604 dscfm = total RCO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,482,426	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$24,497	From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		$1,836,264		Total Direct Costs	$429,772		
	Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 79,607 dscfm	$108,145 $108,145	$720,000 / 530,000 dscfm x 79,607 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$108,145	$108,145	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO		Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 79,607 dscfm	$345,464 $345,464	$2,300,000 / 530,000 dscfm x 79,607 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)		Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 79,607 dscfm	$88,619 $88,619	$590,000 / 530,000 x 79,607 dscfm				
	Costs for 1 replacement every 10 years	$434,083 $434,083	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$43,408 $43,408	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$537,917					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$2,525,735		Updated Total Direct Costs	$537,917		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		Administrative = 2% of TCI	$72,072		
	Property tax = 1% of TCI	$86,834		Property tax = 1% of TCI	$36,036		
	Insurance charges = 1% of TCI	$1,042,013		Insurance charges = 1% of TCI	$36,036		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$819,630		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$340,145		
Total Indirect Costs for RCO		$2,166,810					
Total Indirect Costs for WESP	Add WESP costs	$528,952		Total Indirect Costs for WESP	$528,952		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,221,496	RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,066,869	$1,066,869	WESP costs added to RCO costs for 20 yr life
OSB Stranders, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$5,221,496 per year					
	Pollutant to be removed	10.54 tpy					
	CONTROL COST EFFECTIVENESS	$495,541 per ton					
	RCO w/ no WESP - Annual Control Cost	$4,154,627 per year	= $5,221,496 - $537,917 - $528,952				
	Pollutant to be removed	10.54 tpy					
	CONTROL COST EFFECTIVENESS w/o WESP	$394,291 per ton					

Supporting Documentation for Table 3-15, Summary of Wet Scrubber Costs for Flakers (Total VOCs)

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OSB Flakers, Packed Bed Scrubber Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Packed Bed Scrubber Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$420,280		Replace with TriMer cost proposal 1/21/26
Purchased Equipment Costs	PB Scrubber equipment = A	$420,280		
	Instrumentation = 0.10 x A	$42,028		
	Sales tax = 0.03 x A	$12,608		
	Freight = 0.05 x A	$21,014		
Purchased Equipment Costs	PEC = B	$495,930		
Direct Installation Costs	Foundation/supports = 0.12 x B	$59,512		
	Handling/erection = 0.4 x B	$198,372		
	Electrical = 0.01 x B	$4,959		
	Piping = 0.3 x B	$148,779		
	Insulation for ductwork = 0.01 x B	$4,959		
	Painting = 0.01 x B	$4,959		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$421,541		
TOTAL DIRECT COSTS	DC = 0.85 x B + SP + Bldg	$917,471		
Indirect Costs	Engineering = 0.10 x B	$49,593		
	Construction/field expenses = 0.10 x B	$49,593		
	Contractor fees = 0.10 x B	$49,593		
	Start-up = 0.01 x B	$4,959		
	Performance test = 0.01 x B	$4,959		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$158,698		
Contingency Cost (15%)	Total Capital Investment x 0.15	$161,425		
TOTAL CAPITAL INVESTMENT		$1,237,594		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$7,170		From EPA Cost Spreadsheet
	Annual Solvent cost - (Assume this is water)	$517,388		UPDATED: ((160 gal/min x 60 min/hr) + 35 gal/hr)) x 8760 hr/yr x $6.13/1000 gal
	Annual Wastewater Disposal cost	$608,014		160 gal/min x 60 min/hr x 8760 hr/yr x $7.23/1000 gal
Utilities	Electricity = Annual usage x Price	$63,521		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,270,531		
Annual maintenance/cleaning of scrubber	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm (annual)	$0	$43,258	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)	$0	$138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)	$0	$35,448	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0 $0	$173,634 $34,727	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,270,531		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$24,752		
	Property tax = 1% of TCI	$12,376		
	Insurance charges = 1% of TCI	$12,376		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$176,209		
Total Indirect Costs for PB Scrubber		$270,375		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,540,906		Scrubber, not Including media replacement costs

OSB Flakers, Packed Bed Scrubber Only	Packed Bed Scrubber - Total Annual Control Cost	$1,540,906	per year
	VOC/HAP Pollutants Destroyed	31.19	tpy
	CONTROL COST EFFECTIVENESS	$49,409	per ton

OSB Flakers, Packed Bed Scrubber w/ WESP **VOC Cost Effectiveness** **Capital Cost Summary**	***EPA Cost Manual, 7th Ed., Nov 2017*** **Scrubber 85% Control Efficiency** **Packed Bed Scrubber Costs**	***Tri-Mer quote and EPA Cost Spreadsheet*** ***EPA Cost Spreadsheet, Dec 2024*** **For 20 year Equipment Life**		**Estimated Actual Costs** **Maintenance/Cleaning & Media Replacement** **Assume 10 year Media Life**	***EPA Cost Manual, 6th Ed., Sept 1999*** **WESP 95% Control Efficiency** **WESP Costs**	***EPA Cost Manual, Sept 1999*** **Cost Estimate** **Assume 20 year Equipment Life**		**Estimated Actual Costs**
Direct Costs		*(Kronospan)*					*(Kronospan estimate)*	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available
		$420,280		Packed bed scrubber costs			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	PB Scrubber equipment = A	$420,280			ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$42,028			Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$12,608			Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$21,014			Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$495,930			Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$59,512			Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$198,372			Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$4,959			Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$148,779			Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$4,959			Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$4,959			Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$421,541				$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$917,471**			DC = 1.67 x B + SP + Bldgs	**$947,167**		
Indirect Costs	Engineering = 0.10 x B	$49,593			Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$49,593			Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$49,593			Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$4,959			Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$4,959			Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		**$158,698**			**TOTAL INDIRECT COSTS**	**$306,270**		
Contingency Cost (15%)		$161,425			Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		**$1,237,594**			**TOTAL CAPITAL INVESTMENT**	**$1,441,452**		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$63,521		From EPA cost spreadsheet	Electricity (estimated)	$102,138	$102,138	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm = WESP electricity costs
	Auxiliary Fuel - Natural Gas	$0	$0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs	**From EPA Cost Spreadsheet**	**$1,270,531**			**Total Direct Costs**	**$276,576**		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm	$0	$43,258	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 31,843 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$0	$43,258	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm	$0	$138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm				
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm	$0	$33,645	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm				
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$0	$17,183	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$276,576**	$276,576					
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$1,547,107**			**Updated Total Direct Costs**	**$276,576**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$24,752			Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$12,376			Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$12,376			Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$116,817**			Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$136,059**		
Total Indirect Costs for PB Scrubber		**$210,983**						
Total Indirect Costs for WESP	Add WESP costs	**$238,380**			**Total Indirect Costs for WESP**	**$238,380**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$1,996,470**		Scrubber, including WESP, not media replacement cost	**UPDATED TOTAL ANNUAL COST**	**$514,956**	$514,956	WESP costs added to PB Scrubber for 20 yr life

OSB Flakers, Packed Bed Scrubber w/ WESP	**Packed Bed Scrubber w/ WESP - Annual Control Cost**	**$1,996,470**	**per year**
	Pollutant to be removed	**31.19**	**tpy**
	CONTROL COST EFFECTIVENESS	**$64,017**	**per ton**

Packed Bed Scrubber w/ no WESP - Annual Control Cost	**$1,481,514**	**per year**	**= $1,996,470 - $276,576 - $238,380**
Pollutant to be removed	**31.19**	**tpy**	
CONTROL COST EFFECTIVENESS w/o WESP	**$47,505**	**per ton**	

Supporting Documentation for Table 3-16, Summary of Wet Scrubber Costs for Stranders (Total VOCs)

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OSB Stranders, Packed Bed Scrubber Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Packed Bed Scrubber Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$420,280		Replace with Tri-Mer cost proposal 1/21/26
Purchased Equipment Costs	PB Scrubber equipment = A	$420,280		
	Instrumentation = 0.10 x A	$42,028		
	Sales tax = 0.03 x A	$12,608		
	Freight = 0.05 x A	$21,014		
Purchased Equipment Costs	PEC = B	$495,930		
Direct Installation Costs	Foundation/supports = 0.12 x B	$59,512		
	Handling/erection = 0.4 x B	$198,372		
	Electrical = 0.01 x B	$4,959		
	Piping = 0.3 x B	$148,779		
	Insulation for ductwork = 0.01 x B	$4,959		
	Painting = 0.01 x B	$4,959		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$421,541		
TOTAL DIRECT COSTS	DC = 0.85 x B + SP + Bldg	$917,471		
Indirect Costs	Engineering = 0.10 x B	$49,593		
	Construction/field expenses = 0.10 x B	$49,593		
	Contractor fees = 0.10 x B	$49,593		
	Start-up = 0.01 x B	$4,959		
	Performance test = 0.01 x B	$4,959		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$158,698		
Contingency Cost (15%)	Total Capital Investment x 0.15	$161,425		
TOTAL CAPITAL INVESTMENT		$1,237,594		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$7,170		From EPA Cost Spreadsheet
	Annual Solvent cost (Assume this is water only)	$517,388		UPDATED: ((160 gal/min x 60 min/hr) + 35 gal/hr)) x 8760 hr/yr x $6.13/1000 gal
	Annual Wastewater Disposal cost	$608,014		160 gal/min x 60 min/hr x 8760 hr/yr x $7.23/1000 gal
Utilities	Electricity = Annual usage x Price	$158,806		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,365,816		
Annual maintenance/cleaning of scrubber	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm (annual)	$0	$108,145	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm (5 yrs)	$0	$345,464	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79607 dscfm
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm (5 yrs)	$0	$88,619	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0 $0	$434,083 $86,817	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,365,816		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$24,752		
	Property tax = 1% of TCI	$12,376		
	Insurance charges = 1% of TCI	$12,376		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$176,209		
Total Indirect Costs for PB Scrubber		$270,375		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,636,191		Scrubber, not Including media replacement costs

OSB Stranders, Packed Bed Scrubber Only	Packed Bed Scrubber - Total Annual Control Cost	$1,636,191	per year
	VOC/HAP Pollutants Destroyed	9.95	tpy
	CONTROL COST EFFECTIVENESS	$164,384	per ton

OSB Stranders, Packed Bed Scrubber w/ WESP								
VOC Cost Effectiveness	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs	
Capital Cost Summary	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate			
	Packed Bed Scrubber Costs	For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life			
Direct Costs		*(Kronospan)*				*(Kronospan estimate)*	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available	
		$420,280				$1,201,615	$8,000,000 / 530,000 dscfm x 79,607 dscfm	
Purchased Equipment Costs	PB Scrubber equipment = A	$420,280	PB Scrubber equipment cost	ESP + auxiliary equipment = A	$1,201,615			
	Instrumentation = 0.10 x A	$42,028		Instrumentation = 0.10 x A	$120,162			
	Sales tax = 0.03 x A	$12,608		Sales tax = 0.03 x A	$36,048			
	Freight = 0.05 x A	$21,014		Freight = 0.05 x A	$60,081			
Purchased Equipment Costs	PEC = B	$495,930		Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,417,906			
Direct Installation Costs	Foundation/supports = 0.08 x B	$59,512		Foundation/supports = 0.04 x B	$56,716			
	Handling/erection = 0.14 x B	$198,372		Handling/erection = 0.50 x B	$708,953			
	Electrical = 0.04 x B	$4,959		Electrical = 0.08 x B	$113,432			
	Piping = 0.02 x B	$148,779		Piping = 0.01 x B	$14,179			
	Insulation for ductwork = 0.01 x B	$4,959		Insulation for ductwork = 0.02 x B	$28,358			
	Painting = 0.01 x B	$4,959		Painting = 0.02 x B	$28,358			
	Site Preparation (SP)	$0		Site Preparation (SP)	$0			
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0			
Direct Installation Costs		$421,541			$949,997			
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$917,471		DC = 1.67 x B + SP + Bldgs	$2,367,903			
Indirect Costs	Engineering = 0.10 x B	$49,593		Engineering = 0.20 x B	$283,581			
	Construction/field expenses = 0.05 x B	$49,593		Construction/field expenses = 0.20 x B	$283,581			
	Contractor fees = 0.10 x B	$49,593		Contractor fees = 0.10 x B	$141,791			
	Start-up = 0.02 x B	$4,959		Start-up = 0.01 x B	$14,179			
	Performance test = 0.01 x B	$4,959		Performance test = 0.01 x B	$14,179			
				Model Study = 0.02 x B	$28,358			
TOTAL INDIRECT COSTS		$158,698		TOTAL INDIRECT COSTS	$765,669			
Contingency Cost (15%)		$161,425		Contingency Cost (15%)	$470,036			
TOTAL CAPITAL INVESTMENT		$1,237,594		TOTAL CAPITAL INVESTMENT	$3,603,608			
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			
	Supervision = 15% of operating labor	$3,509		Supervision = 15% of operating labor	$3,509			
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			
	Maintenance material = 100% of maintenance labor	$23,767		Maintenance material = 100% of maintenance labor	$23,767			
Utilities	Electricity	$158,806	From EPA cost spreadsheet	Electricity (estimated)	$248,173	$248,173	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 79,607 dscfm = total RTO + WESP electricity costs	
	Auxiliary Fuel - Natural Gas	$0 $0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP	
				Water Usage (estimated)	$50,000			
				Chemical Usage (estimated)	$50,000			
Total Direct Costs	From EPA Cost Spreadsheet	$1,365,816		Total Direct Costs	$422,611			
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm	$0 $108,145	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 79,607 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$108,145	$108,145	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)	
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm	$0 $345,464	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 79,607 dscfm					
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm	$0 $84,113	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 79,607 dscfm					
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years	$0 $429,577	Costs for 1 replacement every 10 years					
	Annualized cost = media + replacement costs / 10 yrs	$0 $42,958	Annual cost = media + replacement costs / 10 yrs					
Add WESP costs	Add WESP costs	$530,757 $530,757						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,896,573		Updated Total Direct Costs	$530,757		Add WESP costs	
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663			
	Administrative = 2% of TCI	$24,752		Administrative = 2% of TCI	$72,072			
	Property tax = 1% of TCI	$12,376		Property tax = 1% of TCI	$36,036			
	Insurance charges = 1% of TCI	$12,376		Insurance charges = 1% of TCI	$36,036			
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$116,817		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$340,145			
Total Indirect Costs for RTO		$210,983						
Total Indirect Costs for WESP	Add WESP costs	$528,952		Total Indirect Costs for WESP	$528,952		Add WESP costs	
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,636,508	Scrubber, including WESP, not media replacement costs	UPDATED TOTAL ANNUAL COST	$1,059,708	$1,059,708	WESP costs added to PB scrubber costs for 20 yr life	

Packed Bed Scrubber and WESP - Annual Control Cost	$2,636,508	per year	
Pollutant to be removed	9.95	tpy	
CONTROL COST EFFECTIVENESS	$264,882	per ton	
Packed Bed Scrubber w/ no WESP - Annual Control Cost	$1,576,799	per year	= $2,636,508 - $530,757 - $528,952
Pollutant to be removed	9.95	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$158,417	per ton	

Supporting Documentation for Table 3-23, Summary of Thermal and Catalytic Oxidizer Costs for Blending/ Gluing (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Blending/Gluing, RTO Only	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Additional Costs**
VOC Cost Effectiveness	**RTO 95% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***		**Maintenance/Cleaning & Media Replacement**
Capital Cost Summary	**RTO Costs**	**For 10 year Equipment Life**		**Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$3,000,000		**Replace with TANN cost proposal 1/15/26**
Purchased Equipment Costs	RTO equipment = A	$3,000,000		
	Instrumentation = 0.10 x A	$300,000		
	Sales tax = 0.03 x A	$90,000		
	Freight = 0.05 x A	$150,000		
Purchased Equipment Costs	PEC = B	**$3,540,000**		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200		
	Handling/erection = 0.14 x B	$495,600		
	Electrical = 0.04 x B	$141,600		
	Piping = 0.02 x B	$70,800		
	Insulation for ductwork = 0.01 x B	$35,400		
	Painting = 0.01 x B	$35,400		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,062,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$4,602,000**		
Indirect Costs	Engineering = 0.10 x B	$354,000		
	Construction/field expenses = 0.05 x B	$177,000		
	Contractor fees = 0.10 x B	$354,000		
	Start-up = 0.02 x B	$70,800		
	Performance test = 0.01 x B	$35,400		
TOTAL INDIRECT COSTS		**$991,200**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980		
TOTAL CAPITAL INVESTMENT		**$6,432,180**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$84,229		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$173,453		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$332,120**		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$720,000	$720,000	Convert $720,000 maintenance/cleaning from PB RTO Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)	$138,187	$138,187	Convert $2.3 MM media cost from PB RTO; included her $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)	$35,448	$35,448	Convert $590,000 replacement cost (crane, labor, etc.); included here $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$173,634 **$34,727**	$173,634 **$34,727**	Total costs for 1 replacement every 5 years; included annualized cost below Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$1,086,847**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644		
	Property tax = 1% of TCI	$64,322		
	Insurance charges = 1% of TCI	$64,322		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$915,814**		
Total Indirect Costs for RTO		**$1,217,764**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$2,304,611**		For RTO, including cleaning/maintenance and media replacement costs
OSB Blending/Gluing, RTO Only	**RTO w/ 10 yr life - Total Annual Control Cost**	**$2,304,611**	**per year**	
	VOC/HAP Pollutants Destroyed	**83.43**	**tpy**	
	CONTROL COST EFFECTIVENESS	**$27,624**	**per ton**	

OSB Blending/Gluing, RTO w WESP	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Actual Costs**	***EPA Cost Manual, 6th Ed., Sept 1999***	***EPA Cost Manual, Sept 1999***		**Estimated Actual Costs**
VOC Cost Effectiveness	**RTO 95% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***		**Maint/Clean & Media Replace**	**WESP 95% Control Efficiency**	**Cost Estimate**		
Capital Cost Summary	**RTO Costs**	**For 20 year Equipment Life**		**Assume 10 year Media Life**	**WESP Costs**	**Assume 20 year Equipment Life**		
			(Kronospan)				*(Kronospan estimate)*	Assume WESP cost using same approach as PE
Direct Costs			$3,000,000	RTO equipment cost			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	RTO equipment = A	$3,000,000			ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$300,000			Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$90,000			Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$150,000			Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$3,540,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200			Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$495,600			Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$141,600			Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$70,800			Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$35,400			Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$35,400			Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,062,000				$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$4,602,000**			DC = 1.67 x B + SP + Bldgs	**$947,167**		
Indirect Costs	Engineering = 0.10 x B	$354,000			Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$177,000			Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$354,000			Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$70,800			Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$35,400			Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		**$991,200**			**TOTAL INDIRECT COSTS**	**$306,270**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980			Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		**$6,432,180**			**TOTAL CAPITAL INVESTMENT**	**$1,441,452**		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op h	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 h	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8	$23,767		
	Maintenance material = 100% of maintenan	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance lal	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm
Utilities	Electricity	$84,229		From EPA Cost Spreadsheet	Electricity (estimated)	$17,909	$17,909	= total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$173,453		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
			$0		Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		**$332,120**			**Total Direct Costs**	**$192,347**		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning PB RTO
Annual maintenance/cleaning of RTO	Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$720,000	$720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%	Annual maintenance/cleaning of WESP (sludge &	$720,000	$720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 31,843 dscfm	$138,187	$138,187	$2,300,000 / 530,000 dscfm x 31,843 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 31,843 dscfm	$35,448	$33,645	$590,000 / 530,000 x 31,843 dscfm				
	Costs for 1 replacement every 10 years	$173,634	$171,832	Costs for 1 replacement every 10 years				
Annualized (media + replacement) cost	Annualized cost = media + replacement cost	$17,363	$17,183	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$912,347**						
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Co**	**$1,981,830**			**Updated Total Direct Costs**	**$912,347**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+mainten	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644			Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$64,322			Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$64,322			Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (**20 yrs at 7% so CRF=0.**	**$607,133**			Capital Recovery (**20 yrs at 7% so CRF=0.094**	**$136,059**		
Total Indirect Costs for RTO		**$909,084**						
Total Indirect Costs for WESP	Add WESP costs	**$238,380**			**Total Indirect Costs for WESP**	**$238,380**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annu**	**$3,129,294**		RTO and Including media replacer	**UPDATED TOTAL ANNUAL COST**	**$1,150,727**	$1,150,727	WESP costs added to RTO costs for 20 yr life
OSB Blending/Gluing, RTO w/ WESP	**yr life and WESP - Annual Control Cost**	**$3,129,294**	**per year**					
	Pollutant to be removed	**83.43**	**tpy**					
	CONTROL COST EFFECTIVENESS	**$37,509**	**per ton**					

RTO w/ 20 yr life and no WESP - Annual Control Cost	**$1,978,567**	**per year**	**= $3,129,294 - $912,347 - $238,380**
Pollutant to be removed	**83.43**	**tpy**	
CONTROL COST EFFECTIVENESS w/o WESP	**$23,716**	**per ton**	

Kronospan - Eastaboga, AL

OSB Blending/Gluing, Recup TO Only **VOC Cost Effectiveness** **Capital Cost Summary**	***EPA Cost Manual, 7th Ed., Nov 2017*** **Recup TO 98% Control Efficiency** **Recup TO Costs**	***TANN Quote and EPA Cost Spreadsheet*** ***EPA Cost Spreadsheet, Dec 2024*** **For 10 year Equipment Life**		**Estimated Additional Costs** **Maint/Clean & Media Replace** **Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$5,600,000		**Replace with TANN cost proposal 1/15/2**
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		
	Instrumentation = 0.10 x A	$560,000		
	Sales tax = 0.03 x A	$168,000		
	Freight = 0.05 x A	$280,000		
Purchased Equipment Costs	PEC = B	**$6,608,000**		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		
	Handling/erection = 0.14 x B	$925,120		
	Electrical = 0.04 x B	$264,320		
	Piping = 0.02 x B	$132,160		
	Insulation for ductwork = 0.01 x B	$66,080		
	Painting = 0.01 x B	$66,080		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,982,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$8,590,400**		
Indirect Costs	Engineering = 0.10 x B	$660,800		
	Construction/field expenses = 0.05 x B	$330,400		
	Contractor fees = 0.10 x B	$660,800		
	Start-up = 0.02 x B	$132,160		
	Performance test = 0.01 x B	$66,080		
TOTAL INDIRECT COSTS		**$1,850,240**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,566,096		
TOTAL CAPITAL INVESTMENT		**$12,006,736**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$84,229		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,121,988		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$1,280,655**		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$180,000	$180,000	Convert $720,000 maintenance/cleaning fron Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)	$138,187	$138,187	Convert $2.3 MM media cost from PB RTO; ir $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)	$35,448	$35,448	Convert $590,000 replacement cost (crane, labor, etc.); included here $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$173,634 **$34,727**	$173,634 **$34,727**	Total costs for 1 replacement every 5 years; included annualized cost below Annualized cost = (media + replacement cost
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$1,495,382**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135		
	Property tax = 1% of TCI	$120,067		
	Insurance charges = 1% of TCI	$120,067		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$1,709,519**		
Total Indirect Costs for Recup TO		**$2,234,452**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$3,729,833**		For Recup TO, including cleaning/maintenance and media replacement costs
OSB Blending/Gluing, Recup TO Only	**Total Annual Control Cost** **VOC/HAP Pollutants Destroyed** **CONTROL COST EFFECTIVENESS**	**$3,729,833** **86.06** **$43,339**	**per year** **tpy** **per ton**	

	OSB Blending/Gluing, Recup TO w WESP	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***	**Estimated Actual Costs**	***EPA Cost Manual, 6th Ed., Sept 1999***	***EPA Cost Manual, Sept 1999***		**Estimated Actual Costs**
	VOC Cost Effectiveness	**Recup TO 98% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***	**Maintenance/Cleaning & Media Replacement**	**WESP 95% Control Efficiency**	**Cost Estimate**		
	Capital Cost Summary	**Recup TO Costs**	**For 20 year Equipment Life**	**Assume 10 year Media Life**	**WESP Costs**	**Assume 20 year Equipment Life**		
	Direct Costs		*(Kronospan)*				*(Kronospan estimate)*	Assume WESP cost same approach
			$5,600,000	Recup TO equipment cost			$480,649	$8,000,000 / 530,000 x 31,843 dsc
	Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		ESP + auxiliary equipment = A	$480,649		
		Instrumentation = 0.10 x A	$560,000		Instrumentation = 0.10 x A	$48,065		
		Sales tax = 0.03 x A	$168,000		Sales tax = 0.03 x A	$14,419		
		Freight = 0.05 x A	$280,000		Freight = 0.05 x A	$24,032		
	Purchased Equipment Costs	PEC = B	$6,608,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
	Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		Foundation/supports = 0.04 x B	$22,687		
		Handling/erection = 0.14 x B	$925,120		Handling/erection = 0.50 x B	$283,583		
		Electrical = 0.04 x B	$264,320		Electrical = 0.08 x B	$45,373		
		Piping = 0.02 x B	$132,160		Piping = 0.01 x B	$5,672		
		Insulation for ductwork = 0.01 x B	$66,080		Insulation for ductwork = 0.02 x B	$11,343		
		Painting = 0.01 x B	$66,080		Painting = 0.02 x B	$11,343		
		Site Preparation (SP)	$0		Site Preparation (SP)	$0		
		Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
	Direct Installation Costs		$1,982,400			$380,001		
	TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$8,590,400**		DC = 1.67 x B + SP + Bldgs	**$947,167**		
	Indirect Costs	Engineering = 0.10 x B	$660,800		Engineering = 0.20 x B	$113,433		
		Construction/field expenses = 0.05 x B	$330,400		Construction/field expenses = 0.20 x B	$113,433		
		Contractor fees = 0.10 x B	$660,800		Contractor fees = 0.10 x B	$56,717		
		Start-up = 0.02 x B	$132,160		Start-up = 0.01 x B	$5,672		
		Performance test = 0.01 x B	$66,080		Performance test = 0.01 x B	$5,672		
					Model Study = 0.02 x B	$11,343		
	TOTAL INDIRECT COSTS		**$1,850,240**		**TOTAL INDIRECT COSTS**	**$306,270**		
	Contingency Cost (15%)	Total Capital Investment x 0.15	$1,566,096		Contingency Cost (15%)	$188,015		
	TOTAL CAPITAL INVESTMENT		**$12,006,736**		**TOTAL CAPITAL INVESTMENT**	**$1,441,452**		
	Annual Cost Summary							
	Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr	$23,395	From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 h	$23,395		
		Supervision = 15% of operating labor	$3,509	From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
		Maintenance labor = 0.5 hr/shift x Rate x Op	$23,767	From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8	$23,767		
		Maintenance material = 100% of maintenanc	$23,767	From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance lab	$23,767		
								for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm = total
	Utilities	Electricity	$84,229	From EPA Cost Spreadsheet	Electricity (estimated)	$17,909	$17,909	Recup TO + WESP electricity costs
		Auxiliary Fuel - Natural Gas	$1,121,988	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WES
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
	Total Direct Costs		**$1,280,655**		**Total Direct Costs**	**$192,347**		
n PB RTO		Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleanin
	Annual maintenance/cleaning of Recup TO	Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$720,000 $720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%	Annual maintenance/cleaning of WESP (sludge &	$720,000	$720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
ncluded here		Convert $2.3 MM media cost from PB RTO		Convert $2.3 MM media cost from PB RTO				
	Media costs	$2,300,000 / 530,000 dscfm x 31,843 dscfm	$138,187 $138,187	$2,300,000 / 530,000 dscfm x 31,843 dscfm				
		Convert $590,000 replacement cost (crane, labor, etc.)		Convert $590,000 replacement cost (crane, labor, etc.)				
	Media replacement costs	$590,000 / 530,000 x 31,843 dscfm	$35,448 $33,645	$590,000 / 530,000 x 31,843 dscfm				
		Costs for 1 replacement every 10 years	$173,634 $171,832	Costs for 1 replacement every 10 years				
	Annualized (media + replacement) costs	Annualized cost = media + replacement costs	$17,363 $17,183	Annual cost = media + replacement costs / 10 yrs				
	Add WESP costs	Add WESP costs	**$912,347**					
	Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Cos**	**$2,930,365**		**Updated Total Direct Costs**	**$912,347**		Add WESP costs
	Indirect Operating Costs	Overhead (60% of operating labor+maintena	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
		Administrative = 2% of TCI	$240,135		Administrative = 2% of TCI	$28,829		
		Property tax = 1% of TCI	$120,067		Property tax = 1% of TCI	$14,415		
		Insurance charges = 1% of TCI	$120,067		Insurance charges = 1% of TCI	$14,415		
		Capital Recovery (**20 yrs at 7% so CRF=0.**	**$1,133,316**		Capital Recovery (**20 yrs at 7% so CRF=0.0943**	**$136,059**		
	Total Indirect Costs for Recup TO		**$1,658,248**					
	Total Indirect Costs for WESP	Add WESP costs	**$238,380**		**Total Indirect Costs for WESP**	**$238,380**		Add WESP costs
	UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annu**	**$4,826,993**	Recup TO & Including media replacement & WESP cost	**UPDATED TOTAL ANNUAL COST**	**$1,150,727**	$1,150,727	WESP costs added to Recup TO cost
	OSB Blending/Gluing, Recup TO w/ WESP	**20 yr life and WESP - Annual Control Cost**	**$4,826,993**	**per year**				
		Pollutant to be removed	**86.06**	**tpy**				
		CONTROL COST EFFECTIVENESS	**$56,087**	**per ton**				

Recup TO w/ 20 yr life and no WESP - Annual Control Cost	**$3,676,267**	**= $4,826,993 - $912,347 - $238,380**
Pollutant to be removed	**86.06**	
CONTROL COST EFFECTIVENESS w/o WESP	**$42,716**	

Kronospan - Eastaboga, AL

OSB Blending/Gluing, RCO Only **VOC Cost Effectiveness** **Capital Cost Summary**	***EPA Cost Manual, 7th Ed., Nov 2017*** **RCO 90% Control Efficiency** **RCO Costs**	***TANN Quote, not EPA Cost Spreadsheet*** ***EPA Cost Spreadsheet, Dec 2024*** **For 10 year Equipment Life**		**Estimated Additional Costs** **Maintenance/Cleaning & Media Replacement** **Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$4,050,000		**Replace with TANN cost proposal 1/15/26**
Purchased Equipment Costs	RCO equipment = A	$4,050,000		
	Instrumentation = 0.10 x A	$405,000		
	Sales tax = 0.03 x A	$121,500		
	Freight = 0.05 x A	$202,500		
Purchased Equipment Costs	PEC = B	**$4,779,000**		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		
	Handling/erection = 0.14 x B	$669,060		
	Electrical = 0.04 x B	$191,160		
	Piping = 0.02 x B	$95,580		
	Insulation for ductwork = 0.01 x B	$47,790		
	Painting = 0.01 x B	$47,790		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,433,700		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$6,212,700**		
Indirect Costs	Engineering = 0.10 x B	$477,900		
	Construction/field expenses = 0.05 x B	$238,950		
	Contractor fees = 0.10 x B	$477,900		
	Start-up = 0.02 x B	$95,580		
	Performance test = 0.01 x B	$47,790		
TOTAL INDIRECT COSTS		**$1,338,120**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623		
TOTAL CAPITAL INVESTMENT		**$8,683,443**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$101,962		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$570,642		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$9,796		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$756,838**		
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$720,000	$720,000	Convert $720,000 maintenance/cleaning from PB RTO Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm (5 yrs)	$138,187	$138,187	Convert $2.3 MM media cost from PB RTO; included her $2,300,000 / 530,000 dscfm x 31,843 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm (5 yrs)	$35,448	$35,448	Convert $590,000 replacement cost (crane, labor, etc.); included here $590,000 / 530,000 x 31,843 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$173,634 **$34,727**	$173,634 **$34,727**	Total costs for 1 replacement every 5 years; included annualized cost below Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$1,511,565**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		
	Property tax = 1% of TCI	$86,834		
	Insurance charges = 1% of TCI	$86,834		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$1,236,349**		
Total Indirect Costs for RCO		**$1,628,349**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$3,139,914**		For RCO, including cleaning/maintenance and media replacement costs
OSB Blending/Gluing, RCO Only	**RCO w/ 10 yr life - Total Annual Control Cost** **VOC/HAP Pollutants Destroyed** **CONTROL COST EFFECTIVENESS**	**$3,139,914** **79.04** **$39,727**	**per year** **tpy** **per ton**	

OSB Blending/Gluing, RCO with WESP	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote, not EPA Cost Spreadsheet***	**Estimated Actual Costs**	***EPA Cost Manual, 6th Ed., Sept 1999***	***EPA Cost Manual, Sept 1999***		**Estimated Actual Costs**
VOC Cost Effectiveness	**RCO 90% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***	**Maintenance/Cleaning & Media Replacement**	**WESP 95% Control Efficiency**	**Cost Estimate**		
Capital Cost Summary	**RCO Costs**	**For 20 year Equipment Life**	**Assume 10 year Media Life**	**WESP Costs**	**Assume 20 year Equipment Life**		
						(Kronospan estimate)	
Direct Costs		*(Kronospan)*					Assume WESP cost by using same approach as PB
		$4,050,000	RCO equipment cost			$480,649	$8,000,000 / 530,000 dscfm x 31,843 dscfm
Purchased Equipment Costs	RCO equipment = A	$4,050,000		ESP + auxiliary equipment = A	$480,649		
	Instrumentation = 0.10 x A	$405,000		Instrumentation = 0.10 x A	$48,065		
	Sales tax = 0.03 x A	$121,500		Sales tax = 0.03 x A	$14,419		
	Freight = 0.05 x A	$202,500		Freight = 0.05 x A	$24,032		
Purchased Equipment Costs	PEC = B	$4,779,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$567,166		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		Foundation/supports = 0.04 x B	$22,687		
	Handling/erection = 0.14 x B	$669,060		Handling/erection = 0.50 x B	$283,583		
	Electrical = 0.04 x B	$191,160		Electrical = 0.08 x B	$45,373		
	Piping = 0.02 x B	$95,580		Piping = 0.01 x B	$5,672		
	Insulation for ductwork = 0.01 x B	$47,790		Insulation for ductwork = 0.02 x B	$11,343		
	Painting = 0.01 x B	$47,790		Painting = 0.02 x B	$11,343		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$1,433,700			$380,001		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$6,212,700**		DC = 1.67 x B + SP + Bldgs	**$947,167**		
Indirect Costs	Engineering = 0.10 x B	$477,900		Engineering = 0.20 x B	$113,433		
	Construction/field expenses = 0.05 x B	$238,950		Construction/field expenses = 0.20 x B	$113,433		
	Contractor fees = 0.10 x B	$477,900		Contractor fees = 0.10 x B	$56,717		
	Start-up = 0.02 x B	$95,580		Start-up = 0.01 x B	$5,672		
	Performance test = 0.01 x B	$47,790		Performance test = 0.01 x B	$5,672		
				Model Study = 0.02 x B	$11,343		
TOTAL INDIRECT COSTS		**$1,338,120**		**TOTAL INDIRECT COSTS**	**$306,270**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623		Contingency Cost (15%)	$188,015		
TOTAL CAPITAL INVESTMENT		**$8,683,443**		**TOTAL CAPITAL INVESTMENT**	**$1,441,452**		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395	From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509	From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767	From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767	From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
							Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 31,843 dscfm =
Utilities	Electricity	$101,962	From EPA Cost Spreadsheet	Electricity (estimated)	$102,138	$102,138	WESP electricity costs
	Auxiliary Fuel - Natural Gas	$570,642	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst Replacement Cost	Catalyst replacement	$9,796 $0	From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		**$756,838**	**Assume no change**	**Total Direct Costs**	**$276,576**		
	Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	Assume blending/gluing cleaning is 100% of PB cleaning (smaller airflow for OSB, but pMDI residue more difficult to remove) $720,000 x 100%	$720,000 $720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%	Annual maintenance/cleaning of WESP (sludge & WW)	$720,000	$720,000	Assume maintenance/cleaning for pMDI resins requires significant effort as does cleaning UHF resins $720,000 x 100%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm	$138,187 $138,187	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 31,843 dscfm				
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm	$35,448 $35,448	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 31,843 dscfm				
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$173,634 $173,634 $17,363 $17,363	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$996,576**					
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$2,490,777**		**Updated Total Direct Costs**	**$996,576**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		Administrative = 2% of TCI	$28,829		
	Property tax = 1% of TCI	$86,834		Property tax = 1% of TCI	$14,415		
	Insurance charges = 1% of TCI	$86,834		Insurance charges = 1% of TCI	$14,415		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$819,630**		Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$136,059**		
Total Indirect Costs for RCO		**$1,211,631**					
Total Indirect Costs for WESP	Add WESP costs	**$238,380**		**Total Indirect Costs for WESP**	**$238,380**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$3,940,788**	RCO and Including media replacement & WESP costs	**UPDATED TOTAL ANNUAL COST**	**$1,234,956**	$1,234,956	WESP costs added to RCO costs for 20 yr life
OSB Blending/Gluing, RCO with WESP	**RCO w/ 20 yr life and WESP - Annual Control Cost**	**$3,940,788**	**per year**				
	Pollutant to be removed	**79.04**	**tpy**				
	CONTROL COST EFFECTIVENESS	**$49,860**	**per ton**				

RCO w/ 20 yr life and no WESP - Annual Control Cost	**$2,705,832**	**per year**	**= $3,940,788 - $996,576 - $238,380**
Pollutant to be removed	**79.04**	**tpy**	
CONTROL COST EFFECTIVENESS	**$34,235**	**per ton**	
w/o WESP			

Supporting Documentation for Table 3-24, Summary of Thermal and Catalytic Oxidizer Costs for Sifter/ Screening (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Sifting/Screening, RTO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$3,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$3,000,000		
	Instrumentation = 0.10 x A	$300,000		
	Sales tax = 0.03 x A	$90,000		
	Freight = 0.05 x A	$150,000		
Purchased Equipment Costs	PEC = B	$3,540,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200		
	Handling/erection = 0.14 x B	$495,600		
	Electrical = 0.04 x B	$141,600		
	Piping = 0.02 x B	$70,800		
	Insulation for ductwork = 0.01 x B	$35,400		
	Painting = 0.01 x B	$35,400		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,062,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$4,602,000		
Indirect Costs	Engineering = 0.10 x B	$354,000		
	Construction/field expenses = 0.05 x B	$177,000		
	Contractor fees = 0.10 x B	$354,000		
	Start-up = 0.02 x B	$70,800		
	Performance test = 0.01 x B	$35,400		
TOTAL INDIRECT COSTS		$991,200		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980		
TOTAL CAPITAL INVESTMENT		$6,432,180		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$112,305		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$231,288		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$418,031		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)			Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)
	$720,000 x 25%	$180,000	$180,000	$720,000 x 25%
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 42,457 dscfm (5 yrs)	$184,247	$184,247	$2,300,000 / 530,000 dscfm x 42,457 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 42,457 dscfm (5 yrs)	$47,263	$47,263	$590,000 / 530,000 x 42,457 dscfm
	Total costs for 1 replacement every 5 years	$231,511	$231,511	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$46,302	$46,302	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$644,333		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644		
	Property tax = 1% of TCI	$64,322		
	Insurance charges = 1% of TCI	$64,322		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$915,814		
Total Indirect Costs for RTO		$1,217,764		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,862,097		RTO and Including media replacement costs

OSB Sifting/Screening, RTO Only	RTO w/ 10 yr life - Total Annual Control Cost	$1,862,097	per year	
	VOC/HAP Pollutants Destroyed	73.32	tpy	
	CONTROL COST EFFECTIVENESS	$25,398	per ton	

OSB Sifting/Screening, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maint/Clean & Media Replace	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs			*(Kronospan)*					Assume WESP cost by same approach
			$3,000,000	RTO equipment cost			$640,860	$8,000,000 / 530,000 dscfm x 42,457 dscfm
Purchased Equipment Costs	RTO equipment = A	$3,000,000			ESP + auxiliary equipment = A	$640,860		
	Instrumentation = 0.10 x A	$300,000			Instrumentation = 0.10 x A	$64,086		
	Sales tax = 0.03 x A	$90,000			Sales tax = 0.03 x A	$19,226		
	Freight = 0.05 x A	$150,000			Freight = 0.05 x A	$32,043		
Purchased Equipment Costs	PEC = B	$3,540,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$756,215		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200			Foundation/supports = 0.04 x B	$30,249		
	Handling/erection = 0.14 x B	$495,600			Handling/erection = 0.50 x B	$378,108		
	Electrical = 0.04 x B	$141,600			Electrical = 0.08 x B	$60,497		
	Piping = 0.02 x B	$70,800			Piping = 0.01 x B	$7,562		
	Insulation for ductwork = 0.01 x B	$35,400			Insulation for ductwork = 0.02 x B	$15,124		
	Painting = 0.01 x B	$35,400			Painting = 0.02 x B	$15,124		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,062,000				$506,664		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$4,602,000			DC = 1.67 x B + SP + Bldgs	$1,262,879		
Indirect Costs	Engineering = 0.10 x B	$354,000			Engineering = 0.20 x B	$151,243		
	Construction/field expenses = 0.05 x B	$177,000			Construction/field expenses = 0.20 x B	$151,243		
	Contractor fees = 0.10 x B	$354,000			Contractor fees = 0.10 x B	$75,622		
	Start-up = 0.02 x B	$70,800			Start-up = 0.01 x B	$7,562		
	Performance test = 0.01 x B	$35,400			Performance test = 0.01 x B	$7,562		
					Model Study = 0.02 x B	$15,124		
TOTAL INDIRECT COSTS		$991,200			TOTAL INDIRECT COSTS	$408,356		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980			Contingency Cost (15%)	$250,685		
TOTAL CAPITAL INVESTMENT		$6,432,180			TOTAL CAPITAL INVESTMENT	$1,921,921		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8	$23,767		
	Maintenance material = 100% of maintenance	$23,767			Maintenance material = 100% of maintenance labo	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 42,457
Utilities	Electricity	$112,305		From EPA Cost Spreadsheet	Electricity (estimated)	$23,878	$23,878	dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$231,288	$0	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$418,031			Total Direct Costs	$198,316		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				
Annual maintenance/cleaning of RTO	Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 x 25%	$180,000	$57,677	Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 / 530,000 dscfm x 42,457 dscfm	Annual maintenance/cleaning of WESP (sludge & W	$180,000	$180,000	Assume WESP maintenance/cleaning same a WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 42,457 dscfm	$184,247	$184,247	$2,300,000 / 530,000 dscfm x 42,457 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 42,457 dscfm	$47,263	$47,263	$590,000 / 530,000 x 42,457 dscfm				
	Costs for 1 replacement every 10 years	$231,511	$231,511	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs /	$23,151	$23,151	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$378,316						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Cost	$999,498			Updated Total Direct Costs	$378,316		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenanc	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644			Administrative = 2% of TCI	$38,438		
	Property tax = 1% of TCI	$64,322			Property tax = 1% of TCI	$19,219		
	Insurance charges = 1% of TCI	$64,322			Insurance charges = 1% of TCI	$19,219		
	Capital Recovery (20 yrs at 7% so CRF=0.09	$607,133			Capital Recovery (20 yrs at 7% so CRF=0.0943	$181,410		
Total Indirect Costs for RTO		$909,084						
Total Indirect Costs for WESP	Add WESP costs	$302,950			Total Indirect Costs for WESP	$302,950		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annua	$2,211,532		RTO and Including media replacement & WESP	UPDATED TOTAL ANNUAL COST	$681,266	$681,266	WESP costs added to RTO costs for 20 yr life
OSB Sifting/Screening, RTO w/ WESP	20 yr life and WESP - Annual Control Cost	$2,211,532	per year					
	Pollutant to be removed	73.32	tpy					
	CONTROL COST EFFECTIVENESS	$30,164	per ton					

RTO w/ 20 yr life and no WESP - Annual Control Cost	$1,530,266	per year	= $2,211,532 - $378,316 - $302,950
Pollutant to be removed	73.32	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$20,872	per ton	

Kronospan - Eastaboga, AL

OSB Sifting/Screening, Recup TO Onl	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maint/Clean & Media Replace
Capital Cost Summary	Recup TO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$5,600,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		
	Instrumentation = 0.10 x A	$560,000		
	Sales tax = 0.03 x A	$168,000		
	Freight = 0.05 x A	$280,000		
Purchased Equipment Costs	PEC = B	$6,608,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		
	Handling/erection = 0.14 x B	$925,120		
	Electrical = 0.04 x B	$264,320		
	Piping = 0.02 x B	$132,160		
	Insulation for ductwork = 0.01 x B	$66,080		
	Painting = 0.01 x B	$66,080		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,982,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$8,590,400		
Indirect Costs	Engineering = 0.10 x B	$660,800		
	Construction/field expenses = 0.05 x B	$330,400		
	Contractor fees = 0.10 x B	$660,800		
	Start-up = 0.02 x B	$132,160		
	Performance test = 0.01 x B	$66,080		
TOTAL INDIRECT COSTS		$1,850,240		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,566,096		
TOTAL CAPITAL INVESTMENT		$12,006,736		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$112,305		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,504,486		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,691,229		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 x 25%	$180,000	$180,000	Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 x 25%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 42,457 dscfm (5 yrs)	$184,247	$184,247	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 42,457 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 42,457 dscfm (5 yrs)	$47,263	$47,263	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 42,457 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$231,511 $46,302	$231,511 $46,302	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,917,531		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135		
	Property tax = 1% of TCI	$120,067		
	Insurance charges = 1% of TCI	$120,067		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,709,519		
Total Indirect Costs for Recup TO		$2,234,452		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,151,983		Recup TO and Including media replacement costs
OSB Sifting/Screening, Recup TO Onl	Recup TO w/ 10 yr life - Total Annual Control Cost	$4,151,983	per year	
	VOC/HAP Pollutants Destroyed	75.63	tpy	
	CONTROL COST EFFECTIVENESS	$54,897	per ton	

OSB Sift/Screening, Recup TO w WESP	*EPA Cost Manual, 7th Ed., Nov 2017*		*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency		*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	Recup TO Costs		For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs			*(Kronospan)*					Assume WESP cost by same approach
			$5,600,000	Recup TO equipment cost			$640,860	$8,000,000 / 530,000 dscfm x 42,457 dscfm
Purchased Equipment Costs	Recup TO equipment = A		$5,600,000		ESP + auxiliary equipment = A	$640,860		
	Instrumentation = 0.10 x A		$560,000		Instrumentation = 0.10 x A	$64,086		
	Sales tax = 0.03 x A		$168,000		Sales tax = 0.03 x A	$19,226		
	Freight = 0.05 x A		$280,000		Freight = 0.05 x A	$32,043		
Purchased Equipment Costs	PEC = B		$6,608,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$756,215		
Direct Installation Costs	Foundation/supports = 0.08 x B		$528,640		Foundation/supports = 0.04 x B	$30,249		
	Handling/erection = 0.14 x B		$925,120		Handling/erection = 0.50 x B	$378,108		
	Electrical = 0.04 x B		$264,320		Electrical = 0.08 x B	$60,497		
	Piping = 0.02 x B		$132,160		Piping = 0.01 x B	$7,562		
	Insulation for ductwork = 0.01 x B		$66,080		Insulation for ductwork = 0.02 x B	$15,124		
	Painting = 0.01 x B		$66,080		Painting = 0.02 x B	$15,124		
	Site Preparation (SP)		$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)		$0		Buildings (Bldgs)	$0		
Direct Installation Costs			$1,982,400			$506,664		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs		$8,590,400		DC = 1.67 x B + SP + Bldgs	$1,262,879		
Indirect Costs	Engineering = 0.10 x B		$660,800		Engineering = 0.20 x B	$151,243		
	Construction/field expenses = 0.05 x B		$330,400		Construction/field expenses = 0.20 x B	$151,243		
	Contractor fees = 0.10 x B		$660,800		Contractor fees = 0.10 x B	$75,622		
	Start-up = 0.02 x B		$132,160		Start-up = 0.01 x B	$7,562		
	Performance test = 0.01 x B		$66,080		Performance test = 0.01 x B	$7,562		
					Model Study = 0.02 x B	$15,124		
TOTAL INDIRECT COSTS			$1,850,240		TOTAL INDIRECT COSTS	$408,356		
Contingency Cost (15%)	Total Capital Investment x 0.15		$1,566,096		Contingency Cost (15%)	$250,685		
TOTAL CAPITAL INVESTMENT			$12,006,736		TOTAL CAPITAL INVESTMENT	$1,921,921		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor		$3,509		Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 h	$23,767		
	Maintenance material = 100% of maintenance labor		$23,767		Maintenance material = 100% of maintenance labo	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 42,457
Utilities	Electricity		$112,305	From EPA Cost Spreadsheet	Electricity (estimated)	$136,183	$136,183	dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas		$1,504,486	$0 From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs			$1,691,229		Total Direct Costs	$310,621		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)			Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)				Assume WESP maintenance/cleaning same a
	$720,000 x 25%		$180,000	$180,000 $720,000 x 25%	Annual maintenance/cleaning of WESP (sludge & W	$180,000	$180,000	WESP maintenance (sludge & wastewater)
Media costs	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 42,457 dscfm		$184,247	$184,247 $2,300,000 / 530,000 dscfm x 42,457 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 42,457 dscfm		$47,263	$47,263 $590,000 / 530,000 x 42,457 dscfm				
	Costs for 1 replacement every 10 years		$231,511	$231,511 Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs		$23,151	$23,151 Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs		$490,621					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs		$2,385,001		Updated Total Direct Costs	$490,621		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)		$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI		$240,135		Administrative = 2% of TCI	$38,438		
	Property tax = 1% of TCI		$120,067		Property tax = 1% of TCI	$19,219		
	Insurance charges = 1% of TCI		$120,067		Insurance charges = 1% of TCI	$19,219		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)		$1,133,316		Capital Recovery (20 yrs at 7% so CRF=0.0943	$181,410		
Total Indirect Costs for Recup TO			$1,658,248					
Total Indirect Costs for WESP	Add WESP costs		$302,950		Total Indirect Costs for WESP	$302,950		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs		$4,346,199	Recup TO & Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$793,571	$793,571	WESP costs added to Recup TO costs for 20 y
OSB Sift/Screening, Recup TO w WESP	Recup w/ 20 yr life and WESP - Annual Control Cost		$4,346,199	per year				
	Pollutant to be removed		75.63	tpy				
	CONTROL COST EFFECTIVENESS		$57,465	per ton				

Recup TO w/ 20 yr life and no WESP - Annual Control Cost	$3,552,628	per year	= $4,346,199 - $490,621 - $302,950
Pollutant to be removed	75.63	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$46,973	per ton	

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OSB Sifting/Screening, RCO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$4,050,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$4,050,000		
	Instrumentation = 0.10 x A	$405,000		
	Sales tax = 0.03 x A	$121,500		
	Freight = 0.05 x A	$202,500		
Purchased Equipment Costs	PEC = B	$4,779,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		
	Handling/erection = 0.14 x B	$669,060		
	Electrical = 0.04 x B	$191,160		
	Piping = 0.02 x B	$95,580		
	Insulation for ductwork = 0.01 x B	$47,790		
	Painting = 0.01 x B	$47,790		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,433,700		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$6,212,700		
Indirect Costs	Engineering = 0.10 x B	$477,900		
	Construction/field expenses = 0.05 x B	$238,950		
	Contractor fees = 0.10 x B	$477,900		
	Start-up = 0.02 x B	$95,580		
	Performance test = 0.01 x B	$47,790		
TOTAL INDIRECT COSTS		$1,338,120		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623		
TOTAL CAPITAL INVESTMENT		$8,683,443		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$135,948		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$773,243		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$13,063		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$996,692		
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 x 25%	$180,000	$180,000	Convert $720,000 maintenance/cleaning from PB RTO Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove) $720,000 x 25%
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 42,457 dscfm (5 yrs)	$184,247	$184,247	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 42,457 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 42,457 dscfm (5 yrs)	$47,263	$47,263	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 42,457 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$231,511 $46,302	$231,511 $46,302	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,222,994		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		
	Property tax = 1% of TCI	$86,834		
	Insurance charges = 1% of TCI	$86,834		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,236,349		
Total Indirect Costs for RCO		$1,628,349		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,851,343		RCO and Including media replacement costs

OSB Sifting/Screening, RCO Only	Total Annual Control Cost	$2,851,343	per year
	VOC/HAP Pollutants Destroyed	69.46	tpy
	CONTROL COST EFFECTIVENESS	$41,051	per ton

OSB Sifting/Screening, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$4,050,000		RCO equipment cost		$640,860	$640,860	$8,000,000 / 530,000 dscfm x 42,457 dscfm
Purchased Equipment Costs	RCO equipment = A	$4,050,000			ESP + auxiliary equipment = A	$640,860		
	Instrumentation = 0.10 x A	$405,000			Instrumentation = 0.10 x A	$64,086		
	Sales tax = 0.03 x A	$121,500			Sales tax = 0.03 x A	$19,226		
	Freight = 0.05 x A	$202,500			Freight = 0.05 x A	$32,043		
Purchased Equipment Costs	PEC = B	$4,779,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$756,215		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320			Foundation/supports = 0.04 x B	$30,249		
	Handling/erection = 0.14 x B	$669,060			Handling/erection = 0.50 x B	$378,108		
	Electrical = 0.04 x B	$191,160			Electrical = 0.08 x B	$60,497		
	Piping = 0.02 x B	$95,580			Piping = 0.01 x B	$7,562		
	Insulation for ductwork = 0.01 x B	$47,790			Insulation for ductwork = 0.02 x B	$15,124		
	Painting = 0.01 x B	$47,790			Painting = 0.02 x B	$15,124		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,433,700				$506,664		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$6,212,700			DC = 1.67 x B + SP + Bldgs	$1,262,879		
Indirect Costs	Engineering = 0.10 x B	$477,900			Engineering = 0.20 x B	$151,243		
	Construction/field expenses = 0.05 x B	$238,950			Construction/field expenses = 0.20 x B	$151,243		
	Contractor fees = 0.10 x B	$477,900			Contractor fees = 0.10 x B	$75,622		
	Start-up = 0.02 x B	$95,580			Start-up = 0.01 x B	$7,562		
	Performance test = 0.01 x B	$47,790			Performance test = 0.01 x B	$7,562		
					Model Study = 0.02 x B	$15,124		
TOTAL INDIRECT COSTS		$1,338,120			TOTAL INDIRECT COSTS	$408,356		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623			Contingency Cost (15%)	$250,685		
TOTAL CAPITAL INVESTMENT		$8,683,443			TOTAL CAPITAL INVESTMENT	$1,921,921		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 42,457 dscfm =
Utilities	Electricity	$135,948		From EPA Cost Spreadsheet	Electricity (estimated)	$136,183	$136,183	WESP electricity costs
	Auxiliary Fuel - Natural Gas	$773,243		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$13,063		From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$996,692			Total Direct Costs	$310,621		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				
	Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)			Assume sifter/screening cleaning is 25% of PB cleaning (smaller airflow for OSB, but larger quantity particles more difficult to remove)				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 x 25%	$180,000	$180,000	$720,000 x 25%	Annual maintenance/cleaning of WESP (sludge & WW)	$180,000	$180,000	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 42,457 dscfm	$184,247	$184,247	$2,300,000 / 530,000 dscfm x 42,457 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 42,457 dscfm	$47,263	$47,263	$590,000 / 530,000 x 42,457 dscfm				
	Costs for 1 replacement every 10 years	$231,511	$231,511	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$23,151	$23,151	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$490,621						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,690,464			Updated Total Direct Costs	$490,621		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Previously used $44,663	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		Previously used $145,796	Administrative = 2% of TCI	$38,438		
	Property tax = 1% of TCI	$86,834		Previously used $72,898	Property tax = 1% of TCI	$19,219		
	Insurance charges = 1% of TCI	$86,834		Previously used $72, 898	Insurance charges = 1% of TCI	$19,219		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$819,630		Previously used $263,177	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$181,410		
Total Indirect Costs for RCO		$1,211,631						
Total Indirect Costs for WESP	Add WESP costs	$302,950			Total Indirect Costs for WESP	$302,950		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,205,045		RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$793,571	$793,571	WESP costs added to RCO costs for 20 yr life
OSB Sifting/Screening, RCO w. WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$3,205,045	per year	Previously used $1,477,159				
	Pollutant to be removed	69.46	tpy	Previously used 88.75				
	CONTROL COST EFFECTIVENESS	$46,144	per ton	RCO and Including media replacement & WESP costs				

RCO w/ 20 yr life and no WESP - Annual Control Cost	$2,411,474	per year	= $3,205,045 - $490,621 - $302,950
Pollutant to be removed	69.46	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$34,718	per ton	

Supporting Documentation for Table 3-35, Summary of Thermal and Catalytic Oxidizer Costs for OSB Press Hall (Total VOCs)

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OSB Press Hall (after scrubber), RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$6,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$6,000,000		
	Instrumentation = 0.10 x A	$600,000		
	Sales tax = 0.03 x A	$180,000		
	Freight = 0.05 x A	$300,000		
Purchased Equipment Costs	PEC = B	$7,080,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$566,400		
	Handling/erection = 0.14 x B	$991,200		
	Electrical = 0.04 x B	$283,200		
	Piping = 0.02 x B	$141,600		
	Insulation for ductwork = 0.01 x B	$70,800		
	Painting = 0.01 x B	$70,800		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$2,124,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$9,204,000		
Indirect Costs	Engineering = 0.10 x B	$600,000		
	Construction/field expenses = 0.05 x B	$300,000		
	Contractor fees = 0.10 x B	$600,000		
	Start-up = 0.02 x B	$120,000		
	Performance test = 0.01 x B	$60,000		
TOTAL INDIRECT COSTS		$1,680,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,632,600		
TOTAL CAPITAL INVESTMENT		$12,516,600		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$267,525		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$552,771		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$894,734		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,142,427		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$250,332		
	Property tax = 1% of TCI	$125,166		
	Insurance charges = 1% of TCI	$125,166		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,782,114		
Total Indirect Costs for RTO		$2,327,441		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,469,867		RTO and Including media replacement costs

OSB Press Hall (after scrubber), RTO	RTO w/ 10 yr life - Total Annual Control Cost	$3,469,867	per year
	VOC/HAP Pollutants Destroyed	42.98	tpy
	CONTROL COST EFFECTIVENESS	$80,732	per ton

OSB Press Hall (after scrubber), RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs		*(Kronospan)*					*estimate)*	Assume WESP cost by using same approach as PB
		$6,000,000		RTO equipment cost		$1,526,611	$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	RTO equipment = A	$6,000,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$600,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$180,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$300,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$7,080,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$566,400			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$991,200			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$283,200			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$141,600			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$70,800			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$70,800			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$2,124,000				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$9,204,000			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$600,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$300,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$600,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$120,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$60,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$1,680,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$11,594,809			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
								$1,700,000 / 530,000 dscfm x 101,138 dscfm =
Utilities	Electricity	$267,525		From EPA Cost Spreadsheet	Electricity (estimated)	$56,880	$56,880	total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$552,771		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$894,734			Total Direct Costs	$231,318		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$368,713						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$1,455,991			Updated Total Direct Costs	$368,713		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$250,332			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$125,166			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$125,166			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for RTO		$1,059,725						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$3,175,651		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,028,648	$1,028,648	WESP costs to be added to RTO costs for 20 yr life

OSB Press Hall (after scrubber), RTO w/ WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$3,175,651	per year				
	Pollutant to be removed	42.98	tpy				
	CONTROL COST EFFECTIVENESS	$73,887	per ton				
	RTO w/ 20 yr life and no WESP - Annual Control Cost	$2,147,003	per year	= $3,175,651 - $368,713 - $659,936			
	Pollutant to be removed	42.98	tpy				
	CONTROL COST EFFECTIVENESS w/o WESP	$49,954	per ton				

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OSB Press Hall (after scrubber), Recup TO VOC Cost Effectiveness Capital Cost Summary	*EPA Cost Manual, 7th Ed., Nov 2017* Recup TO Costs	*EPA Cost Spreadsheet, Dec 2024* Recup TO 98% Control Efficiency For 10 year Equipment Life		Estimated Additional Costs Maintenance/Cleaning & Media Replacement Assume 5 year Media Life
Direct Costs			*(Kronospan)* $11,200,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$11,200,000		
	Instrumentation = 0.10 x A	$1,120,000		
	Sales tax = 0.03 x A	$336,000		
	Freight = 0.05 x A	$560,000		
Purchased Equipment Costs	PEC = B	$13,216,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,057,280		
	Handling/erection = 0.14 x B	$1,850,240		
	Electrical = 0.04 x B	$528,640		
	Piping = 0.02 x B	$264,320		
	Insulation for ductwork = 0.01 x B	$132,160		
	Painting = 0.01 x B	$132,160		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$3,964,800		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$17,180,800		
Indirect Costs	Engineering = 0.10 x B	$1,120,000		
	Construction/field expenses = 0.05 x B	$560,000		
	Contractor fees = 0.10 x B	$1,120,000		
	Start-up = 0.02 x B	$224,000		
	Performance test = 0.01 x B	$112,000		
TOTAL INDIRECT COSTS		$3,136,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,047,520		
TOTAL CAPITAL INVESTMENT		$23,364,320		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$267,525		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$3,579,094		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,921,057		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$4,168,750		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$467,286		
	Property tax = 1% of TCI	$233,643		
	Insurance charges = 1% of TCI	$233,643		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$3,326,612		
Total Indirect Costs for Recup TO		$4,305,848		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$8,474,597		Recup TO and Including media replacement costs

OSB Press Hall (after scrubber), Recup TO	Recup TO w/ 10 yr life - Total Annual Control Cost	$8,474,597	per year	
	VOC/HAP Pollutants Destroyed	44.34	tpy	
	CONTROL COST EFFECTIVENESS	$191,125	per ton	

OSB Press Hall (after scrubber), Recup TO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		Recup TO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs		*(Kronospan)*					*(Kronospan estimate)*	Assume WESP cost by using same approach as PB
		$11,200,000		Recup TO equipment cost			$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$11,200,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$1,120,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$336,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$560,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$13,216,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,057,280			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$1,850,240			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$528,640			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$264,320			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$132,160			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$132,160			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$3,964,800				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$17,180,800			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$1,120,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$560,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$1,120,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$224,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$112,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$3,136,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$21,027,609			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$267,525		From EPA Cost Spreadsheet	Electricity (estimated)	$56,880	$56,880	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm = total Recup TO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$3,579,094		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$3,921,057			Total Direct Costs	$231,318		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$368,713						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$4,482,314			Updated Total Direct Costs	$368,713		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$467,286			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$233,643			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$233,643			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for Recup TO		$1,493,634						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,635,883		Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$1,028,648	$1,028,648	WESP costs added to Recup TO costs for 20 yr life

OSB Press Hall (after scrubber), Recup TO w/ WESP	Recup TO w/ 20 yr life and WESP - Annual Control Cost	$6,635,883	per year	
	Pollutant to be removed	44.34	tpy	
	CONTROL COST EFFECTIVENESS	$149,657	per ton	Recup TO and Including media replacement & WESP costs
	Recup TO w/ 20 yr life and no WESP - Annual Control Cost	$5,607,235	per year	= $6,635,883 - $368,713 - $659,936
	Pollutant to be removed	44.34	tpy	
	CONTROL COST EFFECTIVENESS w/o WESP	$126,459	per ton	

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OSB Press Hall (after scrubber), RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RCO 90% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$8,100,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$8,100,000		
	Instrumentation = 0.10 x A	$810,000		
	Sales tax = 0.03 x A	$243,000		
	Freight = 0.05 x A	$405,000		
Purchased Equipment Costs	PEC = B	$9,558,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640		
	Handling/erection = 0.14 x B	$1,338,120		
	Electrical = 0.04 x B	$382,320		
	Piping = 0.02 x B	$191,160		
	Insulation for ductwork = 0.01 x B	$95,580		
	Painting = 0.01 x B	$95,580		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$2,867,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$12,425,400		
Indirect Costs	Engineering = 0.10 x B	$810,000		
	Construction/field expenses = 0.05 x B	$405,000		
	Contractor fees = 0.10 x B	$810,000		
	Start-up = 0.02 x B	$162,000		
	Performance test = 0.01 x B	$81,000		
TOTAL INDIRECT COSTS		$2,268,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,204,010		
TOTAL CAPITAL INVESTMENT		$16,897,410		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$323,846		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,829,113		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$2,258,513		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$2,506,206		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948		
	Property tax = 1% of TCI	$168,974		
	Insurance charges = 1% of TCI	$168,974		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$2,405,853		
Total Indirect Costs for RCO		$3,126,413		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,632,618		RCO and Including media replacement costs

OSB Press Hall (after scrubber), RCO	RCO w/ 10 yr life - Total Annual Control Cost	$5,632,618	per year
	VOC/HAP Pollutants Destroyed	40.72	tpy
	CONTROL COST EFFECTIVENESS	$138,323	per ton

OSB Press Hall (after scrubber), RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RCO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$8,100,000		RCO equipment cost		$1,526,611	$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	RCO equipment = A	$8,100,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$810,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$243,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$405,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$9,558,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$1,338,120			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$382,320			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$191,160			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$95,580			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$95,580			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$2,867,400				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$12,425,400			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$810,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$405,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$810,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$162,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$81,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$2,268,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$15,404,209			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm =
Utilities	Electricity	$323,846		From EPA Cost Spreadsheet	Electricity (estimated)	$324,405	$324,405	WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,829,113		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$2,258,513			Total Direct Costs	$498,843		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$636,238						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$3,087,295			Updated Total Direct Costs	$636,238		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$168,974			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$168,974			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for RCO		$1,234,957						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,982,188		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,296,173	$1,296,173	WESP costs to be added to RCO costs for 20 yr life

OSB Press Hall (after scrubber), RCO w/ WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$4,982,188	per year					
	Pollutant to be removed	40.72	tpy					
	CONTROL COST EFFECTIVENESS	$122,350	per ton					
	RCO w/ 20 yr life and no WESP - Annual Control Cost	$3,686,014	per year	= $3,350,884 - $368,713 - $659,936				
	Pollutant to be removed	40.72	tpy					
	CONTROL COST EFFECTIVENESS w/o WESP	$90,519	per ton					

Supporting Documentation for Table 3-36, Summary of Wet Scrubber Costs for OSB Press Hall (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Press Hall, Packed Bed Scrubber Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Packed Bed Scrubber Costs - Used to estimate wet scrubber costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$1,260,840		Replace with Tri-Mer cost proposal 1/21/26
Purchased Equipment Costs	Packed Bed Scrubber equipment = A	$1,260,840		
	Instrumentation = 0.10 x A	$126,084		
	Sales tax = 0.03 x A	$37,825		
	Freight = 0.05 x A	$63,042		
Purchased Equipment Costs	PEC = B	$1,487,791		
Direct Installation Costs	Foundation/supports = 0.12 x B	$178,535		
	Handling/erection = 0.4 x B	$595,116		
	Electrical = 0.01 x B	$14,878		
	Piping = 0.3 x B	$446,337		
	Insulation for ductwork = 0.01 x B	$14,878		
	Painting = 0.01 x B	$14,878		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$1,264,623		
TOTAL DIRECT COSTS	DC = 0.85 x B + SP + Bldg	$2,752,414		
Indirect Costs	Engineering = 0.10 x B	$148,779		
	Construction/field expenses = 0.10 x B	$148,779		
	Contractor fees = 0.10 x B	$148,779		
	Start-up = 0.01 x B	$14,878		
	Performance test = 0.01 x B	$14,878		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$476,093		
Contingency Cost (15%)	Total Capital Investment x 0.15	$484,276		
TOTAL CAPITAL INVESTMENT		$3,712,783		(based on D22+D30+D31)
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$8,881		Estimated from EPA Cost Spreadsheet
	Annual Solvent cost - Assume this is water only	$1,552,164		Estimated: ((160 gal/min x 60 min/hr) + 35 gal/hr)) x 8760 hr/yr x $6.13/1000 gal x 3
	Annual Wastewater Disposal cost	$1,824,042		Estimated: 160 gal/min x 60 min/hr x 8760 hr/yr x $7.23/1000 gal x 3
Utilities	Electricity = Annual usage x Price	$142,321		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,601,846		
Annual maintenance/cleaning of scrubber		$250,000	$250,000	From Kronospan annual cleaning costs $250,000/yr
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$0	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$0	$163,920	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147.250 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0	$802,929 $160,586	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,851,846		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$74,256		
	Property tax = 1% of TCI	$37,128		
	Insurance charges = 1% of TCI	$37,128		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$528,626		
Total Indirect Costs for PB Scrubber		$721,800		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,573,646		Scrubber, not Including media replacement costs

OSB Press Hall, Packed Bed Scrubber Only	Total Annual Control Cost	$4,573,646	per year
	VOC/HAP Pollutants Destroyed	38.46	tpy
	CONTROL COST EFFECTIVENESS	$118,924	per ton

OSB Biomass Heaters, Packed Bed Scrubber / WESP VOC Cost Effectiveness	*EPA Cost Manual, 7th Ed., Nov 2017* Scrubber 85% Control Efficiency	*Tri-Mer Quote and EPA Cost Spreadshee* *EPA Cost Spreadsheet, Dec 2024*		Estimated Actual Costs Maintenance / Cleaning & Media Replacement	*EPA Cost Manual, 6th Ed., Sept 1999* WESP 95% Control Efficiency	*EPA Cost Manual, Sept 1999* Cost Estimate		Estimated Actual Costs
Capital Cost Summary	Packed Bed Scrubber Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs		*(Kronospan)* $1,260,840				$2,222,642	*(Kronospan estimate)* $2,222,642	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available $8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	Packed Bed Scrubber equipment = A	$1,260,840		Packed Bed Scrubber equipment cost	ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$126,084			Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$37,825			Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$63,042			Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$1,487,791			Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$178,535			Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$595,116			Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$14,878			Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$446,337			Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$14,878			Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$14,878			Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,264,623				$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$2,752,414			DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B	$148,779			Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$148,779			Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$148,779			Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$14,878			Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$14,878			Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		$476,093			TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)		$484,276			Contingency Cost (15%)	$869,431		
TOTAL CAPITAL INVESTMENT		$3,712,783			TOTAL CAPITAL INVESTMENT	$6,665,635		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$142,321		From EPA cost spreadsheet	Electricity (estimated)	$463,430	$463,430	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$0	$0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs	From EPA Cost Spreadsheet	$3,601,846			Total Direct Costs	$637,868		
Annual maintenance/cleaning of scrubber		$250,000	$250,000	From Kronospan annual cleaning costs are $250,000/y	Annual maintenance/cleaning of WESP (sludge & WW)	$250,000	$250,000	Assume WESP maint/cleaning same as PB scrubber WESP maintenance (sludge & wastewater)
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$0	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm				
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147.250 dscfm	$0	$155,585	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm				
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$0 $0	$794,594 $79,459	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$887,868	$887,868					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$4,739,714			Updated Total Direct Costs	$887,868		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$74,256			Administrative = 2% of TCI	$133,313		
	Property tax = 1% of TCI	$37,128			Property tax = 1% of TCI	$66,656		
	Insurance charges = 1% of TCI	$37,128			Insurance charges = 1% of TCI	$66,656		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$350,450			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$629,169		
Total Indirect Costs for PB Scrubber		$543,624						
Total Indirect Costs for WESP	Add WESP costs	$940,458			Total Indirect Costs for WESP	$940,458		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,223,796		Scrubber, including WESP, not media replacement cost	UPDATED TOTAL ANNUAL COST	$1,828,326	$1,828,326	WESP costs added to PB scrubber costs for 20 yr life

OSB Biomass Heaters, Packed Bed Scrubber / WESP			
	Annual Control Cost	$6,223,796	per year
	Pollutant to be removed	38.46	tpy
	CONTROL COST EFFECTIVENESS	$161,831	per ton

Annual Control Cost w/o WESP	$4,395,470	per year	= $6,223,796 - $887,868 - $940,458
Pollutant to be removed	38.46	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$114,291	per ton	

Kronospan - Eastaboga, AL

OSB Press Hall, Wet Scrubber	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		Wet Scrubber 85% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Wet Scrubber Costs (based on EPA spreadsheet)	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$2,415,000		From Kronospan quote $2,415,000 + $400,000 ducting
Purchased Equipment Costs	Wet Scrubber equipment = A	$2,415,000		Do not include ducting costs to be conservative
	Instrumentation = 0.10 x A	$254,169		
	Sales tax = 0.03 x A	$76,251		
	Freight = 0.05 x A	$127,085		
Purchased Equipment Costs	PEC = B	$2,872,505		
Direct Installation Costs	Foundation/supports = 0.08 x B	$239,936		
	Handling/erection = 0.14 x B	$419,887		
	Electrical = 0.04 x B	$119,968		
	Piping = 0.02 x B	$59,984		
	Insulation for ductwork = 0.01 x B	$29,992		
	Painting = 0.01 x B	$29,992		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$899,759		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$3,772,264		
Indirect Costs	Engineering = 0.10 x B	$299,920		
	Construction/field expenses = 0.05 x B	$149,960		
	Contractor fees = 0.10 x B	$299,920		
	Start-up = 0.02 x B	$59,984		
	Performance test = 0.01 x B	$29,992		
TOTAL INDIRECT COSTS		$839,776		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809		
TOTAL CAPITAL INVESTMENT		$5,322,849		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$0		Estimated from EPA Cost Spreadsheet, assume $0
	Annual Solvent cost - Assume this is water only	$8,055		Estimated: (50 gal/hr) x 8760 hr/yr x $6.13/1000 gal x 3
	Annual Wastewater Disposal cost	$9,500		Estimated: 50 gal/hr x 8760 hr/yr x $7.23/1000 gal x 3
Utilities	Electricity = Annual usage x Price	$142,321		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		
Total Direct Costs	From EPA Cost Spreadsheet	$234,314		
	Convert $720,000 maintenance/cleaning from PB RTO			
Annual maintenance/cleaning of tank	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$250,000	$250,000	From Kronospan annual cleaning costs are $250,000/yr
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$0	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$0	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$0	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$0	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$484,314		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$108,991		
	Property tax = 1% of TCI	$54,495		
	Insurance charges = 1% of TCI	$54,495		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$775,892		
Total Indirect Costs for Wet Scrubber		$1,038,536		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,522,850		Wet Scrubber costs

OSB Press Hall, Wet Scrubber	Total Annual Control Cost	$1,522,850	per year
	VOC/HAP Pollutants Destroyed	38.46	tpy
	CONTROL COST EFFECTIVENESS	$39,597	per ton

OSB Press Hall, Wet Scrubber with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		Wet Scrubber 85% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	Wet Scrubber Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$2,415,000		Wet scrubber equipment cost		$1,526,611		$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	Wet scrubber equipment = A	$2,415,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$254,169			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$76,251			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$127,085			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$2,872,505			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$239,936			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$419,887			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$119,968			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$59,984			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$29,992			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$29,992			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$899,759				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$3,772,264			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$299,920			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$149,960			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$299,920			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$59,984			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$29,992			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$839,776			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$5,322,849			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$142,321			Electricity (estimated)	$182,084	$182,084	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm = total wet scrubber + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$0			Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$234,314			Total Direct Costs	$356,522		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same
Annual maintenance/cleaning of wet scrubber	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$493,917						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$920,775			Updated Total Direct Costs	$493,917		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$108,991			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$54,495			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$54,495			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for Wet Scrubber		$777,042						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,357,752		Wet scrubber and Including media replacement & WES	UPDATED TOTAL ANNUAL COST	$1,153,852	$1,153,852	WESP costs added to wet scrubber costs for 20 yr lif

OSB Press Hall, Wet Scrubber with WESP	Wet Scrubber - Annual Control Cost	$2,357,752	per year	
	Pollutant to be removed	38.46	tpy	
	CONTROL COST EFFECTIVENESS	$61,306	per ton	
	Wet Scrubber w/ no WESP - Annual Control Cost	$1,203,900	per year	= $2,357,752 - $493,917 - $659,936
	Pollutant to be removed	38.46	tpy	
	CONTROL COST EFFECTIVENESS w/o WESP	$31,304	per ton	

Supporting Documentation for Table 3-43, Summary of Thermal and Catalytic Oxidizer Costs for OSB Press Hall (Total CO)

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Kronospan - Eastaboga, AL

OSB Press Hall (after scrubber), RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
CO Cost Effectiveness		RCO 75% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$8,100,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$8,100,000		
	Instrumentation = 0.10 x A	$810,000		
	Sales tax = 0.03 x A	$243,000		
	Freight = 0.05 x A	$405,000		
Purchased Equipment Costs	PEC = B	$9,558,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640		
	Handling/erection = 0.14 x B	$1,338,120		
	Electrical = 0.04 x B	$382,320		
	Piping = 0.02 x B	$191,160		
	Insulation for ductwork = 0.01 x B	$95,580		
	Painting = 0.01 x B	$95,580		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$2,867,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$12,425,400		
Indirect Costs	Engineering = 0.10 x B	$810,000		
	Construction/field expenses = 0.05 x B	$405,000		
	Contractor fees = 0.10 x B	$810,000		
	Start-up = 0.02 x B	$162,000		
	Performance test = 0.01 x B	$81,000		
TOTAL INDIRECT COSTS		$2,268,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,204,010		
TOTAL CAPITAL INVESTMENT		$16,897,410		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$323,846		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,829,113		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$2,258,513		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$2,506,206		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948		
	Property tax = 1% of TCI	$168,974		
	Insurance charges = 1% of TCI	$168,974		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$2,405,853		
Total Indirect Costs for RCO		$3,126,413		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,632,618		RCO and Including media replacement costs

OSB Press Hall (after scrubber), RCO	RCO w/ 10 yr life - Total Annual Control Cost	$5,632,618	per year
	CO Pollutants Destroyed	41.95	tpy
	CONTROL COST EFFECTIVENESS	$134,272	per ton

OSB Press Hall (after scrubber), RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness		RCO 75% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$8,100,000		RCO equipment cost		$1,526,611	$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	RCO equipment = A	$8,100,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$810,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$243,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$405,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$9,558,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$1,338,120			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$382,320			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$191,160			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$95,580			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$95,580			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$2,867,400				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$12,425,400			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$810,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$405,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$810,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$162,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$81,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$2,268,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$15,404,209			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm =
Utilities	Electricity	$323,846		From EPA Cost Spreadsheet	Electricity (estimated)	$324,405	$324,405	WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,829,113		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$2,258,513			Total Direct Costs	$498,843		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$636,238						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$3,087,295			Updated Total Direct Costs	$636,238		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$168,974			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$168,974			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for RCO		$1,234,957						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,982,188		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,296,173	$1,296,173	WESP costs to be added to RCO costs for 20 yr life

OSB Press Hall (after scrubber), RCO w/ WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$4,982,188	per year	
	Pollutant to be removed	41.95	tpy	
	CONTROL COST EFFECTIVENESS	$118,766	per ton	RCO and Including media replacement & WESP costs

RCO w/ 20 yr life and no WESP - Annual Control Cost	$3,686,014	per year	= $4,982,188 - $636,238 - $659,936
Pollutant to be removed	41.95	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$87,868	per ton	

Kronospan - Eastaboga, AL

OSB Press Hall (after scrubber), Recup TO CO Cost Effectiveness Capital Cost Summary	*EPA Cost Manual, 7th Ed., Nov 2017* Recup TO Costs	*EPA Cost Spreadsheet, Dec 2024* Recup TO 75% Control Efficiency For 10 year Equipment Life		Estimated Additional Costs Maintenance/Cleaning & Media Replacement Assume 5 year Media Life
Direct Costs		*(Kronospan)* $11,200,000		Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$11,200,000		
	Instrumentation = 0.10 x A	$1,120,000		
	Sales tax = 0.03 x A	$336,000		
	Freight = 0.05 x A	$560,000		
Purchased Equipment Costs	PEC = B	$13,216,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,057,280		
	Handling/erection = 0.14 x B	$1,850,240		
	Electrical = 0.04 x B	$528,640		
	Piping = 0.02 x B	$264,320		
	Insulation for ductwork = 0.01 x B	$132,160		
	Painting = 0.01 x B	$132,160		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$3,964,800		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$17,180,800		
Indirect Costs	Engineering = 0.10 x B	$1,120,000		
	Construction/field expenses = 0.05 x B	$560,000		
	Contractor fees = 0.10 x B	$1,120,000		
	Start-up = 0.02 x B	$224,000		
	Performance test = 0.01 x B	$112,000		
TOTAL INDIRECT COSTS		$3,136,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,047,520		
TOTAL CAPITAL INVESTMENT		$23,364,320		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$267,525		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$3,579,094		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,921,057		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$4,168,750		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$467,286		
	Property tax = 1% of TCI	$233,643		
	Insurance charges = 1% of TCI	$233,643		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$3,326,612		
Total Indirect Costs for Recup TO		$4,305,848		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$8,474,597		Recup TO and Including media replacement costs

OSB Press Hall (after scrubber), Recup TO	Recup TO w/ 10 yr life - Total Annual Control Cost	$8,474,597	per year	
	CO Pollutants Destroyed	41.95	tpy	
	CONTROL COST EFFECTIVENESS	$202,019	per ton	

OSB Press Hall (after scrubber), Recup TO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness		Recup TO 75% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$11,200,000		Recup TO equipment cost			$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$11,200,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$1,120,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$336,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$560,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$13,216,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,057,280			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$1,850,240			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$528,640			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$264,320			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$132,160			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$132,160			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$3,964,800				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$17,180,800			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$1,120,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$560,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$1,120,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$224,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$112,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$3,136,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$21,027,609			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm =
Utilities	Electricity	$267,525		From EPA Cost Spreadsheet	Electricity (estimated)	$56,880	$56,880	total Recup TO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$3,579,094		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$3,921,057			Total Direct Costs	$231,318		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$368,713						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$4,482,314			Updated Total Direct Costs	$368,713		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$467,286			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$233,643			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$233,643			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for Recup TO		$1,493,634						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,635,883		Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$1,028,648	$1,028,648	WESP costs added to Recup TO costs for 20 yr life

OSB Press Hall (after scrubber), Recup TO w/ WESP	Recup TO w/ 20 yr life and WESP - Annual Control Cost	$6,635,883	per year	
	Pollutant to be removed	41.95	tpy	
	CONTROL COST EFFECTIVENESS	$158,188	per ton	Recup TO and Including media replacement & WESP costs
	Recup TO w/ 20 yr life and no WESP - Annual Control Cost	$5,607,235	per year	= $6,635,883 - $368,713 - $659,936
	Pollutant to be removed	41.95	tpy	
	CONTROL COST EFFECTIVENESS w/o WESP	$133,666	per ton	

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OSB Press Hall (after scrubber), RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
CO Cost Effectiveness		RCO 75% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$8,100,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$8,100,000		
	Instrumentation = 0.10 x A	$810,000		
	Sales tax = 0.03 x A	$243,000		
	Freight = 0.05 x A	$405,000		
Purchased Equipment Costs	PEC = B	$9,558,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640		
	Handling/erection = 0.14 x B	$1,338,120		
	Electrical = 0.04 x B	$382,320		
	Piping = 0.02 x B	$191,160		
	Insulation for ductwork = 0.01 x B	$95,580		
	Painting = 0.01 x B	$95,580		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$2,867,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$12,425,400		
Indirect Costs	Engineering = 0.10 x B	$810,000		
	Construction/field expenses = 0.05 x B	$405,000		
	Contractor fees = 0.10 x B	$810,000		
	Start-up = 0.02 x B	$162,000		
	Performance test = 0.01 x B	$81,000		
TOTAL INDIRECT COSTS		$2,268,000		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,204,010		
TOTAL CAPITAL INVESTMENT		$16,897,410		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$323,846		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,829,113		From EPA Cost Spreadsheet
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$2,258,513		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$2,506,206		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948		
	Property tax = 1% of TCI	$168,974		
	Insurance charges = 1% of TCI	$168,974		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$2,405,853		
Total Indirect Costs for RCO		$3,126,413		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,632,618		RCO and Including media replacement costs

OSB Press Hall (after scrubber), RCO	RCO w/ 10 yr life - Total Annual Control Cost	$5,632,618	per year
	CO Pollutants Destroyed	41.95	tpy
	CONTROL COST EFFECTIVENESS	$134,272	per ton

OSB Press Hall (after scrubber), RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness		RCO 75% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$8,100,000		RCO equipment cost		$1,526,611	$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	RCO equipment = A	$8,100,000			ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A	$810,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A	$243,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A	$405,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B	$9,558,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B	$764,640			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B	$1,338,120			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B	$382,320			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B	$191,160			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B	$95,580			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B	$95,580			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$2,867,400				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$12,425,400			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B	$810,000			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B	$405,000			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B	$810,000			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B	$162,000			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B	$81,000			Performance test = 0.01 x B	$18,014		
					Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS		$2,268,000			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15	$710,809			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT		$15,404,209			TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 101,138 dscfm =
Utilities	Electricity	$323,846		From EPA Cost Spreadsheet	Electricity (estimated)	$324,405	$324,405	WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,829,113		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement cost	Catalyst replacement	$31,116		From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$2,258,513			Total Direct Costs	$498,843		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm	$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$636,238						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$3,087,295			Updated Total Direct Costs	$636,238		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$337,948			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI	$168,974			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI	$168,974			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$514,398			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for RCO		$1,234,957						
Total Indirect Costs for WESP	Add WESP costs	$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,982,188		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,296,173	$1,296,173	WESP costs to be added to RCO costs for 20 yr life

OSB Press Hall (after scrubber), RCO w/ WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$4,982,188	per year					
	Pollutant to be removed	41.95	tpy					
	CONTROL COST EFFECTIVENESS	$118,766	per ton	RCO and Including media replacement & WESP costs				

RCO w/ 20 yr life and no WESP - Annual Control Cost	$3,686,014	per year	= $4,982,188 - $636,238 - $659,936
Pollutant to be removed	41.95	tpy	
CONTROL COST EFFECTIVENESS	$87,868	per ton	
w/o WESP			

Supporting Documentation for Table 3-44, Summary of Biofilter Costs for OSB Press Hall (Total CO)

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OSB Press Hall (after scrubber), Biofilter	*EPA Cost Manual, 6th Ed., Jan 2022*	*EPA Cost Manual, 6th Ed., Jan 2022*		Estimated Additional Costs
CO Cost Effectiveness		Biofilter 95% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Biofilter Costs	For 10 year Equipment Life		Assume 5 year Biofilter Bed Life
Direct Costs			*(Kronospan)*	
			$4,200,000	Assume equipment cost based on info provided.
Purchased Equipment Costs	Biofilter equipment = A	$4,200,000		
	Instrumentation = 0.10 x A	$420,000		
	Sales tax = 0.03 x A	$126,000		
	Freight = 0.05 x A	$210,000		
Purchased Equipment Costs	PEC = B	$4,956,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$396,480		
	Handling/erection = 0.14 x B	$693,840		
	Electrical = 0.04 x B	$198,240		
	Piping = 0.02 x B	$99,120		
	Insulation for ductwork = 0.01 x B	$49,560		
	Painting = 0.01 x B	$49,560		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,486,800		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$6,442,800		
Indirect Costs	Engineering = 0.10 x B	$495,600		
	Construction/field expenses = 0.05 x B	$247,800		
	Contractor fees = 0.10 x B	$495,600		
	Start-up = 0.02 x B	$99,120		
	Performance test = 0.01 x B	$49,560		
TOTAL INDIRECT COSTS		$1,387,680		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,174,572		
TOTAL CAPITAL INVESTMENT		$9,005,052		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$143,058		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0	$190,826	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 101,138 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$217,496		Assume biofilter bed costs are similar to RTO costs
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of biofilter	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$112,588	$112,588	$590,000 / 530,000 x 101.138 dscfm
	Total costs for 1 replacement every 5 years	$551,488	$551,488	Total costs for 1 replacement every 5 years
Annualized (filter bed replacement) costs	Annualized cost = (filter bed replacement costs) / 5 yrs	$110,298	$110,298	Annualized cost = (filter bed replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$217,496		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$108,990		
	Property tax = 1% of TCI	$54,495		
	Insurance charges = 1% of TCI	$54,495		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,282,139		
Total Indirect Costs for Biofilter		$1,544,782		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,762,278		Biofilter and Including biofilter bed replacement costs

OSB Press Hall (after scrubber), Biofilter	Biofilter - Total Annual Control Cost	$1,762,278	per year
	CO Pollutants Destroyed	43.07	tpy
	CONTROL COST EFFECTIVENESS	$40,918	per ton

OSB Press Hall (after scrubber), Biofilter CO Cost Effectiveness Capital Cost Summary	*EPA Cost Manual, 6th Ed., Jan 2022* Biofilter Costs		*EPA Cost Manual, Jan 2002* Biofilter 85% Control Efficiency For 20 year Equipment Life		Estimated Actual Costs Maintenance/Cleaning & Media Replacement Assume 10 year Biofilter Bed Life	*EPA Cost Manual, 6th Ed., Sept 1999* WESP Costs	*EPA Cost Manual, Sept 1999* WESP 95% Control Efficiency Assume 20 year Equipment Life		Estimated Actual Costs
Direct Costs			*(Kronospan)*					*(Kronospan estimate)*	Assume WESP cost by using same approach as PB
								$1,526,611	$8,000,000 / 530,000 dscfm x 101,138 dscfm
Purchased Equipment Costs	Biofilter equipment = A		$4,200,000	$4,200,000	Assume equipment cost based on info provided.	ESP + auxiliary equipment = A	$1,526,611		
	Instrumentation = 0.10 x A		$420,000			Instrumentation = 0.10 x A	$152,661		
	Sales tax = 0.03 x A		$126,000			Sales tax = 0.03 x A	$45,798		
	Freight = 0.05 x A		$210,000			Freight = 0.05 x A	$76,331		
Purchased Equipment Costs	PEC = B		$4,956,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$1,801,401		
Direct Installation Costs	Foundation/supports = 0.08 x B		$396,480			Foundation/supports = 0.04 x B	$72,056		
	Handling/erection = 0.14 x B		$693,840			Handling/erection = 0.50 x B	$900,701		
	Electrical = 0.04 x B		$198,240			Electrical = 0.08 x B	$144,112		
	Piping = 0.02 x B		$99,120			Piping = 0.01 x B	$18,014		
	Insulation for ductwork = 0.01 x B		$49,560			Insulation for ductwork = 0.02 x B	$36,028		
	Painting = 0.01 x B		$49,560			Painting = 0.02 x B	$36,028		
	Site Preparation (SP)		$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)		$0			Buildings (Bldgs)	$0		
Direct Installation Costs			$1,486,800				$1,206,939		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs		$6,442,800			DC = 1.67 x B + SP + Bldgs	$3,008,340		
Indirect Costs	Engineering = 0.10 x B		$495,600			Engineering = 0.20 x B	$360,280		
	Construction/field expenses = 0.05 x B		$247,800			Construction/field expenses = 0.20 x B	$360,280		
	Contractor fees = 0.10 x B		$495,600			Contractor fees = 0.10 x B	$180,140		
	Start-up = 0.02 x B		$99,120			Start-up = 0.01 x B	$18,014		
	Performance test = 0.01 x B		$49,560			Performance test = 0.01 x B	$18,014		
						Model Study = 0.02 x B	$36,028		
TOTAL INDIRECT COSTS			$1,387,680			TOTAL INDIRECT COSTS	$972,757		
Contingency Cost (15%)	Total Capital Investment x 0.15		$1,174,572			Contingency Cost (15%)	$597,165		
TOTAL CAPITAL INVESTMENT			$9,005,052	$9,000,000		TOTAL CAPITAL INVESTMENT	$4,578,262		
Annual Cost Summary									
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor		$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor		$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity		$143,058			Electricity (estimated)	$143,058	$143,058	Use electricity from biofilter cost calculation for controlling VOC from Huber USB 2006 application.
	Auxiliary Fuel - Natural Gas		$0	$0	Auxiliary Fuel - Natural Gas for Biofilter	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
						Water Usage (estimated)	$50,000		
						Chemical Usage (estimated)	$50,000		
Total Direct Costs			$217,496			Total Direct Costs	$317,496		
	Convert $720,000 maintenance/cleaning from PB RTO				Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Biofilter	$720,000 / 530,000 dscfm x 101,138 dscfm		$137,395	$137,395	$720,000 / 530,000 dscfm x 101,138 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$137,395	$137,395	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO				Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 101,138 dscfm		$438,901	$438,901	$2,300,000 / 530,000 dscfm x 101,138 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)				Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 101,138 dscfm		$112,588	$112,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years		$551,488	$551,488	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs		$55,149	$55,149	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs		$454,891						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs		$864,931			Updated Total Direct Costs	$454,891		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)		$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI		$108,990			Administrative = 2% of TCI	$91,565		
	Property tax = 1% of TCI		$54,495			Property tax = 1% of TCI	$45,783		
	Insurance charges = 1% of TCI		$54,495			Insurance charges = 1% of TCI	$45,783		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)		$849,987			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$432,142		
Total Indirect Costs for Biofilter			$1,112,630						
Total Indirect Costs for WESP	Add WESP costs		$659,936			Total Indirect Costs for WESP	$659,936		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs		$2,637,496		Biofilter and Including bed replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,114,827	$1,114,827	WESP costs added to biofilter costs for 20 yr life

OSB Press Hall (after scrubber), Biofilter	Biofilter - Annual Control Cost	$2,637,496	per year	
	CO Pollutant to be removed	43.07	tpy	
	CONTROL COST EFFECTIVENESS	$61,240	per ton	
	Biofilter - Annual Control Cost w/o WESP	$1,522,670	per year	= $2,637,496 - $454,891- $659,936
	Pollutant to be removed	43.07	tpy	
	CONTROL COST EFFECTIVENESS w/o WESP	$35,355	per ton	

Supporting Documentation for Table 3-51, Summary of Thermal and Catalytic Oxidizer Costs for Dust and Granulate Operations (Total VOCs)

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Kronospan - Eastaboga, AL

OSB Dust/Granulate, RTO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$3,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$3,000,000		
	Instrumentation = 0.10 x A	$300,000		
	Sales tax = 0.03 x A	$90,000		
	Freight = 0.05 x A	$150,000		
Purchased Equipment Costs	PEC = B	$3,540,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200		
	Handling/erection = 0.14 x B	$495,600		
	Electrical = 0.04 x B	$141,600		
	Piping = 0.02 x B	$70,800		
	Insulation for ductwork = 0.01 x B	$35,400		
	Painting = 0.01 x B	$35,400		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,062,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$4,602,000		
Indirect Costs	Engineering = 0.10 x B	$354,000		
	Construction/field expenses = 0.05 x B	$177,000		
	Contractor fees = 0.10 x B	$354,000		
	Start-up = 0.02 x B	$70,800		
	Performance test = 0.01 x B	$35,400		
TOTAL INDIRECT COSTS		$991,200		
Contingency Cost (15%)	Total Capital Investment x 0.15	$838,980		
TOTAL CAPITAL INVESTMENT		$6,432,180		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$117,921		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$242,871	$84,113	Assume natural gas cost by same approach as PB
				$1,000,000 / 530,000 dscfm x 44,580 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$435,230		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 44,580 dscfm (annual)	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 44,580 dscfm (5 yrs)	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 44,580 dscfm (5 yrs)	$49,627	$49,627	$590,000 / 530,000 x 44,580 dscfm
	Total costs for 1 replacement every 5 years	$243,087	$243,087	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$48,617	$48,617	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$544,409		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644		
	Property tax = 1% of TCI	$64,322		
	Insurance charges = 1% of TCI	$64,322		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$915,814		
Total Indirect Costs for RTO		$1,217,764		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,762,173		RTO and Including media replacement costs

OSB Dust/Granulate, RTO Only	RTO w/ 10 yr life - Total Annual Control Cost	$1,762,173	per year
	VOC/HAP Pollutants Destroyed	39.95	tpy
	CONTROL COST EFFECTIVENESS	$44,114	per ton

OSB Dust/Granulate, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
			(Kronospan)				*(Kronospan estimate)*	
Direct Costs			$3,000,000			$672,906		Assume WESP cost by using same approach as PB
Purchased Equipment Costs	RTO equipment = A	$3,000,000		RTO equipment cost	ESP + auxiliary equipment = A	$672,906		$8,000,000 / 530,000 dscfm x 44,580 dscfm
	Instrumentation = 0.10 x A	$300,000			Instrumentation = 0.10 x A	$67,291		
	Sales tax = 0.03 x A	$90,000			Sales tax = 0.03 x A	$20,187		
	Freight = 0.05 x A	$150,000			Freight = 0.05 x A	$33,645		
Purchased Equipment Costs	PEC = B	$3,540,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$794,029		
Direct Installation Costs	Foundation/supports = 0.08 x B	$283,200			Foundation/supports = 0.04 x B	$31,761		
	Handling/erection = 0.14 x B	$495,600			Handling/erection = 0.50 x B	$397,014		
	Electrical = 0.04 x B	$141,600			Electrical = 0.08 x B	$63,522		
	Piping = 0.02 x B	$70,800			Piping = 0.01 x B	$7,940		
	Insulation for ductwork = 0.01 x B	$35,400			Insulation for ductwork = 0.02 x B	$15,881		
	Painting = 0.01 x B	$35,400			Painting = 0.02 x B	$15,881		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,062,000				$531,999		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$4,602,000			DC = 1.67 x B + SP + Bldgs	$1,326,028		
Indirect Costs	Engineering = 0.10 x B	$354,000			Engineering = 0.20 x B	$158,806		
	Construction/field expenses = 0.05 x B	$177,000			Construction/field expenses = 0.20 x B	$158,806		
	Contractor fees = 0.10 x B	$354,000			Contractor fees = 0.10 x B	$79,403		
	Start-up = 0.02 x B	$70,800			Start-up = 0.01 x B	$7,940		
	Performance test = 0.01 x B	$35,400			Performance test = 0.01 x B	$7,940		
					Model Study = 0.02 x B	$15,881		
TOTAL INDIRECT COSTS		$991,200			TOTAL INDIRECT COSTS	$428,775		
Contingency Cost (15%)	Total Capital Investment x 0.15	$376,225			Contingency Cost (15%)	$263,221		
TOTAL CAPITAL INVESTMENT		$5,969,425			TOTAL CAPITAL INVESTMENT	$2,018,024		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 44,580 dscfm =
Utilities	Electricity	$117,921			Electricity (estimated)	$25,071	$25,071	total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$242,871	$84,113	Assume natural gas cost by same approach as PB	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				$1,000,000 / 530,000 dscfm x 44,580 dscfm	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$435,230			Total Direct Costs	$199,509		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 44,580 dscfm	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$60,562	$60,562	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 44,580 dscfm	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 44,580 dscfm	$49,627	$47,103	$590,000 / 530,000 x 44,580 dscfm				
	Costs for 1 replacement every 10 years	$243,087	$240,564	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$24,309	$24,056	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$260,071						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$780,171			Updated Total Direct Costs	$260,071		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$128,644			Administrative = 2% of TCI	$40,360		
	Property tax = 1% of TCI	$64,322			Property tax = 1% of TCI	$20,180		
	Insurance charges = 1% of TCI	$64,322			Insurance charges = 1% of TCI	$20,180		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$272,266			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$190,481		
Total Indirect Costs for RTO		$574,216						
Total Indirect Costs for WESP	Add WESP costs	$315,865			Total Indirect Costs for WESP	$315,865		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,670,253		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$575,936	$575,936	WESP costs to be added to RTO costs for 20 yr life

OSB Dust/Granulate, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$1,670,253	per year
	Pollutant to be removed	39.95	tpy
	CONTROL COST EFFECTIVENESS	$41,813	per ton

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$1,094,316	per year	= $1,528,341 - $260,071- $315,865
Pollutant to be removed	39.95	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$27,395	per ton	

OSB Dust/Granulate, Recup TO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		Recup TO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Recup TO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$5,600,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		
	Instrumentation = 0.10 x A	$560,000		
	Sales tax = 0.03 x A	$168,000		
	Freight = 0.05 x A	$280,000		
Purchased Equipment Costs	PEC = B	$6,608,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640		
	Handling/erection = 0.14 x B	$925,120		
	Electrical = 0.04 x B	$264,320		
	Piping = 0.02 x B	$132,160		
	Insulation for ductwork = 0.01 x B	$66,080		
	Painting = 0.01 x B	$66,080		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,982,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$8,590,400		
Indirect Costs	Engineering = 0.10 x B	$660,800		
	Construction/field expenses = 0.05 x B	$330,400		
	Contractor fees = 0.10 x B	$660,800		
	Start-up = 0.02 x B	$132,160		
	Performance test = 0.01 x B	$66,080		
TOTAL INDIRECT COSTS		$1,850,240		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,566,096		
TOTAL CAPITAL INVESTMENT		$12,006,736		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$117,921		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$242,871	$84,113	Assume natural gas cost by same approach as PB
				$1,000,000 / 530,000 dscfm x 44,580 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$435,230		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 44,580 dscfm (annual)	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 44,580 dscfm (5 yrs)	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 44,580 dscfm (5 yrs)	$49,627	$49,627	$590,000 / 530,000 x 44,580 dscfm
	Total costs for 1 replacement every 5 years	$243,087	$243,087	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$48,617	$48,617	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$544,409		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135		
	Property tax = 1% of TCI	$120,067		
	Insurance charges = 1% of TCI	$120,067		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,709,519		
Total Indirect Costs for Recup TO		$2,234,452		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,778,860		Recup TO and Including media replacement costs

OSB Dust/Granulate, Recup TO Only	Recup TO w/ 10 yr life - Total Annual Control Cost	$2,778,860	per year
	VOC/HAP Pollutants Destroyed	41.21	tpy
	CONTROL COST EFFECTIVENESS	$67,437	per ton

OSB Dust/Granulate, Recup w/ WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		Recup TO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan estimate)	
Direct Costs		*(Kronospan)*						Assume WESP cost by using same approach as PB
		$5,600,000					$672,906	$8,000,000 / 530,000 dscfm x 44,580 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$5,600,000		Recup TO equipment cost	ESP + auxiliary equipment = A	$672,906		
	Instrumentation = 0.10 x A	$560,000			Instrumentation = 0.10 x A	$67,291		
	Sales tax = 0.03 x A	$168,000			Sales tax = 0.03 x A	$20,187		
	Freight = 0.05 x A	$280,000			Freight = 0.05 x A	$33,645		
Purchased Equipment Costs	PEC = B	$6,608,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$794,029		
Direct Installation Costs	Foundation/supports = 0.08 x B	$528,640			Foundation/supports = 0.04 x B	$31,761		
	Handling/erection = 0.14 x B	$925,120			Handling/erection = 0.50 x B	$397,014		
	Electrical = 0.04 x B	$264,320			Electrical = 0.08 x B	$63,522		
	Piping = 0.02 x B	$132,160			Piping = 0.01 x B	$7,940		
	Insulation for ductwork = 0.01 x B	$66,080			Insulation for ductwork = 0.02 x B	$15,881		
	Painting = 0.01 x B	$66,080			Painting = 0.02 x B	$15,881		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,982,400				$531,999		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$8,590,400			DC = 1.67 x B + SP + Bldgs	$1,326,028		
Indirect Costs	Engineering = 0.10 x B	$660,800			Engineering = 0.20 x B	$158,806		
	Construction/field expenses = 0.05 x B	$330,400			Construction/field expenses = 0.20 x B	$158,806		
	Contractor fees = 0.10 x B	$660,800			Contractor fees = 0.10 x B	$79,403		
	Start-up = 0.02 x B	$132,160			Start-up = 0.01 x B	$7,940		
	Performance test = 0.01 x B	$66,080			Performance test = 0.01 x B	$7,940		
					Model Study = 0.02 x B	$15,881		
TOTAL INDIRECT COSTS		$1,850,240			TOTAL INDIRECT COSTS	$428,775		
Contingency Cost (15%)	Total Capital Investment x 0.15	$376,225			Contingency Cost (15%)	$263,221		
TOTAL CAPITAL INVESTMENT		$10,816,865			TOTAL CAPITAL INVESTMENT	$2,018,024		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 44,580 dscfm =
Utilities	Electricity	$117,921			Electricity (estimated)	$25,071	$25,071	total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$242,871	$84,113	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 44,580 dscfm	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$435,230			Total Direct Costs	$199,509		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as Recup
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 44,580 dscfm	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$60,562	$60,562	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 44,580 dscfm	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 44,580 dscfm	$49,627	$47,103	$590,000 / 530,000 x 44,580 dscfm				
	Costs for 1 replacement every 10 years	$243,087	$240,564	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$24,309	$24,056	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$260,071						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$780,171			Updated Total Direct Costs	$260,071		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$240,135			Administrative = 2% of TCI	$40,360		
	Property tax = 1% of TCI	$120,067			Property tax = 1% of TCI	$20,180		
	Insurance charges = 1% of TCI	$120,067			Insurance charges = 1% of TCI	$20,180		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$272,266			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$190,481		
Total Indirect Costs for Recup TO		$797,198						
Total Indirect Costs for WESP	Add WESP costs	$315,865			Total Indirect Costs for WESP	$315,865		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,893,235		Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$575,936	$575,936	WESP costs to be added to RTO costs for 20 yr life
OSB Dust/Granulate, Recup with WES	Recup w/ 20 yr life and WESP - Annual Control Cost	$1,893,235	per year					
	Pollutant to be removed	41.21	tpy					
	CONTROL COST EFFECTIVENESS	$45,944	per ton					

Recup TO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$1,317,299	per year	= $1,528,341 - $260,071- $315,865
Pollutant to be removed	41.21	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$31,968	per ton	

OSB Dust/Granulate, RCO Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RCO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$4,050,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$4,050,000		
	Instrumentation = 0.10 x A	$405,000		
	Sales tax = 0.03 x A	$121,500		
	Freight = 0.05 x A	$202,500		
Purchased Equipment Costs	PEC = B	$4,779,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320		
	Handling/erection = 0.14 x B	$669,060		
	Electrical = 0.04 x B	$191,160		
	Piping = 0.02 x B	$95,580		
	Insulation for ductwork = 0.01 x B	$47,790		
	Painting = 0.01 x B	$47,790		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,433,700		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$6,212,700		
Indirect Costs	Engineering = 0.10 x B	$477,900		
	Construction/field expenses = 0.05 x B	$238,950		
	Contractor fees = 0.10 x B	$477,900		
	Start-up = 0.02 x B	$95,580		
	Performance test = 0.01 x B	$47,790		
TOTAL INDIRECT COSTS		$1,338,120		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,132,623		
TOTAL CAPITAL INVESTMENT		$8,683,443		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$117,921		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$242,871	$84,113	Assume natural gas cost by same approach as PB
				$1,000,000 / 530,000 dscfm x 44,580 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$435,230		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 44,580 dscfm (annual)	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 44,580 dscfm (5 yrs)	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 44,580 dscfm (5 yrs)	$49,627	$49,627	$590,000 / 530,000 x 44,580 dscfm
	Total costs for 1 replacement every 5 years	$243,087	$243,087	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$48,617	$48,617	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$544,409		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669		
	Property tax = 1% of TCI	$86,834		
	Insurance charges = 1% of TCI	$86,834		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,236,349		
Total Indirect Costs for RCO		$1,628,349		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$2,172,758		RCO and Including media replacement costs

OSB Dust/Granulate, RCO Only	RCO w/ 10 yr life - Total Annual Control Cost	$2,172,758	per year
	VOC/HAP Pollutants Destroyed	37.84	tpy
	CONTROL COST EFFECTIVENESS	$57,415	per ton

OSB Dust/Granulate, RCO w/ WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RCO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
			(Kronospan)				*(Kronospan estimate)*	
Direct Costs			$4,050,000				$672,906	Assume WESP cost by using same approach as PB $8,000,000 / 530,000 dscfm x 44,580 dscfm
Purchased Equipment Costs	RCO equipment = A	$4,050,000		RCO equipment cost	ESP + auxiliary equipment = A	$672,906		
	Instrumentation = 0.10 x A	$405,000			Instrumentation = 0.10 x A	$67,291		
	Sales tax = 0.03 x A	$121,500			Sales tax = 0.03 x A	$20,187		
	Freight = 0.05 x A	$202,500			Freight = 0.05 x A	$33,645		
Purchased Equipment Costs	PEC = B	$4,779,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$794,029		
Direct Installation Costs	Foundation/supports = 0.08 x B	$382,320			Foundation/supports = 0.04 x B	$31,761		
	Handling/erection = 0.14 x B	$669,060			Handling/erection = 0.50 x B	$397,014		
	Electrical = 0.04 x B	$191,160			Electrical = 0.08 x B	$63,522		
	Piping = 0.02 x B	$95,580			Piping = 0.01 x B	$7,940		
	Insulation for ductwork = 0.01 x B	$47,790			Insulation for ductwork = 0.02 x B	$15,881		
	Painting = 0.01 x B	$47,790			Painting = 0.02 x B	$15,881		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,433,700				$531,999		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$6,212,700			DC = 1.67 x B + SP + Bldgs	$1,326,028		
Indirect Costs	Engineering = 0.10 x B	$477,900			Engineering = 0.20 x B	$158,806		
	Construction/field expenses = 0.05 x B	$238,950			Construction/field expenses = 0.20 x B	$158,806		
	Contractor fees = 0.10 x B	$477,900			Contractor fees = 0.10 x B	$79,403		
	Start-up = 0.02 x B	$95,580			Start-up = 0.01 x B	$7,940		
	Performance test = 0.01 x B	$47,790			Performance test = 0.01 x B	$7,940		
					Model Study = 0.02 x B	$15,881		
TOTAL INDIRECT COSTS		$1,338,120			TOTAL INDIRECT COSTS	$428,775		
Contingency Cost (15%)	Total Capital Investment x 0.15	$376,225			Contingency Cost (15%)	$263,221		
TOTAL CAPITAL INVESTMENT		$7,927,045			TOTAL CAPITAL INVESTMENT	$2,018,024		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 44,580 dscfm =
Utilities	Electricity	$117,921			Electricity (estimated)	$25,071	$25,071	total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$242,871	$84,113	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 44,580 dscfm	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$435,230			Total Direct Costs	$199,509		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RCO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 44,580 dscfm	$60,562	$60,562	$720,000 / 530,000 dscfm x 44,580 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$60,562	$60,562	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 44,580 dscfm	$193,460	$193,460	$2,300,000 / 530,000 dscfm x 44,580 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 44,580 dscfm	$49,627	$47,103	$590,000 / 530,000 x 44,580 dscfm				
	Costs for 1 replacement every 10 years	$243,087	$240,564	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$24,309	$24,056	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$260,071						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$780,171			Updated Total Direct Costs	$260,071		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$173,669			Administrative = 2% of TCI	$40,360		
	Property tax = 1% of TCI	$86,834			Property tax = 1% of TCI	$20,180		
	Insurance charges = 1% of TCI	$86,834			Insurance charges = 1% of TCI	$20,180		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$272,266			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$190,481		
Total Indirect Costs for RCO		$664,267						
Total Indirect Costs for WESP	Add WESP costs	$315,865			Total Indirect Costs for WESP	$315,865		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$1,760,303		RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$575,936	$575,936	WESP costs to be added to RTO costs for 20 yr life

OSB Dust/Granulate, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$1,760,303	per year
	Pollutant to be removed	37.84	tpy
	CONTROL COST EFFECTIVENESS	$46,516	per ton

RCO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$1,184,367	per year	= $1,528,341 - $260,071- $315,865
Pollutant to be removed	37.84	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$31,297	per ton	

Supporting Documentation for Tables 3-58, 3-59, and 3-60, Summary of Thermal and Catalytic Oxidizer Costs for Belt Dryers #1, #2, and #3 (Total VOCs)

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OSB Belt Dryer 3, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$15,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$15,000,000		
	Instrumentation = 0.10 x A	$1,500,000		
	Sales tax = 0.03 x A	$465,000		
	Freight = 0.05 x A	$750,000		
Purchased Equipment Costs	PEC = B	$17,715,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,417,200		
	Handling/erection = 0.14 x B	$2,480,100		
	Electrical = 0.04 x B	$708,600		
	Piping = 0.02 x B	$354,300		
	Insulation for ductwork = 0.01 x B	$177,150		
	Painting = 0.01 x B	$177,150		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$5,314,500		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$23,029,500		
Indirect Costs	Engineering = 0.10 x B	$1,771,500		
	Construction/field expenses = 0.05 x B	$885,750		
	Contractor fees = 0.10 x B	$1,771,500		
	Start-up = 0.02 x B	$354,300		
	Performance test = 0.01 x B	$354,300		
TOTAL INDIRECT COSTS		$5,137,350		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,225,028		
TOTAL CAPITAL INVESTMENT		$32,391,878		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$1,807,271		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$3,754,789	$1,289,132	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 683,240 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$5,636,498		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$928,175	$928,175	$720,000 / 530,000 dscfm x 683,240 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683,240 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$760,588	$760,588	$590,000 / 530,000 x 683,240 dscfm
	Total costs for 1 replacement every 5 years	$3,725,592	$3,725,592	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$745,118	$745,118	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$7,309,791		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$647,838		
	Property tax = 1% of TCI	$323,919		
	Insurance charges = 1% of TCI	$323,919		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$4,611,956		
Total Indirect Costs for RTO		$5,952,294		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$13,262,085		RTO and Including media replacement costs

OSB Belt Dryer 3, RTO	RTO w/ 10 yr life - Total Annual Control Cost	$13,262,085	per year
	VOC/HAP Pollutants Destroyed	126.41	tpy
	CONTROL COST EFFECTIVENESS	$104,912	per ton

OSB Belt Dryer 3, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan)*	Assume WESP cost by using same approach as PB
			$15,000,000	RTO equipment cost			$10,313,057	$8,000,000 / 530,000 dscfm x 683,240 dscfm
Purchased Equipment Costs	RTO equipment = A	$15,000,000			ESP + auxiliary equipment = A	$10,313,057		
	Instrumentation = 0.10 x A	$1,500,000			Instrumentation = 0.10 x A	$1,031,306		
	Sales tax = 0.03 x A	$465,000			Sales tax = 0.03 x A	$309,392		
	Freight = 0.05 x A	$750,000			Freight = 0.05 x A	$515,653		
Purchased Equipment Costs	PEC = B	$17,715,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$12,169,407		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,417,200			Foundation/supports = 0.04 x B	$486,776		
	Handling/erection = 0.14 x B	$2,480,100			Handling/erection = 0.50 x B	$6,084,703		
	Electrical = 0.04 x B	$708,600			Electrical = 0.08 x B	$973,553		
	Piping = 0.02 x B	$354,300			Piping = 0.01 x B	$121,694		
	Insulation for ductwork = 0.01 x B	$177,150			Insulation for ductwork = 0.02 x B	$243,388		
	Painting = 0.01 x B	$177,150			Painting = 0.02 x B	$243,388		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$5,314,500				$8,153,503		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$23,029,500			DC = 1.67 x B + SP + Bldgs	$20,322,909		
Indirect Costs	Engineering = 0.10 x B	$1,771,500			Engineering = 0.20 x B	$2,433,881		
	Construction/field expenses = 0.05 x B	$885,750			Construction/field expenses = 0.20 x B	$2,433,881		
	Contractor fees = 0.10 x B	$1,771,500			Contractor fees = 0.10 x B	$1,216,941		
	Start-up = 0.02 x B	$354,300			Start-up = 0.01 x B	$121,694		
	Performance test = 0.01 x B	$354,300			Performance test = 0.01 x B	$121,694		
					Model Study = 0.02 x B	$243,388		
TOTAL INDIRECT COSTS		$5,137,350			TOTAL INDIRECT COSTS	$6,571,480		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,154,424			Contingency Cost (15%)	$4,034,158		
TOTAL CAPITAL INVESTMENT		$32,321,274			TOTAL CAPITAL INVESTMENT	$30,928,547		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$1,807,271			Electricity (estimated)	$384,254	$384,254	$1,700,000 / 530,000 dscfm x 683,240 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$3,754,789	$1,289,132	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 683,240 dscfm	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$5,636,498			Total Direct Costs	$558,692		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 683,240 dscfm	$928,175	$928,175	$720,000 / 530,000 dscfm x 683240 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$928,175	$928,175	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 683,240 dscfm	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683240 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 683,240 dscfm	$760,588	$760,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$3,725,592	$3,725,592	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$372,559	$372,559	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$1,486,867						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$8,424,099			Updated Total Direct Costs	$1,486,867		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$647,838			Administrative = 2% of TCI	$618,571		
	Property tax = 1% of TCI	$323,919			Property tax = 1% of TCI	$309,285		
	Insurance charges = 1% of TCI	$323,919			Insurance charges = 1% of TCI	$309,285		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$3,006,470			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$2,919,346		
Total Indirect Costs for RTO		$4,346,808						
Total Indirect Costs for WESP	Add WESP costs	$4,201,150			Total Indirect Costs for WESP	$4,201,150		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$16,972,057		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$5,688,017	$5,688,017	WESP costs to be added to RTO costs for 20 yr life

OSB Belt Dryer 3, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$16,972,057	per year
	Pollutant to be removed	126.41	tpy
	CONTROL COST EFFECTIVENESS	$134,261	per ton

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$11,284,040	per year	= $16,972,057 - $1,486,867 - $4,201,150
Pollutant to be removed	126.41	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$89,265	per ton	

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OSB Belt Dryer 3, Recup TO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		Recup TO 98% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$28,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$28,000,000		
	Instrumentation = 0.10 x A	$2,800,000		
	Sales tax = 0.03 x A	$868,000		
	Freight = 0.05 x A	$1,400,000		
Purchased Equipment Costs	PEC = B	$33,068,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$2,645,440		
	Handling/erection = 0.14 x B	$4,629,520		
	Electrical = 0.04 x B	$1,322,720		
	Piping = 0.02 x B	$661,360		
	Insulation for ductwork = 0.01 x B	$330,680		
	Painting = 0.01 x B	$330,680		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$9,920,400		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$42,988,400		
Indirect Costs	Engineering = 0.10 x B	$3,306,800		
	Construction/field expenses = 0.05 x B	$1,653,400		
	Contractor fees = 0.10 x B	$3,306,800		
	Start-up = 0.02 x B	$661,360		
	Performance test = 0.01 x B	$661,360		
TOTAL INDIRECT COSTS		$9,589,720		
Contingency Cost (15%)	Total Capital Investment x 0.15	$7,886,718		
TOTAL CAPITAL INVESTMENT		$60,464,838		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$1,807,271		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$24,002,487	$1,289,132	Assume natural gas cost by same approach as PB $1,000,000 / 530,000 dscfm x 683,240 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$25,884,196		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$928,175	$928,175	$720,000 / 530,000 dscfm x 683,240 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683,240 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$760,588	$760,588	$590,000 / 530,000 x 683,240 dscfm
	Total costs for 1 replacement every 5 years	$3,725,592	$3,725,592	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$745,118	$745,118	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$27,557,489		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$1,209,297		
	Property tax = 1% of TCI	$604,648		
	Insurance charges = 1% of TCI	$604,648		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$8,608,984		
Total Indirect Costs for Recup TO		$11,072,240		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$38,629,730		RTO and Including media replacement costs

OSB Belt Dryer 3, RTO	Recup TO w/ 10 yr life - Total Annual Control Cost	$38,629,730	per year
	VOC/HAP Pollutants Destroyed	130.40	tpy
	CONTROL COST EFFECTIVENESS	$296,233	per ton

OSB Belt Dryer 3, Recup TO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RTO 95% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan)*	Assume WESP cost by using same approach as PB
			$28,000,000	RTO equipment cost			$10,313,057	$8,000,000 / 530,000 dscfm x 683,240 dscfm
Purchased Equipment Costs	RTO equipment = A	$28,000,000			ESP + auxiliary equipment = A	$10,313,057		
	Instrumentation = 0.10 x A	$2,800,000			Instrumentation = 0.10 x A	$1,031,306		
	Sales tax = 0.03 x A	$868,000			Sales tax = 0.03 x A	$309,392		
	Freight = 0.05 x A	$1,400,000			Freight = 0.05 x A	$515,653		
Purchased Equipment Costs	PEC = B	$33,068,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$12,169,407		
Direct Installation Costs	Foundation/supports = 0.08 x B	$2,645,440			Foundation/supports = 0.04 x B	$486,776		
	Handling/erection = 0.14 x B	$4,629,520			Handling/erection = 0.50 x B	$6,084,703		
	Electrical = 0.04 x B	$1,322,720			Electrical = 0.08 x B	$973,553		
	Piping = 0.02 x B	$661,360			Piping = 0.01 x B	$121,694		
	Insulation for ductwork = 0.01 x B	$330,680			Insulation for ductwork = 0.02 x B	$243,388		
	Painting = 0.01 x B	$330,680			Painting = 0.02 x B	$243,388		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$9,920,400				$8,153,503		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$42,988,400			DC = 1.67 x B + SP + Bldgs	$20,322,909		
Indirect Costs	Engineering = 0.10 x B	$3,306,800			Engineering = 0.20 x B	$2,433,881		
	Construction/field expenses = 0.05 x B	$1,653,400			Construction/field expenses = 0.20 x B	$2,433,881		
	Contractor fees = 0.10 x B	$3,306,800			Contractor fees = 0.10 x B	$1,216,941		
	Start-up = 0.02 x B	$661,360			Start-up = 0.01 x B	$121,694		
	Performance test = 0.01 x B	$661,360			Performance test = 0.01 x B	$121,694		
					Model Study = 0.02 x B	$243,388		
TOTAL INDIRECT COSTS		$9,589,720			TOTAL INDIRECT COSTS	$6,571,480		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,154,424			Contingency Cost (15%)	$4,034,158		
TOTAL CAPITAL INVESTMENT		$56,732,544			TOTAL CAPITAL INVESTMENT	$30,928,547		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$1,807,271			Electricity (estimated)	$384,254	$384,254	$1,700,000 / 530,000 dscfm x 683,240 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$24,002,487	$1,289,132	Assume natural gas cost by same approach as PB	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				$1,000,000 / 530,000 dscfm x 683,240 dscfm	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$25,884,196			Total Direct Costs	$558,692		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 683,240 dscfm	$928,175	$928,175	$720,000 / 530,000 dscfm x 683240 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$928,175	$928,175	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 683,240 dscfm	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683240 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 683,240 dscfm	$760,588	$760,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$3,725,592	$3,725,592	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$372,559	$372,559	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$1,486,867						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$28,671,797			Updated Total Direct Costs	$1,486,867		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$1,209,297			Administrative = 2% of TCI	$618,571		
	Property tax = 1% of TCI	$604,648			Property tax = 1% of TCI	$309,285		
	Insurance charges = 1% of TCI	$604,648			Insurance charges = 1% of TCI	$309,285		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$3,006,470			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$2,919,346		
Total Indirect Costs for RTO		$5,469,727						
Total Indirect Costs for WESP	Add WESP costs	$4,201,150			Total Indirect Costs for WESP	$4,201,150		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$38,342,674		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$5,688,017	$5,688,017	WESP costs to be added to RTO costs for 20 yr life

OSB Belt Dryer 3, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$38,342,674	per year			
	Pollutant to be removed	130.40	tpy			
	CONTROL COST EFFECTIVENESS	$294,032	per ton			

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$32,654,657 per year	= $38,342,674 - $1,486,867 - $4,201,150
Pollutant to be removed	130.40 tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$250,413 per ton	

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OSB Belt Dryer 3, RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Cost Spreadsheet, Dec 2024*		Estimated Additional Costs
VOC Cost Effectiveness		RCO 90% Control Efficiency		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$20,250,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$20,250,000		
	Instrumentation = 0.10 x A	$2,025,000		
	Sales tax = 0.03 x A	$627,750		
	Freight = 0.05 x A	$1,012,500		
Purchased Equipment Costs	PEC = B	$23,915,250		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,913,220		
	Handling/erection = 0.14 x B	$3,348,135		
	Electrical = 0.04 x B	$956,610		
	Piping = 0.02 x B	$478,305		
	Insulation for ductwork = 0.01 x B	$239,153		
	Painting = 0.01 x B	$239,153		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$7,174,575		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$31,089,825		
Indirect Costs	Engineering = 0.10 x B	$2,391,525		
	Construction/field expenses = 0.05 x B	$1,195,763		
	Contractor fees = 0.10 x B	$2,391,525		
	Start-up = 0.02 x B	$478,305		
	Performance test = 0.01 x B	$478,305		
TOTAL INDIRECT COSTS		$6,935,423		
Contingency Cost (15%)	Total Capital Investment x 0.15	$5,703,787		
TOTAL CAPITAL INVESTMENT		$43,729,035		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$2,187,749		
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$12,139,345	$1,289,132	Assume natural gas cost by same approach as PB
Catalyst replacement costs	Catalyst replacement	$205,586		$1,000,000 / 530,000 dscfm x 683,240 dscfm
Total Direct Costs	From EPA Cost Spreadsheet	$14,607,118		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 101,138 dscfm (annual)	$928,175	$928,175	$720,000 / 530,000 dscfm x 683,240 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
	$2,300,000 / 530,000 dscfm x 101,138 dscfm (5 yrs)	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683,240 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
	$590,000 / 530,000 x 101,138 dscfm (5 yrs)	$760,588	$760,588	$590,000 / 530,000 x 683,240 dscfm
	Total costs for 1 replacement every 5 years	$3,725,592	$3,725,592	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$745,118	$745,118	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$16,280,411		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$874,581		
	Property tax = 1% of TCI	$437,290		
	Insurance charges = 1% of TCI	$437,290		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$6,226,140		
Total Indirect Costs for RCO		$8,019,964		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$24,300,376		RCO and Including media replacement costs

OSB Belt Dryer 3, RCO	RCO w/ 10 yr life - Total Annual Control Cost	$24,300,376	per year
	VOC/HAP Pollutants Destroyed	119.76	tpy
	CONTROL COST EFFECTIVENESS	$202,912	per ton

OSB Belt Dryer 3, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*EPA Spreadsheet, Dec 2024*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness		RCO 90% Control Efficiency		Maintenance/Cleaning & Media Replacement		WESP 95% Control Efficiency		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan)*	Assume WESP cost by using same approach as PB
			$20,250,000	RCO equipment cost			$10,313,057	$8,000,000 / 530,000 dscfm x 683,240 dscfm
Purchased Equipment Costs	RCO equipment = A	$20,250,000			ESP + auxiliary equipment = A	$10,313,057		
	Instrumentation = 0.10 x A	$2,025,000			Instrumentation = 0.10 x A	$1,031,306		
	Sales tax = 0.03 x A	$627,750			Sales tax = 0.03 x A	$309,392		
	Freight = 0.05 x A	$1,012,500			Freight = 0.05 x A	$515,653		
Purchased Equipment Costs	PEC = B	$23,915,250			Purchased Equipment Costs (PEC) = B = 1.18 x A	$12,169,407		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,913,220			Foundation/supports = 0.04 x B	$486,776		
	Handling/erection = 0.14 x B	$3,348,135			Handling/erection = 0.50 x B	$6,084,703		
	Electrical = 0.04 x B	$956,610			Electrical = 0.08 x B	$973,553		
	Piping = 0.02 x B	$478,305			Piping = 0.01 x B	$121,694		
	Insulation for ductwork = 0.01 x B	$239,153			Insulation for ductwork = 0.02 x B	$243,388		
	Painting = 0.01 x B	$239,153			Painting = 0.02 x B	$243,388		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$7,174,575				$8,153,503		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$31,089,825			DC = 1.67 x B + SP + Bldgs	$20,322,909		
Indirect Costs	Engineering = 0.10 x B	$2,391,525			Engineering = 0.20 x B	$2,433,881		
	Construction/field expenses = 0.05 x B	$1,195,763			Construction/field expenses = 0.20 x B	$2,433,881		
	Contractor fees = 0.10 x B	$2,391,525			Contractor fees = 0.10 x B	$1,216,941		
	Start-up = 0.02 x B	$478,305			Start-up = 0.01 x B	$121,694		
	Performance test = 0.01 x B	$478,305			Performance test = 0.01 x B	$121,694		
					Model Study = 0.02 x B	$243,388		
TOTAL INDIRECT COSTS		$6,935,423			TOTAL INDIRECT COSTS	$6,571,480		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,154,424			Contingency Cost (15%)	$4,034,158		
TOTAL CAPITAL INVESTMENT		$42,179,672			TOTAL CAPITAL INVESTMENT	$30,928,547		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$2,187,749			Electricity (estimated)	$3,776	$3,776	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 683,240 dscfm = total RCO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$12,139,345	$1,289,132	Assume natural gas cost by same approach as PB	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
		$205,586		$1,000,000 / 530,000 dscfm x 683,240 dscfm	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$14,607,118			Total Direct Costs	$178,214		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RCO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 683,240 dscfm	$928,175	$928,175	$720,000 / 530,000 dscfm x 683240 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$928,175	$928,175	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
	$2,300,000 / 530,000 dscfm x 683,240 dscfm	$2,965,004	$2,965,004	$2,300,000 / 530,000 dscfm x 683240 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
	$590,000 / 530,000 x 683,240 dscfm	$760,588	$760,588	$590,000 / 530,000 x 101,138 dscfm				
	Costs for 1 replacement every 10 years	$3,725,592	$3,725,592	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$372,559	$372,559	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$1,106,389						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$17,014,241			Updated Total Direct Costs	$1,106,389		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$874,581			Administrative = 2% of TCI	$618,571		
	Property tax = 1% of TCI	$437,290			Property tax = 1% of TCI	$309,285		
	Insurance charges = 1% of TCI	$437,290			Insurance charges = 1% of TCI	$309,285		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$3,006,470			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$2,919,346		
Total Indirect Costs for RCO		$4,800,294						
Total Indirect Costs for WESP	Add WESP costs	$4,201,150			Total Indirect Costs for WESP	$4,201,150		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$26,015,686		RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$5,307,539	$5,307,539	WESP costs to be added to RCO costs for 20 yr life

OSB Belt Dryer 3, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$26,015,686	per year
	Pollutant to be removed	119.76	tpy
	CONTROL COST EFFECTIVENESS	$217,236	per ton

RCO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$20,708,147	per year	= $6,015,686 - $ 1,106,389 - $4,201,150
Pollutant to be removed	119.76	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$172,917	per ton	

Supporting Documentation for Table 3-73, Summary of Thermal and Catalytic Oxidizer Costs for Biomass Heaters (VOCs)

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OSB Biomass Heaters, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$9,000,000		Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$9,000,000		
	Instrumentation = 0.10 x A	$900,000		
	Sales tax = 0.03 x A	$270,000		
	Freight = 0.05 x A	$450,000		
Purchased Equipment Costs	PEC = B	$10,620,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$849,600		
	Handling/erection = 0.14 x B	$1,486,800		
	Electrical = 0.04 x B	$424,800		
	Piping = 0.02 x B	$212,400		
	Insulation for ductwork = 0.01 x B	$106,200		
	Painting = 0.01 x B	$106,200		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$3,186,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$13,806,000		
Indirect Costs	Engineering = 0.10 x B	$1,062,000		
	Construction/field expenses = 0.05 x B	$531,000		
	Contractor fees = 0.10 x B	$1,062,000		
	Start-up = 0.02 x B	$212,400		
	Performance test = 0.01 x B	$106,200		
TOTAL INDIRECT COSTS		$2,973,600		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,516,940		
TOTAL CAPITAL INVESTMENT		$19,296,540		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$389,498		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$802,079		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,266,015		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm
	Total costs for 1 replacement every 5 years	$802,929	$802,929	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$160,586	$160,586	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$1,626,639		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817		
	Property tax = 1% of TCI	$75,409		
	Insurance charges = 1% of TCI	$75,409		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$2,747,441		
Total Indirect Costs for RTO		$3,093,739		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,720,378		RTO and Including media replacement costs
OSB Biomass Heaters, RTO	RTO w/ 10 yr life - Total Annual Control Cost	$4,720,378	per year	
	VOC/HAP Pollutants Destroyed	60.92	tpy	
	CONTROL COST EFFECTIVENESS	$77,489	per ton	

OSB Biomass Heaters, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
						(Kronospan estimate)	
Direct Costs		*(Kronospan)*					Assume WESP cost by using same approach as PB
		$9,000,000	RTO equipment cost			$2,222,642	$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RTO equipment = A	$9,000,000		ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$900,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$270,000		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$450,000		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$10,620,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$849,600		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$1,486,800		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$424,800		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$212,400		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$106,200		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$106,200		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$3,186,000			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$13,806,000		DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B	$1,062,000		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$531,000		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,062,000		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$212,400		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$106,200		Performance test = 0.01 x B	$26,227		
				Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		$2,973,600		TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,516,940		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		$19,296,540		TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		Maintenance material = 100% of maintenance labor	$23,767		
							Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm =
Utilities	Electricity	$389,498	From EPA Cost Spreadsheet	Electricity (estimated)	$82,813	$82,813	total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$802,079	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		$1,266,015		Total Direct Costs	$257,251		
	Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038 $200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO		Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009 $639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)		Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920 $155,585	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929 $794,594	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293 $79,459	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$457,289					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$2,003,635		Updated Total Direct Costs	$457,289		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$75,409		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$75,409		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$1,821,400		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for RTO		$2,167,698					
Total Indirect Costs for WESP	Add WESP costs	$911,908		Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,083,241	RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,369,197	$1,369,197	WESP costs added to RTO costs for 20 yr life
OSB Biomass Heaters, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost	$5,083,241 per year					
	Pollutant to be removed	60.92 tpy					
	CONTROL COST EFFECTIVENESS	$83,445 per ton					

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$3,714,044 per year	= $5,083,241 - $457,289 - $911,908
Pollutant to be removed	60.92 tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$60,969 per ton	

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OSB Biomass Heaters, Recup TO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Recup TO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$16,800,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000		
	Instrumentation = 0.10 x A	$1,680,000		
	Sales tax = 0.03 x A	$504,000		
	Freight = 0.05 x A	$840,000		
Purchased Equipment Costs	PEC = B	$19,824,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,585,920		
	Handling/erection = 0.14 x B	$2,775,360		
	Electrical = 0.04 x B	$792,960		
	Piping = 0.02 x B	$396,480		
	Insulation for ductwork = 0.01 x B	$198,240		
	Painting = 0.01 x B	$198,240		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$5,947,200		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$25,771,200		
Indirect Costs	Engineering = 0.10 x B	$1,982,400		
	Construction/field expenses = 0.05 x B	$991,200		
	Contractor fees = 0.10 x B	$1,982,400		
	Start-up = 0.02 x B	$396,480		
	Performance test = 0.01 x B	$198,240		
TOTAL INDIRECT COSTS		$5,550,720		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,698,288		
TOTAL CAPITAL INVESTMENT		$36,020,208		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$389,498		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$4,621,717		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$5,085,653		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm
	Total costs for 1 replacement every 5 years	$802,929	$802,929	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$160,586	$160,586	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$5,446,277		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817		
	Property tax = 1% of TCI	$75,409		
	Insurance charges = 1% of TCI	$75,409		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,073,649		
Total Indirect Costs for Recup TO		$1,419,947		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,866,224		Recup TO and Including media replacement costs
OSB Biomass Heaters, Recup TO	Recup w/ 10 yr life - Total Annual Control Cost	$6,866,224	per year	
	VOC/HAP Pollutants Destroyed	62.84	tpy	
	CONTROL COST EFFECTIVENESS	$109,264	per ton	

OSB Biomass Heaters, Recup TO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs			*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
			$16,800,000	Recup TO equipment cost		$2,222,642		$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000			ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$1,680,000			Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$504,000			Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$840,000			Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$19,824,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,585,920			Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$2,775,360			Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$792,960			Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$396,480			Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$198,240			Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$198,240			Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$5,947,200				$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$25,771,200			DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B	$1,982,400			Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$991,200			Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,982,400			Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$396,480			Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$198,240			Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		$5,550,720			TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15	$983,591			Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		$32,305,511			TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm =
Utilities	Electricity	$389,498		From EPA Cost Spreadsheet	Electricity (estimated)	$82,813	$82,813	total Recup TO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$4,621,717		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$5,085,653			Total Direct Costs	$257,251		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920	$155,585	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	$794,594	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	$79,459	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$457,289						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$5,823,273			Updated Total Direct Costs	$457,289		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817			Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$75,409			Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$75,409			Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$711,804			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for Recup TO		$1,058,102						
Total Indirect Costs for WESP	Add WESP costs	$911,908			Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$7,793,283		Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$1,369,197	$1,369,197	WESP costs added to Recup TO costs for 20 yr life

OSB Biomass Heaters, Recup TO with WESP	ecup w/ 20 yr life and WESP - Annual Control Cost	$7,793,283	per year
	Pollutant to be removed	62.84	tpy
	CONTROL COST EFFECTIVENESS	$124,016	per ton

Recup TO w/20 yr life and no WESP - Annual Control Cost w/o WESP		$6,424,086	per year
	Pollutant to be removed	62.84	tpy
	CONTROL COST EFFECTIVENESS w/o WESP	$102,228	per ton

= $7,793,283 - $457,289 - $911,908

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OSB Biomass Heaters, RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$12,150,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$12,150,000		
	Instrumentation = 0.10 x A	$1,215,000		
	Sales tax = 0.03 x A	$364,500		
	Freight = 0.05 x A	$607,500		
Purchased Equipment Costs	PEC = B	$14,337,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,146,960		
	Handling/erection = 0.14 x B	$2,007,180		
	Electrical = 0.04 x B	$573,480		
	Piping = 0.02 x B	$286,740		
	Insulation for ductwork = 0.01 x B	$143,370		
	Painting = 0.01 x B	$143,370		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$4,301,100		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$18,638,100		
Indirect Costs	Engineering = 0.10 x B	$1,433,700		
	Construction/field expenses = 0.05 x B	$716,850		
	Contractor fees = 0.10 x B	$1,433,700		
	Start-up = 0.02 x B	$286,740		
	Performance test = 0.01 x B	$143,370		
TOTAL INDIRECT COSTS		$4,014,360		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,397,869		
TOTAL CAPITAL INVESTMENT		$26,050,329		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$471,498		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$2,096,050		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$2,641,986		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm
	Total costs for 1 replacement every 5 years	$802,929	$802,929	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement costs) / 5 yrs	$160,586	$160,586	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,002,610		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817		
	Property tax = 1% of TCI	$75,409		
	Insurance charges = 1% of TCI	$75,409		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,073,649		
Total Indirect Costs for RCO		$1,419,947		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,422,557		RCO and Including media replacement costs
OSB Biomass Heaters, RCO	RCO w/ 10 yr life - Total Annual Control Cost	$4,422,557	per year	
	VOC/HAP Pollutants Destroyed	57.71	tpy	
	CONTROL COST EFFECTIVENESS	$76,633	per ton	

OSB Biomass Heaters, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
			(Kronospan)				*(Kronospan estimate)*	
Direct Costs			$12,150,000	RCO equipment cost			$2,222,642	Assume WESP cost by using same approach as PB $8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RCO equipment = A	$12,150,000			ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$1,215,000			Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$364,500			Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$607,500			Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$14,337,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,146,960			Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$2,007,180			Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$573,480			Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$286,740			Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$143,370			Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$143,370			Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$4,301,100				$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$18,638,100			DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B	$1,433,700			Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$716,850			Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,433,700			Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$286,740			Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$143,370			Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		$4,014,360			TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15	$983,591			Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		$23,636,051			TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$471,498		From EPA Cost Spreadsheet	Electricity (estimated)	$813	$813	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = total RCO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$2,096,050		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$2,641,986			Total Direct Costs	$175,251		
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	Assume WESP maintenance/cleaning same as RCO WESP maintenance (sludge & wastewater)
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm				
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm	$163,920	$155,585	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm				
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$802,929 $80,293	$794,594 $79,459	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$375,289						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$3,297,606			Updated Total Direct Costs	$375,289		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$150,817			Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$75,409			Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$75,409			Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$711,804			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for RCO		$1,058,102						
Total Indirect Costs for WESP	Add WESP costs	$911,908			Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,267,616		RCO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,287,197	$1,287,197	WESP costs added to RCO costs for 20 yr life

OSB Biomass Heaters, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$5,267,616	per year	
	Pollutant to be removed	57.71	tpy	
	CONTROL COST EFFECTIVENESS	$91,276	per ton	
	RCO w/ 20 yr life and no WESP - Annual Control Cost	$3,980,419	per year	= $5,267,616 - $375,289 - $911,908
	Pollutant to be removed	57.71	tpy	
	CONTROL COST EFFECTIVENESS w/o WESP	$68,972	per ton	

Supporting Documentation for Table 3-74, Summary of Thermal and Catalytic Oxidizer Costs for Thermal Oil Heaters (Biomass Heaters & Natural Gas-Fired Heaters) (VOCs)

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OSB All Thermal Oil Heaters, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$12,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$12,000,000		
	Instrumentation = 0.10 x A	$443,421		
	Sales tax = 0.03 x A	$133,026		
	Freight = 0.05 x A	$221,711		
Purchased Equipment Costs	PEC = B	$12,798,158		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590		
	Handling/erection = 0.14 x B	$732,532		
	Electrical = 0.04 x B	$209,295		
	Piping = 0.02 x B	$104,647		
	Insulation for ductwork = 0.01 x B	$52,324		
	Painting = 0.01 x B	$52,324		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,569,712		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$14,367,870		
Indirect Costs	Engineering = 0.10 x B	$523,237		
	Construction/field expenses = 0.05 x B	$261,619		
	Contractor fees = 0.10 x B	$523,237		
	Start-up = 0.02 x B	$104,647		
	Performance test = 0.01 x B	$52,324		
TOTAL INDIRECT COSTS		$1,465,064		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072		
TOTAL CAPITAL INVESTMENT		$17,073,006		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$504,181		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,038,250		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,616,869		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$258,936	$258,936	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 190,606 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$827,158	$827,158	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 190,606 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$212,184	$212,184	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 190,606 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$1,039,342 $207,868	$1,039,342 $207,868	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$2,083,674		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$341,460		
	Property tax = 1% of TCI	$170,730		
	Insurance charges = 1% of TCI	$170,730		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,353,614		
Total Indirect Costs for RTO		$2,081,197		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,164,871		RTO and Including media replacement costs
OSB All Thermal Oil Heaters, RTO	RTO w/ 10 yr life - Total Annual Control Cost	$4,164,871	per year	
	VOC/HAP Pollutants Destroyed	62.91	tpy	
	CONTROL COST EFFECTIVENESS	$66,202	per ton	

OSB All Thermal Oil Heaters, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RTO 95% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs		*(Kronospan)*					*(Kronospan)*	Assume WESP cost by using same approach as PB
		$12,000,000		RTO equipment cost			$2,877,072	$8,000,000 / 530,000 dscfm x 190,606 dscfm
Purchased Equipment Costs	RTO equipment = A	$12,000,000			ESP + auxiliary equipment = A	$2,877,072		
	Instrumentation = 0.10 x A	$443,421			Instrumentation = 0.10 x A	$287,707		
	Sales tax = 0.03 x A	$133,026			Sales tax = 0.03 x A	$86,312		
	Freight = 0.05 x A	$221,711			Freight = 0.05 x A	$143,854		
Purchased Equipment Costs	PEC = B	$12,798,158			Purchased Equipment Costs (PEC) = B = 1.18 x A	$3,394,945		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590			Foundation/supports = 0.04 x B	$135,798		
	Handling/erection = 0.14 x B	$732,532			Handling/erection = 0.50 x B	$1,697,472		
	Electrical = 0.04 x B	$209,295			Electrical = 0.08 x B	$271,596		
	Piping = 0.02 x B	$104,647			Piping = 0.01 x B	$33,949		
	Insulation for ductwork = 0.01 x B	$52,324			Insulation for ductwork = 0.02 x B	$67,899		
	Painting = 0.01 x B	$52,324			Painting = 0.02 x B	$67,899		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,569,712				$2,274,613		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$14,367,870			DC = 1.67 x B + SP + Bldgs	$5,669,557		
Indirect Costs	Engineering = 0.10 x B	$523,237			Engineering = 0.20 x B	$678,989		
	Construction/field expenses = 0.05 x B	$261,619			Construction/field expenses = 0.20 x B	$678,989		
	Contractor fees = 0.10 x B	$523,237			Contractor fees = 0.10 x B	$339,494		
	Start-up = 0.02 x B	$104,647			Start-up = 0.01 x B	$33,949		
	Performance test = 0.01 x B	$52,324			Performance test = 0.01 x B	$33,949		
					Model Study = 0.02 x B	$67,899		
TOTAL INDIRECT COSTS		$1,465,064			TOTAL INDIRECT COSTS	$1,833,270		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072			Contingency Cost (15%)	$850,434		
TOTAL CAPITAL INVESTMENT		$897,414			TOTAL CAPITAL INVESTMENT	$8,353,261		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$504,181		From EPA Cost Spreadsheet	Electricity (estimated)	$107,197	$107,197	$1,700,000 / 530,000 dscfm x 190,606 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$1,038,250		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$1,616,869			Total Direct Costs	$281,635		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	$802,929	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	$80,293	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$481,672						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$2,378,872			Updated Total Direct Costs	$481,672		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$341,460			Administrative = 2% of TCI	$167,065		
	Property tax = 1% of TCI	$170,730			Property tax = 1% of TCI	$83,533		
	Insurance charges = 1% of TCI	$170,730			Insurance charges = 1% of TCI	$83,533		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$897,414			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$788,464		
Total Indirect Costs for RTO		$1,624,997						
Total Indirect Costs for WESP	Add WESP costs	$1,167,258			Total Indirect Costs for WESP	$1,167,258		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,171,127		RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,648,930	$1,648,930	WESP costs added to RTO costs for 20 yr life

OSB All Thermal Oil Heaters, RTO with WESP	RTO w 20 yr life and WESP - Annual Control Cost	$5,171,127	per year			
	Pollutant to be removed	62.91	tpy			
	CONTROL COST EFFECTIVENESS	$82,197	per ton			
	RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$3,522,197	per year	= $5,171,127 - $481,692 - $1,167,258		
	Pollutant to be removed	62.91	tpy			
	CONTROL COST EFFECTIVENESS w/o WESP	$55,987	per ton			

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OSB All Thermal Oil Heaters, Recup T	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maint/Clean & Media Replace
Capital Cost Summary	Recup TO Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs			*(Kronospan)*	
			$16,800,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000		
	Instrumentation = 0.10 x A	$443,421		
	Sales tax = 0.03 x A	$133,026		
	Freight = 0.05 x A	$221,711		
Purchased Equipment Costs	PEC = B	$17,598,158		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590		
	Handling/erection = 0.14 x B	$732,532		
	Electrical = 0.04 x B	$209,295		
	Piping = 0.02 x B	$104,647		
	Insulation for ductwork = 0.01 x B	$52,324		
	Painting = 0.01 x B	$52,324		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,569,712		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$19,167,870		
Indirect Costs	Engineering = 0.10 x B	$523,237		
	Construction/field expenses = 0.05 x B	$261,619		
	Contractor fees = 0.10 x B	$523,237		
	Start-up = 0.02 x B	$104,647		
	Performance test = 0.01 x B	$52,324		
TOTAL INDIRECT COSTS		$1,465,064		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072		
TOTAL CAPITAL INVESTMENT		$21,873,006		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op h	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x O	$23,767		
	Maintenance material = 100% of maintenan	$23,767		
Utilities	Electricity = Annual usage x Price	$504,181		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage	$5,986,678		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$6,565,297		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 147,250 dscfm	$258,936	$258,936	$720,000 / 530,000 dscfm x 190,606 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscf	$827,158	$827,158	$2,300,000 / 530,000 dscfm x 190,606 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm (5 yrs	$212,184	$212,184	$590,000 / 530,000 x 190,606 dscfm
	Total costs for 1 replacement every 5 years	$1,039,342	$1,039,342	Total costs for 1 replacement every 5 years
Annualized (media + replacement) costs	Annualized cost = (media + replacement co	$207,868	$207,868	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Ann	$7,032,102		
Indirect Operating Costs	Overhead (60% of operating labor+mainten	$44,663		
	Administrative = 2% of TCI	$437,460		
	Property tax = 1% of TCI	$218,730		
	Insurance charges = 1% of TCI	$218,730		
	Capital Recovery (10 yrs at 7% so CRF=0	$1,353,614		
Total Indirect Costs for Recup TO		$2,273,197		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Ann	$9,305,299		Recup TO and Including media replacement costs
OSB All Thermal Oil Heaters, Recup T	Total Annual Control Cost	$9,305,299	per year	
	VOC/HAP Pollutants Destroyed	64.90	tpy	
	CONTROL COST EFFECTIVENESS	$143,384	per ton	

OSB All Thermal Oil Heaters, Recup TO with WES	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	Recup TO 98% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	Recup TO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
Direct Costs			*(Kronospan)*				*(Kronospan)*	Assume WESP cost by using same approach as PB
			$16,800,000	Recup TO equipment cost			$2,877,072	$8,000,000 / 530,000 dscfm x 190,606 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000			ESP + auxiliary equipment = A	$2,877,072		
	Instrumentation = 0.10 x A	$443,421			Instrumentation = 0.10 x A	$287,707		
	Sales tax = 0.03 x A	$133,026			Sales tax = 0.03 x A	$86,312		
	Freight = 0.05 x A	$221,711			Freight = 0.05 x A	$143,854		
Purchased Equipment Costs	PEC = B	$17,598,158			Purchased Equipment Costs (PEC) = B = 1.18 x A	$3,394,945		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590			Foundation/supports = 0.04 x B	$135,798		
	Handling/erection = 0.14 x B	$732,532			Handling/erection = 0.50 x B	$1,697,472		
	Electrical = 0.04 x B	$209,295			Electrical = 0.08 x B	$271,596		
	Piping = 0.02 x B	$104,647			Piping = 0.01 x B	$33,949		
	Insulation for ductwork = 0.01 x B	$52,324			Insulation for ductwork = 0.02 x B	$67,899		
	Painting = 0.01 x B	$52,324			Painting = 0.02 x B	$67,899		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,569,712				$2,274,613		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$19,167,870			DC = 1.67 x B + SP + Bldgs	$5,669,557		
Indirect Costs	Engineering = 0.10 x B	$523,237			Engineering = 0.20 x B	$678,989		
	Construction/field expenses = 0.05 x B	$261,619			Construction/field expenses = 0.20 x B	$678,989		
	Contractor fees = 0.10 x B	$523,237			Contractor fees = 0.10 x B	$339,494		
	Start-up = 0.02 x B	$104,647			Start-up = 0.01 x B	$33,949		
	Performance test = 0.01 x B	$52,324			Performance test = 0.01 x B	$33,949		
					Model Study = 0.02 x B	$67,899		
TOTAL INDIRECT COSTS		$1,465,064			TOTAL INDIRECT COSTS	$1,833,270		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072			Contingency Cost (15%)	$850,434		
TOTAL CAPITAL INVESTMENT		$897,414			TOTAL CAPITAL INVESTMENT	$8,353,261		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$504,181		From EPA Cost Spreadsheet	Electricity (estimated)	$107,197	$107,197	$1,700,000 / 530,000 dscfm x 190,606 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$5,986,678		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$6,565,297			Total Direct Costs	$281,635		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of Recup TO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	$802,929	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	$80,293	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$481,672						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$7,327,300			Updated Total Direct Costs	$481,672		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$437,460			Administrative = 2% of TCI	$167,065		
	Property tax = 1% of TCI	$218,730			Property tax = 1% of TCI	$83,533		
	Insurance charges = 1% of TCI	$218,730			Insurance charges = 1% of TCI	$83,533		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$897,414			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$788,464		
Total Indirect Costs for Recup TO		$1,816,997						
Total Indirect Costs for WESP	Add WESP costs	$1,167,258			Total Indirect Costs for WESP	$1,167,258		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$10,311,555		Recup TO and Including media replacement & WESP co	UPDATED TOTAL ANNUAL COST	$1,648,930	$1,648,930	WESP costs added to Recup TO costs for 20 yr life
OSB All Thermal Oil Heaters, Recup TO with WES	ecup w/ 20 yr life and WESP - Annual Control Cost	$10,311,555	per year					
	Pollutant to be removed	64.90	tpy					
	CONTROL COST EFFECTIVENESS	$158,889	per ton					

Recup TO w 20 yr life and no WESP - Annual Control Cost w/o WESP	$8,662,625	per year	= $10,311,555 - $481,672 - $1,167,258
Pollutant to be removed	64.90	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$133,481	per ton	

Kronospan - Eastaboga, AL

OSB All Thermal Oil Heaters, RCO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RCO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$12,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RCO equipment = A	$12,000,000		
	Instrumentation = 0.10 x A	$443,421		
	Sales tax = 0.03 x A	$133,026		
	Freight = 0.05 x A	$221,711		
Purchased Equipment Costs	PEC = B	$12,798,158		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590		
	Handling/erection = 0.14 x B	$732,532		
	Electrical = 0.04 x B	$209,295		
	Piping = 0.02 x B	$104,647		
	Insulation for ductwork = 0.01 x B	$52,324		
	Painting = 0.01 x B	$52,324		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$1,569,712		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$14,367,870		
Indirect Costs	Engineering = 0.10 x B	$523,237		
	Construction/field expenses = 0.05 x B	$261,619		
	Contractor fees = 0.10 x B	$523,237		
	Start-up = 0.02 x B	$104,647		
	Performance test = 0.01 x B	$52,324		
TOTAL INDIRECT COSTS		$1,465,064		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072		
TOTAL CAPITAL INVESTMENT		$17,073,006		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity = Annual usage x Price	$610,324		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$2,717,177		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,401,939		
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$258,936	$258,936	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 190,606 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$827,158	$827,158	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 190,606 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$212,184	$212,184	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 190,606 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$1,039,342 $207,868	$1,039,342 $207,868	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,868,744		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$341,460		
	Property tax = 1% of TCI	$170,730		
	Insurance charges = 1% of TCI	$170,730		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$1,353,614		
Total Indirect Costs for RCO		$2,081,197		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$5,949,941		RCO and Including media replacement costs
OSB All Thermal Oil Heaters, RCO	RCO w/ 10 yr life - Total Annual Control Cost	$5,949,941	per year	
	VOC/HAP Pollutants Destroyed	59.60	tpy	
	CONTROL COST EFFECTIVENESS	$99,831	per ton	

OSB All Thermal Oil Heaters, RCO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
VOC Cost Effectiveness	RCO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RCO Costs	For 20 year Equipment Life		Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs			*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
			$12,000,000	RCO equipment cost		$2,877,072		$8,000,000 / 530,000 dscfm x 190,606 dscfm
Purchased Equipment Costs	RCO equipment = A	$12,000,000			ESP + auxiliary equipment = A	$2,877,072		
	Instrumentation = 0.10 x A	$443,421			Instrumentation = 0.10 x A	$287,707		
	Sales tax = 0.03 x A	$133,026			Sales tax = 0.03 x A	$86,312		
	Freight = 0.05 x A	$221,711			Freight = 0.05 x A	$143,854		
Purchased Equipment Costs	PEC = B	$12,798,158			Purchased Equipment Costs (PEC) = B = 1.18 x A	$3,394,945		
Direct Installation Costs	Foundation/supports = 0.08 x B	$418,590			Foundation/supports = 0.04 x B	$135,798		
	Handling/erection = 0.14 x B	$732,532			Handling/erection = 0.50 x B	$1,697,472		
	Electrical = 0.04 x B	$209,295			Electrical = 0.08 x B	$271,596		
	Piping = 0.02 x B	$104,647			Piping = 0.01 x B	$33,949		
	Insulation for ductwork = 0.01 x B	$52,324			Insulation for ductwork = 0.02 x B	$67,899		
	Painting = 0.01 x B	$52,324			Painting = 0.02 x B	$67,899		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,569,712				$2,274,613		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$14,367,870			DC = 1.67 x B + SP + Bldgs	$5,669,557		
Indirect Costs	Engineering = 0.10 x B	$523,237			Engineering = 0.20 x B	$678,989		
	Construction/field expenses = 0.05 x B	$261,619			Construction/field expenses = 0.20 x B	$678,989		
	Contractor fees = 0.10 x B	$523,237			Contractor fees = 0.10 x B	$339,494		
	Start-up = 0.02 x B	$104,647			Start-up = 0.01 x B	$33,949		
	Performance test = 0.01 x B	$52,324			Performance test = 0.01 x B	$33,949		
					Model Study = 0.02 x B	$67,899		
TOTAL INDIRECT COSTS		$1,465,064			TOTAL INDIRECT COSTS	$1,833,270		
Contingency Cost (15%)	Total Capital Investment x 0.15	$1,240,072			Contingency Cost (15%)	$850,434		
TOTAL CAPITAL INVESTMENT		$897,414			TOTAL CAPITAL INVESTMENT	$8,353,261		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
Utilities	Electricity	$610,324		From EPA Cost Spreadsheet	Electricity (estimated)	$1,054	$1,054	$1,700,000 / 530,000 dscfm x 190,606 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$2,717,177		From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		$3,401,939			Total Direct Costs	$175,492		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RCO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	$802,929	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	$80,293	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	$375,529						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$4,057,799			Updated Total Direct Costs	$375,529		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$341,460			Administrative = 2% of TCI	$167,065		
	Property tax = 1% of TCI	$170,730			Property tax = 1% of TCI	$83,533		
	Insurance charges = 1% of TCI	$170,730			Insurance charges = 1% of TCI	$83,533		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$897,414			Capital Recovery (20 yrs at 7% so CRF=0.09439)	$788,464		
Total Indirect Costs for RCO		$1,624,997						
Total Indirect Costs for WESP	Add WESP costs	$1,167,258			Total Indirect Costs for WESP	$1,167,258		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,850,054		ROC and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,542,787	$1,542,787	WESP costs added to RCO costs for 20 yr life

OSB All Thermal Oil Heaters, RCO with WESP	RCO w/ 20 yr life and WESP - Annual Control Cost	$6,850,054	per year
	Pollutant to be removed	59.60	tpy
	CONTROL COST EFFECTIVENESS	$114,933	per ton

	RCO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$5,307,267	per year
	Pollutant to be removed	59.60	tpy
	CONTROL COST EFFECTIVENESS w/o WESP	$89,048	per ton

= $6,850,054 - $375,529 - $1,167,258

Supporting Documentation for Table 3-75, Summary of Scrubber Costs for Biomass Heaters (Total VOCs)

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OSB Biomass Heaters, Packed Bed Scrubber Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Packed Bed Scrubber Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$1,260,840		Replace with Tri-Mer cost proposal 1/21/26
Purchased Equipment Costs	Scrubber equipment = A	$1,260,840		
	Instrumentation = 0.10 x A	$126,084		
	Sales tax = 0.03 x A	$37,825		
	Freight = 0.05 x A	$63,042		
Purchased Equipment Costs	PEC = B	$1,487,791		
Direct Installation Costs	Foundation/supports = 0.12 x B	$178,535		
	Handling/erection = 0.4 x B	$595,116		
	Electrical = 0.01 x B	$14,878		
	Piping = 0.3 x B	$446,337		
	Insulation for ductwork = 0.01 x B	$14,878		
	Painting = 0.01 x B	$14,878		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$1,264,623		
TOTAL DIRECT COSTS	DC = 0.85 x B + SP + Bldg	$2,752,414		
Indirect Costs	Engineering = 0.10 x B	$148,779		
	Construction/field expenses = 0.10 x B	$148,779		
	Contractor fees = 0.10 x B	$148,779		
	Start-up = 0.01 x B	$14,878		
	Performance test = 0.01 x B	$14,878		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$476,093		
Contingency Cost (15%)	Total Capital Investment x 0.15	$484,276		
TOTAL CAPITAL INVESTMENT		$3,712,783		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$15,215		Estimated from EPA Cost Spreadsheet
	Annual Solvent cost - Assume this is water only	$1,552,164		Estimated: ((160 gal/min x 60 min/hr) + 35 gal/hr)) x 8760 hr/yr x $6.13/1000 gal x 3
	Annual Wastewater Disposal cost	$1,824,042		Estimated: 160 gal/min x 60 min/hr x 8760 hr/yr x $7.23/1000 gal x 3
Utilities	Electricity = Annual usage x Price	$201,290		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,667,149		
Annual maintenance/cleaning of scrubber	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$0	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$0	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$0	$163,920	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0 $0	$802,929 $160,586	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,667,149		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$74,256		
	Property tax = 1% of TCI	$37,128		
	Insurance charges = 1% of TCI	$37,128		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$528,626		
Total Indirect Costs for PB Scrubber		$721,800		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,388,949		Scrubber, not Including media replacement costs
OSB Biomass Heaters, Packed Bed Scrubber Only	Total Annual Control Cost	$4,388,949	per year	
	VOC/HAP Pollutants Destroyed	54.50	tpy	
	CONTROL COST EFFECTIVENESS	$80,524	per ton	

OSB Biomass Heaters, Packed Bed Scrubber/WESP **VOC Cost Effectiveness** **Capital Cost Summary**	***EPA Cost Manual, 7th Ed., Nov 2017*** **Scrubber 85% Control Efficiency** **Packed Bed Scrubber Costs**	***Tri-Mer Quote and EPA Cost Spreadshee*** ***EPA Cost Spreadsheet, Dec 2024*** **For 20 year Equipment Life**		**Estimated Actual Costs** **Maintenance/Cleaning & Media Replacement** **Assume 10 year Media Life**	***EPA Cost Manual, 6th Ed., Sept 1999*** **WESP 95% Control Efficiency** **WESP Costs**	***EPA Cost Manual, Sept 1999*** **Cost Estimate** **Assume 20 year Equipment Life**		**Estimated Actual Costs**
Direct Costs		*(Kronospan)* $840,560					*(Kronospan estimate)* $2,222,642	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available $8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	Scrubber equipment = A	$1,260,840		Scrubber equipment cost	ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$126,084			Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$37,825			Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$63,042			Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$1,487,791			Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$178,535			Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$595,116			Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$14,878			Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$446,337			Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$14,878			Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$14,878			Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$1,264,623				$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$2,752,414**			DC = 1.67 x B + SP + Bldgs	**$4,379,937**		
Indirect Costs	Engineering = 0.10 x B	$148,779			Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$148,779			Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$148,779			Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$14,878			Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$14,878			Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		**$476,093**			**TOTAL INDIRECT COSTS**	**$1,416,267**		
Contingency Cost (15%)		$484,276			Contingency Cost (15%)	$869,431		
TOTAL CAPITAL INVESTMENT		**$3,712,783**			**TOTAL CAPITAL INVESTMENT**	**$6,665,635**		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$201,290		From EPA cost spreadsheet	Electricity (estimated)	$457,096	$457,096	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$0	$0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs	**From EPA Cost Spreadsheet**	**$3,667,149**			**Total Direct Costs**	**$631,534**		
Annual maintenance/cleaning PB Scrubber	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	$0	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$0	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm				
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147.250 dscfm	$0	$155,585	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm				
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$0 $0	$794,594 $79,459	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$831,572**	$831,572					
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$4,498,721**			**Updated Total Direct Costs**	**$831,572**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$74,256			Administrative = 2% of TCI	$133,313		
	Property tax = 1% of TCI	$37,128			Property tax = 1% of TCI	$66,656		
	Insurance charges = 1% of TCI	$37,128			Insurance charges = 1% of TCI	$66,656		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$350,450**			Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$629,169**		
Total Indirect Costs for RTO		**$543,624**						
Total Indirect Costs for WESP	Add WESP costs	**$940,458**			**Total Indirect Costs for WESP**	**$940,458**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$5,982,803**		Scrubber, including WESP, not media replacement costs	**UPDATED TOTAL ANNUAL COST**	**$1,772,030**	$1,772,030	WESP costs added to PB scrubber costs for 20 yr life

OSB Biomass Heaters, Packed Bed Scrubber/WESP	**Packed Bed Scrubber w/20 yr life and WESP - Annual Control Cost**	**$5,982,803**	**per year**	
	Pollutant to be removed	**54.50**	**tpy**	
	CONTROL COST EFFECTIVENESS	**$109,767**	**per ton**	
	Annual Control Cost w/o WESP	**$4,210,773**	**per year**	**= $5,982,803 - $831,572 - $940,458**
	Pollutant to be removed	**54.50**	**tpy**	
	CONTROL COST EFFECTIVENESS w/o WESP	**$77,255**	**per ton**	

Supporting Documentation for Table 3-76, Summary of Scrubber Costs for Thermal Oil Heaters (Total VOCs)

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OSB TOH, Packed Bed Scrubber Only	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	Packed Bed Scrubber Costs	For 10 year Equipment Life		Assume 5 year Media Life
Direct Costs		*(Kronospan)*		
		$1,260,840		Replace with Tri-Mer cost proposal 1/21/26
Purchased Equipment Costs	Scrubber equipment = A	$1,260,840		
	Instrumentation = 0.10 x A	$126,084		
	Sales tax = 0.03 x A	$37,825		
	Freight = 0.05 x A	$63,042		
Purchased Equipment Costs	PEC = B	$1,487,791		
Direct Installation Costs	Foundation/supports = 0.12 x B	$178,535		
	Handling/erection = 0.4 x B	$595,116		
	Electrical = 0.01 x B	$14,878		
	Piping = 0.3 x B	$446,337		
	Insulation for ductwork = 0.01 x B	$14,878		
	Painting = 0.01 x B	$14,878		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs	DIC = C	$1,264,623		
TOTAL DIRECT COSTS	DC = 0.85 x B + SP + Bldg	$2,752,414		
Indirect Costs	Engineering = 0.10 x B	$148,779		
	Construction/field expenses = 0.10 x B	$148,779		
	Contractor fees = 0.10 x B	$148,779		
	Start-up = 0.01 x B	$14,878		
	Performance test = 0.01 x B	$14,878		
TOTAL INDIRECT COSTS	Total Indirect Costs (IC)	$476,093		
Contingency Cost (15%)	Total Capital Investment x 0.15	$484,276		
TOTAL CAPITAL INVESTMENT		$3,712,783		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
	Annual Sodium Hydroxide cost	$15,715		Estimated from EPA Cost Spreadsheet
	Annual Solvent cost - Assume this is water only	$1,552,164		Estimated: ((160 gal/min x 60 min/hr) + 35 gal/hr)) x 8760 hr/yr x $6.13/1000 gal x 3
	Annual Wastewater Disposal cost	$1,824,042		Estimated: 160 gal/min x 60 min/hr x 8760 hr/yr x $7.23/1000 gal x 3
Utilities	Electricity = Annual usage x Price	$286,923		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$0		From EPA Cost Spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,753,282		
Annual maintenance/cleaning of scrubber	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$0	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$0	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$0	$163,920	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147.250 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$0	$802,929 $160,586	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,753,282		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$74,256		
	Property tax = 1% of TCI	$37,128		
	Insurance charges = 1% of TCI	$37,128		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$528,626		
Total Indirect Costs for PB Scrubber		$721,800		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$4,475,082		Scrubber, not Including media replacement costs

OSB TOH, Packed Bed Scrubber Only	Packed Bed Scrubber - Total Annual Control Cost	$4,475,082	per year
	VOC/HAP Pollutants Destroyed	56.29	tpy
	CONTROL COST EFFECTIVENESS	$79,505	per ton

OSB TOH, Packed Bed Scrubber/WESP	*EPA Cost Manual, 7th Ed., Nov 2017*	*Tri-Mer Quote and EPA Cost Spreadshee*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs	
VOC Cost Effectiveness	Scrubber 85% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate			
Capital Cost Summary	Packed Bed Scrubber Costs	For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life			
Direct Costs		*(Kronospan)* $840,560				*(Kronospan estimate)* $2,222,642	Convert $8MM WESP cost from PB, since updated spreadsheet from EPA is not available	
Purchased Equipment Costs	Scrubber equipment = A	$1,260,840	Scrubber equipment cost	ESP + auxiliary equipment = A	$2,222,642		$8,000,000 / 530,000 dscfm x 147,250 dscfm	
	Instrumentation = 0.10 x A	$126,084		Instrumentation = 0.10 x A	$222,264			
	Sales tax = 0.03 x A	$37,825		Sales tax = 0.03 x A	$66,679			
	Freight = 0.05 x A	$63,042		Freight = 0.05 x A	$111,132			
Purchased Equipment Costs	PEC = B	$1,487,791		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717			
Direct Installation Costs	Foundation/supports = 0.08 x B	$178,535		Foundation/supports = 0.04 x B	$104,909			
	Handling/erection = 0.14 x B	$595,116		Handling/erection = 0.50 x B	$1,311,358			
	Electrical = 0.04 x B	$14,878		Electrical = 0.08 x B	$209,817			
	Piping = 0.02 x B	$446,337		Piping = 0.01 x B	$26,227			
	Insulation for ductwork = 0.01 x B	$14,878		Insulation for ductwork = 0.02 x B	$52,454			
	Painting = 0.01 x B	$14,878		Painting = 0.02 x B	$52,454			
	Site Preparation (SP)	$0		Site Preparation (SP)	$0			
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0			
Direct Installation Costs		$1,264,623			$1,757,220			
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	$2,752,414		DC = 1.67 x B + SP + Bldgs	$4,379,937			
Indirect Costs	Engineering = 0.10 x B	$148,779		Engineering = 0.20 x B	$524,543			
	Construction/field expenses = 0.05 x B	$148,779		Construction/field expenses = 0.20 x B	$524,543			
	Contractor fees = 0.10 x B	$148,779		Contractor fees = 0.10 x B	$262,272			
	Start-up = 0.02 x B	$14,878		Start-up = 0.01 x B	$26,227			
	Performance test = 0.01 x B	$14,878		Performance test = 0.01 x B	$26,227			
				Model Study = 0.02 x B	$52,454			
TOTAL INDIRECT COSTS		$476,093		TOTAL INDIRECT COSTS	$1,416,267			
Contingency Cost (15%)		$484,276		Contingency Cost (15%)	$869,431			
TOTAL CAPITAL INVESTMENT		$3,712,783		TOTAL CAPITAL INVESTMENT	$6,665,635			
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			
	Supervision = 15% of operating labor	$3,509		Supervision = 15% of operating labor	$3,509			
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			
	Maintenance material = 100% of maintenance labor	$23,767		Maintenance material = 100% of maintenance labor	$23,767			
Utilities	Electricity	$286,923	From EPA cost spreadsheet	Electricity (estimated)	$456,596	$456,596	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = total RTO + WESP electricity costs	
	Auxiliary Fuel - Natural Gas	$0 $0	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP	
				Water Usage (estimated)	$50,000			
				Chemical Usage (estimated)	$50,000			
Total Direct Costs	From EPA Cost Spreadsheet	$3,753,282		Total Direct Costs	$631,034			
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	$0 $200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$200,038	$200,038	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)	
Media costs (packed bed)	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$0 $639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm					
Media replacement costs (packed bed)	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147.250 dscfm	$0 $155,585	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm					
Annualized (media + replacement) costs	Costs for 1 replacement every 10 years Annualized cost = media + replacement costs / 10 yrs	$0 $794,594 $0 $79,459	Costs for 1 replacement every 10 years Annual cost = media + replacement costs / 10 yrs					
Add WESP costs	Add WESP costs	$831,072 $831,072						
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs	$4,584,354		Updated Total Direct Costs	$831,072		Add WESP costs	
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663			
	Administrative = 2% of TCI	$74,256		Administrative = 2% of TCI	$133,313			
	Property tax = 1% of TCI	$37,128		Property tax = 1% of TCI	$66,656			
	Insurance charges = 1% of TCI	$37,128		Insurance charges = 1% of TCI	$66,656			
	Capital Recovery (20 yrs at 7% so CRF=0.09439)	$350,450		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$629,169			
Total Indirect Costs for RTO		$543,624						
Total Indirect Costs for WESP	Add WESP costs	$940,458		Total Indirect Costs for WESP	$940,458		Add WESP costs	
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,068,436	Scrubber, including WESP, not media replacement cost	UPDATED TOTAL ANNUAL COST	$1,771,530	$1,771,530	WESP costs added to PB scrubber costs for 20 yr life	

OSB TOH, Packed Bed Scrubber/WESP	ked Bed Scrubber and WESP - Annual Control Cost	$6,068,436	per year
	Pollutant to be removed	56.29	tpy
	CONTROL COST EFFECTIVENESS	$107,812	per ton

Packed Bed Scrubber w/ no WESP - Annual Control Cost w/o WESP	$4,296,906	per year	= $6,237,364 - $831,072 - $940,458
Pollutant to be removed	56.29	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$76,339	per ton	

Supporting Documentation for Table 3-83, Summary of Thermal and Catalytic Oxidizer Costs for Biomass Heaters (Total CO)

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Kronospan - Eastaboga, AL

OSB Biomass Heaters, RTO	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Additional Costs**
CO Cost Effectiveness	**RTO 90% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***		**Maintenance/Cleaning & Media Replacement**
Capital Cost Summary	**RTO Costs**	**For 10 year Equipment Life**		**Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$9,000,000		**Replace with TANN cost proposal 1/15/26**
Purchased Equipment Costs	RTO equipment = A	$9,000,000		
	Instrumentation = 0.10 x A	$900,000		
	Sales tax = 0.03 x A	$270,000		
	Freight = 0.05 x A	$450,000		
Purchased Equipment Costs	PEC = B	**$10,620,000**		
Direct Installation Costs	Foundation/supports = 0.08 x B	$849,600		
	Handling/erection = 0.14 x B	$1,486,800		
	Electrical = 0.04 x B	$424,800		
	Piping = 0.02 x B	$212,400		
	Insulation for ductwork = 0.01 x B	$106,200		
	Painting = 0.01 x B	$106,200		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$3,186,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$13,806,000**		
Indirect Costs	Engineering = 0.10 x B	$1,062,000		
	Construction/field expenses = 0.05 x B	$531,000		
	Contractor fees = 0.10 x B	$1,062,000		
	Start-up = 0.02 x B	$212,400		
	Performance test = 0.01 x B	$106,200		
TOTAL INDIRECT COSTS		**$2,973,600**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,516,940		
TOTAL CAPITAL INVESTMENT		**$19,296,540**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$389,498		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$801,951		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$1,265,887**		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	$720,000 / 530,000 dscfm x 147,250 dscfm
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	$590,000 / 530,000 x 147,250 dscfm
	Total costs for 1 replacement every 5 years	$802,929	$802,929	Total costs for 1 replacement every 5 years
Annualized (media + replacement) co	Annualized cost = (media + replacement costs) / 5 yrs	$160,586	$160,586	Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$1,626,511**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$385,931		
	Property tax = 1% of TCI	$192,965		
	Insurance charges = 1% of TCI	$192,965		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$2,747,441**		
Total Indirect Costs for RTO		**$3,563,966**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$5,190,477**		RTO and Including media replacement costs
OSB Biomass Heaters, RTO	**RTO w/ 10 yr life - Total Annual Control Cost**	**$5,190,477**	**per year**	
	CO Pollutants Destroyed	**288.95**	**tpy**	
	CONTROL COST EFFECTIVENESS	**$17,963**	**per ton**	

OSB Biomass Heaters, RTO with WESP	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***	**Estimated Actual Costs**	***EPA Cost Manual, 6th Ed., Sept 1999***	***EPA Cost Manual, Sept 1999***		**Estimated Actual Costs**
CO Cost Effectiveness	**RTO 90% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***	**Maint/Clean & Media Replace**	**WESP 95% Control Efficiency**	**Cost Estimate**		
Capital Cost Summary	**RTO Costs**	**For 20 year Equipment Life**	**Assume 10 year Media Life**	**WESP Costs**	**Assume 20 year Equipment Life**		
						(Kronospan estimate)	
Direct Costs		*(Kronospan)*				$2,222,642	Assume WESP cost same approach as PB
		$9,000,000	RTO equipment cost				$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RTO equipment = A	$9,000,000		ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$900,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$270,000		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$450,000		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$10,620,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$849,600		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$1,486,800		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$424,800		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$212,400		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$106,200		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$106,200		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$3,186,000			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$13,806,000**		DC = 1.67 x B + SP + Bldgs	**$4,379,937**		
Indirect Costs	Engineering = 0.10 x B	$1,062,000		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$531,000		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,062,000		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$212,400		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$106,200		Performance test = 0.01 x B	$26,227		
				Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		**$2,973,600**		**TOTAL INDIRECT COSTS**	**$1,416,267**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$2,516,940		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		**$19,296,540**		**TOTAL CAPITAL INVESTMENT**	**$6,453,195**		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 h	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		Maintenance material = 100% of maintenance labor	$23,767		
							Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250
Utilities	Electricity	$389,498	From EPA Cost Spreadsheet	Electricity (estimated)	$82,813	$82,813	dscfm = total RTO + WESP electricity costs
	Auxiliary Fuel - Natural Gas	$801,951 $0	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
				Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		**$1,265,887**		**Total Direct Costs**	**$257,251**		
	Convert $720,000 maintenance/cleaning from PB RTO		Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 147,250 dscfm	$200,038 $200,038	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & W	$200,038	$200,038	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO		Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009 $639,009	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)		Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 147,250 dscfm	$163,920 $155,585	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929 $794,594	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293 $79,459	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$457,289**					
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$2,003,507**		**Updated Total Direct Costs**	**$457,289**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$385,931		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$192,965		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$192,965		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$1,821,400**		Capital Recovery (**20 yrs at 7% so CRF=0.09439**	**$609,117**		
Total Indirect Costs for RTO		**$2,637,925**					
Total Indirect Costs for WESP	Add WESP costs	**$911,908**		**Total Indirect Costs for WESP**	**$911,908**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$5,553,340**	RTO and Including media replacement & WESP costs	**UPDATED TOTAL ANNUAL COST**	**$1,369,197**	$1,369,197	WESP costs added to RTO costs for 20 yr life
OSB Biomass Heaters, RTO with WESP	**RTO w/ 20 yr life - Annual Control Cost**	**$5,553,340 per year**					
	Pollutant to be removed	**288.95 tpy**					
	CONTROL COST EFFECTIVENESS	**$19,219 per ton**					

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	**$4,184,143 per year**	**= $5,553,340 - $457,289 - $911,908**
Pollutant to be removed	**288.95 tpy**	
CONTROL COST EFFECTIVENESS w/o WESP	**$14,481 per ton**	

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OSB Biomass Heaters, Recup TO	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Additional Costs**
CO Cost Effectiveness	**Recup TO 75% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***		**Maintenance/Cleaning & Media Replacement**
Capital Cost Summary	**Recup TO Costs**	**For 10 year Equipment Life**		**Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$16,800,000		**Replace with TANN cost proposal 1/15/26**
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000		
	Instrumentation = 0.10 x A	$1,680,000		
	Sales tax = 0.03 x A	$504,000		
	Freight = 0.05 x A	$840,000		
Purchased Equipment Costs	PEC = B	$19,824,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,585,920		
	Handling/erection = 0.14 x B	$2,775,360		
	Electrical = 0.04 x B	$792,960		
	Piping = 0.02 x B	$396,480		
	Insulation for ductwork = 0.01 x B	$198,240		
	Painting = 0.01 x B	$198,240		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$5,947,200		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$25,771,200**		
Indirect Costs	Engineering = 0.10 x B	$1,982,400		
	Construction/field expenses = 0.05 x B	$991,200		
	Contractor fees = 0.10 x B	$1,982,400		
	Start-up = 0.02 x B	$396,480		
	Performance test = 0.01 x B	$198,240		
TOTAL INDIRECT COSTS		**$5,550,720**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,698,288		
TOTAL CAPITAL INVESTMENT		**$36,020,208**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$389,498		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$4,556,958		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$5,020,894**		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$802,929 $160,586	$802,929 $160,586	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$5,381,518**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$720,404		
	Property tax = 1% of TCI	$360,202		
	Insurance charges = 1% of TCI	$360,202		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$5,128,557**		
Total Indirect Costs for Recup TO		**$6,614,029**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$11,995,546**		Recup TO and Including media replacement costs
OSB Biomass Heaters, Recup TO	**Recup TO w/ 10 yr life - Total Annual Control Cost**	**$11,995,546**	**per year**	
	CO Pollutants Destroyed	**240.79**	**tpy**	
	CONTROL COST EFFECTIVENESS	**$49,817**	**per ton**	

OSB Biomass Heaters, Recup TO with WESP	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Actual Costs**	***EPA Cost Manual, 6th Ed., Sept 1999***	***EPA Cost Manual, Sept 1999***		**Estimated Actual Costs**
CO Cost Effectiveness	**Recup TO 75% Control Effic**	***EPA Cost Spreadsheet, Dec 2024***		**Maint/Clean & Media Replace**	**WESP 95% Control Efficiency**	**Cost Estimate**		
Capital Cost Summary	**Recup TO Costs**	**For 20 year Equipment Life**		**Assume 10 year Media Life**	**WESP Costs**	**Assume 20 year Equipment Life**		
Direct Costs		*(Kronospan)*					*(Kronospan estimate)*	Assume WESP cost same approach
		$16,800,000		Recup TO equipment cost		$2,222,642		$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	Recup TO equipment = A	$16,800,000			ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$1,680,000			Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$504,000			Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$840,000			Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	$19,824,000			Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,585,920			Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$2,775,360			Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$792,960			Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$396,480			Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$198,240			Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$198,240			Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0			Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0			Buildings (Bldgs)	$0		
Direct Installation Costs		$5,947,200				$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$25,771,200**			DC = 1.67 x B + SP + Bldgs	**$4,379,937**		
Indirect Costs	Engineering = 0.10 x B	$1,982,400			Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$991,200			Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,982,400			Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$396,480			Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$198,240			Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		**$5,550,720**			**TOTAL INDIRECT COSTS**	**$1,416,267**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,698,288			Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		**$36,020,208**			**TOTAL CAPITAL INVESTMENT**	**$6,453,195**		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395			Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509			Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767			Maintenance labor = 0.5 hr/shift x Rate x Op hr/8	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767			Maintenance material = 100% of maintenance labo	$23,767		
Utilities	Electricity	$389,498		From EPA Cost Spreadsheet	Electricity (estimated)	$472,311	$472,311	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = WESP electricity costs
	Auxiliary Fuel - Natural Gas	$4,556,958	$0	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs		**$5,020,894**			**Total Direct Costs**	**$646,749**		
Annual maintenance/cleaning of Recup TO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & W	$200,038	$200,038	Assume WESP maintenance/cleaning same as Recup WESP maintenance (sludge & wastewater)
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm				
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm	$163,920	$155,585	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	$794,594	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	$79,459	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$846,787**						
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$6,148,012**			**Updated Total Direct Costs**	**$846,787**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663			Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$720,404			Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$360,202			Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$360,202			Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$3,399,947**			Capital Recovery (**20 yrs at 7% so CRF=0.0943**	**$609,117**		
Total Indirect Costs for Recup TO		**$4,885,419**						
Total Indirect Costs for WESP	Add WESP costs	**$911,908**			**Total Indirect Costs for WESP**	**$911,908**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$11,945,338**		Recup TO & Including media replacement & WESP costs	**UPDATED TOTAL ANNUAL COST**	**$1,758,695**	$1,758,695	WESP costs added to Recup TO costs for 20 yr life
OSB Biomass Heaters, Recup TO with WESP	**ecup w/ 20 yr life and WESP - Annual Control Cost**	**$11,945,338**	**per year**					
	Pollutant to be removed	**240.79**	**tpy**					
	CONTROL COST EFFECTIVENESS	**$49,609**	**per ton**					

Recup TO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	**$10,186,643**	**per year**	**= $11,945,338 - $846.787- $911,900**
Pollutant to be removed	**240.79**	**tpy**	
CONTROL COST EFFECTIVENESS w/o WESP	**$42,305**	**per ton**	

Kronospan - Eastaboga, AL

OSB Biomass Heaters, RCO	***EPA Cost Manual, 7th Ed., Nov 2017***	***TANN Quote and EPA Cost Spreadsheet***		**Estimated Additional Costs**
CO Cost Effectiveness	**RCO 75% Control Efficiency**	***EPA Cost Spreadsheet, Dec 2024***		**Maint/Clean & Media Replace**
Capital Cost Summary	**RCO Costs**	**For 10 year Equipment Life**		**Assume 5 year Media Life**
Direct Costs		*(Kronospan)*		
		$12,150,000		**Replace with TANN cost proposal 1/15/26**
Purchased Equipment Costs	RCO equipment = A	$12,150,000		
	Instrumentation = 0.10 x A	$1,215,000		
	Sales tax = 0.03 x A	$364,500		
	Freight = 0.05 x A	$607,500		
Purchased Equipment Costs	PEC = B	$14,337,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,146,960		
	Handling/erection = 0.14 x B	$2,007,180		
	Electrical = 0.04 x B	$573,480		
	Piping = 0.02 x B	$286,740		
	Insulation for ductwork = 0.01 x B	$143,370		
	Painting = 0.01 x B	$143,370		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$4,301,100		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	**$18,638,100**		
Indirect Costs	Engineering = 0.10 x B	$1,433,700		
	Construction/field expenses = 0.05 x B	$716,850		
	Contractor fees = 0.10 x B	$1,433,700		
	Start-up = 0.02 x B	$286,740		
	Performance test = 0.01 x B	$143,370		
TOTAL INDIRECT COSTS		**$4,014,360**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,397,869		
TOTAL CAPITAL INVESTMENT		**$26,050,329**		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA Cost Spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA Cost Spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA Cost Spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA Cost Spreadsheet
Utilities	Electricity = Annual usage x Price	$610,321		From EPA Cost Spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$2,652,979		From EPA Cost Spreadsheet
Catalyst replacement	Catalyst replacement cost	$58,552		From EPA Cost Spreadsheet
Total Direct Costs	**From EPA Cost Spreadsheet**	**$3,396,290**		
Annual maintenance/cleaning of RCO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$200,038	$200,038	Convert $720,000 maintenance/cleaning PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$639,009	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$163,920	$163,920	Convert $590,000 replace cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$802,929 $160,586	$802,929 $160,586	Total costs for 1 replacement every 5 years Annualized cost = (media + replace costs) / 5 yrs
Updated Total Direct Costs	**EPA Cost Spreadsheet + Additional Annual Costs**	**$3,756,914**		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$521,007		
	Property tax = 1% of TCI	$260,503		
	Insurance charges = 1% of TCI	$260,503		
	Capital Recovery (**10 yrs at 7% so CRF=0.14238**)	**$3,709,046**		
Total Indirect Costs for RCO		**$4,795,722**		
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$8,552,636**		RTO and Including media replacement costs
OSB Biomass Heaters, RCO	**RCO w/ 10 yr life - Total Annual Control Cost**	**$8,552,636**	**per year**	
	CO Pollutants Destroyed	**240.79**	**tpy**	
	CONTROL COST EFFECTIVENESS	**$35,519**	**per ton**	

OSB Biomass Heaters, RTO with WESP **CO Cost Effectiveness** **Capital Cost Summary**	***EPA Cost Manual, 7th Ed., Nov 2017*** **RCO 75% Control Efficiency** **RCO Costs**	***TANN Quote and EPA Cost Spreadsheet*** ***EPA Cost Spreadsheet, Dec 2024*** **For 20 year Equipment Life**	**Estimated Actual Costs** **Maint/Clean & Media Replace** **Assume 10 year Media Life**	***EPA Cost Manual, 6th Ed., Sept 1999*** **WESP 95% Control Efficiency** **WESP Costs**	***EPA Cost Manual, Sept 1999*** **Cost Estimate** **Assume 20 year Equipment Life**		**Estimated Actual Costs**
Direct Costs		*(Kronospan)*				*(Kronospan estimate)*	Assume WESP cost same approach as PB
		$12,150,000	RCO equipment cost			$2,222,642	$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RCO equipment = A	$12,150,000		ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A	$1,215,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A	$364,500		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A	$607,500		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B	**$14,337,000**		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,146,960		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B	$2,007,180		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B	$573,480		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B	$286,740		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B	$143,370		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B	$143,370		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)	$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)	$0		Buildings (Bldgs)	$0		
Direct Installation Costs		$4,301,100			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs	**$18,638,100**		DC = 1.67 x B + SP + Bldgs	**$4,379,937**		
Indirect Costs	Engineering = 0.10 x B	$1,433,700		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B	$716,850		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B	$1,433,700		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B	$286,740		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B	$143,370		Performance test = 0.01 x B	$26,227		
				Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS		**$4,014,360**		**TOTAL INDIRECT COSTS**	**$1,416,267**		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,397,869		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT		**$26,050,329**		**TOTAL CAPITAL INVESTMENT**	**$6,453,195**		
Annual Cost Summary							
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor	$3,509		Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 h	$23,767		
	Maintenance material = 100% of maintenance labor	$23,767		Maintenance material = 100% of maintenance labor	$23,767		
Utilities	Electricity	$610,321	From EPA Cost Spreadsheet	Electricity (estimated)	$472,311	$472,311	Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm = WESP electricity costs
	Auxiliary Fuel - Natural Gas	$2,652,979	From EPA Cost Spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement	Catalyst replacement cost	$58,552	From EPA Cost Spreadsheet	Water Usage (estimated)	$50,000		
				Chemical Usage (estimated)	$50,000		
Total Direct Costs		**$3,396,290**		**Total Direct Costs**	**$646,749**		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	$200,038	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & W	$200,038	$200,038	Assume WESP maintenance/cleaning same as RTO WESP maintenance (sludge & wastewater)
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm	$639,009	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm				
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm	$163,920	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years	$802,929	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs	$80,293	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs	**$846,787**					
Updated Total Direct Costs	**EPA Cost Manual + Additional Annual Costs**	**$4,523,408**		**Updated Total Direct Costs**	**$846,787**		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$521,007		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI	$260,503		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI	$260,503		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (**20 yrs at 7% so CRF=0.09439**)	**$2,458,891**		Capital Recovery (**20 yrs at 7% so CRF=0.09439**	**$609,117**		
Total Indirect Costs for RCO		**$3,545,567**					
Total Indirect Costs for WESP	Add WESP costs	**$911,908**		**Total Indirect Costs for WESP**	**$911,908**		Add WESP costs
UPDATED TOTAL ANNUAL COST	**EPA Cost Spreadsheet + Additional Annual Costs**	**$8,980,882**	RCO and Including media replacement & WESP costs	**UPDATED TOTAL ANNUAL COST**	**$1,758,695**	$1,758,695	WESP costs added to RTO costs for 20 yr life
Annual Control Cost	**RCO w/ 20 yr life and WESP - Annual Control Cost**	**$8,980,882**	**per year**				
	Pollutant to be removed	**240.79**	**tpy**				
	CONTROL COST EFFECTIVENESS	**$37,297**	**per ton**				

RCO w/ 20 yr life and no WESP - Annual Control Cost	**$7,222,187**	**per year**	**= $8,980,882 - $846,787 - $911,908**
Pollutant to be removed	**240.79**	**tpy**	
CONTROL COST EFFECTIVENESS w/o WESP	**$29,994**	**per ton**	

Supporting Documentation for Table 3-84, Summary of Thermal and Catalytic Oxidizer Costs for Thermal Oil Heaters (Biomass Heaters & Natural Gas-Fired Heaters) (CO)

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OSB All Thermal Oil Heaters, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
CO Cost Effectiveness	RTO 90% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$12,000,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$12,000,000		
	Instrumentation = 0.10 x A	$1,200,000		
	Sales tax = 0.03 x A	$360,000		
	Freight = 0.05 x A	$600,000		
Purchased Equipment Costs	PEC = B	$14,160,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,132,800		
	Handling/erection = 0.14 x B	$1,982,400		
	Electrical = 0.04 x B	$566,400		
	Piping = 0.02 x B	$283,200		
	Insulation for ductwork = 0.01 x B	$141,600		
	Painting = 0.01 x B	$141,600		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$4,248,000		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$18,408,000		
Indirect Costs	Engineering = 0.10 x B	$1,416,000		
	Construction/field expenses = 0.05 x B	$708,000		
	Contractor fees = 0.10 x B	$1,416,000		
	Start-up = 0.02 x B	$283,200		
	Performance test = 0.01 x B	$141,600		
TOTAL INDIRECT COSTS		$3,964,800		
Contingency Cost (15%)	Total Capital Investment x 0.15	$3,355,920		
TOTAL CAPITAL INVESTMENT		$25,728,720		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$504,181		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$1,038,121		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$1,616,740		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$258,936	$258,936	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 190,606 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$827,158	$827,158	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 190,606 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$212,184	$212,184	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 190,606 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$1,039,342 $207,868	$1,039,342 $207,868	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$2,083,545		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$514,574		
	Property tax = 1% of TCI	$257,287		
	Insurance charges = 1% of TCI	$257,287		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$3,663,255		
Total Indirect Costs for RTO		$4,737,067		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$6,820,612		RTO and Including media replacement costs
OSB All Thermal Oil Heaters, RTO	RTO w/ 10 yr life - Total Annual Control Cost	$6,820,612	per year	
	CO Pollutants Destroyed	293.11	tpy	
	CONTROL COST EFFECTIVENESS	$23,270	per ton	

OSB All Thermal Oil Heaters, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*		*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness	RTO 90% Control Efficiency		*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs		For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs			*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
			$12,000,000	RTO equipment cost		$2,222,642		$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RTO equipment = A				ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A		$1,200,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A		$360,000		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A		$600,000		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B		$14,160,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B		$1,132,800		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B		$1,982,400		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B		$566,400		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B		$283,200		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B		$141,600		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B		$141,600		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)		$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)		$0		Buildings (Bldgs)	$0		
Direct Installation Costs			$4,248,000			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs		$18,408,000		DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B		$1,416,000		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B		$708,000		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B		$1,416,000		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B		$283,200		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B		$141,600		Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS			$3,964,800		TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15		$3,355,920		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT			$25,728,720		TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,395	From EPA cost spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor		$3,509	From EPA cost spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,767	From EPA cost spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor		$23,767	From EPA cost spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm =
Utilities	Electricity		$504,181	From EPA cost spreadsheet	Electricity (estimated)	$472,311	$472,311	WESP electricity costs
	Auxiliary Fuel - Natural Gas		$1,038,121	From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs			$1,616,740		Total Direct Costs	$646,749		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 190,606 dscfm		$258,936 $258,936	$720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$258,936	$258,936	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 190,606 dscfm		$827,158 $827,158	$2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 190,606 dscfm		$212,184 $212,184	$590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years		$1,039,342 $1,039,342	Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs		$103,934 $103,934	Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs		$905,686					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs		$2,885,296		Updated Total Direct Costs	$905,686		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)		$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI		$514,574		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI		$257,287		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI		$257,287		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)		$2,428,534		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for RTO			$3,502,346					
Total Indirect Costs for WESP	Add WESP costs		$911,908		Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs		$7,299,550	RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,817,594	$1,817,594	WESP costs to be added to RTO costs for 20 yr life
OSB All Thermal Oil Heaters, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost		$7,299,550 per year					
	Pollutant to be removed		293.11 tpy					
	CONTROL COST EFFECTIVENESS		$24,904 per ton					

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP $5,481,956 per year = $7,299,550 - $905,686 - $911,908
Pollutant to be removed 293.11 tpy
CONTROL COST EFFECTIVENESS w/o WESP $18,703 per ton

Kronospan - Eastaboga, AL

OSB All Thermal Oil Heaters, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
CO Cost Effectiveness	RTO 75% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$22,400,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$22,400,000		
	Instrumentation = 0.10 x A	$2,240,000		
	Sales tax = 0.03 x A	$672,000		
	Freight = 0.05 x A	$1,120,000		
Purchased Equipment Costs	PEC = B	$26,432,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$2,114,560		
	Handling/erection = 0.14 x B	$3,700,480		
	Electrical = 0.04 x B	$1,057,280		
	Piping = 0.02 x B	$528,640		
	Insulation for ductwork = 0.01 x B	$264,320		
	Painting = 0.01 x B	$264,320		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$7,929,600		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$34,361,600		
Indirect Costs	Engineering = 0.10 x B	$2,643,200		
	Construction/field expenses = 0.05 x B	$1,321,600		
	Contractor fees = 0.10 x B	$2,643,200		
	Start-up = 0.02 x B	$528,640		
	Performance test = 0.01 x B	$264,320		
TOTAL INDIRECT COSTS		$7,400,960		
Contingency Cost (15%)	Total Capital Investment x 0.15	$6,264,384		
TOTAL CAPITAL INVESTMENT		$48,026,944		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$504,178		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$5,921,246		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$6,499,862		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$258,936	$258,936	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 190,606 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$827,158	$827,158	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 190,606 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$212,184	$212,184	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 190,606 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$1,039,342 $207,868	$1,039,342 $207,868	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$6,966,667		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$960,539		
	Property tax = 1% of TCI	$480,269		
	Insurance charges = 1% of TCI	$480,269		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$6,838,076		
Total Indirect Costs for RTO		$8,803,817		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$15,770,484		RTO and Including media replacement costs
OSB All Thermal Oil Heaters, RTO	Total Annual Control Cost	$15,770,484	per year	
	CO Pollutants Destroyed	244.26	tpy	
	CONTROL COST EFFECTIVENESS	$64,564	per ton	

OSB All Thermal Oil Heaters, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*		*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness	RTO 75% Control Efficiency		*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs		For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs			*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
			$22,400,000	RTO equipment cost		$2,222,642	$2,222,642	$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RTO equipment = A		$22,400,000		ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A		$2,240,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A		$672,000		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A		$1,120,000		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B		$26,432,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B		$2,114,560		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B		$3,700,480		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B		$1,057,280		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B		$528,640		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B		$264,320		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B		$264,320		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)		$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)		$0		Buildings (Bldgs)	$0		
Direct Installation Costs			$7,929,600			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs		$34,361,600		DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B		$2,643,200		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B		$1,321,600		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B		$2,643,200		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B		$528,640		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B		$264,320		Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS			$7,400,960		TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15		$6,264,384		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT			$48,026,944		TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,395	From EPA cost spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor		$3,509	From EPA cost spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,767	From EPA cost spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor		$23,767	From EPA cost spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB:
								$1,700,000 / 530,000 dscfm x 147,250 dscfm =
Utilities	Electricity		$504,178	From EPA cost spreadsheet	Electricity (estimated)	$472,311	$472,311	WESP electricity costs
	Auxiliary Fuel - Natural Gas		$5,921,246	$0 From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
					Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs			$6,499,862		Total Direct Costs	$646,749		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 190,606 dscfm		$258,936	$258,936 $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$258,936	$258,936	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 190,606 dscfm		$827,158	$827,158 $2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 190,606 dscfm		$212,184	$212,184 $590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years		$1,039,342	$1,039,342 Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs		$103,934	$103,934 Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs		$905,686					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs		$7,768,418		Updated Total Direct Costs	$905,686		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)		$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI		$960,539		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI		$480,269		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI		$480,269		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)		$4,533,263		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for RTO			$6,499,004					
Total Indirect Costs for WESP	Add WESP costs		$911,908		Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs		$15,179,330	RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,817,594	$1,817,594	WESP costs to be added to RTO costs for 20 yr life
OSB All Thermal Oil Heaters, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost		$15,179,330	per year				
	Pollutant to be removed		244.26	tpy				
	CONTROL COST EFFECTIVENESS		$62,144	per ton				

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$13,361,737	per year	= $15,179,330 - $905,686 - $911,908
Pollutant to be removed	244.26	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$54,703	per ton	

Kronospan - Eastaboga, AL

OSB All Thermal Oil Heaters, RTO	*EPA Cost Manual, 7th Ed., Nov 2017*	*TANN Quote and EPA Cost Spreadsheet*		Estimated Additional Costs
CO Cost Effectiveness	RTO 75% Control Efficiency	*EPA Cost Spreadsheet, Dec 2024*		Maintenance/Cleaning & Media Replacement
Capital Cost Summary	RTO Costs	For 10 year Equipment Life		Assume 5 year Media Life
			(Kronospan)	
Direct Costs			$16,200,000	Replace with TANN cost proposal 1/15/26
Purchased Equipment Costs	RTO equipment = A	$16,200,000		
	Instrumentation = 0.10 x A	$1,620,000		
	Sales tax = 0.03 x A	$486,000		
	Freight = 0.05 x A	$810,000		
Purchased Equipment Costs	PEC = B	$19,116,000		
Direct Installation Costs	Foundation/supports = 0.08 x B	$1,529,280		
	Handling/erection = 0.14 x B	$2,676,240		
	Electrical = 0.04 x B	$764,640		
	Piping = 0.02 x B	$382,320		
	Insulation for ductwork = 0.01 x B	$191,160		
	Painting = 0.01 x B	$191,160		
	Site Preparation = SP	$0		
	Buildings = Bldg	$0		
Direct Installation Costs		$5,734,800		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldg	$24,850,800		
Indirect Costs	Engineering = 0.10 x B	$1,911,600		
	Construction/field expenses = 0.05 x B	$955,800		
	Contractor fees = 0.10 x B	$1,911,600		
	Start-up = 0.02 x B	$382,320		
	Performance test = 0.01 x B	$191,160		
TOTAL INDIRECT COSTS		$5,352,480		
Contingency Cost (15%)	Total Capital Investment x 0.15	$4,530,492		
TOTAL CAPITAL INVESTMENT		$34,733,772		
Annual Cost Summary				
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		From EPA cost spreadsheet
	Supervision = 15% of operating labor	$3,509		From EPA cost spreadsheet
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		From EPA cost spreadsheet
	Maintenance material = 100% of maintenance labor	$23,767		From EPA cost spreadsheet
Utilities	Electricity = Annual usage x Price	$610,321		From EPA cost spreadsheet
	Auxiliary Fuel - Natural Gas = Annual usage x Price	$2,651,827		From EPA cost spreadsheet
Catalyst replacement	Catalyst replacement cost	$58,222		From EPA cost spreadsheet
Total Direct Costs	From EPA Cost Spreadsheet	$3,394,808		
Annual maintenance/cleaning of RTO	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 147,250 dscfm (annual)	$258,936	$258,936	Convert $720,000 maintenance/cleaning from PB RTO $720,000 / 530,000 dscfm x 190,606 dscfm
Media costs	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 147,250 dscfm (5 yrs)	$827,158	$827,158	Convert $2.3 MM media cost from PB RTO $2,300,000 / 530,000 dscfm x 190,606 dscfm
Media replacement costs	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 147,250 dscfm (5 yrs)	$212,184	$212,184	Convert $590,000 replacement cost (crane, labor, etc.) $590,000 / 530,000 x 190,606 dscfm
Annualized (media + replacement) costs	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs	$1,039,342 $207,868	$1,039,342 $207,868	Total costs for 1 replacement every 5 years Annualized cost = (media + replacement costs) / 5 yrs
Updated Total Direct Costs	EPA Cost Spreadsheet + Additional Annual Costs	$3,861,613		
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI	$694,675		
	Property tax = 1% of TCI	$347,338		
	Insurance charges = 1% of TCI	$347,338		
	Capital Recovery (10 yrs at 7% so CRF=0.14238)	$4,945,394		
Total Indirect Costs for RTO		$6,379,408		
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs	$10,241,021		RTO and Including media replacement costs
OSB All Thermal Oil Heaters, RTO	RTO w/ 10 yr life - Total Annual Control Cost	$10,241,021	per year	
	CO Pollutants Destroyed	244.26	tpy	
	CONTROL COST EFFECTIVENESS	$41,927	per ton	

OSB All Thermal Oil Heaters, RTO with WESP	*EPA Cost Manual, 7th Ed., Nov 2017*		*TANN Quote and EPA Cost Spreadsheet*	Estimated Actual Costs	*EPA Cost Manual, 6th Ed., Sept 1999*	*EPA Cost Manual, Sept 1999*		Estimated Actual Costs
CO Cost Effectiveness	RTO 75% Control Efficiency		*EPA Cost Spreadsheet, Dec 2024*	Maintenance/Cleaning & Media Replacement	WESP 95% Control Efficiency	Cost Estimate		
Capital Cost Summary	RTO Costs		For 20 year Equipment Life	Assume 10 year Media Life	WESP Costs	Assume 20 year Equipment Life		
							(Kronospan	
Direct Costs			*(Kronospan)*				*estimate)*	Assume WESP cost by using same approach as PB
			$16,200,000	RTO equipment cost		$2,222,642	$2,222,642	$8,000,000 / 530,000 dscfm x 147,250 dscfm
Purchased Equipment Costs	RTO equipment = A		$16,200,000		ESP + auxiliary equipment = A	$2,222,642		
	Instrumentation = 0.10 x A		$1,620,000		Instrumentation = 0.10 x A	$222,264		
	Sales tax = 0.03 x A		$486,000		Sales tax = 0.03 x A	$66,679		
	Freight = 0.05 x A		$810,000		Freight = 0.05 x A	$111,132		
Purchased Equipment Costs	PEC = B		$19,116,000		Purchased Equipment Costs (PEC) = B = 1.18 x A	$2,622,717		
Direct Installation Costs	Foundation/supports = 0.08 x B		$1,529,280		Foundation/supports = 0.04 x B	$104,909		
	Handling/erection = 0.14 x B		$2,676,240		Handling/erection = 0.50 x B	$1,311,358		
	Electrical = 0.04 x B		$764,640		Electrical = 0.08 x B	$209,817		
	Piping = 0.02 x B		$382,320		Piping = 0.01 x B	$26,227		
	Insulation for ductwork = 0.01 x B		$191,160		Insulation for ductwork = 0.02 x B	$52,454		
	Painting = 0.01 x B		$191,160		Painting = 0.02 x B	$52,454		
	Site Preparation (SP)		$0		Site Preparation (SP)	$0		
	Buildings (Bldgs)		$0		Buildings (Bldgs)	$0		
Direct Installation Costs			$5,734,800			$1,757,220		
TOTAL DIRECT COSTS	DC = 1.30 x B + SP + Bldgs		$24,850,800		DC = 1.67 x B + SP + Bldgs	$4,379,937		
Indirect Costs	Engineering = 0.10 x B		$1,911,600		Engineering = 0.20 x B	$524,543		
	Construction/field expenses = 0.05 x B		$955,800		Construction/field expenses = 0.20 x B	$524,543		
	Contractor fees = 0.10 x B		$1,911,600		Contractor fees = 0.10 x B	$262,272		
	Start-up = 0.02 x B		$382,320		Start-up = 0.01 x B	$26,227		
	Performance test = 0.01 x B		$191,160		Performance test = 0.01 x B	$26,227		
					Model Study = 0.02 x B	$52,454		
TOTAL INDIRECT COSTS			$5,352,480		TOTAL INDIRECT COSTS	$1,416,267		
Contingency Cost (15%)	Total Capital Investment x 0.15		$4,530,492		Contingency Cost (15%)	$656,991		
TOTAL CAPITAL INVESTMENT			$34,733,772		TOTAL CAPITAL INVESTMENT	$6,453,195		
Annual Cost Summary								
Direct Annual Costs	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,395	From EPA cost spreadsheet	Operating labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,395		
	Supervision = 15% of operating labor		$3,509	From EPA cost spreadsheet	Supervision = 15% of operating labor	$3,509		
	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr		$23,767	From EPA cost spreadsheet	Maintenance labor = 0.5 hr/shift x Rate x Op hr/8 hr	$23,767		
	Maintenance material = 100% of maintenance labor		$23,767	From EPA cost spreadsheet	Maintenance material = 100% of maintenance labor	$23,767		
								Convert $1.7MM electricity costs for PB: $1,700,000 / 530,000 dscfm x 147,250 dscfm =
Utilities	Electricity		$610,321	From EPA cost spreadsheet	Electricity (estimated)	$472,311	$472,311	WESP electricity costs
	Auxiliary Fuel - Natural Gas		$2,651,827	$0 From EPA cost spreadsheet	Auxiliary Fuel - Natural Gas	$0	$0	Auxiliary Fuel - Natural Gas for WESP
Catalyst replacement	Catalyst replacement cost		$58,222	From EPA cost spreadsheet	Water Usage (estimated)	$50,000		
					Chemical Usage (estimated)	$50,000		
Total Direct Costs			$3,394,808		Total Direct Costs	$646,749		
	Convert $720,000 maintenance/cleaning from PB RTO			Convert $720,000 maintenance/cleaning from PB RTO				Assume WESP maintenance/cleaning same as RTO
Annual maintenance/cleaning of RTO	$720,000 / 530,000 dscfm x 190,606 dscfm		$258,936	$258,936 $720,000 / 530,000 dscfm x 147,250 dscfm	Annual maintenance/cleaning of WESP (sludge & WW)	$258,936	$258,936	WESP maintenance (sludge & wastewater)
	Convert $2.3 MM media cost from PB RTO			Convert $2.3 MM media cost from PB RTO				
Media costs	$2,300,000 / 530,000 dscfm x 190,606 dscfm		$827,158	$827,158 $2,300,000 / 530,000 dscfm x 147,250 dscfm				
	Convert $590,000 replacement cost (crane, labor, etc.)			Convert $590,000 replacement cost (crane, labor, etc.)				
Media replacement costs	$590,000 / 530,000 x 190,606 dscfm		$212,184	$212,184 $590,000 / 530,000 x 147,250 dscfm				
	Costs for 1 replacement every 10 years		$1,039,342	$1,039,342 Costs for 1 replacement every 10 years				
Annualized (media + replacement) costs	Annualized cost = media + replacement costs / 10 yrs		$103,934	$103,934 Annual cost = media + replacement costs / 10 yrs				
Add WESP costs	Add WESP costs		$905,686					
Updated Total Direct Costs	EPA Cost Manual + Additional Annual Costs		$4,663,364		Updated Total Direct Costs	$905,686		Add WESP costs
Indirect Operating Costs	Overhead (60% of operating labor+maintenance)		$44,663		Overhead (60% of operating labor+maintenance)	$44,663		
	Administrative = 2% of TCI		$694,675		Administrative = 2% of TCI	$129,064		
	Property tax = 1% of TCI		$347,338		Property tax = 1% of TCI	$64,532		
	Insurance charges = 1% of TCI		$347,338		Insurance charges = 1% of TCI	$64,532		
	Capital Recovery (20 yrs at 7% so CRF=0.09439)		$3,278,521		Capital Recovery (20 yrs at 7% so CRF=0.09439)	$609,117		
Total Indirect Costs for RTO			$4,712,535					
Total Indirect Costs for WESP	Add WESP costs		$911,908		Total Indirect Costs for WESP	$911,908		Add WESP costs
UPDATED TOTAL ANNUAL COST	EPA Cost Spreadsheet + Additional Annual Costs		$10,287,807	RTO and Including media replacement & WESP costs	UPDATED TOTAL ANNUAL COST	$1,817,594	$1,817,594	WESP costs to be added to RTO costs for 20 yr life
OSB All Thermal Oil Heaters, RTO with WESP	RTO w/ 20 yr life and WESP - Annual Control Cost		$10,287,807	per year				
	Pollutant to be removed		244.26	tpy				
	CONTROL COST EFFECTIVENESS		$42,118	per ton				

RTO w/ 20 yr life and no WESP - Annual Control Cost w/o WESP	$8,470,213	per year	= $10,287,807 - $905,686 - $911,908
Pollutant to be removed	244.26	tpy	
CONTROL COST EFFECTIVENESS w/o WESP	$34,677	per ton	

APPENDIX B SOURCE TEST REPORT FOR KRONOSPAN LLC, SHIPPENVILLE, PA

Alliance
SOURCE TESTING

Source Test Report

Kronospan, LLC
301 Fiberboard Road
Shippenville, PA 16254

Test Date: August 23, 2018

AST Project No. 2018-0912

Source Information

Source Name	*Target Parameters*
Wet Scrubber Exhaust	CH_3OH, NH_3, THC, NMEHC

Contact Information

Test Location
Kronospan, LLC
201 Fiberboard Road
Shippenville, PA 16254

Facility Contact
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James Haynes
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Alliance Source Testing, LLC (AST) has completed the source testing as described in this report. Results apply only to the source(s) tested and operating condition(s) for the specific test date(s) and time(s) identified within this report. All results are intended to be considered in their entirety, and AST is not responsible for use of less than the complete test report without written consent. This report shall not be reproduced in full or in part without written approval from the customer.

To the best of my knowledge and abilities, all information, facts and test data are correct. Data presented in this report has been checked for completeness and is accurate, error-free and legible. Onsite testing was conducted in accordance with approved internal Standard Operating Procedures. Any deviations or problems are detailed in the relevant sections on the test report.

This report is only considered valid once an authorized representative of AST has signed in the space provided below; any other version is considered draft. This document was prepared in portable document format (.pdf) and contains pages as identified in the bottom footer of this document.

10/1/2018

Adam Robinson, QSTI
Alliance Source Testing, LLC

Date

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Introduction

1.0 Introduction

Alliance Source Testing, LLC (AST) was retained by Kronospan, LLC (Kronospan) to conduct investigative testing at the Clarion, Pennsylvania facility. Testing was conducted to determine the emission rates of methanol (CH_3OH), ammonia (NH_3), total hydrocarbons (THC) and non-methane-ethane hydrocarbons (NMEHC) from the wet scrubber exhaust.

1.1 Project Team

Personnel involved in this project are identified in the following table.

Table 1-1
Project Team

Facility Personnel	Jon Anderson - Kronospan
AST Personnel	Adam Robinson Tyler Branca Brendan Price

Summary of Results

2.0 Summary of Results

AST conducted investigative testing at the Kronospan facility in Clarion, Pennsylvania on August 23, 2018. Testing consisted of determining the emission rates of CH_3OH, NH_3, THC and NMEHC from one (1) wet scrubber exhaust.

Table 2-1 provides a summary of the emission testing results. Any difference between the summary results listed in the following table and the detailed results contained in appendices is due to rounding for presentation.

Table 2-1
Summary of Results

Run Number	Run 1	Run 2	Run 3	Average
Date	**8/23/18**	**8/23/18**	**8/23/18**	**--**
Methanol Data [1]				
Concentration, ppmvd	2.3	4.4	4.9	3.9
Emission Rate, lb/hr	0.56	1.1	1.2	0.93
Ammonia Data [2]				
Concentration, ppmvd	0.017	0.023	0.024	0.021
Emission Rate, lb/hr	0.0023	0.0031	0.0033	0.0029
Total Hydrocarbon Data				
Concentration, ppmvd	3.1	3.0	3.6	3.3
Emission Rate, lb/hr	1.0	1.0	1.2	1.1
Non-Methane-Ethane Hydrocarbons				
Concentration, ppmvd	2.5 [3]	2.3 [3]	-- [4]	2.4
Emission Rate, lb/hr	0.82 [3]	0.76 [3]	-- [4]	0.79

[1] The methanol concentration for one (1) or more fractions was below the detection limit (DL). The DL was used for emission calculation purposes.

[2] The ammonia laboratory data for all three (3) runs was below the DL. The DL was used for emission calculation purposes.

[3] The ethane values for Runs 1 and 2 were below the DL. Zero was used in the NMEHC calculation.

[4] Run 3 methane /ethane sample was not analyzed.

Testing Methodology

3.0 Testing Methodology

The emission testing program was conducted in accordance with the test methods listed in Table 3-1. Method descriptions are provided below while quality assurance/quality control data is provided in Appendix D.

Table 3-1
Source Testing Methodology

Parameter	U.S. EPA Reference Test Methods	Notes/Remarks
Volumetric Flow Rate	1-2	Full Velocity Traverses
Oxygen / Carbon Dioxide	3A	Instrumental Analysis
Moisture Content	4	Volumetric / Gravimetric Analysis
Total Hydrocarbons / Non-Methane-Ethane Hydrocarbons	25A / 18	Instrumental Analysis
Methanol	308	Constant Rate Sampling
Ammonia	CTM-027	Isokinetic Sampling
Gas Dilution System Certification	205	--

3.1 U.S. EPA Reference Test Methods 1 and 2 – Sampling/Traverse Points and Volumetric Flow Rate

The sampling location and number of traverse (sampling) points were selected in accordance with U.S. EPA Reference Test Method 1. To determine the minimum number of traverse points, the upstream and downstream distances were equated into equivalent diameters and compared to Figure 1-1 (for isokinetic sampling) and/or Figure 1-2 (measuring velocity alone) in U.S. EPA Reference Test Method 1.

Full velocity traverses were conducted in accordance with U.S. EPA Reference Test Method 2 to determine the average stack gas velocity pressure, static pressure and temperature. The velocity and static pressure measurement system consisted of a pitot tube and inclined manometer. The stack gas temperature was measured with a K-type thermocouple and pyrometer.

3.2 U.S. EPA Reference Test Method 3A – Oxygen/Carbon Dioxide

The oxygen (O_2) and carbon dioxide (CO_2) testing was conducted in accordance with U.S. EPA Reference Test Method 3A. Data was collected online and reported in one-minute averages. The sampling system consisted of a stainless-steel probe, Teflon sample line(s), gas conditioning system and the identified gas analyzer. The gas conditioning system was a non-contact condenser used to remove moisture from the stack gas. If an unheated Teflon sample line was used, then a portable non-contact condenser was placed in the system directly after the probe. Otherwise, a heated Teflon sample line was used. The quality control measures are described in Section 3.8.

3.3 U.S. EPA Reference Test Method 4 – Moisture Content

The stack gas moisture content was determined in accordance with U.S. EPA Reference Test Method 4. The gas conditioning train consisted of a series of chilled impingers. Prior to testing, each impinger was filled with a known quantity of water or silica gel. Post testing, the quantities of water and silica gel were measured to determine the amount of moisture condensed during the test run. Alternatively, each impinger was analyzed gravimetrically before and after each test run on the same balance to determine the amount of moisture condensed.

3.4 U.S. EPA Reference Test Methods 25A and 18 – THC / NMEHC

The total hydrocarbons (THC) and non-methane-ethane hydrocarbons (NMEHC) testing was conducted in accordance with U.S. EPA Reference Test Methods 25A and 18. The sampling system consisted of a stainless-steel probe, heated Teflon sample line(s) and the identified gas analyzer. Total hydrocarbon data was collected online and reported in one-minute averages. The quality control measures are described in Section 3.9.

Methane concentration was determined by integrated Tedlar bag sampling and offsite lab analysis using U.S. EPA Reference Test Method 18. The average methane concentration was subtracted from the average total hydrocarbon concentration to provide a non-methane VOC concentration.

3.5 U.S. EPA Reference Test Method 308 – Methanol

The methanol (MeOH) testing was conducted in accordance with U.S. EPA Reference Test Method 308. The sample was withdrawn at a constant rate. The complete sampling system consisted of a glass probe, gas conditioning train, silica gel tube (520/260 mg), rotameter and calibrated dry gas meter. The gas conditioning train consisted of two (2) chilled impingers. The first impinger was empty and the second impinger contained 20 mL of DI water.

Following the completion of each test run, the sample train was leaked checked at a vacuum equal to or greater than the highest vacuum observed during the test run. The contents of impingers 1 and 2 were placed in container 1. Impingers 1 and 2, along with the connecting glassware were rinsed with DI water, and these rinses were added to container 1. The containers (including tubes) were sealed, labeled and liquid level marked (as applicable) for transport to the identified laboratory for analysis. The samples were kept cool for transport.

3.6 U.S. EPA Reference Test Method CTM-027 – Ammonia

The ammonia (NH_3) concentrations were determined in accordance with EPA Conditional Test Method 027. The complete sampling train consisted of a Teflon nozzle, glass-fiber filter contained in a glass filter holder, heated glass-lined probe, gas conditioning system and dry gas meter. The gas conditioning system consisted of four (4) chilled, glass impingers. The first and second impingers contained 100 mL of 0.1 N H_2SO_4, the third was empty and the fourth contained 200-300grams of silica gel.

Following the completion of each test run, the sampling train was leak checked at a vacuum pressure greater than or equal to the highest vacuum pressure observed during the run. Contents from impingers 1-3 were recovered in container 2 and then triple rinsed with DI water. The DI water rinse was also added to container 2. The filter was removed and the probe rinsed and discarded after each run. All containers were sealed, labeled, and liquid levels marked for transport to the identified laboratory for analysis.

3.7 U.S. EPA Reference Test Method 205 – Gas Dilution System Certification

A calibration gas dilution system field check was conducted in accordance with U.S. EPA Reference Method 205. Multiple dilution rates and total gas flow rates were utilized to force the dilution system to perform two dilutions on each mass flow controller. The diluted calibration gases were sent directly to the analyzer, and the analyzer response recorded in an electronic field data sheet. The analyzer response agreed within 2% of the actual diluted gas concentration. A second Protocol 1 calibration gas, with a cylinder concentration within 10% of one of the gas divider settings described above, was introduced directly to the analyzer, and the analyzer response recorded in an electronic field data sheet. The cylinder concentration and the analyzer response agreed within 2%. These steps

were repeated three (3) times. Copies of the Method 205 data can be found in the Quality Assurance/Quality Control Appendix.

3.8 Quality Assurance/Quality Control – U.S. EPA Reference Test Method 3A

Cylinder calibration gases used met EPA Protocol 1 (+/- 2%) standards. Copies of all calibration gas certificates can be found in the Quality Assurance/Quality Control Appendix.

Low Level gas was introduced directly to the analyzer. After adjusting the analyzer to the Low-Level gas concentration and once the analyzer reading was stable, the analyzer value was recorded. This process was repeated for the High-Level gas. For the Calibration Error Test, Low, Mid, and High Level calibration gases were sequentially introduced directly to the analyzer. All values were within 2.0 percent of the Calibration Span or 0.5 ppmv absolute difference.

High or Mid Level gas (whichever was closer to the stack gas concentration) was introduced at the probe and the time required for the analyzer reading to reach 95 percent or 0.5 ppm (whichever was less restrictive) of the gas concentration was recorded. The analyzer reading was observed until it reached a stable value, and this value was recorded. Next, Low Level gas was introduced at the probe and the time required for the analyzer reading to decrease to a value within 5.0 percent or 0.5 ppm (whichever was less restrictive) was recorded. If the Low-Level gas was zero gas, the response was 0.5 ppm or 5.0 percent of the upscale gas concentration (whichever was less restrictive). The analyzer reading was observed until it reached a stable value and this value was recorded. The measurement system response time and initial system bias were determined from these data. The System Bias was within 5.0 percent of the Calibration Span or 0.5 ppmv absolute difference

High or Mid Level gas (whichever was closer to the stack gas concentration) was introduced at the probe. After the analyzer response was stable, the value was recorded. Next, Low Level gas was introduced at the probe, and the analyzer value recorded once it reached a stable response. The System Bias was within 5.0 percent of the Calibration Span or 0.5 ppmv absolute difference or the data was invalidated and the Calibration Error Test and System Bias were repeated.

Drift between pre- and post-run System Bias was within 3% of the Calibration Span or 0.5 ppmv absolute difference. If the drift exceeded 3% or 0.5 ppmv, the Calibration Error Test and System Bias were repeated.

A Data Acquisition System with battery backup was used to record the instrument response in one (1) minute averages. The data was continuously stored as a *.CSV file in Excel format on the hard drive of a computer. At the completion of testing, the data was also saved to the AST server. All data was reviewed by the Field Team Leader before leaving the facility. Once arriving at AST's office, all written and electronic data was relinquished to the report coordinator and then a final review was performed by the Project Manager.

3.9 Quality Assurance/Quality Control – U.S. EPA Reference Test Method 25A

Cylinder calibration gases used met EPA Protocol 1 (+/- 2%) standards. Copies of all calibration gas certificates can be found in the Quality Assurance/Quality Control Appendix.

Within two (2) hours prior to testing, zero gas was introduced through the sampling system to the analyzer. After adjusting the analyzer to the Zero gas concentration and once the analyzer reading was stable, the analyzer value was recorded. This process was repeated for the High-Level gas, and the time required for the analyzer reading to

reach 95 percent of the gas concentration was recorded to determine the response time. Next, Low and Mid-Level gases were introduced through the sampling system to the analyzer, and the response was recorded when it was stable. All values were less than +/- 5 percent of the calibration gas concentrations.

Mid Level gas was introduced through the sampling system. After the analyzer response was stable, the value was recorded. Next, Zero gas was introduced through the sampling system, and the analyzer value recorded once it reached a stable response. The Analyzer Drift was less than +/- 3 percent of the span value.

A Data Acquisition System with battery backup was used to record the instrument response in one (1) minute averages. The data was continuously stored as a *.CSV file in Excel format on the hard drive of a computer. At the completion of testing, the data was also saved to the AST server. All data was reviewed by the Field Team Leader before leaving the facility. Once arriving at AST's office, all written and electronic data was relinquished to the report coordinator and then a final review was performed by the Project Manager.

Appendix A

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Run No.: 1
Parameter: NH3

Meter Pressure (Pm), in. Hg

$$Pm = Pb + \frac{\Delta H}{13.6}$$

where,

Pb	28.46	= barometric pressure, in. Hg
ΔH	1.904	= pressure differential of orifice, in H_2O
Pm	28.60	= in. Hg

Absolute Stack Gas Pressure (Ps), in. Hg

$$Ps = Pb + \frac{Pg}{13.6}$$

where,

Pb	28.46	= barometric pressure, in. Hg
Pg	-1.10	= static pressure, in. H_2O
Ps	28.38	= in. Hg

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647 \times Y \times Vm \times Pm}{Tm}$$

where,

Y	0.995	= meter correction factor
Vm	91.210	= meter volume, cf
Pm	28.60	= absolute meter pressure, in. Hg
Tm	530.1	= absolute meter temperature, ^oR
Vmstd	86.409	= dscf

Standard Wet Volume (Vwstd), scf

$$Vwstd = 0.04707 \times Vlc$$

where,

Vlc	83.4	= volume of H_2O collected, ml
Vwstd	3.932	= scf

Moisture Fraction (BWSsat), dimensionless (theoretical at saturated conditions)

$$BWSsat = \frac{10^{6.37 - \left(\frac{2,827}{Ts + 365}\right)}}{Ps}$$

where,

Ts	80.8	= stack temperature, °F
Ps	28.38	= absolute stack gas pressure, in. Hg
BWSsat	0.037	= dimensionless

Moisture Fraction (BWS), dimensionless (measured)

$$BWS = \frac{Vwstd}{(Vwstd + Vmstd)}$$

where,

Vwstd	3.932	= standard wet volume, scf
Vmstd	86.409	= standard meter volume, dscf
BWS	0.044	= dimensionless

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Run No.: 1
Parameter: NH3

Moisture Fraction (BWS), dimensionless

$$BWS = BWSmsd \ unless \ BWSsat < BWSmsd$$

where,

BWSsat	0.037	= moisture fraction (theoretical at saturated conditions)
BWSmsd	0.044	= moisture fraction (measured)
BWS	0.037	

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28\ (100 - \%CO_2 - \%O_2))$$

where,

CO_2	0.0	= carbon dioxide concentration, %
O_2	20.9	= oxygen concentration, %
Md	28.84	= lb/lb mol

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms = Md\ (1 - BWS) + 18\ (BWS)$$

where,

Md	28.84	= molecular weight (DRY), lb/lb mol
BWS	0.037	= moisture fraction, dimensionless
Ms	28.43	= lb/lb mol

Average Velocity (Vs), ft/sec

$$Vs = 85.49 \times Cp \times (\Delta P^{1/2})avg \times \sqrt{\frac{Ts}{Ps \times Ms}}$$

where,

Cp	0.840	= pitot tube coefficient
$\Delta P^{1/2}$	1.464	= velocity head of stack gas, $(in.\ H_2O)^{1/2}$
Ts	540.8	= absolute stack temperature, °R
Ps	28.38	= absolute stack gas pressure, in. Hg
Ms	28.43	= molecular weight of stack gas, lb/lb mol
Vs	86.1	= ft/sec

Average Stack Gas Flow at Stack Conditions (Qa), acfm

$$Qa = 60 \times Vs \times As$$

where,

Vs	86.1	= stack gas velocity, ft/sec
As	10.56	= cross-sectional area of stack, ft^2
Qa	54,543	= acfm

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.647 \times Qa \times (1 - BWS) \times \frac{Ps}{Ts}$$

where,

Qa	54,543	= average stack gas flow at stack conditions, acfm
BWS	0.037	= moisture fraction, dimensionless
Ps	28.38	= absolute stack gas pressure, in. Hg
Ts	540.8	= absolute stack temperature, °R
Qs	48,622	= dscfm

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Run No.: 1
Parameter: NH3

Dry Gas Meter Calibration Check (Yqa), dimensionless

$$Yqa = \frac{Y - \left(\frac{\Theta}{Vm} \sqrt{\frac{0.0319 \times Tm \times 29}{\Delta H @ \times \left(Pb + \frac{\Delta H\ avg.}{13.6} \right) \times Md}} \sqrt{\Delta H}\ avg. \right)}{Y} \times 100$$

where,

Y	0.995	= meter correction factor, dimensionless
Θ	120	= run time, min.
Vm	91.21	= total meter volume, dcf
Tm	530.1	= absolute meter temperature, °R
ΔH@	1.86	= orifice meter calibration coefficient, in. H_2O
Pb	28.46	= barometric pressure, in. Hg
ΔH avg	1.904	= average pressure differential of orifice, in H_2O
Md	28.84	= molecular weight (DRY), lb/lb mol
$(\Delta H)^{1/2}$	1.375	= average squareroot pressure differential of orifice, $(in. H2O)^{1/2}$
Yqa	-2.8	= dimensionless

Volume of Nozzle (Vn), ft^3

$$Vn = \frac{Ts}{Ps}\left(0.002669 \times Vlc + \frac{Vm \times Pm \times Y}{Tm} \right)$$

where,

Ts	540.8	= absolute stack temperature, °R
Ps	28.38	= absolute stack gas pressure, in. Hg
Vlc	83.4	= volume of H_2O collected, ml
Vm	91.210	= meter volume, cf
Pm	28.60	= absolute meter pressure, in. Hg
Y	0.995	= meter correction factor, unitless
Tm	530.1	= absolute meter temperature, °R
Vn	97.550	= volume of nozzle, ft^3

Isokinetic Sampling Rate (I), %

$$I = \left(\frac{Vn}{\theta \times 60 \times An \times Vs} \right) \times 100$$

where,

Vn	97.550	= nozzle volume, ft^3
θ	120.0	= run time, minutes
An	0.00016	= area of nozzle, ft^2
Vs	86.1	= average velocity, ft/sec
I	97.0	= %

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Run No.: 1
Parameter: NH3

Ammonia Concentration (C_{HClp}), ppmvd

$$C_{NH3} = \frac{M_{NH3} \times 24.04}{MW \times Vmstd \times 28.32}$$

where,

M_{HCl}	31.25	= Ammonium Ion mass, ug
MW	18.04	= molecular weight, g/g mol
Vmstd	86.409	= standard meter volume, dscf
C_{HClp}	0.017	= ppmvd

Ammonia Emission Rate ($ER_{NH\#}$), lb/hr

$$ER_{NH3} = \frac{M_{NH3} \times Qs \times 60}{Vmstd \times 4.54\ E+08}$$

where,

M_{HCl}	31.25	= Ammonium Ion mass, ug
Qs	48,622	= average stack gas flow at standard conditions, dscfm
Vmstd	86.409	= standard meter volume, dscf
ER_{HCl}	0.0023	= lb/hr

Location:	Kronospan - Clarion, PA
Source:	Wet Scrubber Exhaust
Project No.:	2018-0912
Run No. /Method	Run 1 - Method 25A

Total Hydrocarbons Concentration (C_{THCd}), ppmvd

$$C_{THCd} = \frac{C_{THCw}}{1 - BWS}$$

where,

C_{THCw}	3.0	= THC concentration, ppmvw (as C_3H_8)
BWS	0.037	= moisture fraction, unitless
C_{THCd}	3.1	= ppmvd

Non Methane-Ethane Hydrocarbons Concentration (C_{NMEHC}), ppmvd

$$C_{NMEHC} = C_{THC} - \frac{C_{Methane}}{3} - \frac{2\ x\ C_{Ethane}}{3}$$

C_{THC}	3.1	= THC concentration, ppmvd (as C_3H_8)
$C_{methane}$	2.0	= Methane concentration, ppmvd
C_{ethane}	0.0	=Ethane concentration, ppmvd
C_{NMEHC}	2.5	= ppmvd (as C3H8)

Non Methane-Ethane Hydrocarbons Emission Rate (ER_{NMEHC}), lb/hr

$$ER_{NMEHC} = \frac{C_{NMEHC} \times MW \times Qs \times 60 \times 28.32}{24.04 \times 1.0E+06 \times 454}$$

where,

C_{VOC}	2.5	= VOC concentration, ppmvd (as C_3H_8)
MW	44.1	= molecular weight, g/g-mole
Qs	48,622	= stack gas volumetric flow rate at standard conditions, dscfm
ER_{VOC}	0.82	= lb/hr

Location	**Kronospan - Clarion, PA**
Source	**Wet Scrubber Exhaust**
Project No.	**2018-0912**
Run No.	
Parameter(s)	**MeOH**

Standard Meter Volume (Vmstd), dscf

$$Vmstd = \frac{17.647 \times Vm \times Pm}{Tm}$$

where,

Y	0.999	= meter correction factor
Vm	48.935	= meter volume, cf
Pm	28.49	= absolute meter pressure, in. Hg
Tm	540.8	= absolute meter temperature, ^{o}R
Vmstd	45.450	= dscf

Methanol Concentration (C_{CH4Op}), ppmvd

$$C_{CH\,4O} = \frac{M_{CH\,4O} \times 24.04}{MW \times Vmstd \times 28.32}$$

where,

M_{CH4O}	139.48	= methanol mass, ug
MW	32.04	= molecular weight, g/g mol
Vmstd	1.605	= standard meter volume, dscf
C_{CH4Op}	2.3	= ppmvd

Methanol Emission Rate (ER_{CH4O}), lb/hr

$$ER_{CH\,4O} = \frac{M_{CH\,4O} \times Qs \times 60}{Vmstd \times 4.54E+08}$$

where,

M_{CH4O}	139.48	= methanol mass, ug
Qs	48,622	= average stack gas flow at standard conditions, dscfm
Vmstd	1.605	= standard meter volume, dscf
ER_{CH4O}	0.56	= lb/hr

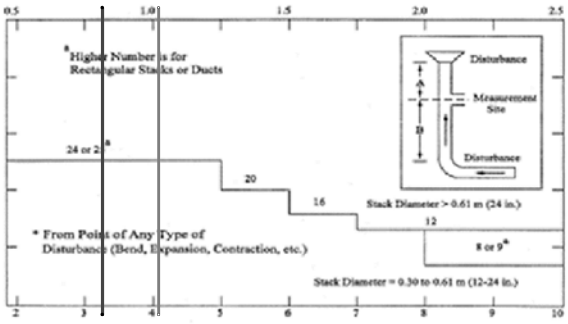
Appendix B

Method 1 Data

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Date: 08/22/18

Stack Parameters

Duct Orientation:	Vertical	
Duct Design:	Circular	
Distance from Far Wall to Outside of Port:	48.00	in
Nipple Length:	4.00	in
Depth of Duct:	44.00	in
Cross Sectional Area of Duct:	10.56	ft^2
No. of Test Ports:	2	
Distance A:	3.0	ft
Distance A Duct Diameters:	0.8	(must be > 0.5)
Distance B:	15.0	ft
Distance B Duct Diameters:	4.1	(must be > 2)
Minimum Number of Traverse Points:	24	
Actual Number of Traverse Points:	24	
Number of Readings per Point:	1	



CIRCULAR DUCT

LOCATION OF TRAVERSE POINTS

Number of traverse points on a diameter

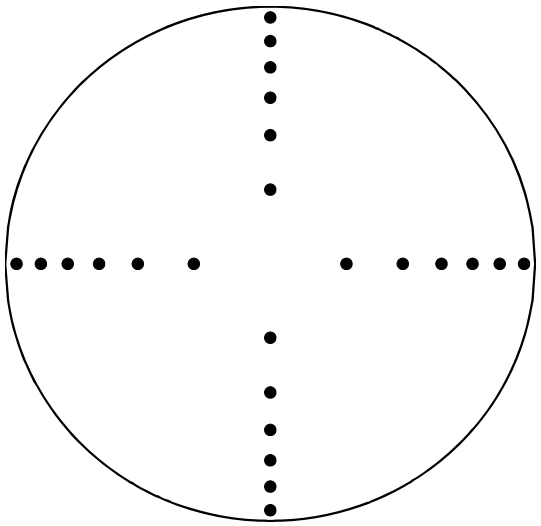
	2	3	4	5	6	7	8	9	10	11	12
1	14.6	--	6.7	--	4.4	--	3.2	--	2.6	--	2.1
2	85.4	--	25.0	--	14.6	--	10.5	--	8.2	--	6.7
3	--	--	75.0	--	29.6	--	19.4	--	14.6	--	11.8
4	--	--	93.3	--	70.4	--	32.3	--	22.6	--	17.7
5	--	--	--	--	85.4	--	67.7	--	34.2	--	25.0
6	--	--	--	--	95.6	--	80.6	--	65.8	--	35.6
7	--	--	--	--	--	--	89.5	--	77.4	--	64.4
8	--	--	--	--	--	--	96.8	--	85.4	--	75.0
9	--	--	--	--	--	--	--	--	91.8	--	82.3
10	--	--	--	--	--	--	--	--	97.4	--	88.2
11	--	--	--	--	--	--	--	--	--	--	93.3
12	--	--	--	--	--	--	--	--	--	--	97.9

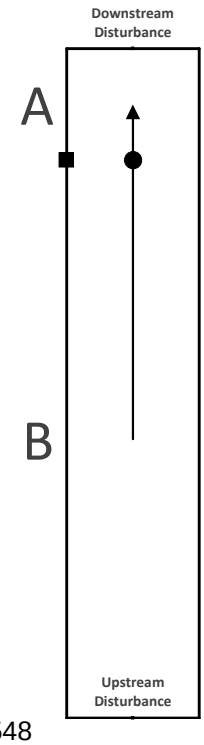
**Percent of stack diameter from inside wall to traverse point.*

Traverse Point	% of Diameter	Distance from inside wall	Distance from outside of port
1	2.1	1.00	5.00
2	6.7	2.95	6.95
3	11.8	5.19	9.19
4	17.7	7.79	11.79
5	25.0	11.00	15.00
6	35.6	15.66	19.66
7	64.4	28.34	32.34
8	75.0	33.00	37.00
9	82.3	36.21	40.21
10	88.2	38.81	42.81
11	93.3	41.05	45.05
12	97.9	43.00	47.00

Stack Diagram
A = 3 ft.
B = 15 ft.
Depth of Duct = 44 in.

Cross Sectional Area





Emission Calculations

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter NH3

Run Number		Run 1	Run 2	Run 3	Average
Date		8/23/16	8/23/18	8/23/18	--
Start Time		8:05	10:35	13:00	--
Stop Time		10:11	12:42	15:06	--
Run Time, min	(θ)	120.0	120.0	120.0	120.0
INPUT DATA					
Barometric Pressure, in. Hg	(Pb)	28.46	28.46	28.46	28.46
Meter Correction Factor	(Y)	0.995	0.995	0.995	0.995
Orifice Calibration Value	(ΔH @)	1.860	1.860	1.860	1.860
Meter Volume, ft^3	(Vm)	91.210	95.970	96.690	94.623
Meter Temperature, °F	(Tm)	70.1	77.5	83.9	77.2
Meter Temperature, °R	(Tm)	530.1	537.5	543.9	537.2
Meter Orifice Pressure, in. WC	(ΔH)	1.904	1.913	1.929	1.915
Volume H_2O Collected, mL	(Vlc)	83.4	87.7	85.3	85.5
Nozzle Diameter, in	(Dn)	0.172	0.172	0.172	0.172
Area of Nozzle, ft^2	(An)	0.0002	0.0002	0.0002	0.0002
Ammonium Ion Mass, ug	(M_{NH4})	*31.25*	*43.42*	*45.78*	40.15
ISOKINETIC DATA					
Standard Meter Volume, ft^3	(Vmstd)	86.409	89.673	89.277	88.453
Standard Water Volume, ft^3	(Vwstd)	3.932	4.135	4.022	4.030
Moisture Fraction Measured	(BWSmsd)	0.044	0.044	0.043	0.044
Moisture Fraction @ Saturation	(BWSsat)	0.037	0.039	0.039	0.038
Moisture Fraction	(BWS)	0.037	0.039	0.039	0.038
Meter Pressure, in Hg	(Pm)	28.60	28.60	28.60	28.60
Volume at Nozzle, ft^3	(Vn)	97.550	101.249	100.785	99.861
Isokinetic Sampling Rate, (%)	(I)	97.0	100.9	100.8	99.6
DGM Calibration Check Value, (+/- 5%)	(Y_{qa})	-2.8	1.4	1.1	-0.1
EMISSION CALCULATIONS					
Ammonia Concentration, ppmvd	(C_{NH3p})	0.017	0.023	0.024	0.021
Ammonia Emission Rate, lb/hr	(ER_{NH3})	0.0023	0.0031	0.0033	0.0029

Volumetric Flow Rate Data

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter NH3

Run Number		Run 1	Run 2	Run 3	Average
Date		8/23/16	8/23/18	8/23/18	--
Start Time		8:05	10:35	13:00	--
Stop Time		10:11	12:42	15:06	--
Run Time, min		120.0	120.0	120.0	120.0
VELOCITY HEAD, in. WC					
Point 1		1.80	2.20	1.70	1.90
Point 2		1.80	2.40	1.90	2.03
Point 3		1.80	2.40	1.90	2.03
Point 4		1.80	2.50	2.00	2.10
Point 5		1.90	2.40	2.10	2.13
Point 6		2.10	2.40	2.40	2.30
Point 7		2.70	2.20	2.80	2.57
Point 8		2.30	1.90	2.60	2.27
Point 9		2.50	1.80	2.40	2.23
Point 10		2.30	1.60	2.20	2.03
Point 11		2.30	1.50	2.10	1.97
Point 12		1.90	1.70	2.10	1.90
Point 13		2.50	1.80	2.00	2.10
Point 14		2.40	2.00	2.20	2.20
Point 15		2.50	2.00	2.60	2.37
Point 16		2.50	2.00	2.30	2.27
Point 17		2.60	2.20	2.40	2.40
Point 18		2.50	2.40	2.40	2.43
Point 19		2.40	2.90	2.20	2.50
Point 20		2.00	2.60	2.20	2.27
Point 21		1.80	2.40	2.00	2.07
Point 22		1.60	2.20	1.90	1.90
Point 23		1.50	2.00	1.60	1.70
Point 24		2.30	2.10	1.30	1.90
CALCULATED DATA					
Square Root of ΔP, $(\text{in. WC})^{1/2}$	(ΔP)	1.464	1.462	1.457	1.461
Pitot Tube Coefficient	(Cp)	0.840	0.840	0.840	0.840
Barometric Pressure, in. Hg	(Pb)	28.46	28.46	28.46	28.46
Static Pressure, in. WC	(Pg)	-1.10	-0.10	-0.10	-0.43
Stack Pressure, in. Hg	(Ps)	28.38	28.45	28.45	28.43
Stack Cross-sectional Area, ft^2	(As)	10.56	10.56	10.56	10.56
Temperature, °F	(Ts)	80.8	82.0	82.4	81.7
Temperature, °R	(Ts)	540.8	542.0	542.4	541.7
Moisture Fraction Measured	(BWSmsd)	0.044	0.044	0.043	0.044
Moisture Fraction @ Saturation	(BWSsat)	0.037	0.039	0.039	0.038
Moisture Fraction	(BWS)	0.037	0.039	0.039	0.038
O_2 Concentration, %	(O_2)	20.9	20.9	20.8	20.9
CO_2 Concentration, %	(CO_2)	0.0	0.0	0.0	0.0
Molecular Weight, lb/lb-mole (dry)	(Md)	28.84	28.84	28.83	28.83
Molecular Weight, lb/lb-mole (wet)	(Ms)	28.43	28.42	28.41	28.42
Velocity, ft/sec	(Vs)	86.1	86.0	85.7	85.9
VOLUMETRIC FLOW RATE					
At Stack Conditions, acfm	(Qa)	54,543	54,455	54,321	54,440
At Standard Conditions, dscfm	(Qs)	48,622	48,496	48,307	48,475

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter NH3
Analysis Gravimetric

Run 1	Date:	8/23/16			
Impinger No.	**1**	**2**	**3**	**4**	**Total**
Contents	H2SO4	H2SO4	Empty	Silica	--
Initial Mass, g	757.5	753.4	654.2	894.7	3059.8
Final Mass, g	799.5	770.0	660.2	913.5	3143.2
Gain	42.0	16.6	6.0	18.8	83.4
Run 2	**Date:**	8/23/18			
Impinger No.	**1**	**2**	**3**	**4**	**Total**
Contents	H2SO4	H2SO4	Empty	Silica	--
Initial Mass, g	765.2	733.4	645.0	857.1	3000.7
Final Mass, g	802.3	756.0	653.7	876.4	3088.4
Gain	37.1	22.6	8.7	19.3	87.7
Run 3	**Date:**	8/23/18			
Impinger No.	**1**	**2**	**3**	**4**	**Total**
Contents	H2SO4	H2SO4	Empty	Silica	--
Initial Mass, g	756.7	753.9	656.0	893.1	3059.7
Final Mass, g	804.7	771.3	659.3	909.7	3145.0
Gain	48.0	17.4	3.3	16.6	85.3

Alliance SOURCE TESTING

Isokinetic Field Data

Location:	Kronospan - Clarion, PA			**Start Time:**	8:05	**Source:**	Wet Scrubber Exhaust
Date:	8/23/16	**Run 1**	**VALID**	**End Time:**	10:11	**Project No.:**	2018-0912

Parameter: NH3

STACK DATA (EST)			EQUIPMENT			STACK DATA (EST)			FILTER NO.	STACK DATA (FINAL)			MOIST. DATA
Moisture:	4.6	% est.	Meter Box ID:	2026		Est. Tm:	85	°F	NA	Pb:	28.46	in. Hg	Vlc (ml)
Barometric:	28.46	in. Hg	Y:	0.995		Est. Ts:	84	°F		Pg:	-1.10	in. WC	83.4
Static Press:	-0.10	in. WC	ΔH @ (in.WC):	1.860		Est. ΔP:	2.59	in. WC		O_2:	20.9	%	K-FACTOR
Stack Press:	28.45	in. Hg	Probe ID:	PR-404-0		Est. Dn:	0.159	in.		CO_2:	0.0	%	0.897
CO_2:	0.1	%	Liner Material:	glass		Target Rate:	0.75	scfm					
O_2:	20.3	%	Pitot ID:	PT-404-4		LEAK CHECKS	Pre	Mid 1	Mid 2	Post	Check Pt.	Initial	Final / Corr.
N_2/CO:	79.6	%	Pitot Cp/Type:	0.840	S-type	Leak Rate (cfm):	0.000	--	--	0.000	Mid 1 (cf)		--
Md:	28.83	lb/lb-mole	Nozzle ID:	TF-202		Vacuum (in Hg):	15	--	--	15	Mid 2 (cf)		--
Ms:	28.33	lb/lb-mole	Nozzle Dn (in.):	0.172		Pitot Tube:	Pass	--	--	Pass	Mid 3 (cf)		--
											Mid-Point Leak Check Vol (cf):		--

Sample Pt.	Sample Time (minutes) Begin	End	Dry Gas Meter Reading (ft^3)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F) DGM Average Amb.	Stack Amb.	Orifice Press. ΔH (in. WC) Ideal	Actual	Pump Vac (in. Hg)	Gas Temperatures (°F) Probe Amb.	Filter Amb.	Imp Exit Amb.	Aux Amb.	% ISO	Vs (fps)
A-1	0.00	5.00	953.925	1.80	59	80	1.55	1.60	2	243	262	52	-	105.2	78.86
2	5.00	10.00	957.610	1.80	61	80	1.56	1.60	2	244	262	51	-	**112.7**	78.86
3	10.00	15.00	961.570	1.80	64	80	1.57	1.60	2	245	263	50	-	98.7	78.86
4	15.00	20.00	965.060	1.80	66	80	1.57	1.60	2	247	264	51	-	**80.0**	78.86
5	20.00	25.00	967.900	1.90	66	79	1.66	1.60	2	246	262	51	-	**83.0**	80.94
6	25.00	30.00	970.930	2.10	66	80	1.83	1.80	1	247	263	51	-	**66.3**	85.18
7	30.00	35.00	973.470	2.70	64	80	2.35	2.30	1	251	261	50	-	**78.0**	96.58
8	35.00	40.00	976.840	2.30	66	80	2.01	2.00	3	254	263	52	-	101.1	89.14
9	40.00	45.00	980.890	2.50	66	80	2.18	2.50	3	243	263	54	-	97.5	92.93
10	45.00	50.00	984.960	2.30	66	81	2.00	2.00	3	228	260	54	-	105.2	89.22
11	50.00	55.00	989.170	2.30	66	80	2.01	2.00	3	229	260	54	-	100.8	89.14
12	55.00	60.00	993.210	1.90	66	80	1.66	1.70	3	232	260	54	-	102.3	81.02
B-1	60.00	65.00	996.940	2.50	63	79	2.17	2.20	3	229	259	53	-	102.7	92.85
2	65.00	70.00	1001.210	2.40	68	81	2.10	2.10	3	233	259	49	-	103.3	91.14
3	70.00	75.00	1005.450	2.50	71	82	2.19	2.20	3	236	261	51	-	100.8	93.11
4	75.00	80.00	1009.690	2.50	73	82	2.20	2.20	3	238	259	51	-	100.2	93.11
5	80.00	85.00	1013.920	2.60	75	82	2.30	2.30	3	239	260	52	-	99.0	94.95
6	85.00	90.00	1018.200	2.50	78	82	2.22	2.20	3	241	260	53	-	100.4	93.11
7	90.00	95.00	1022.480	2.40	80	82	2.14	2.10	3	240	259	54	-	99.7	91.23
8	95.00	100.00	1026.660	2.00	81	81	1.79	1.80	3	241	260	55	-	100.5	83.20
9	100.00	105.00	1030.520	1.80	81	81	1.61	1.60	3	239	259	56	-	102.0	78.93
10	105.00	110.00	1034.240	1.60	80	82	1.43	1.40	3	242	261	55	-	102.6	74.49
11	110.00	115.00	1037.760	1.50	79	82	1.34	1.30	2	242	260	55	-	99.2	72.12
12	115.00	120.00	1041.050	2.30	77	83	2.04	2.00	3	239	259	54	-	100.1	89.39
	120.00	--	1045.135										-		--
	Final DGM:		1045.135												

RESULTS

Run Time		Vm		ΔP		Tm		Ts		Max Vac	ΔH		%ISO	BWS	Y_{qa}
120.0	**min**	**91.210**	**ft^3**	**2.16**	**in. WC**	**70.1**	**°F**	**80.8**	**°F**	**3**	**1.904**	**in. WC**	**97.0**	**0.037**	**-2.8**

Alliance SOURCE TESTING

Isokinetic Field Data

Location:	Kronospan - Clarion, PA			**Start Time:**	10:35	**Source:**	Wet Scrubber Exhaust
Date:	8/23/18	**Run 2**	**VALID**	**End Time:**	12:42	**Project No.:**	2018-0912

Parameter: NH3

STACK DATA (EST)			EQUIPMENT		STACK DATA (EST)			FILTER NO.	STACK DATA (FINAL)			MOIST. DATA
Moisture:	4.5	% est.	**Meter Box ID:**	2026	**Est. Tm:**	70	°F	NA	**Pb:**	28.46	in. Hg	**Vlc (ml)**
Barometric:	28.46	in. Hg	**Y:**	0.995	**Est. Ts:**	81	°F		**Pg:**	-0.10	in. WC	87.7
Static Press:	-0.10	in. WC	**ΔH @ (in.WC):**	1.860	**Est. ΔP:**	2.16	in. WC		**O_2:**	20.9	%	**K-FACTOR**
Stack Press:	28.45	in. Hg	**Probe ID:**	PR-404-0	**Est. Dn:**	0.169	in.		**CO_2:**	0.0	%	0.88
CO_2:	0.1	%	**Liner Material:**	glass	**Target Rate:**	0.75	scfm			**Check Pt.**	**Initial**	**Final**	**Corr.**
O_2:	20.3	%	**Pitot ID:**	PT-404-4	**LEAK CHECKS**	**Pre**	**Mid 1**	**Mid 2**	**Post**	**Mid 1 (cf)**			--
N_2/CO:	79.6	%	**Pitot Cp/Type:**	0.840 S-type	**Leak Rate (cfm):**	0.000	--	--	0.000	**Mid 2 (cf)**			--
Md:	28.83	lb/lb-mole	**Nozzle ID:**	TF-202	**Vacuum (in Hg):**	15	--	--	15	**Mid 3 (cf)**			--
Ms:	28.34	lb/lb-mole	**Nozzle Dn (in.):**	0.172	**Pitot Tube:**	Pass	--	--	Pass	**Mid-Point Leak Check Vol (cf):**			--

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft^3)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
					DGM Average	Stack				Probe	Filter	Imp Exit	Aux		
					Amb.	Amb.				Amb.	Amb.	Amb.	Amb.		
	Begin	End			--	--	Ideal	Actual		--	--	--	--		
A-1	0.00	5.00	1047.565	2.20	72	82	1.94	2.00	2	234	262	63	-	102.1	87.33
2	5.00	10.00	1051.610	2.40	74	83	2.12	2.10	2	238	260	57	-	100.8	91.29
3	10.00	15.00	1055.790	2.40	75	83	2.12	2.10	2	238	262	61	-	100.4	91.29
4	15.00	20.00	1059.960	2.50	75	83	2.21	2.20	2	240	261	63	-	100.5	93.17
5	20.00	25.00	1064.220	2.40	75	83	2.12	2.10	2	240	260	64	-	100.9	91.29
6	25.00	30.00	1068.410	2.40	76	82	2.13	2.10	2	242	257	63	-	100.6	91.21
7	30.00	35.00	1072.600	2.20	77	82	1.96	2.00	2	249	261	64	-	102.1	87.33
8	35.00	40.00	1076.680	1.90	77	81	1.69	1.70	2	256	259	62	-	102.4	81.08
9	40.00	45.00	1080.490	1.80	77	81	1.61	1.60	2	255	263	61	-	103.5	78.92
10	45.00	50.00	1084.240	1.60	77	83	1.42	1.40	2	255	262	59	-	101.1	74.54
11	50.00	55.00	1087.690	1.50	78	83	1.34	1.30	2	254	260	59	-	99.7	72.17
12	55.00	60.00	1090.990	1.70	79	83	1.52	1.50	2	255	256	61	-	100.3	76.83
B-1	60.00	65.00	1094.530	1.80	76	82	1.60	1.60	2	248	258	66	-	101.9	78.99
2	65.00	70.00	1098.210	2.00	78	82	1.78	1.80	2	250	260	57	-	102.1	83.26
3	70.00	75.00	1102.110	2.00	79	82	1.79	1.80	2	252	261	56	-	101.9	83.26
4	75.00	80.00	1106.010	2.00	79	81	1.79	1.80	2	253	261	54	-	101.8	83.18
5	80.00	85.00	1109.910	2.20	79	81	1.97	2.00	2	255	261	54	-	101.6	87.24
6	85.00	90.00	1113.990	2.40	79	82	2.14	2.10	2	249	260	54	-	101.0	91.21
7	90.00	95.00	1118.220	2.90	79	83	2.58	2.60	3	255	263	54	-	101.4	100.35
8	95.00	100.00	1122.880	2.60	79	81	2.32	2.30	3	255	260	54	-	100.2	94.84
9	100.00	105.00	1127.250	2.40	79	81	2.15	2.10	2	255	260	54	-	101.8	91.12
10	105.00	110.00	1131.520	2.20	80	81	1.97	2.00	2	256	263	55	-	102.2	87.24
11	110.00	115.00	1135.630	2.00	80	81	1.79	1.80	2	254	259	54	-	101.6	83.18
12	115.00	120.00	1139.530	2.10	80	81	1.88	1.90	2	255	261	55	-	101.9	85.24
--	120.00	--	1143.535										-		--
	Final DGM:		1143.535												

RESULTS	Run Time		Vm		ΔP		Tm		Ts		Max Vac	ΔH		%ISO	BWS	Y_{qa}
	120.0	min	95.970	ft^3	2.15	in. WC	77.5	°F	82.0	°F	3	1.913	in. WC	100.9	0.039	1.4

Alliance SOURCE TESTING

Isokinetic Field Data

Location:	Kronospan - Clarion, PA			**Start Time:**	13:00	**Source:**	Wet Scrubber Exhaust
Date:	8/23/18	**Run 3**	**VALID**	**End Time:**	15:06	**Project No.:**	2018-0912

Parameter: NH3

STACK DATA (EST)			EQUIPMENT			STACK DATA (EST)			FILTER NO.	STACK DATA (FINAL)			MOIST. DATA
Moisture:	4.5	% est.	Meter Box ID:	2026		Est. Tm:	77	°F	NA	Pb:	28.46	in. Hg	Vlc (ml)
Barometric:	28.46	in. Hg	Y:	0.995		Est. Ts:	82	°F		Pg:	-0.10	in. WC	85.3
Static Press:	-0.10	in. WC	ΔH @ (in.WC):	1.860		Est. ΔP:	2.15	in. WC		O_2:	20.8	%	K-FACTOR
Stack Press:	28.45	in. Hg	Probe ID:	PR-404-0		Est. Dn:	0.168	in.		CO_2:	0.0	%	0.890
CO_2:	0.1	%	Liner Material:	glass		Target Rate:	0.75	scfm			Check Pt.	Initial	Final	Corr.
O_2:	20.3	%	Pitot ID:	PT-404-4		LEAK CHECKS	Pre	Mid 1	Mid 2	Post	Mid 1 (cf)			--
N_2/CO:	79.6	%	Pitot Cp/Type:	0.840	S-type	Leak Rate (cfm):	0.000	--	--	0.000	Mid 2 (cf)			--
Md:	28.83	lb/lb-mole	Nozzle ID:	TF-202		Vacuum (in Hg):	15	--	--	15	Mid 3 (cf)			--
Ms:	28.34	lb/lb-mole	Nozzle Dn (in.):	0.172		Pitot Tube:	Pass	--	--	Pass	Mid-Point Leak Check Vol (cf):			--

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft^3)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
					DGM Average	Stack				Probe	Filter	Imp Exit	Aux		
					Amb.	Amb.				Amb.	Amb.	Amb.	Amb.		
	Begin	End			--	--	Ideal	Actual		--	--	--	--		
A-1	0.00	5.00	143.850	1.70	80	82	1.52	1.50	3	240	260	64	-	102.9	76.76
2	5.00	10.00	147.490	1.90	82	82	1.71	1.70	3	245	260	57	-	101.0	81.15
3	10.00	15.00	151.280	1.90	82	82	1.71	1.70	3	250	259	53	-	99.9	81.15
4	15.00	20.00	155.030	2.00	82	82	1.80	1.80	3	252	261	53	-	100.8	83.26
5	20.00	25.00	158.910	2.10	82	82	1.89	1.90	3	253	261	54	-	101.7	85.32
6	25.00	30.00	162.920	2.40	82	83	2.15	2.20	3	255	259	54	-	101.7	91.29
7	30.00	35.00	167.200	2.80	83	83	2.51	2.50	3	252	260	54	-	101.5	98.61
8	35.00	40.00	171.820	2.60	84	82	2.34	2.30	3	255	260	55	-	101.6	94.93
9	40.00	45.00	176.290	2.40	84	82	2.16	2.20	3	251	258	55	-	101.5	91.21
10	45.00	50.00	180.580	2.20	84	82	1.98	2.00	3	254	260	57	-	101.5	87.33
11	50.00	55.00	184.690	2.10	84	83	1.89	1.90	3	254	259	58	-	101.2	85.40
12	55.00	60.00	188.690	2.10	84	82	1.89	1.90	3	256	259	58	-	101.2	85.32
B-1	60.00	65.00	192.695	2.00	80	83	1.79	1.80	3	251	257	63	-	100.9	83.34
2	65.00	70.00	196.560	2.20	84	83	1.98	2.00	3	253	257	56	-	98.4	87.41
3	70.00	75.00	200.540	2.60	86	83	2.34	2.30	3	254	263	57	-	100.2	95.02
4	75.00	80.00	204.960	2.30	87	83	2.08	2.10	3	255	263	59	-	101.5	89.37
5	80.00	85.00	209.180	2.40	86	83	2.16	2.20	3	255	259	60	-	101.4	91.29
6	85.00	90.00	213.480	2.40	86	83	2.16	2.20	3	255	262	60	-	101.2	91.29
7	90.00	95.00	217.770	2.20	85	82	1.99	2.00	3	254	261	61	-	101.6	87.33
8	95.00	100.00	221.890	2.20	85	82	1.99	2.00	3	255	260	58	-	101.3	87.33
9	100.00	105.00	226.000	2.00	85	81	1.81	1.80	3	256	257	57	-	101.7	83.18
10	105.00	110.00	229.940	1.90	85	83	1.71	1.70	3	254	261	55	-	100.0	81.23
11	110.00	115.00	233.710	1.60	86	82	1.45	1.40	3	255	257	57	-	103.1	74.47
12	115.00	120.00	237.290	1.30	86	83	1.18	1.20	3	256	258	58	-	103.9	67.19
--	120.00	--	240.540										-		--
	Final DGM:		240.540												

RESULTS	Run Time		Vm		ΔP		Tm		Ts		Max Vac	ΔH		%ISO	BWS	Y_{qa}
	120.0	min	96.690	ft^3	2.14	in. WC	83.9	°F	82.4	°F	3	1.929	in. WC	100.8	0.039	1.1

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912

Run Number		Run 1	Run 2	Run 3	Average
Date		8/23/18	8/23/18	8/23/18	--
Start Time		8:05	10:35	13:00	--
Stop Time		10:05	12:35	15:00	--
Input Data					
Volumetric Flow Rate (M1-4), dscfm	Qs	48,622	48,496	48,307	48,475
Methane Concentration, ppmvd	C_{CH4}	1.98	2.21	--	2.1
Ethane Concentration, ppmvd	C_{C2H6}	*0.0*	*0.0*	--	0.0
Moisture Fraction, dimensionless	BWS	0.037	0.039	0.039	0.038
Calculated Data					
O2 Concentration, % dry	$C_{O2\ \%d}$	20.9	20.9	20.8	20.9
CO2 Concentration, % dry	$C_{CO2\ \%d}$	0.0	0.0	0.0	0.0
THC (as C3H8) Concentration, ppmvd	C_{THCd}	3.1	3.0	3.6	3.3
THC (as C3H8) Concentration, ppmvw	C_{THCw}	3.0	2.9	3.5	3.1
THC (as C3H8) Emission Rate, lb/hr	ER_{THC}	1.0	1.0	1.2	1.1
NMEHC (as C3H8) Concentration, ppmvd	C_{NMEHC}	2.5	2.3	--	2.4
NMEHC (as C3H8) Emission Rate, lb/hr	ER_{NMEHC}	0.82	0.76	--	0.79

**Underlined values below detection limit*
***Run 3 Methane/Ethane sample was not analyzed*

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O_2	CO_2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
8:05	20.6	0.1	2.9
8:06	20.6	0.1	3.0
8:07	20.6	0.1	3.0
8:08	20.6	0.1	3.0
8:09	20.6	0.1	3.0
8:10	20.6	0.1	3.0
8:11	20.6	0.1	3.0
8:12	20.6	0.1	3.0
8:13	20.6	0.1	3.0
8:14	20.6	0.1	3.1
8:15	20.6	0.1	3.1
8:16	20.6	0.1	3.1
8:17	20.6	0.1	3.1
8:18	20.6	0.1	3.2
8:19	20.6	0.1	3.2
8:20	20.6	0.1	3.2
8:21	20.6	0.1	3.2
8:22	20.6	0.1	3.2
8:23	20.6	0.1	3.1
8:24	20.6	0.1	3.1
8:25	20.6	0.1	3.1
8:26	20.6	0.1	3.1
8:27	20.6	0.1	3.1
8:28	20.6	0.1	3.1
8:29	20.6	0.1	3.0
8:30	20.7	0.1	3.0
8:31	20.6	0.1	3.0
8:32	20.6	0.1	3.1
8:33	20.7	0.1	3.1
8:34	20.6	0.1	3.1
8:35	20.6	0.1	3.1
8:36	20.7	0.1	3.1
8:37	20.7	0.1	3.1
8:38	20.7	0.1	3.1
8:39	20.7	0.1	3.1
8:40	20.7	0.1	3.1
8:41	20.7	0.1	3.1
8:42	20.7	0.1	3.1
8:43	20.7	0.1	3.1
8:44	20.7	0.1	3.1
8:45	20.7	0.1	3.1
8:46	20.7	0.1	3.1
8:47	20.7	0.1	3.1
8:48	20.7	0.1	3.1
8:49	20.7	0.1	3.1
8:50	20.7	0.1	3.1
8:51	20.7	0.1	3.2
8:52	20.7	0.1	3.2
8:53	20.7	0.1	3.1
8:54	20.7	0.1	3.2
8:55	20.7	0.1	3.2
8:56	20.7	0.1	3.1
8:57	20.7	0.1	3.1
8:58	20.7	0.1	3.1
8:59	20.7	0.1	3.0
9:00	20.7	0.1	3.1
9:01	20.7	0.1	3.1
9:02	20.7	0.1	3.0
9:03	20.7	0.1	3.0
9:04	20.7	0.1	3.0
9:05	20.7	0.1	2.9
9:06	20.7	0.1	2.9
9:07	20.7	0.1	2.9
9:08	20.7	0.1	2.9
9:09	20.7	0.1	2.9
9:10	20.7	0.1	2.8
9:11	20.7	0.1	2.7
9:12	20.7	0.1	2.7
9:13	20.7	0.1	2.7
9:14	20.7	0.1	2.8
9:15	20.7	0.1	2.7
9:16	20.6	0.1	2.7
9:17	20.7	0.1	2.7

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O_2	CO_2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
9:18	20.7	0.1	2.7
9:19	20.6	0.1	2.8
9:20	20.6	0.1	2.8
9:21	20.6	0.1	2.8
9:22	20.6	0.1	2.9
9:23	20.6	0.1	2.9
9:24	20.6	0.1	2.9
9:25	20.6	0.1	2.9
9:26	20.6	0.1	2.9
9:27	20.6	0.1	2.9
9:28	20.6	0.1	2.9
9:29	20.6	0.1	2.9
9:30	20.6	0.1	3.0
9:31	20.6	0.1	3.0
9:32	20.6	0.1	3.0
9:33	20.6	0.1	3.0
9:34	20.6	0.1	3.0
9:35	20.6	0.1	3.0
9:36	20.6	0.1	3.0
9:37	20.6	0.1	3.0
9:38	20.6	0.1	3.0
9:39	20.6	0.1	3.1
9:40	20.6	0.1	3.1
9:41	20.6	0.1	3.1
9:42	20.6	0.1	3.2
9:43	20.6	0.1	3.2
9:44	20.6	0.1	3.2
9:45	20.7	0.1	3.2
9:46	20.6	0.1	3.1
9:47	20.6	0.1	3.1
9:48	20.6	0.1	3.1
9:49	20.6	0.1	3.0
9:50	20.6	0.1	3.0
9:51	20.6	0.1	3.0
9:52	20.6	0.1	2.9
9:53	20.7	0.1	2.9
9:54	20.6	0.1	2.9
9:55	20.6	0.1	2.9
9:56	20.6	0.1	2.9
9:57	20.6	0.1	2.9
9:58	20.6	0.1	3.0
9:59	20.6	0.1	3.0
10:00	20.7	0.1	3.0
10:01	20.7	0.1	3.0
10:02	20.6	0.1	3.0
10:03	20.7	0.1	3.0
10:04	20.6	0.1	3.0

Parameter	O2	CO2	THC
Uncorrected Run Average (C_{obs})	20.6	0.1	3.0
Cal Gas Concentration (C_{MA})	10.0	5.0	10.0
Pretest System Zero Response	0.1	0.0	0.0
Posttest System Zero Response	0.4	0.1	0.2
Average Zero Response (Co)	0.2	0.0	0.1
Pretest System Cal Response	9.9	5.0	10.0
Posttest System Cal Response	10.1	5.1	10.0
Average Cal Response (C_M)	10.0	5.1	10.0
Corrected Run Average (Corr)	20.9	0.0	NA

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O2	CO2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
10:35	20.6	0.1	2.7
10:36	20.6	0.1	2.6
10:37	20.6	0.1	2.7
10:38	20.6	0.1	2.7
10:39	20.6	0.1	2.7
10:40	20.6	0.1	3.0
10:41	20.6	0.1	3.2
10:42	20.6	0.1	3.0
10:43	20.6	0.1	2.9
10:44	20.6	0.1	2.8
10:45	20.6	0.1	2.8
10:46	20.6	0.1	2.8
10:47	20.6	0.1	2.8
10:48	20.6	0.1	2.8
10:49	20.6	0.1	2.8
10:50	20.6	0.1	2.8
10:51	20.6	0.1	2.8
10:52	20.6	0.1	2.8
10:53	20.6	0.1	2.8
10:54	20.6	0.1	2.8
10:55	20.6	0.1	2.8
10:56	20.6	0.1	2.8
10:57	20.6	0.1	2.8
10:58	20.6	0.1	2.9
10:59	20.6	0.1	3.0
11:00	20.6	0.1	3.0
11:01	20.6	0.1	3.1
11:02	20.6	0.1	3.2
11:03	20.6	0.1	3.2
11:04	20.6	0.1	3.2
11:05	20.6	0.1	3.1
11:06	20.6	0.1	3.2
11:07	20.6	0.1	3.2
11:08	20.6	0.1	3.1
11:09	20.6	0.1	3.1
11:10	20.6	0.1	3.1
11:11	20.6	0.1	3.1
11:12	20.6	0.1	3.0
11:13	20.6	0.1	3.0
11:14	20.6	0.1	3.0
11:15	20.6	0.1	3.0
11:16	20.6	0.1	3.0
11:17	20.6	0.1	2.9
11:18	20.6	0.1	2.9
11:19	20.6	0.1	2.8
11:20	20.6	0.1	2.8
11:21	20.6	0.1	2.7
11:22	20.6	0.1	2.8
11:23	20.6	0.1	2.8
11:24	20.6	0.1	2.8
11:25	20.6	0.1	2.8
11:26	20.6	0.1	2.8
11:27	20.6	0.1	2.8
11:28	20.6	0.1	2.8
11:29	20.6	0.1	2.8
11:30	20.6	0.1	2.8
11:31	20.6	0.1	2.8
11:32	20.6	0.1	2.9
11:33	20.6	0.1	2.8
11:34	20.6	0.1	2.8
11:35	20.6	0.1	2.8
11:36	20.6	0.1	2.9
11:37	20.6	0.1	2.9
11:38	20.6	0.1	2.9
11:39	20.6	0.1	2.9
11:40	20.6	0.1	2.9
11:41	20.6	0.1	2.9
11:42	20.6	0.1	2.9
11:43	20.6	0.1	2.9
11:44	20.6	0.1	2.9
11:45	20.6	0.1	2.8
11:46	20.6	0.1	2.8
11:47	20.6	0.1	2.8

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O2	CO2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
11:48	20.6	0.1	2.9
11:49	20.6	0.1	2.9
11:50	20.6	0.1	2.9
11:51	20.6	0.1	2.9
11:52	20.6	0.1	3.0
11:53	20.6	0.1	3.0
11:54	20.6	0.1	2.9
11:55	20.6	0.1	2.9
11:56	20.6	0.1	2.9
11:57	20.6	0.1	2.9
11:58	20.6	0.1	2.9
11:59	20.6	0.1	2.9
12:00	20.6	0.1	2.9
12:01	20.6	0.1	2.9
12:02	20.6	0.1	2.9
12:03	20.6	0.1	2.9
12:04	20.6	0.1	2.9
12:05	20.6	0.1	2.9
12:06	20.6	0.1	2.8
12:07	20.6	0.1	2.7
12:08	20.6	0.1	2.8
12:09	20.6	0.1	2.8
12:10	20.6	0.1	2.8
12:11	20.6	0.1	2.9
12:12	20.6	0.1	2.8
12:13	20.6	0.1	2.8
12:14	20.6	0.1	2.8
12:15	20.6	0.1	2.9
12:16	20.6	0.1	2.9
12:17	20.6	0.1	2.9
12:18	20.6	0.1	2.9
12:19	20.6	0.1	2.9
12:20	20.6	0.1	2.9
12:21	20.6	0.1	2.9
12:22	20.6	0.1	2.9
12:23	20.6	0.1	2.9
12:24	20.6	0.1	2.9
12:25	20.6	0.1	3.0
12:26	20.6	0.1	3.0
12:27	20.6	0.1	2.9
12:28	20.6	0.1	2.9
12:29	20.6	0.1	2.9
12:30	20.6	0.1	2.9
12:31	20.6	0.1	3.0
12:32	20.6	0.1	3.0
12:33	20.6	0.1	3.0
12:34	20.6	0.1	2.9

Parameter	O2	CO2	THC
Uncorrected Run Average (C_{obs})	20.6	0.1	2.9
Cal Gas Concentration (C_{MA})	10.0	5.0	10.0
Pretest System Zero Response	0.4	0.1	0.2
Posttest System Zero Response	0.4	0.1	0.0
Average Zero Response (Co)	0.4	0.1	0.1
Pretest System Cal Response	10.1	5.1	10.0
Posttest System Cal Response	10.1	4.9	10.0
Average Cal Response (C_M)	10.1	5.0	10.0
Corrected Run Average (Corr)	20.9	0.0	NA

Alliance SOURCE TESTING

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O2	CO2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
13:00	20.6	0.1	3.4
13:01	20.6	0.1	3.4
13:02	20.6	0.1	3.4
13:03	20.6	0.1	3.4
13:04	20.6	0.1	3.5
13:05	20.6	0.1	3.4
13:06	20.6	0.1	3.4
13:07	20.6	0.1	3.4
13:08	20.6	0.1	3.4
13:09	20.6	0.1	3.4
13:10	20.6	0.1	3.5
13:11	20.6	0.1	3.5
13:12	20.6	0.1	3.6
13:13	20.6	0.1	3.5
13:14	20.6	0.1	3.5
13:15	20.6	0.1	3.5
13:16	20.6	0.1	3.5
13:17	20.6	0.1	3.5
13:18	20.6	0.1	3.5
13:19	20.6	0.1	3.6
13:20	20.6	0.1	3.5
13:21	20.6	0.1	3.5
13:22	20.6	0.1	3.5
13:23	20.6	0.1	3.5
13:24	20.6	0.1	3.5
13:25	20.6	0.1	3.5
13:26	20.6	0.1	3.5
13:27	20.6	0.1	3.5
13:28	20.6	0.1	3.5
13:29	20.6	0.1	3.5
13:30	20.6	0.1	3.6
13:31	20.6	0.1	3.5
13:32	20.6	0.1	3.6
13:33	20.6	0.1	3.6
13:34	20.6	0.1	3.6
13:35	20.6	0.1	3.6
13:36	20.6	0.1	3.6
13:37	20.6	0.1	3.5
13:38	20.6	0.1	3.5
13:39	20.6	0.1	3.5
13:40	20.6	0.1	3.5
13:41	20.6	0.1	3.5
13:42	20.6	0.1	3.5
13:43	20.6	0.1	3.5
13:44	20.6	0.1	3.5
13:45	20.6	0.1	3.5
13:46	20.6	0.1	3.5
13:47	20.6	0.1	3.5
13:48	20.6	0.1	3.4
13:49	20.6	0.1	3.3
13:50	20.6	0.1	3.4
13:51	20.6	0.1	3.4
13:52	20.6	0.1	3.5
13:53	20.6	0.1	3.5
13:54	20.6	0.1	3.5
13:55	20.6	0.1	3.4
13:56	20.6	0.1	3.5
13:57	20.6	0.1	3.5
13:58	20.6	0.1	3.5
13:59	20.6	0.1	3.5
14:00	20.6	0.1	3.6
14:01	20.6	0.1	3.6
14:02	20.6	0.1	3.6
14:03	20.6	0.1	3.6
14:04	20.6	0.1	3.6
14:05	20.6	0.1	3.5
14:06	20.6	0.1	3.5
14:07	20.6	0.1	3.6
14:08	20.6	0.1	3.6
14:09	20.6	0.1	3.6
14:10	20.6	0.1	3.6
14:11	20.6	0.1	3.6
14:12	20.6	0.1	3.5

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912
Date: 8/23/18

Time	O2	CO2	THC
Unit	% dry	% dry	ppmvw
Status	Valid	Valid	Valid
14:13	20.6	0.1	3.5
14:14	20.6	0.1	3.5
14:15	20.6	0.1	3.5
14:16	20.6	0.1	3.5
14:17	20.6	0.1	3.5
14:18	20.6	0.1	3.6
14:19	20.6	0.1	3.6
14:20	20.6	0.1	3.5
14:21	20.6	0.1	3.5
14:22	20.6	0.1	3.5
14:23	20.6	0.1	3.4
14:24	20.6	0.1	3.5
14:25	20.6	0.1	3.5
14:26	20.6	0.1	3.5
14:27	20.6	0.1	3.5
14:28	20.6	0.1	3.5
14:29	20.6	0.1	3.5
14:30	20.6	0.1	3.5
14:31	20.6	0.1	3.5
14:32	20.6	0.1	3.5
14:33	20.6	0.1	3.6
14:34	20.6	0.1	3.7
14:35	20.6	0.1	3.6
14:36	20.6	0.1	3.6
14:37	20.6	0.1	3.6
14:38	20.6	0.1	3.6
14:39	20.6	0.1	3.5
14:40	20.6	0.1	3.5
14:41	20.6	0.1	3.5
14:42	20.6	0.1	3.5
14:43	20.6	0.1	3.5
14:44	20.6	0.1	3.5
14:45	20.6	0.1	3.5
14:46	20.6	0.1	3.5
14:47	20.6	0.1	3.4
14:48	20.6	0.1	3.4
14:49	20.6	0.1	3.5
14:50	20.6	0.1	3.5
14:51	20.6	0.1	3.5
14:52	20.6	0.1	3.5
14:53	20.6	0.1	3.4
14:54	20.6	0.1	3.4
14:55	20.6	0.1	3.5
14:56	20.6	0.1	3.5
14:57	20.6	0.1	3.5
14:58	20.6	0.1	3.5
14:59	20.6	0.1	3.5

Parameter	O2	CO2	THC
Uncorrected Run Average (C_{obs})	20.6	0.1	3.5
Cal Gas Concentration (C_{MA})	10.0	5.0	10.0
Pretest System Zero Response	0.4	0.1	0.0
Posttest System Zero Response	0.4	0.1	0.0
Average Zero Response (Co)	0.4	0.1	0.0
Pretest System Cal Response	10.1	4.9	10.0
Posttest System Cal Response	10.1	4.9	10.0
Average Cal Response (C_M)	10.1	4.9	10.0
Corrected Run Average (Corr)	20.8	0.0	NA

Alliance SOURCE TESTING

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter(s): MeOH

Run Number		Run 1	Run 2	Run 3	Average
Date		8/23/18	8/23/18	8/23/18	--
Start Time		8:05	10:35	13:00	--
Stop Time		10:05	12:35	15:00	--
Input Data					
Volumetric Flow Rate, dscfm	(Qs)	48,622	48,496	48,307	48,475
Standard Meter Volume, L	(Vmstd)	45.450	44.742	44.338	45
Methanol Mass, Impinger Catch, ug	(M_{CH4O})	129.48	203.35	185.55	173
Methanol Mass, Impinger Catch 2, ug	(M_{CH4O})	--	*40.00*	87.10	64
Methanol Mass, Tube (front), ug	(M_{CH4O})	*5.00*	*10.00*	*10.00*	8
Methanol Mass, Tube (back), ug	(M_{CH4O})	*5.00*	*7.50*	*7.50*	7
Methanol Mass, ug	(M_{CH4O})	139.48	260.85	290.15	230
Emissions Calculations					
Methanol Concentration, ppmvd	(C_{CH4Op})	2.3	4.4	4.9	3.9
Methanol Emission Rate, lb/hr	(ER_{CH4O})	0.56	1.1	1.2	0.93

**Underlined values below detection limit*

Alliance SOURCE TESTING

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter(s): MeOH
Console Type Low Flow

Run No.		1				2				3			
Date		8/23/18				8/23/18				8/23/18			
Status		VALID				VALID				VALID			
Start Time		8:05				10:35				13:00			
End Time		10:05				12:35				15:00			
Run Time, min	(θ)	120				120				120			
Meter ID		2071A				2071A				2071A			
Meter Correction Factor	(Y)	0.9991				0.9991				0.9991			
Max Vacuum, in. Hg		1.0				3.0				3.0			
Post Leak Check, L/min (at max vac.)		0.000				0.000				0.000			
Meter Volume, L													
0		0.000				0.000				0.000			
5		2.090				1.820				2.190			
10		4.160				3.650				4.200			
15		6.220				5.470				6.370			
20		8.330				7.360				8.510			
25		10.410				9.580				10.610			
30		12.430				11.690				12.460			
35		14.490				13.780				14.210			
40		16.620				15.860				16.290			
45		18.530				17.940				18.250			
50		20.980				20.020				20.410			
55		22.670				22.070				22.290			
60		24.590				24.110				24.350			
65		26.620				26.150				26.290			
70		28.690				28.170				28.360			
75		30.820				30.070				30.440			
80		32.730				31.880				32.380			
85		34.760				33.640				34.350			
90		36.820				35.830				36.210			
95		39.210				38.040				38.300			
100		41.090				40.320				40.360			
105		43.080				42.500				42.420			
110		44.840				44.580				44.480			
115		46.900				46.590				46.570			
120		48.935				48.675				48.790			
Total Meter Volume, L	(Vm)	48.935				48.675				48.790			
Temperature, °F		Meter	Probe	Filter	Imp. Exit	Meter	Probe	Filter	Imp. Exit	Meter	Probe	Filter	Imp. Exit
0		81	--	--	--	83	--	--	--	91	--	--	--
5		81	--	--	--	84	--	--	--	92	--	--	--
10		81	--	--	--	84	--	--	--	92	--	--	--
15		81	--	--	--	84	--	--	--	92	--	--	--
20		80	--	--	--	84	--	--	--	92	--	--	--
25		80	--	--	--	85	--	--	--	92	--	--	--
30		80	--	--	--	85	--	--	--	92	--	--	--
35		80	--	--	--	85	--	--	--	92	--	--	--
40		80	--	--	--	86	--	--	--	92	--	--	--
45		80	--	--	--	86	--	--	--	93	--	--	--
50		80	--	--	--	86	--	--	--	93	--	--	--
55		80	--	--	--	87	--	--	--	93	--	--	--
60		80	--	--	--	87	--	--	--	93	--	--	--
65		80	--	--	--	87	--	--	--	93	--	--	--
70		80	--	--	--	88	--	--	--	93	--	--	--
75		80	--	--	--	88	--	--	--	94	--	--	--
80		80	--	--	--	88	--	--	--	94	--	--	--
85		81	--	--	--	88	--	--	--	94	--	--	--
90		82	--	--	--	89	--	--	--	94	--	--	--
95		82	--	--	--	89	--	--	--	94	--	--	--
100		83	--	--	--	89	--	--	--	94	--	--	--
105		84	--	--	--	89	--	--	--	94	--	--	--
110		84	--	--	--	89	--	--	--	94	--	--	--
115		84	--	--	--	89	--	--	--	94	--	--	--
120		84	--	--	--	90	--	--	--	95	--	--	--
Average Temperature, °F	(Tm)	81	--	--	--	87	--	--	--	93	--	--	--
Average Temperature, °R	(Tm)	541	--	--	--	546	--	--	--	553	--	--	--
Minimum Temperature, °F		80	--	--	--	83	--	--	--	91	--	--	--
Maximum Temperature, °F		84	--	--	--	90	--	--	--	95	--	--	--
Barometeric Pressure, in. Hg	(Pb)	28.46				28.46				28.46			
Meter Pressure, in. Hg	(Pm)	28.49				28.49				28.49			
Standard Meter Volume, L	(Vmstd)	44.[illegible]				44.742				44.338			

Appendix C

(281) 476-4769
goldenspecialty.com

Certificate No.
T104704255-17-14

Laboratory Analysis Report (III)

Report Date: 9/11/2018

Alliance Source Testing

Report No.: **GSL_180834**
Project: **2018-0912 - Kronospan**
Clarion, PA

Prepared for:

Adam Robinson
Alliance Source Testing
1201 Parkway View Drive
Pittsburgh, PA 15205

Alliance Source Testing
Project: 2018-0912 - Kronospan
GSL Order ID: GSL_180834

Adam Robinson
1201 Parkway View Drive
Pittsburgh, PA 15205

The samples submitted under the above referenced project name and identified by our Golden Specialty laboratory order number have been analyzed, and the data is enclosed. Only results for samples listed on the original Chain of Custody (at end of report) are included in this report. Raw data and subcontract data, if applicable, are attached to this report. Results provided in this report relate only to the samples.

All samples will be kept for no less than five business days after the final report is submitted, unless other arrangements have been made. Samples put on hold or held in canisters due to client issues will incur weekly canister rental fees. Golden Specialty reserves the right to return any unused samples due to hazardous sample matrices. Raw data and final reports will be filed for five years unless otherwise requested by client or regulatory mandates. To protect the integrity and completeness of this report, it must remain attached to this cover letter.

I certify to the best of my knowledge all analytical data presented in this report has been checked for completeness and accuracy, and is free of errors. Any deviations from the stated analytical protocols due to sample matrix have been documented in the laboratory narrative of this analytical report. Unless otherwise noted, any analysis performed by Golden Specialty falls within the scope of our NELAC accreditation and meets all NELAC requirements.

We thank you for selecting Golden Specialty to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

James Haynes
QA/QC Manager

This analytical report and data associated has been reviewed and prepared specifically for you. The data package represents the best analytical and technical judgment and interpretations of our personnel, in accordance with the Golden Specialty Laboratory Quality Assurance Manual. Golden Specialty Inc. assumes no responsibility for the end use of this document or any portion extracted from it. Unless it is otherwise agreed upon, in writing, and prior to analytical work, Golden Specialty Inc. liability may not exceed the amount invoiced for this order.

Laboratory Narrative

EPA Method 18 Spike and Recovery Procedure:

Typically Method 18 samples are received as three bags per sampling location. One bag is screened to determine an estimated concentration. The sample is spiked at 40-60% of the concentration of the highest target analyte, or half the midpoint of the calibration, whichever is higher. The calculation used to determine the aliquot volume of sample to which the spike will be added is as follows:

[Sample]*Vol.Sample + [Spike]*Vol.Spike = [Spiked Sample]*Total Volume

If a dilution is required for sample analysis, the sample with the highest dilution will be used to determine recoveries. If sample dilution is required for spike analysis due to matrix interference, raw data from sample analyses at the spiked dilution will be included with the sample chromatography. Spike recovery will be calculated prior to the inclusion of any dilution factors.

For the sample which will be spiked, the sample volume is removed via a large volume syringe. The appropriate sample volume and spike volume, taken from an existing standard, are combined in the original sample bag. Method 18 samples received as a single bag will be spiked according to an alternative procedure, with an aliquot of sample volume combined with the spike volume in a new 1L Tedlar bag. The spiked sample is analyzed at the appropriate time/date to correspond with Method 18 holding time criteria.

The calculation used to correct sample results for the matrix spike recovery is as follows:

[Analyzed Average Result]/[Recovery] = Corrected Sample Result

Respectfully,

James Haynes
QA/QC Manager

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Laboratory Narrative

Accreditation:

The Pennsylvania Department of Environmental Protection does not currently offer accreditation for air testing.

EPA Method 308:

EPA Method 308 sample volumes represent either the actual sample volume received of the impinger samples, or the total volume used for the analyzed tube fraction(s). Samples Tube 1 - R2B and Tube 1 - R3B (GSL_180834-013 and 014, respectively) were received completely saturated, and the excess moisture is included in the sample volumes for the respective tube fractions.

Respectfully,

James Haynes
QA/QC Manager

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Laboratory Analysis Report

Sample Results

Test:	Analysis by EPA Method 18		
Client Name:	Alliance Source Testing		
Sample Number:	**GSL_180834-001**		
Analytical SOP:	GSL_TM001	**Source Sampled:**	**Wet Scrubber Analysis**
Analysis Location:	Deer Park, TX	**Client Sample ID:**	**Primary Bag - Run 1A**
Instrument ID:	GC #1 - Agilent	**Date Sampled:**	8/23/2018 at 10:05 AM
Sample Analyst:	Dhan Yeddula	**Date Analyzed:**	8/28/2018
QC Batch ID:	QC_09268	**Matrix:**	Air

Parameter	MQL (ppmv)	DF	SQL (ppmv)	Run 1 (ppmv) 11:14 AM	Run 2 (ppmv) 11:31 AM	Run 3 (ppmv) 11:47 AM	Average (ppmv)	Matrix Spike Recovery (%)	Recovery-Corrected Result (ppmv)	CAS #
Methane	0.10	1.00	0.10	2.00	2.04	1.89	1.98	115	1.72	74-82-8
Ethane	0.10	1.00	0.10	< 0.10	< 0.10	< 0.10	< 0.10	104	< 0.10	74-84-0

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Laboratory Analysis Report

Sample Results

Test:	Analysis by EPA Method 18		
Client Name:	Alliance Source Testing		
Sample Number:	**GSL_180834-002**		
Analytical SOP:	GSL_TM001	**Source Sampled:**	**Wet Scrubber Analysis**
Analysis Location:	Deer Park, TX	**Client Sample ID:**	**Primary Bag - Run 2A**
Instrument ID:	GC #1 - Agilent	**Date Sampled:**	8/23/2018 at 12:35 PM
Sample Analyst:	Dhan Yeddula	**Date Analyzed:**	8/28/2018
QC Batch ID:	QC_09268	**Matrix:**	Air

Parameter	MQL (ppmv)	DF	SQL (ppmv)	Run 1 (ppmv) 12:04 PM	Run 2 (ppmv) 12:21 PM	Run 3 (ppmv) 12:37 PM	Average (ppmv)	Matrix Spike Recovery (%)	Recovery-Corrected Result (ppmv)	CAS #
Methane	0.10	1.00	0.10	2.14	2.35	2.15	2.21	115	1.92	74-82-8
Ethane	0.10	1.00	0.10	< 0.10	< 0.10	< 0.10	< 0.10	104	< 0.10	74-84-0

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Laboratory Analysis Report

Sample Results

Test: Analysis by EPA Method 308
Client Name: Alliance Source Testing
Order ID: **GSL_180834**
Analytical SOP: GSL_TM008
Analysis Location: Deer Park, TX
Instrument ID: GC #10 - Agilent
Sample Analyst: Emily Decker
QC Batch ID: QC_09269
Source Sampled: **Wet Scrubber Exhaust**
Date Sampled: 8/23/2018
Date Analyzed: 9/6/2018
Matrix: Liquid

Sample ID	Sample Number	Parameter	MQL (ug/ml)	DF	SQL (ug/ml)	Run 1 (ug/ml)	Run 2 (ug/ml)	Average Result (ug/ml)	Sample Vol (ml)	Fraction Result (ug)
Imp Catch - R1A	007	Methanol	2.50	1.00	2.50	3.82	3.80	3.81	34	129.48
Imp Catch - R2A	008	Methanol	2.50	1.00	2.50	4.80	4.88	4.84	42	203.35
Imp Catch 2 - R2A	009	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	16	< 40.00
Imp Catch - R3A	010	Methanol	2.50	1.00	2.50	4.74	4.78	4.76	39	185.55
Imp Catch 2 - R3A	011	Methanol	2.50	1.00	2.50	5.19	5.06	5.12	17	87.10
Tube 1 - R1B Front	012	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	2	< 5.00
Tube 1 - R1B Back	012	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	2	< 5.00
Tube 1 - R2B Front	013	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	4	< 10.00
Tube 1 - R2B Back	013	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	3	< 7.50
Tube 1 - R3B Front	014	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	4	< 10.00
Tube 1 - R3B Back	014	Methanol	2.50	1.00	2.50	< 2.50	< 2.50	< 2.50	3	< 7.50

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Laboratory Analysis Report

Sample Results

Test:	Analysis by Conditional Test Method 027		
Client Name:	Alliance Source Testing		
Order ID:	**GSL_180834**		
Analytical SOP:	GSL_TM024		
Analysis Location:	Deer Park, TX	**Source Sampled:**	**Wet Scrubber Exhaust**
Instrument ID:	IC #2 - Metrohm	**Date Sampled:**	8/23/2018
Sample Analyst:	Dhan Yeddula	**Date Analyzed:**	8/28/2018
QC Batch ID:	QC_09267	**Matrix:**	Liquid

Sample ID	Sample Number	Parameter	MQL (ug/ml)	DF	SQL (ug/ml)	Result (ug/ml)	Sample Volume (ml)	Result (ug/sample)
Impinger 1 - Run 1	017	Ammonia	0.09	1.00	0.09	< 0.09	331	< 31.25
Impinger 1 - Run 2	018	Ammonia	0.09	1.00	0.09	< 0.09	460	< 43.42
Impinger 1 - Run 3	019	Ammonia	0.09	1.00	0.09	< 0.09	485	< 45.78

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Laboratory Analysis Report

Quality Control Information

Sample Duplicate Recovery

Test: Analysis by Conditional Test Method 027
Duplicate Sample Number: GSL_180834-019
Duplicate Sample Dilution: 1.00x
Date Analyzed: 8/28/2018 at 03:07 PM
Matrix: Liquid
Instrument ID: IC #2 - Metrohm
Analyst: Dhan Yeddula
QC Batch ID: QC_09267

Parameter	SQL (ug/ml)	Sample Result (ug/ml)	Duplicate Result (ug/ml)	RPD (%)	RPD Limit (%)	Flag
Ammonium	0.10	< 0.10	< 0.10	NC	25	

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Laboratory Analysis Report

Quality Control Information

Matrix Spike Recovery

Test: Analysis by EPA Method 18
Client Name: Alliance Source Testing
Spiked Sample: **GSL_180834-001**
Sample Dilution: 1.00x
Analytical SOP: GSL_TM001
Instrument ID: GC #1 - Agilent
Sample Analyst: Dhan Yeddula
QC Batch ID: QC_09268
Source Sampled: **Wet Scrubber Analysis**
Spike Prepared: 8/29/2018
Spike Analyzed: 9/4/2018
Matrix: Air

Parameter	MQL (ppmv)	Spike Run 1 (ppmv) 08:35 AM	Spike Run 2 (ppmv) 08:51 AM	Spike Run 3 (ppmv) 09:08 AM	Spike Average (ppmv)	Sample Average (ppmv)	Spike Amount (ppmv)	Percent Recovery	Flag
Methane	0.10	7.69	7.77	7.73	7.73	1.98	5.00	115	
Ethane	0.10	5.10	5.14	5.33	5.19	< 0.10	5.00	104	

Spike Recovery Limits: 70-130%

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Laboratory Analysis Report

Quality Control Information

Matrix Spike Recovery

Test: Analysis by EPA Method 308
Spiked Sample Number: GSL_180834-012
Spiked Sample Dilution: 1.00x
Date Analyzed: 9/5/2018
Matrix: Liquid
Instrument ID: GC #10 - Agilent
Analyst: Emily Decker
QC Batch ID: QC_09269

Parameter	MQL (ug/mL)	Sample Average (ug/mL)	Spike Run 1 (ug/mL)	Spike Run 2 (ug/mL)	Spike Average (ug/mL)	Spike Amount (ug/mL)	Percent Recovery	Recovery Limits	Flag
Methanol	2.50	< 2.50	10.06	9.67	9.87	10.00	99	70 - 130	

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Laboratory Analysis Report

Quality Control Information

Matrix Spike Recovery

Test: Analysis by EPA Method 308
Spiked Sample Number: GSL_180834-009
Spiked Sample Dilution: 1.00x
Date Analyzed: 9/5/2018
Matrix: Liquid
Instrument ID: GC #10 - Agilent
Analyst: Emily Decker
QC Batch ID: QC_09269

Parameter	MQL (ug/mL)	Sample Average (ug/mL)	Spike Run 1 (ug/mL)	Spike Run 2 (ug/mL)	Spike Average (ug/mL)	Spike Amount (ug/mL)	Percent Recovery	Recovery Limits	Flag
Methanol	2.50	< 2.50	11.47	11.62	11.55	10.00	98	70 - 130	

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Laboratory Analysis Report

Quality Control Information

Matrix Spike Recovery

Test: Analysis by Conditional Test Method 027
Spiked Sample Number: GSL_180834-019
Spiked Sample Dilution: 1.00x
Date Analyzed: 8/28/2018 at 03:20 PM
Matrix: Liquid
Instrument ID: IC #2 - Metrohm
Analyst: Dhan Yeddula
QC Batch ID: QC_09267

Parameter	MQL (ug/ml)	Sample Result (ug/ml)	Spike Amount (ug/ml)	Spike Result (ug/ml)	Percent Recovery	Percent Recovery Limits	Flag
Ammonium	0.10	< 0.10	5.00	5.08	101	70 - 130	

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Laboratory Analysis Report

Quality Control Information

Continuing Calibration Verification

Test: Analysis by EPA Method 18
Date Analyzed: 8/28/2018 at 10:22 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	CCV Area Result	Initial Calibration Area Result	Percent Recovery	Percent Recovery Limit	Flag
Methane	8.73	8.98	97	95 - 105	
Ethane	16.95	17.21	99	95 - 105	

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Laboratory Analysis Report

Quality Control Information

Continuing Calibration Verification

Test: Analysis by EPA Method 18
Date Analyzed: 9/4/2018 at 07:42 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	CCV Area Result	Initial Calibration Area Result	Percent Recovery	Percent Recovery Limit	Flag
Methane	8.61	8.98	96	95 - 105	
Ethane	16.83	17.21	98	95 - 105	

This analytical report and data associated has been reviewed and prepared specifically for you. The data package represents the best analytical and technical judgment and interpretations of our personnel, in accordance with the Golden Specialty Laboratory Quality Assurance Manual. Golden Specialty Inc. assumes no responsibility for the end use of this document or any portion extracted from it. Unless it is otherwise agreed upon, in writing, and prior to analytical work, Golden Specialty Inc. liability may not exceed the amount invoiced for this order.

Laboratory Analysis Report

Quality Control Information

Blank Analysis

Test: Analysis by EPA Method 18
Date Analyzed: 8/28/2018 at 10:57 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	CAS #	MQL (ppmv)	Blank Result (ppmv)	Flag
Methane	74-82-8	0.10	< 0.10	
Ethane	74-84-0	0.10	< 0.10	

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Laboratory Analysis Report

Quality Control Information

Blank Analysis

Test: Analysis by EPA Method 18
Date Analyzed: 9/4/2018 at 08:18 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	CAS #	MQL (ppmv)	Blank Result (ppmv)	Flag
Methane	74-82-8	0.10	< 0.10	
Ethane	74-84-0	0.10	< 0.10	

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Laboratory Analysis Report

Quality Control Information

Blank Analysis

Test: Analysis by EPA Method 308
Date Analyzed: 9/5/2018 at 11:10 AM
Matrix: Liquid
Instrument ID: GC #10 - Agilent
Analyst: Emily Decker
QC Batch ID: QC_09269

Parameter	CAS #	MQL (ug/ml)	Blank Result (ug/ml)	Flag
Methanol	67-56-1	2.50	< 2.50	

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Laboratory Analysis Report

Quality Control Information

Blank Analysis

Test: Analysis by Conditional Test Method 027
Date Analyzed: 8/28/2018 at 01:09 PM
Matrix: Liquid
Instrument ID: IC #2 - Metrohm
Analyst: Dhan Yeddula
QC Batch ID: QC_09267

Parameter	CAS #	MQL (ug/ml)	Blank Result (ug/ml)	Flag
Ammonium	14798-03-9	0.10	< 0.10	

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Laboratory Analysis Report

Quality Control Information

Laboratory Control Sample

Test: Analysis by EPA Method 18
Date Analyzed: 8/28/2018 at 10:41 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	LCS Result (ppmv)	Spike Amount (ppmv)	Percent Recovery	Percent Recovery Limit	Flag
Methane	10.21	10.00	102	80 - 120	
Ethane	10.40	10.00	104	80 - 120	

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Laboratory Analysis Report

Quality Control Information

Laboratory Control Sample

Test: Analysis by EPA Method 18
Date Analyzed: 9/4/2018 at 08:01 AM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	LCS Result (ppmv)	Spike Amount (ppmv)	Percent Recovery	Percent Recovery Limit	Flag
Methane	10.19	10.00	102	80 - 120	
Ethane	10.26	10.00	103	80 - 120	

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Laboratory Analysis Report

Quality Control Information

Laboratory Control Sample

Test: Analysis by EPA Method 308
Date Analyzed: 9/5/2018 at 10:53 AM
Matrix: Liquid
Instrument ID: GC #10 - Agilent
Analyst: Emily Decker
QC Batch ID: QC_09269

Parameter	LCS Result (ug/ml)	Spike Amount (ug/ml)	Percent Recovery	Percent Recovery Limit	Flag
Methanol	481.59	500.00	96	80 - 120	

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Laboratory Analysis Report

Quality Control Information

Laboratory Control Sample

Test: Analysis by Conditional Test Method 027
Date Analyzed: 8/28/2018 at 02:01 PM
Matrix: Liquid
Instrument ID: IC #2 - Metrohm
Analyst: Dhan Yeddula
QC Batch ID: QC_09267

Parameter	LCS Result (ug/ml)	Spike Amount (ug/ml)	Percent Recovery	Percent Recovery Limit	Flag
Ammonium	2.03	2.00	101	80 - 120	

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Laboratory Analysis Report

Quality Control Information

Post Analysis Continuing Calibration Verification

Test: Analysis by EPA Method 18
Date Analyzed: 8/28/2018 at 02:11 PM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	Post CCV Area Result	CCV Area Result	RPD (%)	RPD Limit	Flag
Methane	8.94	8.73	2	5	
Ethane	16.97	16.95	0	5	

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Laboratory Analysis Report

Quality Control Information

Post Analysis Continuing Calibration Verification

Test: Analysis by EPA Method 18
Date Analyzed: 9/4/2018 at 03:17 PM
Matrix: Air
Instrument ID: GC #1 - Agilent
Analyst: Dhan Yeddula
QC Batch ID: QC_09268

Parameter	Post CCV Area Result	CCV Area Result	RPD (%)	RPD Limit	Flag
Methane	8.72	8.61	1	5	
Ethane	16.79	16.83	0	5	

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Laboratory Analysis Report

Quality Control Information

Post Analysis Continuing Calibration Verification

Test: Analysis by EPA Method 308
Date Analyzed: 9/6/2018 at 01:13 AM
Matrix: Liquid
Instrument ID: GC #10 - Agilent
Analyst: Emily Decker
QC Batch ID: QC_09269

Parameter	Post CCV Area Result	Initial Cal Area Result	RPD (%)	RPD Limit	Flag
Methanol	157.69	159.82	1	5	

This analytical report and data associated has been reviewed and prepared specifically for you. The data package represents the best analytical and technical judgment and interpretations of our personnel, in accordance with the Golden Specialty Laboratory Quality Assurance Manual. Golden Specialty Inc. assumes no responsibility for the end use of this document or any portion extracted from it. Unless it is otherwise agreed upon, in writing, and prior to analytical work, Golden Specialty Inc. liability may not exceed the amount invoiced for this order.

Laboratory Analysis Report

Quality Control Information

Post Analysis Continuing Calibration Verification

Test: Analysis by Conditional Test Method 027
Date Analyzed: 8/28/2018 at 04:12 PM
Matrix: Liquid
Instrument ID: IC #2 - Metrohm
Analyst: Dhan Yeddula
QC Batch ID: QC_09267

Parameter	CCV Result (ug/ml)	Spike Amount (ug/ml)	Percent Recovery	Percent Recovery Limit	Flag
Ammonium	2.11	2.00	106	90 - 110	

This analytical report and data associated has been reviewed and prepared specifically for you. The data package represents the best analytical and technical judgment and interpretations of our personnel, in accordance with the Golden Specialty Laboratory Quality Assurance Manual. Golden Specialty Inc. assumes no responsibility for the end use of this document or any portion extracted from it. Unless it is otherwise agreed upon, in writing, and prior to analytical work, Golden Specialty Inc. liability may not exceed the amount invoiced for this order.

Data Qualifiers and Flags

- MDL – Method Detection Limit
- MQL – Method Quantitation Limit
- SDL – Sample Detection Limit
- SQL – Sample Quantitation Limit
- RPD - Relative Percent Difference
- J – Target analyte is between the MDL and SQL values.
- L – Target analyte recovered below the recovery limits.
- H – Target analyte recovered above the recovery limits.
- B – Target analyte identified in blank run.
- F – RPD/RSD is outside the control limits.
- NC – Not calculated due to division by zero, or negative spike recovery.
- M – Target analyte reported outside control limit due to matrix interference.
- E – Estimated; Target analyte is above the Upper Quantitation Limit, or estimated due to other issue(s) noted in narrative.
- ND - Non-detect; analyte is below the MDL value, or TIC not detected in GC/MS scan.
- A - Sample analyzed outside holding time.
- C - Sample analyzed by FTIR; results estimated.
- I - Internal standard outside acceptable response range.

This analytical report and data associated has been reviewed and prepared specifically for you. The data package represents the best analytical and technical judgment and interpretations of our personnel, in accordance with the Golden Specialty Laboratory Quality Assurance Manual. Golden Specialty Inc. assumes no responsibility for the end use of this document or any portion extracted from it. Unless it is otherwise agreed upon, in writing, and prior to analytical work, Golden Specialty Inc. liability may not exceed the amount invoiced for this order.

GOLDEN SPECIALTY

Chain of Custody

GSL-180834 (1 of 5)

Project #: 2018-0912	**Client/Plant Name:** AST/Kronospan– Clarion, PA	**Special Instructions:** Primary & backup bags may be packaged separately–explain as needed when prepping COC Spike and Recovery - explain as needed when prepping COC
Sampling Location: Wet Scrubber Analysis		
Sampled by (Print): **(Signature):**	**Report Turnaround Time:** ☒ Normal (10 business days) ☐ 5 business days ☐ Other:	
	Analytical Deadline: ☐ 7 days ☒ 72 hrs. (bags) ☐ 24 hrs. ☐ Other:	
Work Requested by: Adam Robinson / PA	**Phone:** (412) 668-4040	**Fax:** **e-Mail:** Adam.Robinson@stacktest.com; all emails: firstname.lastname@stacktest.com
Submit Report to: Above & AST Group	**Phone:** 503-715-7095	**Fax:** **e-Mail:** AST group:, Jordan Laster, Laura Aymett, Paula Metz

Field Sample ID (include Run and Sample Fraction)	Lab Sample ID	Collection Date	Collection Time(s)	Container Type*	Vol. (mL)	Tare Wt. (g)	EPA Method or Rule	Analysis: TO-14A	Method 18	Flare Gas Analysis (Method 18 + ASTM 1946D)	ASTM D1946	TO-15	Method 26A	Method 5	Method 202	CTM-027	Hold	Comments: (Visual observance, canister start/stop pressures, additional analytes, etc.)
Wet Scrubber Exhaust – Primary Bag – Run 1A	001	8/23/18	10:05	T	NA	NA	M18		✔									Methane, Ethane
Wet Scrubber Exhaust – Primary Bag – Run 2A	002	8/23/18	12:35	T	NA	NA	M18		✔									"
Wet Scrubber Exhaust – Primary Bag – Run 3A	003	8/23/18	15:00	T	NA	NA	M18		✔									Empty bag, open on one side
																AUG 28 2018		

Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)
[signature]	8/27/18	14:00	T. Rakabina	8/28/18 9:52			
Relinquished by (signature)	**Date**	**Time**	**Received by (signature)**	**Relinquished by (signature)**	**Date**	**Time**	**Received by (signature)**

Sample Pick-Up (Circle One): Yes / No by _____ (Print) Canister Rental (Circle One): Yes / No

*Types - C: Canister T: Tedlar bag B: Bomb cylinder GA: Glass, amber GC: Glass, clear P: Plastic F: Filter O: Other

FORM

Chain of Custody

GSINC-DR1001-001, Revision 2017-01, Effective 04/05/17

GOLDEN SPECIALTY

Chain of Custody

GSL_180834(2 of 5)

Project #: 2018-0912	**Client/Plant Name: AST/Kronospan– Clarion, PA**	**Special Instructions:** Primary & backup bags may be packaged separately–explain as needed when prepping COC; Spike and Recovery - explain as needed when prepping COC
Sampling Location: Wet Scrubber Analysis		
Sampled by (Print):	**Report Turnaround Time:** ☒ Normal (10 business days) ☐ 5 business days ☐ Other:	
(Signature):	**Analytical Deadline:** ☐ 7 days ☒ 72 hrs. (bags) ☐ 24 hrs. ☐ Other:	
Work Requested by: Adam Robinson / PA	**Phone: (412) 668-4040**	**Fax:** **e-Mail: Adam.Robinson@stacktest.com; all emails: firstname.lastname@stacktest.com**
Submit Report to: Above & AST Group	**Phone: 503-715-7095**	**Fax:** **e-Mail: AST group:, Jordan Laster, Laura Aymett, Paula Metz**

Field Sample ID (include Run and Sample Fraction)	Lab Sample ID	Collection Date	Collection Time(s)	Container Type*	Vol. (mL)	Tare Wt. (g)	EPA Method or Rule	Analysis: TO-14A	Method 18	Flare Gas Analysis (Method 18 + ASTM 1946D)	ASTM D1946	TO-15	Method 26A	Method 5	Method 202	CTM-027	Hold	Comments: (Visual observance, canister start/stop pressures, additional analytes, etc.)
Wet Scrubber Exhaust – Backup Bag – Run 1B	004	8/23/18	10:05	T	NA	NA	M18										✓	Empty bag, open on one side (analyze if Primary Bag is flat)
Wet Scrubber Exhaust – Backup Bag – Run 2B	005	8/23/18	12:35	T	NA	NA	M18										✓	Empty bag, open on one side
Wet Scrubber Exhaust – Backup Bag – Run 3B	006	8/23/18	15:00	T	NA	NA	M18										✓	Empty bag, open on one side

AUG 28 2018 09:52

Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)
	8/27/18	14:00	T. Lokalim 8/28/18 9:52				
Relinquished by (signature)	**Date**	**Time**	**Received by (signature)**	**Relinquished by (signature)**	**Date**	**Time**	**Received by (signature)**

Sample Pick-Up (Circle One): Yes / No by _____ (Print) **Canister Rental (Circle One): Yes / No**

*Types - C: Canister T: Tedlar bag B: Bomb cylinder GA: Glass, amber GC: Glass, clear P: Plastic F: Filter O: Other

PDF Page 424 of 548

FORM

Chain of Custody

GSINC-DR1001-001, Revision 2017-01, Effective 04/05/17

GOLDEN SPECIALTY

Chain of Custody

68L-180834 (3 of 5)

Project #: 2018-0912	**Client/Plant Name:** AST/Kronospan – Clarion, PA	**Special Instructions:** Received 6 unused tubes.
Sampling Location: Wet Scrubber Exhaust		
Sampled by (Print):	**Report Turnaround Time:** ☒ Normal (10 business days) ☐ 5 business days ☐ Other:	
(Signature):	**Analytical Deadline:** ☒ 7 days ☐ 72 hrs. ☐ 24 hrs. ☐ Other:	
Work Requested by: Adam Robinson / PA	**Phone:** (412) 668-4040	**Fax:** **e-Mail:** Adam.Robinson@stacktest.com; all emails: firstname.lastname@stacktest.com
Submit Report to: Above & AST Group	**Phone:** 503-715-7095	**Fax:** **e-Mail:** AST group: Jordan Laster, Laura Aymett, Paula Metz

Field Sample ID (include Run and Sample Fraction)	Lab Sample ID	Collection Date	Collection Time(s)	Container Type*	Vol. (mL)	Tare Wt. (g)	EPA Method or Rule	Analysis: TO-14A	Method 18	Flare Gas Analysis (Method 18 + ASTM 1946D)	ASTM D1946	TO-15	Method 26A	Method 5	Method 202	CTM-027	Hold	Comments: (Visual observance, canister start/stop pressures, additional analytes, etc.)
Wet Scrubber Exhaust – Impinger Catch – Run 01A	007	8/23/18	10:15	GC			308											Methanol
Wet Scrubber Exhaust – Impinger Catch – Run 02A	008	"	12:50	GC			"											"
Wet Scrubber Exhaust—Impinger Catch 2 – Run 02A	009	"	12:50	GC			"											"
Wet Scrubber Exhaust – Impinger Catch – Run 03A	010	"	15:10	GC			"											"
Wet Scrubber Exhaust – Impinger Catch 2 – Run 03A	011	"	15:10	GC			"											"
Wet Scrubber Exhaust – Tube 1 – Run 01B	012	"	10:15	O			"											"
Wet Scrubber Exhaust – Tube 1 – Run 02B	013	"	12:45	O			"											"
Wet Scrubber Exhaust – Tube 1 – Run 03B	014	"	15:10	O			"											"

Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)
	8/27/18	14:00	T. Kakalina	8/28/18 9:52			
Relinquished by (signature)	**Date**	**Time**	**Received by (signature)**	**Relinquished by (signature)**	**Date**	**Time**	**Received by (signature)**

Sample Pick-Up (Circle One): Yes / No by _____ (Print)

Canister Rental (Circle One): Yes / No

*Types - C: Canister T: Tedlar bag B: Bomb cylinder GA: Glass, amber GC: Glass, clear P: Plastic F: Filter O: Other

FORM

Chain of Custody

GSINC-DR1001-001, Revision 2017-01, Effective 04/05/17

GOLDEN SPECIALTY

GSL_180834 (4 of 5)

Chain of Custody

Project #: 2018-0912	Client/Plant Name: AST/Kronospan – Clarion, PA	Special Instructions: t = 1.3°C
Sampling Location: Wet Scrubber Exhaust		
Sampled by (Print):	Report Turnaround Time: ☒ Normal (10 business days) ☐ 5 business days ☐ Other:	
(Signature):	Analytical Deadline: ☒ 7 days ☐ 72 hrs. ☐ 24 hrs. ☐ Other:	
Work Requested by: Adam Robinson / PA	Phone: (412) 668-4040	Fax: e-Mail: Adam.Robinson@stacktest.com; all emails: firstname.lastname@stacktest.com
Submit Report to: Above & AST Group	Phone: 503-715-7095	Fax: e-Mail: AST group: Jordan Laster, Laura Aymett, Paula Metz

Field Sample ID (include Run and Sample Fraction)	Lab Sample ID	Collection Date	Collection Time(s)	Container Type*	Vol. (mL)	Tare Wt. (g)	EPA Method or Rule	Analysis: TO-14A	Method 18	Flare Gas Analysis (Method 18 + ASTM 1946D)	ASTM D1946	TO-15	Method 26A	Method 5	Method 202	CTM-027	Hold	Comments: (Visual observance, canister start/stop pressures, additional analytes, etc.)
DI Water Reagent Blank	015	8/23/18	12:05				308										✓	
Tube (Silica Gel) Reagent Blank	016	"	12:00				"										✓	

Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)
	8/27/18	17:00	T. Rakolang	8/28/18	9:52		
Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)

Sample Pick-Up (Circle One): Yes / No by _____ (Print)

Canister Rental (Circle One): Yes / No

FORM

Chain of Custody

GSINC-DR1001-001, Revision 2017-01, Effective 04/05/17

GOLDEN SPECIALTY

Chain of Custody

GSL_180839 (5 of 5)

Project #: 2018-0912	Client/Plant Name: AST/Kronospan– Clarion, PA	Special Instructions: t= 1.3°C
Sampling Location: Wet Scrubber Exhaust		
Sampled by (Print):	Report Turnaround Time: ☒ Normal (10 business days) ☐ 5 business days ☐ Other:	
(Signature):	Analytical Deadline: ☒ 7 days ☐ 72 hrs. ☐ 24 hrs. ☐ Other:	
Work Requested by: Adam Robinson / PA — Phone: (412) 668-4040	Fax:	e-Mail: Adam.Robinson@stacktest.com; all emails: firstname.lastname@stacktest.com
Submit Report to: Above & AST Group — Phone: 503-715-7095	Fax:	e-Mail: AST group: Jordan Laster, Laura Aymett, Paula Metz

Field Sample ID (include Run and Sample Fraction)	Lab Sample ID	Collection Date	Collection Time(s)	Container Type*	Vol. (mL)	Tare Wt. (g)	EPA Method or Rule	Analysis: TO-14A	Method 18	Flare Gas Analysis (Method 18 + ASTM 1946D)	ASTM D1946	TO-15	Method 26A	Method 5	Method 202	CTM-027	Hold	Comments: (Visual observance, canister start/stop pressures, additional analytes, etc.)
Wet Scrubber Exhaust - Impinger 1 – Run 1	017	8/23/18	10:20	P												✓		Ammonia
Wet Scrubber Exhaust - Impinger 1 – Run 2	018	"	13:00	P												✓		"
Wet Scrubber Exhaust - Impinger 1 – Run 3	019	"	15:20	P												✓		"
CTM-027 0.1 N H2SO4 Blank	020	"	12:00	P													✓	
CTM-027 DI Water Blank	021	"	12:00	P													✓	

Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)
[signature]	8/27/18	14:00	T Lakolina	8/28/18 9:52			
Relinquished by (signature)	Date	Time	Received by (signature)	Relinquished by (signature)	Date	Time	Received by (signature)

Sample Pick-Up (Circle One): Yes / No by _____ (Print) — Canister Rental (Circle One): Yes / No

*Types - C: Canister T: Tedlar bag B: Bomb cylinder GA: Glass, amber GC: Glass, clear P: Plastic F: Filter O: Other

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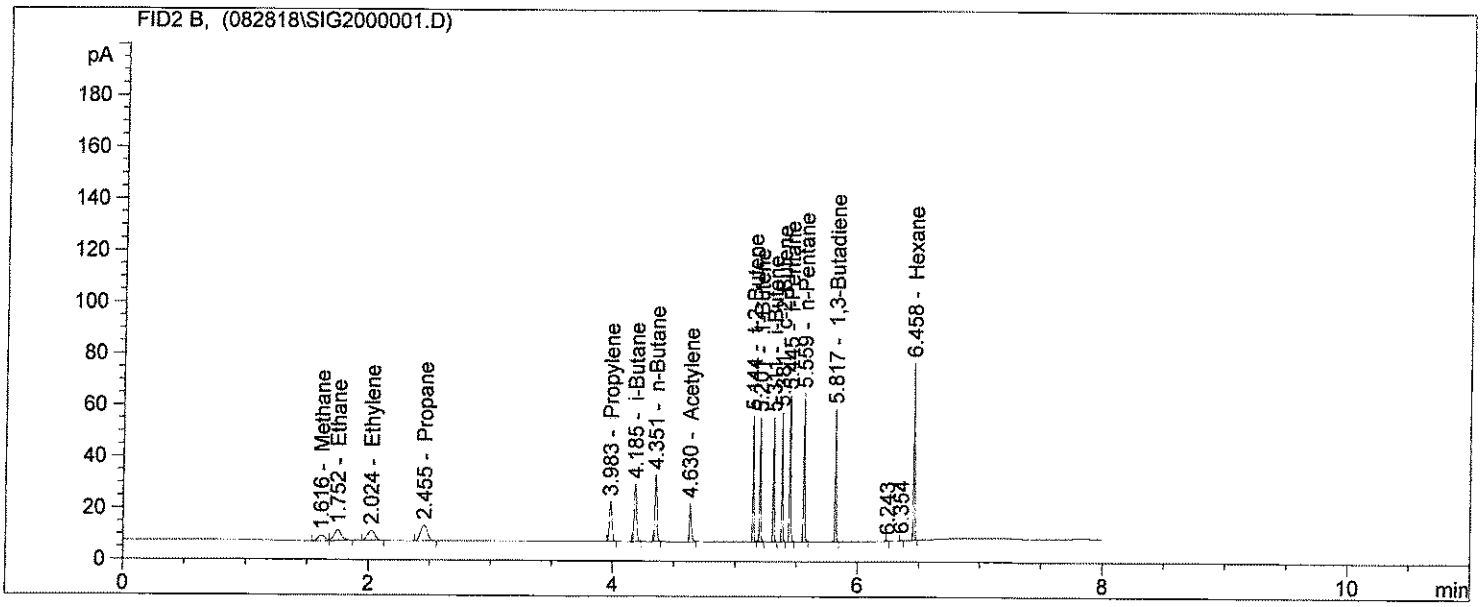
Data File C:\CHEM32\1\DATA\082818\SIG2000001.D
Sample Name: CCV
CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 8/28/2018 10:22:27 AM	Seq. Line :	1
Sample Name	: CCV	Location :	Vial 1
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:35:06 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 10:33:36 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.616	BV	8.72630	1.12222	9.79287		Methane
1.752	VB	16.94919	5.89609e-1	9.99339		Ethane
2.024	BB	15.25843	6.45663e-1	9.85181		Ethylene
2.455	BB	22.94271	4.34024e-1	9.95768		Propane
3.983	BB	22.91778	4.30557e-1	9.86740		Propylene
4.185	BB	30.29929	3.29374e-1	9.97980		i-Butane
4.351	BB	30.33412	3.26258e-1	9.89676		n-Butane
4.630	BB	14.40552	6.47127e-1	9.32220		Acetylene
5.144	BB	30.20317	3.29413e-1	9.94932		t-2-Butene
5.201	BB	30.76486	3.26200e-1	10.03549		1-Butene
5.311	BB	30.30143	3.31334e-1	10.03988		i-Butene
5.381	BB	30.52845	3.40178e-1	10.38511		c-2-Butene
5.445	BB	38.30355	2.52648e-1	9.67732		i-Pentane
5.559	BB	38.24018	2.58175e-1	9.87264		n-Pentane
5.817	BB	30.56643	3.37185e-1	10.30654		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000001.D
Sample Name: CCV
CCV(10ppmv HRVOC+ALKANES)
Method:18

```
==========================================================================
Injection Date  : 8/28/2018 10:22:27 AM          Seq. Line :   1
Sample Name     : CCV                             Location : Vial 1
Acq. Operator   : dyeddula                            Inj :   1
Acq. Instrument : Instrument 1                  Inj Volume : Manually
Acq. Method     : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 10:35:06 AM by dyeddula
                  (modified after loading)
HRVOC
==========================================================================
```

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.458	BB	43.66441	2.30048e-1	10.04492		Hexane

Totals : 158.97312

Uncalibrated Peaks : using compound Methane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.243	BB	1.60262e-1	1.12222	1.79850e-1		?
6.354	BB	3.82862e-1	1.12222	4.29657e-1		?

Uncalib. totals : 6.09507e-1

1 Warnings or Errors :

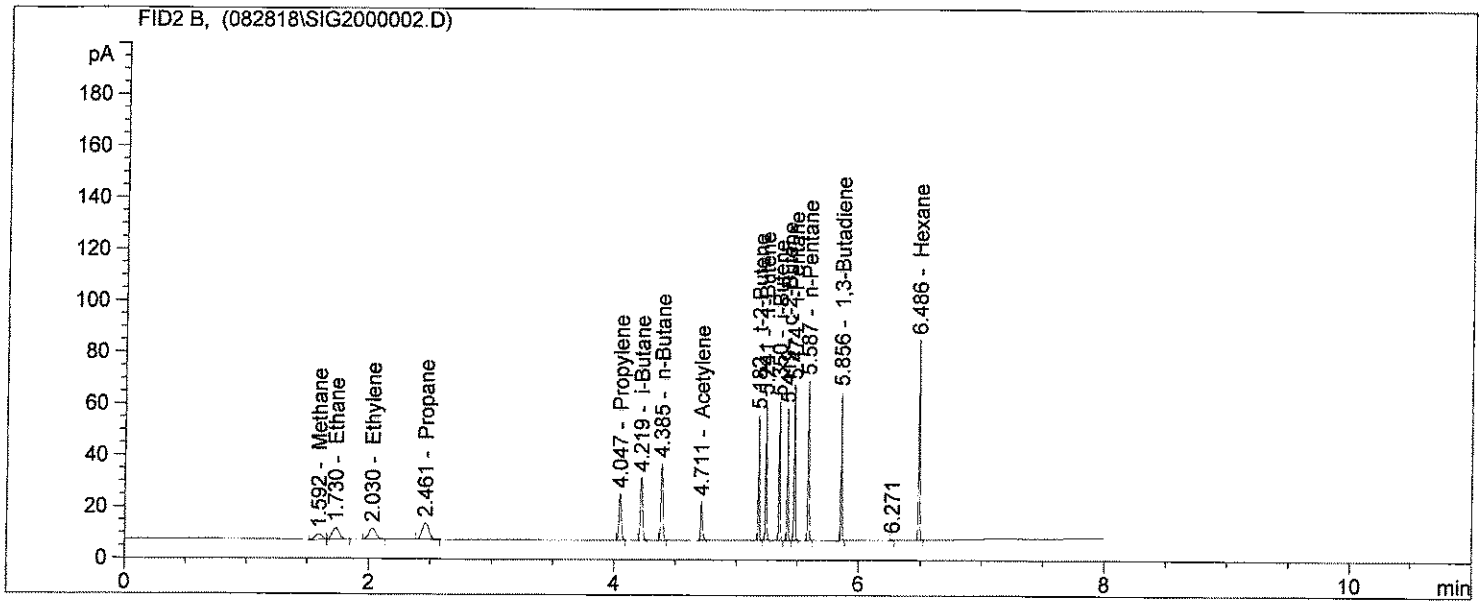
Warning : Calibration warnings (see calibration table listing)

```
==========================================================================
                        *** End of Report ***
```

Data File C:\CHEM32\1\DATA\082818\SIG2000002.D
Sample Name: LCS
LCS(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 8/28/2018 10:41:23 AM	Seq. Line	: 1
Sample Name	: LCS	Location	: Vial 2
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:56:44 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 10:56:31 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.592	BV	9.10102	1.12222	10.21339		Methane
1.730	VB	17.63234	5.89609e-1	10.39618		Ethane
2.030	BB	16.36644	6.45663e-1	10.56721		Ethylene
2.461	BB	24.11840	4.34024e-1	10.46795		Propane
4.047	BB	24.16165	4.30557e-1	10.40296		Propylene
4.219	BB	32.39503	3.29374e-1	10.67008		i-Butane
4.385	BB	33.20818	3.26258e-1	10.83445		n-Butane
4.711	BB	14.34509	6.47127e-1	9.28309		Acetylene
5.182	BB	29.65989	3.29413e-1	9.77036		t-2-Butene
5.241	BB	33.49844	3.26200e-1	10.92718		1-Butene
5.350	BB	33.60218	3.31334e-1	11.13354		i-Butene
5.419	BB	30.44910	3.40178e-1	10.35811		c-2-Butene
5.474	BB	40.12272	2.52648e-1	10.13693		i-Pentane
5.587	BB	41.16922	2.58175e-1	10.62885		n-Pentane
5.856	BB	33.86303	3.37185e-1	11.41810		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000002.D
Sample Name: LCS
LCS(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 8/28/2018 10:41:23 AM	Seq. Line :	1
Sample Name	: LCS	Location :	Vial 2
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:56:44 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.486	BB	49.52692	2.30048e-1	11.39358		Hexane

Totals : 168.60196

Uncalibrated Peaks : using compound Methane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.271	BB	2.45518e-1	1.12222	2.75526e-1		?

Uncalib. totals : 2.75526e-1

1 Warnings or Errors :

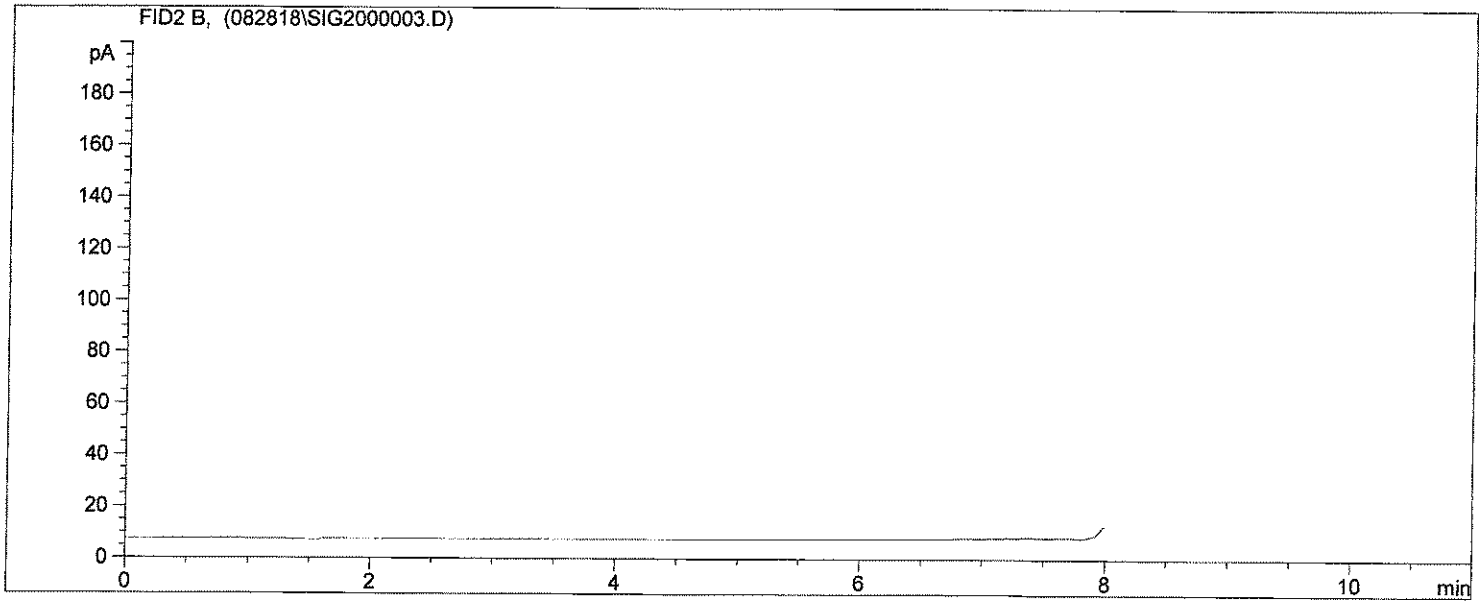
Warning : Calibration warnings (see calibration table listing)

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 8/28/2018 10:57:57 AM	Seq. Line :	2
Sample Name	: BLANK	Location :	Vial 3
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:56:44 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 10:56:31 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.585		-	-	-		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.445		-	-	-		i-Pentane
5.641		-	-	-		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 8/28/2018 10:57:57 AM	Seq. Line :	2
Sample Name	: BLANK	Location :	Vial 3
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:56:44 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.595		-	-	-		Hexane

Totals : 0.00000

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

Area Percent Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 10:56:31 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	1.585		0.0000	0.00000	0.00000	Methane
2	1.733		0.0000	0.00000	0.00000	Ethane
3	2.023		0.0000	0.00000	0.00000	Ethylene
4	2.455		0.0000	0.00000	0.00000	Propane
5	3.983		0.0000	0.00000	0.00000	Propylene
6	4.185		0.0000	0.00000	0.00000	i-Butane
7	4.453		0.0000	0.00000	0.00000	n-Butane
8	4.630		0.0000	0.00000	0.00000	Acetylene
9	5.182		0.0000	0.00000	0.00000	t-2-Butene
10	5.201		0.0000	0.00000	0.00000	1-Butene
11	5.350		0.0000	0.00000	0.00000	i-Butene
12	5.419		0.0000	0.00000	0.00000	c-2-Butene
13	5.445		0.0000	0.00000	0.00000	i-Pentane
14	5.641		0.0000	0.00000	0.00000	n-Pentane
15	5.808		0.0000	0.00000	0.00000	1,3-Butadiene
16	6.595		0.0000	0.00000	0.00000	Hexane

Totals : 0.00000 0.0000

Uncalibrated Peaks:

Data File C:\CHEM32\1\DATA\082818\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 8/28/2018 10:57:57 AM	Seq. Line :	2
Sample Name	: BLANK	Location :	Vial 3
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:56:44 AM by dyeddula (modified after loading)		

HRVOC

2 Warnings or Errors :

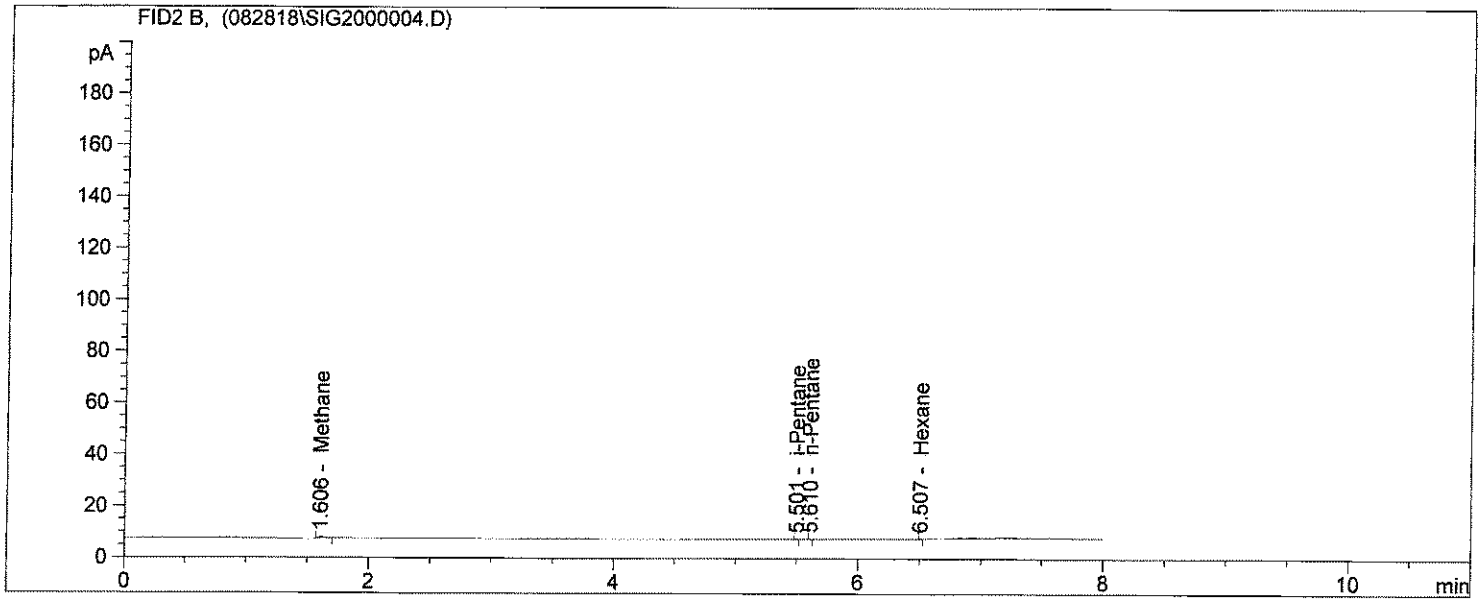
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000004.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

Injection Date	: 8/28/2018 11:14:33 AM	Seq. Line	: 3
Sample Name	: GSL_180834-001	Location	: Vial 4
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 11:29:17 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.606	BB	1.78586	1.12222	2.00414		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.501	BB	5.74475e-2	2.52648e-1	1.45140e-2		i-Pentane
5.610	BB	1.21394e-1	2.58175e-1	3.13409e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000004.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

Injection Date : 8/28/2018 11:14:33 AM Seq. Line : 3
Sample Name : GSL_180834-001 Location : Vial 4
Acq. Operator : dyeddula Inj : 1
Acq. Instrument : Instrument 1 Inj Volume : Manually
Acq. Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 11:29:17 AM by dyeddula
(modified after loading)
HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.507	BB	5.80997e-2	2.30048e-1	1.33657e-2		Hexane

Totals : 2.06336

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

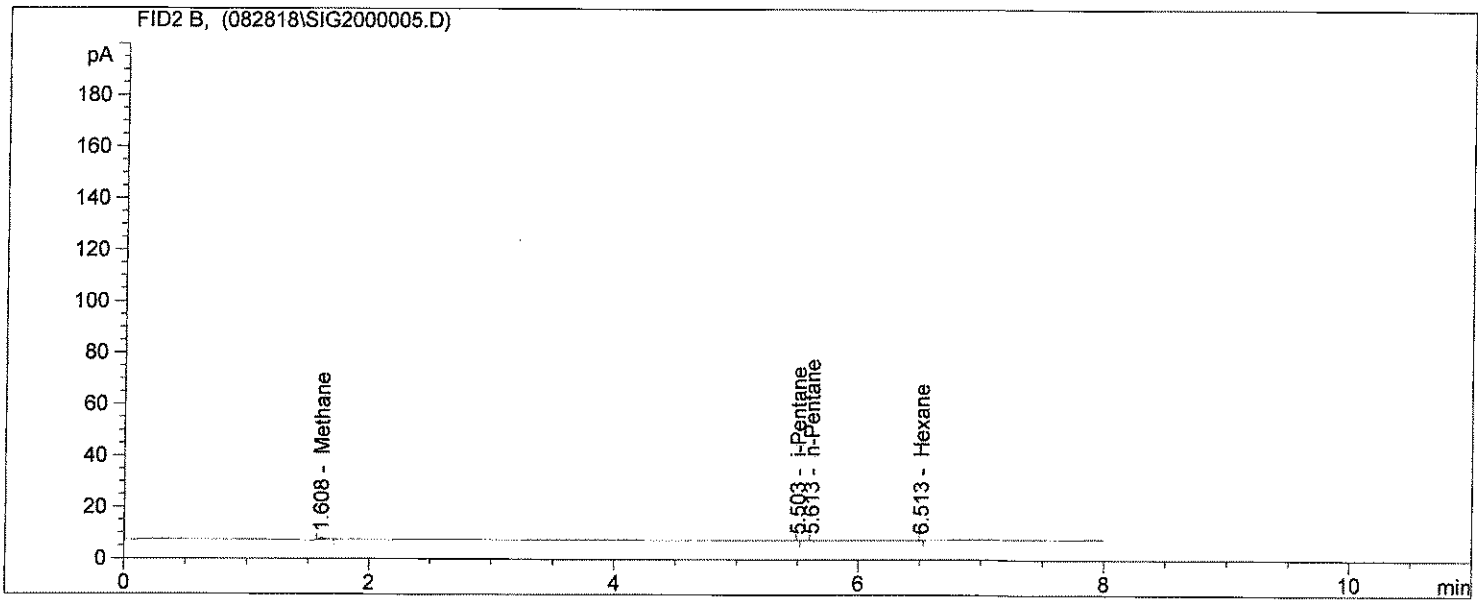
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000005.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

Injection Date	: 8/28/2018 11:31:11 AM	Seq. Line	: 3
Sample Name	: GSL_180834-001	Location	: Vial 4
Acq. Operator	: dyeddula	Inj	: 2
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 11:29:17 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.608	BB	1.81539	1.12222	2.03728		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.503	BB	5.77847e-2	2.52648e-1	1.45992e-2		i-Pentane
5.613	BB	1.19355e-1	2.58175e-1	3.08145e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

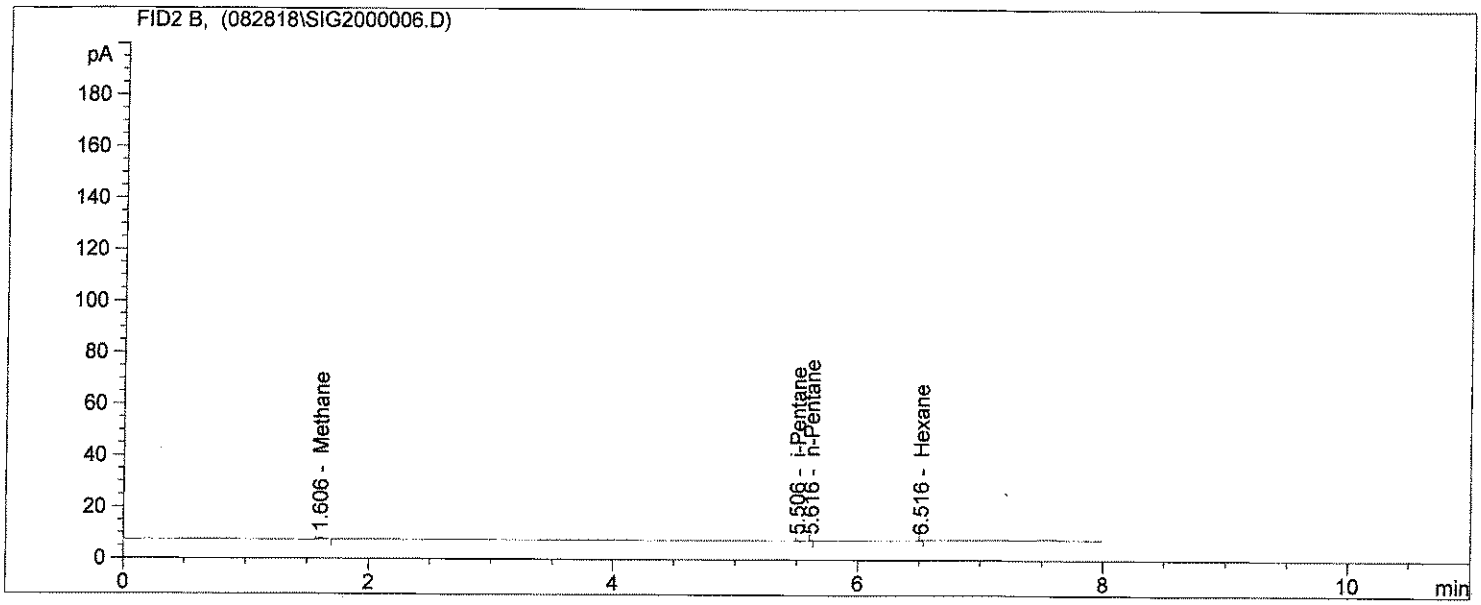
Data File C:\CHEM32\1\DATA\082818\SIG2000005.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

```
================================================================================
Injection Date  : 8/28/2018 11:31:11 AM          Seq. Line :   3
Sample Name     : GSL_180834-001                  Location : Vial 4
Acq. Operator   : dyeddula                            Inj :   2
Acq. Instrument : Instrument 1                  Inj Volume : Manually
Acq. Method     : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 11:29:17 AM by dyeddula
                  (modified after loading)
HRVOC
================================================================================

RetTime  Type     Area      Amt/Area    Amount   Grp   Name
 [min]          [pA*s]                 [ppmv]
--------|------|----------|----------|----------|--|------------------
  6.513 BB     5.95683e-2 2.30048e-1 1.37036e-2     Hexane

Totals :                                 2.09640

Uncalibrated Peaks    :      using compound Methane


2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

================================================================================
                          *** End of Report ***
```

Data File C:\CHEM32\1\DATA\082818\SIG2000006.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

Injection Date	: 8/28/2018 11:47:49 AM	Seq. Line	: 3
Sample Name	: GSL_180834-001	Location	: Vial 4
Acq. Operator	: dyeddula	Inj	: 3
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 11:29:17 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.606	BB	1.67980	1.12222	1.88511		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.506	BB	5.85884e-2	2.52648e-1	1.48023e-2		i-Pentane
5.616	BB	1.14356e-1	2.58175e-1	2.95238e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000006.D
Sample Name: GSL_180834-001
GSL_180834-001
Method:18

```
Injection Date  : 8/28/2018 11:47:49 AM          Seq. Line :   3
Sample Name     : GSL_180834-001                  Location : Vial 4
Acq. Operator   : dyeddula                            Inj :   3
Acq. Instrument : Instrument 1                 Inj Volume : Manually
Acq. Method     : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed    : 8/28/2018 11:29:17 AM by dyeddula
                  (modified after loading)
HRVOC
```

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.516	BB	5.07580e-2	2.30048e-1	1.16768e-2		Hexane

Totals : 1.94111

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

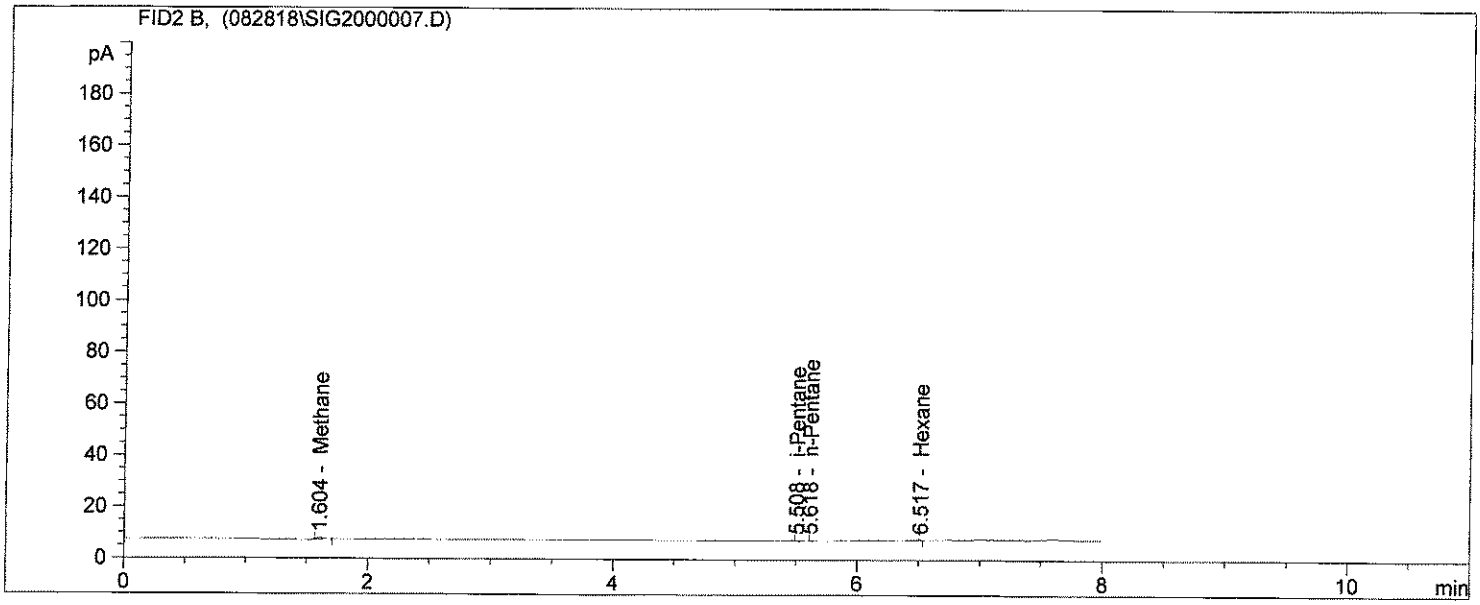
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000007.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date	: 8/28/2018 12:04:30 PM	Seq. Line	: 4
Sample Name	: GSL_180834-002	Location	: Vial 5
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 12:33:47 PM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.604	BB	1.90658	1.12222	2.13961		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.508	BB	5.84734e-2	2.52648e-1	1.47732e-2		i-Pentane
5.618	BB	1.01897e-1	2.58175e-1	2.63071e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000007.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date : 8/28/2018 12:04:30 PM Seq. Line : 4
Sample Name : GSL_180834-002 Location : Vial 5
Acq. Operator : dyeddula Inj : 1
Acq. Instrument : Instrument 1 Inj Volume : Manually
Acq. Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 12:33:47 PM by dyeddula
(modified after loading)
HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.517	BB	6.21130e-2	2.30048e-1	1.42890e-2		Hexane

Totals : 2.19498

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

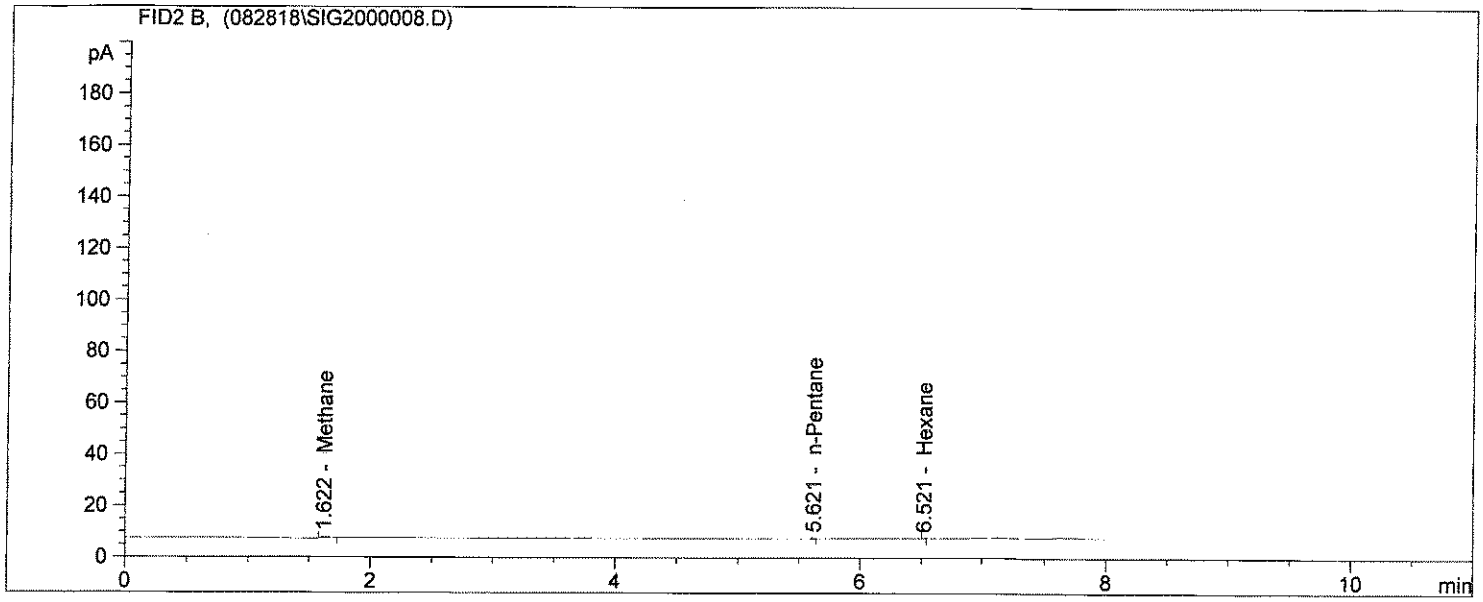
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000008.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date	: 8/28/2018 12:21:13 PM	Seq. Line	: 4
Sample Name	: GSL_180834-002	Location	: Vial 5
Acq. Operator	: dyeddula	Inj	: 2
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 12:34:24 PM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.622	BB	2.09378	1.12222	2.34970		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.445		-	-	-		i-Pentane
5.621	BB	1.18131e-1	2.58175e-1	3.04985e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/28/2018

Data File C:\CHEM32\1\DATA\082818\SIG2000008.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date : 8/28/2018 12:21:13 PM Seq. Line : 4
Sample Name : GSL_180834-002 Location : Vial 5
Acq. Operator : dyeddula Inj : 2
Acq. Instrument : Instrument 1 Inj Volume : Manually
Acq. Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 12:34:24 PM by dyeddula
(modified after loading)
HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.521	BB	5.67986e-2	2.30048e-1	1.30664e-2		Hexane

Totals : 2.39326

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

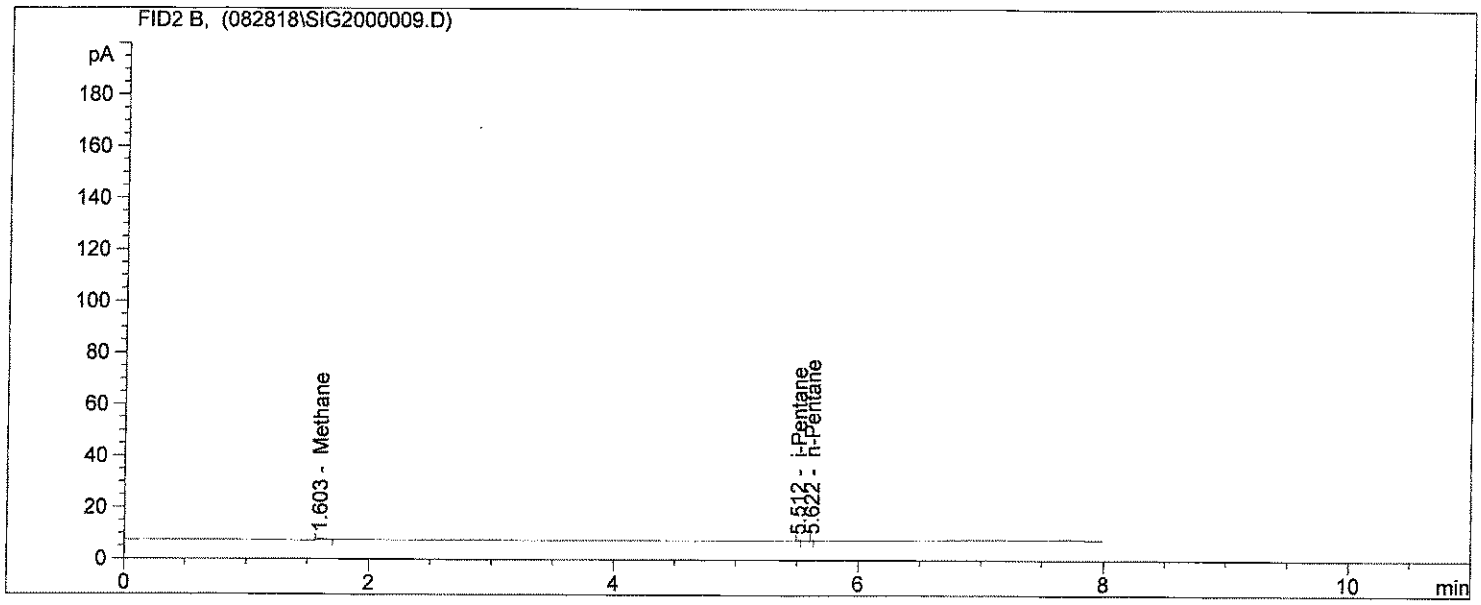
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000009.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date	: 8/28/2018 12:37:55 PM	Seq. Line	: 4
Sample Name	: GSL_180834-002	Location	: Vial 5
Acq. Operator	: dyeddula	Inj	: 3
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 10:16:18 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 12:58:02 PM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 11:28:08 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.603	BB	1.91453	1.12222	2.14853		Methane
1.733		-	-	-		Ethane
2.023		-	-	-		Ethylene
2.455		-	-	-		Propane
3.983		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.453		-	-	-		n-Butane
4.630		-	-	-		Acetylene
5.182		-	-	-		t-2-Butene
5.201		-	-	-		1-Butene
5.350		-	-	-		i-Butene
5.419		-	-	-		c-2-Butene
5.512	BB	6.21494e-2	2.52648e-1	1.57019e-2		i-Pentane
5.622	BB	1.07326e-1	2.58175e-1	2.77089e-2		n-Pentane
5.808		-	-	-		1,3-Butadiene

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000009.D
Sample Name: GSL_180834-002
GSL_180834-002
Method:18

Injection Date : 8/28/2018 12:37:55 PM Seq. Line : 4
Sample Name : GSL_180834-002 Location : Vial 5
Acq. Operator : dyeddula Inj : 3
Acq. Instrument : Instrument 1 Inj Volume : Manually
Acq. Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 10:16:18 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 8/28/2018 12:58:02 PM by dyeddula
(modified after loading)
HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.595		-	-	-		Hexane

Totals : 2.19194

Uncalibrated Peaks : using compound Methane

2 Warnings or Errors :

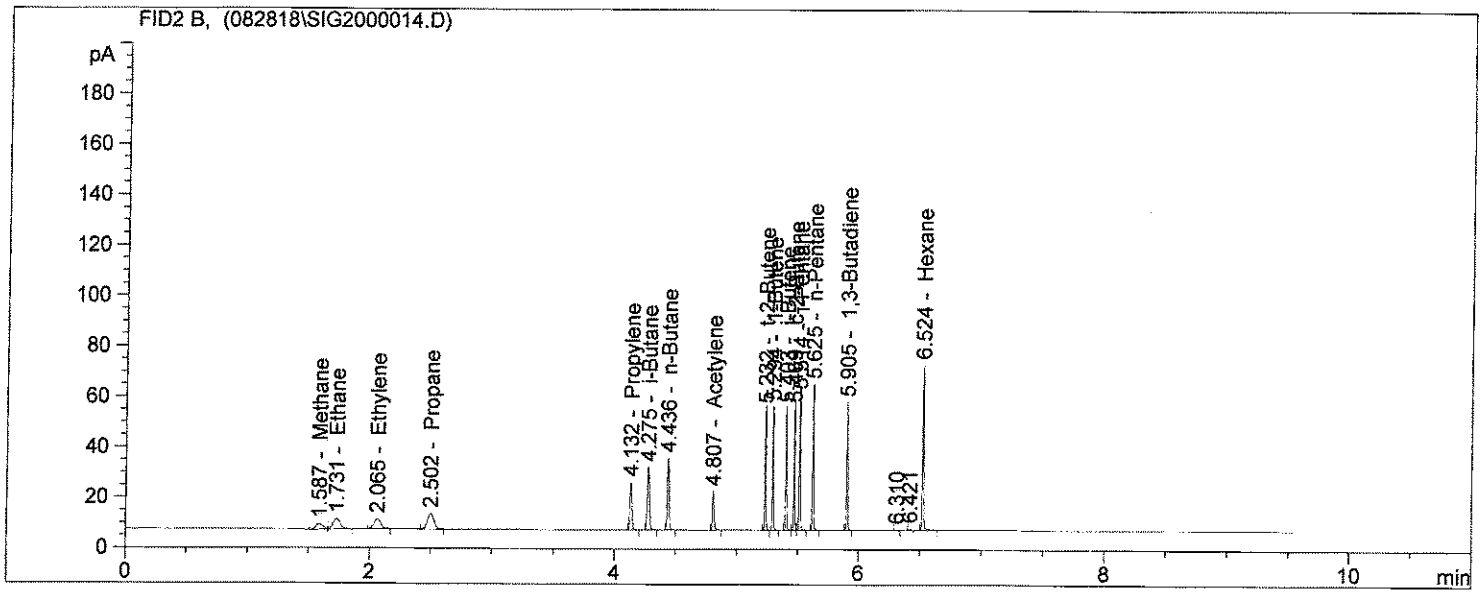
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\082818\SIG2000014.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 8/28/2018 2:11:10 PM	Seq. Line :	7
Sample Name	: POST CCV	Location :	Vial 8
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 1:05:27 PM by dyeddula (modified after loading)		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 2:22:10 PM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 8/28/2018 2:21:33 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.587	BV	8.93688	1.12222	10.02918		Methane
1.731	VB	16.97060	5.89609e-1	10.00602		Ethane
2.065	BB	15.09806	6.45663e-1	9.74826		Ethylene
2.502	BB	22.74128	4.34024e-1	9.87025		Propane
4.132	BB	22.95771	4.30557e-1	9.88460		Propylene
4.275	BB	30.22580	3.29374e-1	9.95559		i-Butane
4.436	BB	30.25325	3.26258e-1	9.87038		n-Butane
4.807	BB	14.40781	6.47127e-1	9.32368		Acetylene
5.232	BV	29.89649	3.29413e-1	9.84829		t-2-Butene
5.294	VB	30.78560	3.26200e-1	10.04225		1-Butene
5.403	BV	29.99007	3.31334e-1	9.93672		i-Butene
5.469	VV	30.09347	3.40178e-1	10.23713		c-2-Butene
5.514	VB	38.08475	2.52648e-1	9.62204		i-Pentane
5.625	BB	37.73959	2.58175e-1	9.74341		n-Pentane

8/29/18

Data File C:\CHEM32\1\DATA\082818\SIG2000014.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 8/28/2018 2:11:10 PM	Seq. Line :	7
Sample Name	: POST CCV	Location :	Vial 8
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 1:05:27 PM by dyeddula (modified after loading)		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 8/28/2018 2:22:10 PM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
5.905	BB	30.05347	3.37185e-1	10.13357		1,3-Butadiene
6.524	BB	44.67503	2.30048e-1	10.27742		Hexane

Totals : 158.52879

Uncalibrated Peaks : using compound Methane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.310	BB	1.60601e-1	1.12222	1.80230e-1		?
6.421	BB	3.70749e-1	1.12222	4.16063e-1		?

Uncalib. totals : 5.96293e-1

2 Warnings or Errors :

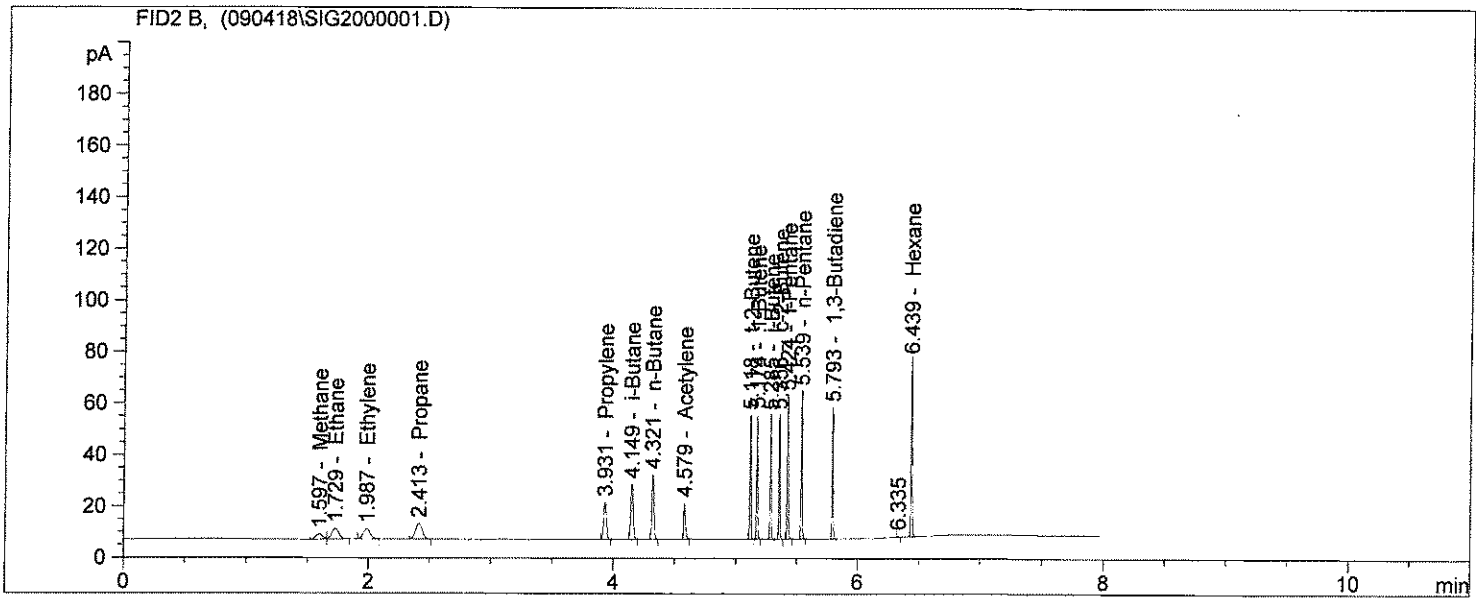
Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000001.D
Sample Name: CCV
CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 7:42:18 AM	Seq. Line	: 1
Sample Name	: CCV	Location	: Vial 1
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:55:25 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 7:54:25 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.597	BV	8.60596	1.12222	9.65781		Methane
1.729	VB	16.82963	5.89609e-1	9.92290		Ethane
1.987	BB	15.22711	6.45663e-1	9.83158		Ethylene
2.413	BB	23.01920	4.34024e-1	9.99087		Propane
3.931	BB	23.02209	4.30557e-1	9.91231		Propylene
4.149	BB	30.39310	3.29374e-1	10.01070		i-Butane
4.321	BB	30.48183	3.26258e-1	9.94495		n-Butane
4.579	BB	14.19221	6.47127e-1	9.18415		Acetylene
5.118	BB	30.28188	3.29413e-1	9.97524		t-2-Butene
5.174	BB	30.87075	3.26200e-1	10.07003		1-Butene
5.285	BB	30.39488	3.31334e-1	10.07085		i-Butene
5.356	BB	30.62686	3.40178e-1	10.41858		c-2-Butene
5.424	BB	38.47049	2.52648e-1	9.71949		i-Pentane
5.539	BB	38.38005	2.58175e-1	9.90876		n-Pentane
5.793	BB	30.69474	3.37185e-1	10.34980		1,3-Butadiene

9/4/2018

Data File C:\CHEM32\1\DATA\090418\SIG2000001.D
Sample Name: CCV
CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 7:42:18 AM	Seq. Line :	1
Sample Name	: CCV	Location :	Vial 1
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:55:25 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.439	BB	43.71316	2.30048e-1	10.05614		Hexane

Totals : 159.02418

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.335	BB	3.32805e-1	2.30048e-1	7.65612e-2		?

Uncalib. totals : 7.65612e-2

1 Warnings or Errors :

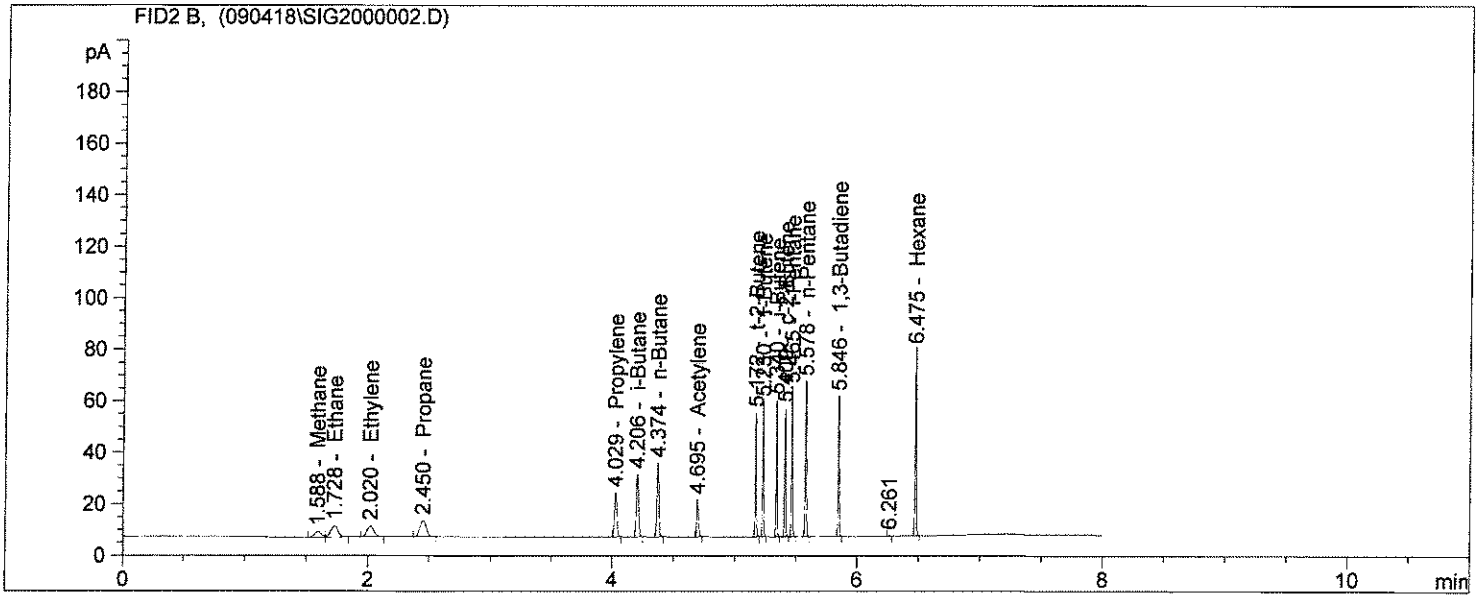
Warning : Calibration warnings (see calibration table listing)

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000002.D
Sample Name: LCS
LCS(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 8:01:09 AM	Seq. Line	: 1
Sample Name	: LCS	Location	: Vial 2
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:10:09 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 8:09:35 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.588	BV	9.08240	1.12222	10.19249		Methane
1.728	VB	17.40444	5.89609e-1	10.26181		Ethane
2.020	BB	16.24695	6.45663e-1	10.49006		Ethylene
2.450	BB	23.75505	4.34024e-1	10.31025		Propane
4.029	BB	23.77905	4.30557e-1	10.23823		Propylene
4.206	BB	31.82322	3.29374e-1	10.48174		i-Butane
4.374	BB	32.50557	3.26258e-1	10.60522		n-Butane
4.695	BB	14.04460	6.47127e-1	9.08863		Acetylene
5.172	BB	28.91263	3.29413e-1	9.52420		t-2-Butene
5.230	BB	32.79493	3.26200e-1	10.69769		1-Butene
5.340	BB	32.81973	3.31334e-1	10.87428		i-Butene
5.409	BB	29.76324	3.40178e-1	10.12480		c-2-Butene
5.465	BB	39.01855	2.52648e-1	9.85796		i-Pentane
5.578	BB	39.62905	2.58175e-1	10.23122		n-Pentane
5.846	BB	33.01731	3.37185e-1	11.13294		1,3-Butadiene

9/4/18

Data File C:\CHEM32\1\DATA\090418\SIG2000002.D
Sample Name: LCS
LCS(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 8:01:09 AM	Seq. Line :	1
Sample Name	: LCS	Location :	Vial 2
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:10:09 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.475	BB	46.38855	2.30048e-1	10.67161		Hexane

Totals : 164.78312

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.261	BB	2.18124e-1	2.30048e-1	5.01791e-2		?

Uncalib. totals : 5.01791e-2

1 Warnings or Errors :

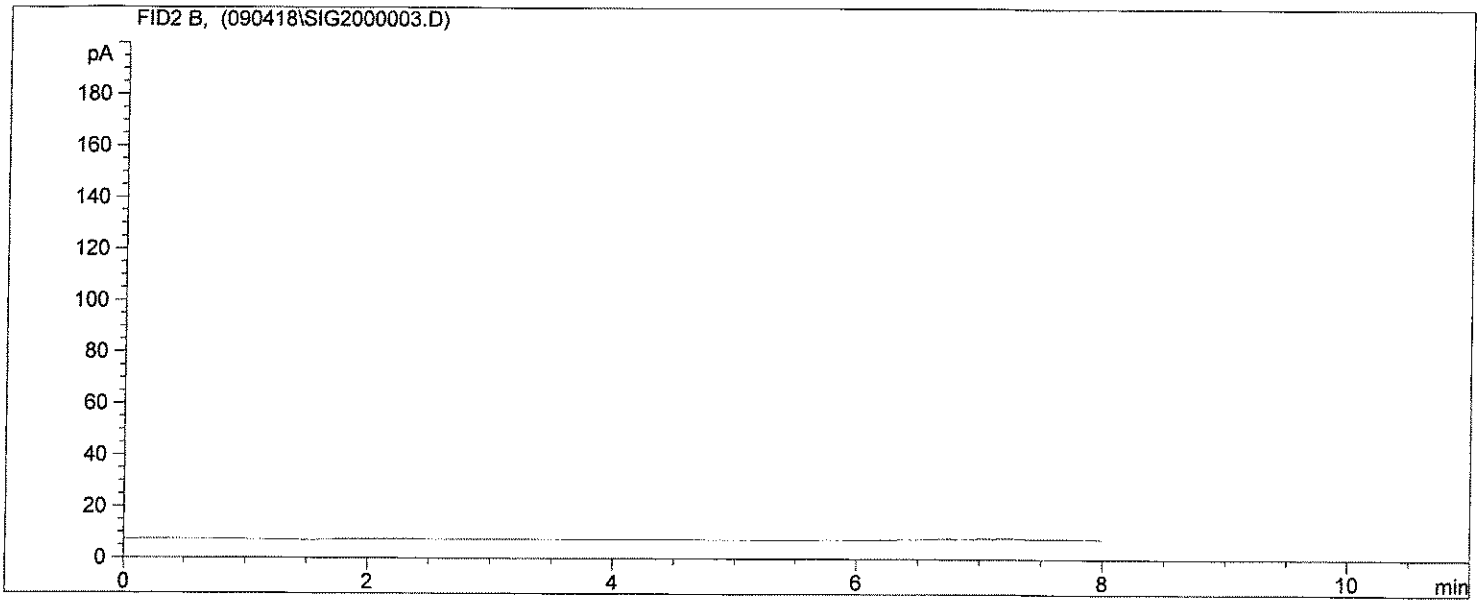
Warning : Calibration warnings (see calibration table listing)

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 9/4/2018 8:18:05 AM	Seq. Line :	2
Sample Name	: BLANK	Location :	Vial 3
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:10:09 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 8:09:35 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.585		-	-	-		Methane
1.733		-	-	-		Ethane
1.987		-	-	-		Ethylene
2.455		-	-	-		Propane
4.029		-	-	-		Propylene
4.185		-	-	-		i-Butane
4.321		-	-	-		n-Butane
4.695		-	-	-		Acetylene
5.172		-	-	-		t-2-Butene
5.230		-	-	-		1-Butene
5.340		-	-	-		i-Butene
5.409		-	-	-		c-2-Butene
5.424		-	-	-		i-Pentane
5.641		-	-	-		n-Pentane
5.808		-	-	-		1,3-Butadiene

9/5/18

Data File C:\CHEM32\1\DATA\090418\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 9/4/2018 8:18:05 AM	Seq. Line	: 2
Sample Name	: BLANK	Location	: Vial 3
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:10:09 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.595		-	-	-		Hexane

Totals : 0.00000

Uncalibrated Peaks : using compound Hexane

2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

Area Percent Report

Sorted By	: Signal
Calib. Data Modified	: 9/4/2018 8:09:35 AM
Multiplier	: 1.0000
Dilution	: 1.0000

Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	1.585		0.0000	0.00000	0.00000	Methane
2	1.733		0.0000	0.00000	0.00000	Ethane
3	1.987		0.0000	0.00000	0.00000	Ethylene
4	2.455		0.0000	0.00000	0.00000	Propane
5	4.029		0.0000	0.00000	0.00000	Propylene
6	4.185		0.0000	0.00000	0.00000	i-Butane
7	4.321		0.0000	0.00000	0.00000	n-Butane
8	4.695		0.0000	0.00000	0.00000	Acetylene
9	5.172		0.0000	0.00000	0.00000	t-2-Butene
10	5.230		0.0000	0.00000	0.00000	1-Butene
11	5.340		0.0000	0.00000	0.00000	i-Butene
12	5.409		0.0000	0.00000	0.00000	c-2-Butene
13	5.424		0.0000	0.00000	0.00000	i-Pentane
14	5.641		0.0000	0.00000	0.00000	n-Pentane
15	5.808		0.0000	0.00000	0.00000	1,3-Butadiene
16	6.595		0.0000	0.00000	0.00000	Hexane
Totals :				0.00000	0.0000	

Uncalibrated Peaks:

Data File C:\CHEM32\1\DATA\090418\SIG2000003.D
Sample Name: BLANK
BLANK
Method:18

Injection Date	: 9/4/2018 8:18:05 AM	Seq. Line :	2
Sample Name	: BLANK	Location :	Vial 3
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:10:09 AM by dyeddula (modified after loading)		

HRVOC

2 Warnings or Errors :

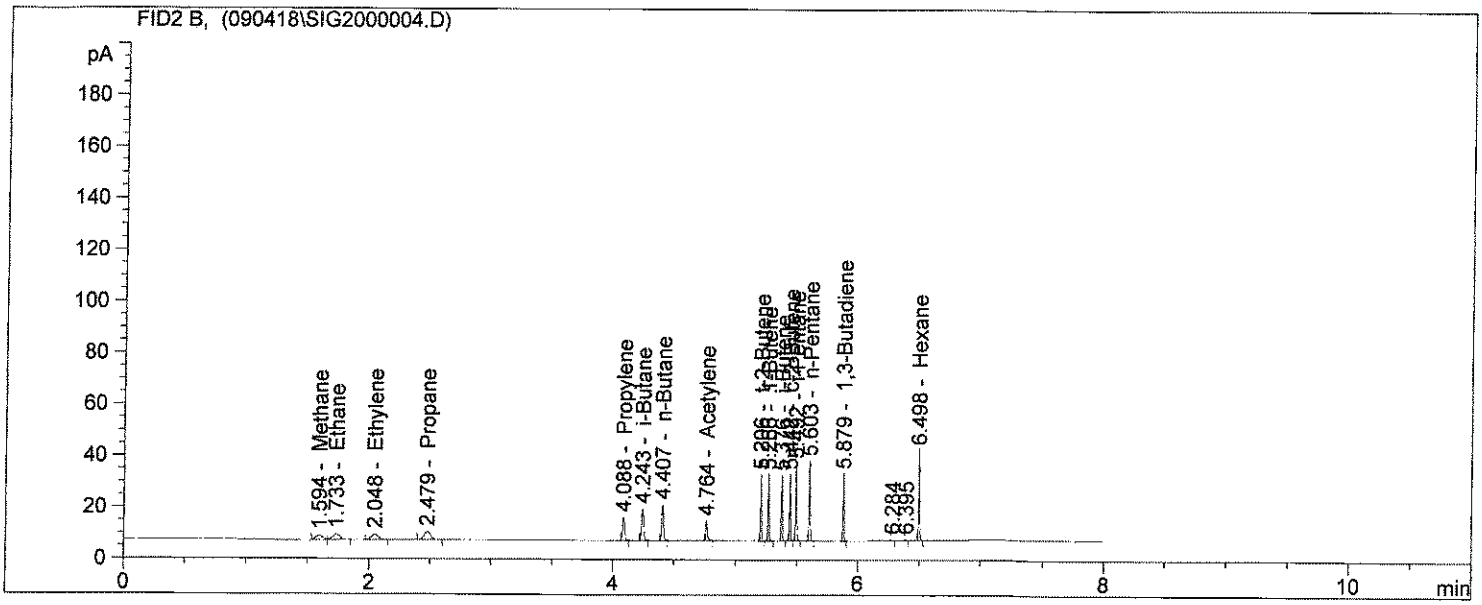
Warning : Calibration warnings (see calibration table listing)
Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000004.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date	: 9/4/2018 8:35:07 AM	Seq. Line :	3
Sample Name	: GSL_180834-001MS	Location :	Vial 4
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:56:56 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 8:53:00 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.594	BV	6.85244	1.12222	7.68997		Methane
1.733	VB	8.65048	5.89609e-1	5.10040		Ethane
2.048	BB	7.56023	6.45663e-1	4.88136		Ethylene
2.479	BB	11.55016	4.34024e-1	5.01304		Propane
4.088	BB	11.38781	4.30557e-1	4.90310		Propylene
4.243	BB	15.12430	3.29374e-1	4.98155		i-Butane
4.407	BB	15.21883	3.26258e-1	4.96527		n-Butane
4.764	BB	6.77848	6.47127e-1	4.38654		Acetylene
5.206	BB	14.99279	3.29413e-1	4.93882		t-2-Butene
5.266	BB	15.42459	3.26200e-1	5.03150		1-Butene
5.376	BB	15.01792	3.31334e-1	4.97594		i-Butene
5.442	BB	15.08922	3.40178e-1	5.13302		c-2-Butene
5.492	BB	19.26767	2.52648e-1	4.86794		i-Pentane
5.603	BB	19.25844	2.58175e-1	4.97204		n-Pentane
5.879	BB	14.85207	3.37185e-1	5.00789		1,3-Butadiene

Data File C:\CHEM32\1\DATA\090418\SIG2000004.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date	: 9/4/2018 8:35:07 AM	Seq. Line :	3
Sample Name	: GSL_180834-001MS	Location :	Vial 4
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:56:56 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.498	BB	22.12371	2.30048e-1	5.08952		Hexane

Totals : 81.93791

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.284	BB	1.63118e-1	2.30048e-1	3.75249e-2		?
6.395	BB	1.96733e-1	2.30048e-1	4.52580e-2		?

Uncalib. totals : 8.27830e-2

2 Warnings or Errors :

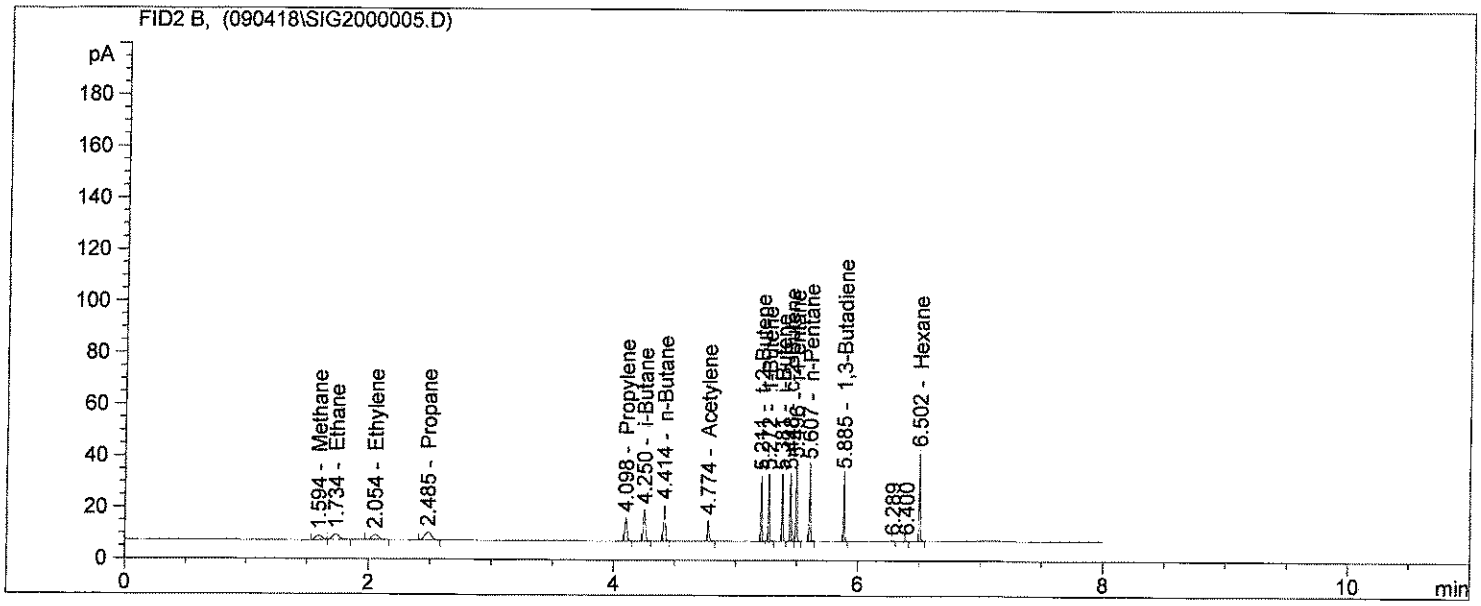
Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000005.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date	: 9/4/2018 8:51:56 AM	Seq. Line	: 3
Sample Name	: GSL_180834-001MS	Location	: Vial 4
Acq. Operator	: dyeddula	Inj	: 2
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 8:56:56 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 8:53:00 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.594	BV	6.92479	1.12222	7.77117		Methane
1.734	VB	8.72114	5.89609e-1	5.14206		Ethane
2.054	BB	7.60462	6.45663e-1	4.91003		Ethylene
2.485	BB	11.47087	4.34024e-1	4.97863		Propane
4.098	BB	11.43007	4.30557e-1	4.92129		Propylene
4.250	BB	15.17941	3.29374e-1	4.99970		i-Butane
4.414	BB	15.20107	3.26258e-1	4.95948		n-Butane
4.774	BB	6.74826	6.47127e-1	4.36698		Acetylene
5.211	BB	15.01753	3.29413e-1	4.94697		t-2-Butene
5.272	BB	15.45081	3.26200e-1	5.04005		1-Butene
5.381	BB	15.03356	3.31334e-1	4.98112		i-Butene
5.448	BV	15.12426	3.40178e-1	5.14494		c-2-Butene
5.496	VB	19.32313	2.52648e-1	4.88195		i-Pentane
5.607	BB	19.29066	2.58175e-1	4.98036		n-Pentane
5.885	BB	14.84118	3.37185e-1	5.00422		1,3-Butadiene

9/19/18

Data File C:\CHEM32\1\DATA\090418\SIG2000005.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date : 9/4/2018 8:51:56 AM Seq. Line : 3
Sample Name : GSL_180834-001MS Location : Vial 4
Acq. Operator : dyeddula Inj : 2
Acq. Instrument : Instrument 1 Inj Volume : Manually
Acq. Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 9/4/2018 7:35:50 AM by dyeddula
Analysis Method : C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M
Last changed : 9/4/2018 8:56:56 AM by dyeddula
(modified after loading)
HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.502	BB	22.23359	2.30048e-1	5.11480		Hexane

Totals : 82.14374

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.289	BB	1.52206e-1	2.30048e-1	3.50148e-2		?
6.400	BB	2.14462e-1	2.30048e-1	4.93366e-2		?

Uncalib. totals : 8.43514e-2

2 Warnings or Errors :

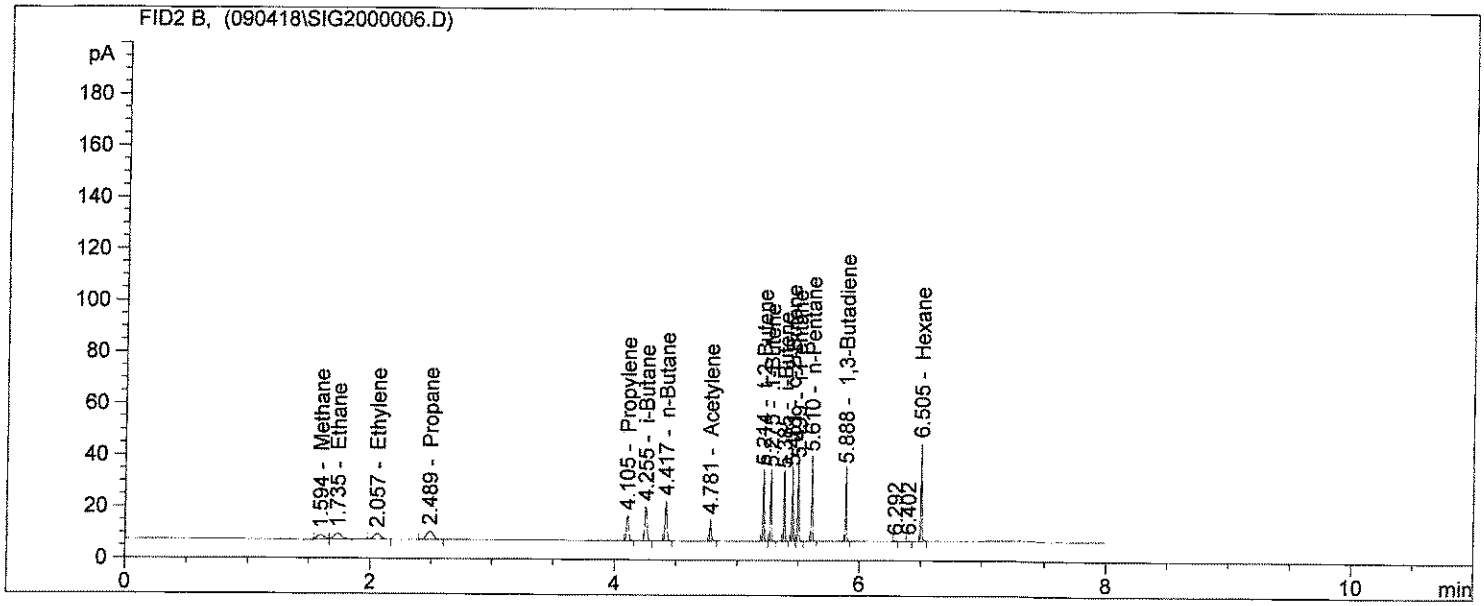
Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000006.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date	: 9/4/2018 9:08:48 AM	Seq. Line	: 3
Sample Name	: GSL_180834-001MS	Location	: Vial 4
Acq. Operator	: dyeddula	Inj	: 3
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 9:19:51 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 9:19:25 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.594	BV	6.88437	1.12222	7.72581		Methane
1.735	VB	9.03910	5.89609e-1	5.32953		Ethane
2.057	BB	8.10567	6.45663e-1	5.23353		Ethylene
2.489	BB	12.41059	4.34024e-1	5.38649		Propane
4.105	BB	12.27494	4.30557e-1	5.28506		Propylene
4.255	BB	16.36604	3.29374e-1	5.39055		i-Butane
4.417	BB	16.42350	3.26258e-1	5.35831		n-Butane
4.781	BB	7.17753	6.47127e-1	4.64477		Acetylene
5.214	BB	16.17559	3.29413e-1	5.32845		t-2-Butene
5.275	BB	16.66068	3.26200e-1	5.43471		1-Butene
5.385	BB	16.22806	3.31334e-1	5.37690		i-Butene
5.451	BV	16.28523	3.40178e-1	5.53988		c-2-Butene
5.499	VB	20.87943	2.52648e-1	5.27515		i-Pentane
5.610	BB	20.78746	2.58175e-1	5.36680		n-Pentane
5.888	BB	15.94206	3.37185e-1	5.37542		1,3-Butadiene

9/13/18

Data File C:\CHEM32\1\DATA\090418\SIG2000006.D
Sample Name: GSL_180834-001MS
GSL_180834-001MS
Method:18

Injection Date	: 9/4/2018 9:08:48 AM	Seq. Line :	3
Sample Name	: GSL_180834-001MS	Location :	Vial 4
Acq. Operator	: dyeddula	Inj :	3
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 9:19:51 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.505	BB	23.94200	2.30048e-1	5.50782		Hexane
Totals :				87.55915		

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.292	BB	1.71684e-1	2.30048e-1	3.94956e-2		?
6.402	BB	2.20977e-1	2.30048e-1	5.08353e-2		?
Uncalib. totals :				9.03309e-2		

2 Warnings or Errors :

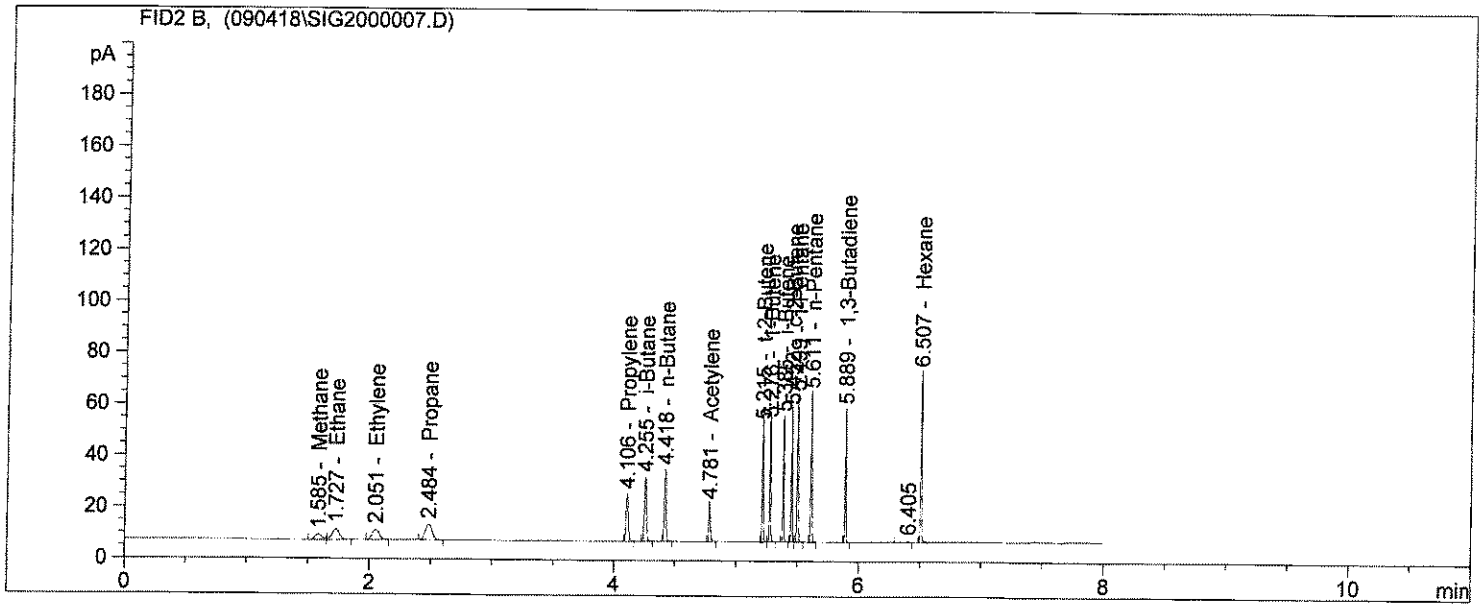
Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000007.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 9:25:43 AM	Seq. Line	: 4
Sample Name	: POST CCV	Location	: Vial 5
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 9:38:26 AM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 9:19:25 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.585	BV	8.87453	1.12222	9.95922		Methane
1.727	VB	17.08927	5.89609e-1	10.07598		Ethane
2.051	BB	15.24240	6.45663e-1	9.84146		Ethylene
2.484	BB	23.09015	4.34024e-1	10.02167		Propane
4.106	BB	23.13316	4.30557e-1	9.96014		Propylene
4.255	BB	30.48475	3.29374e-1	10.04088		i-Butane
4.418	BB	30.55220	3.26258e-1	9.96791		n-Butane
4.781	BB	13.84410	6.47127e-1	8.95888		Acetylene
5.215	BV	30.23376	3.29413e-1	9.95940		t-2-Butene
5.276	VB	31.11052	3.26200e-1	10.14824		1-Butene
5.385	BB	30.27931	3.31334e-1	10.03256		i-Butene
5.452	BV	30.38935	3.40178e-1	10.33779		c-2-Butene
5.499	VB	38.42920	2.52648e-1	9.70906		i-Pentane
5.611	BB	38.13652	2.58175e-1	9.84588		n-Pentane
5.889	BB	30.35354	3.37185e-1	10.23475		1,3-Butadiene

9/15/18

Data File C:\CHEM32\1\DATA\090418\SIG2000007.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 9:25:43 AM	Seq. Line	: 4
Sample Name	: POST CCV	Location	: Vial 5
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 9:38:26 AM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.507	BB	43.17053	2.30048e-1	9.93131		Hexane

Totals : 159.02513

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.405	BB	5.45656e-1	2.30048e-1	1.25527e-1		?

Uncalib. totals : 1.25527e-1

2 Warnings or Errors :

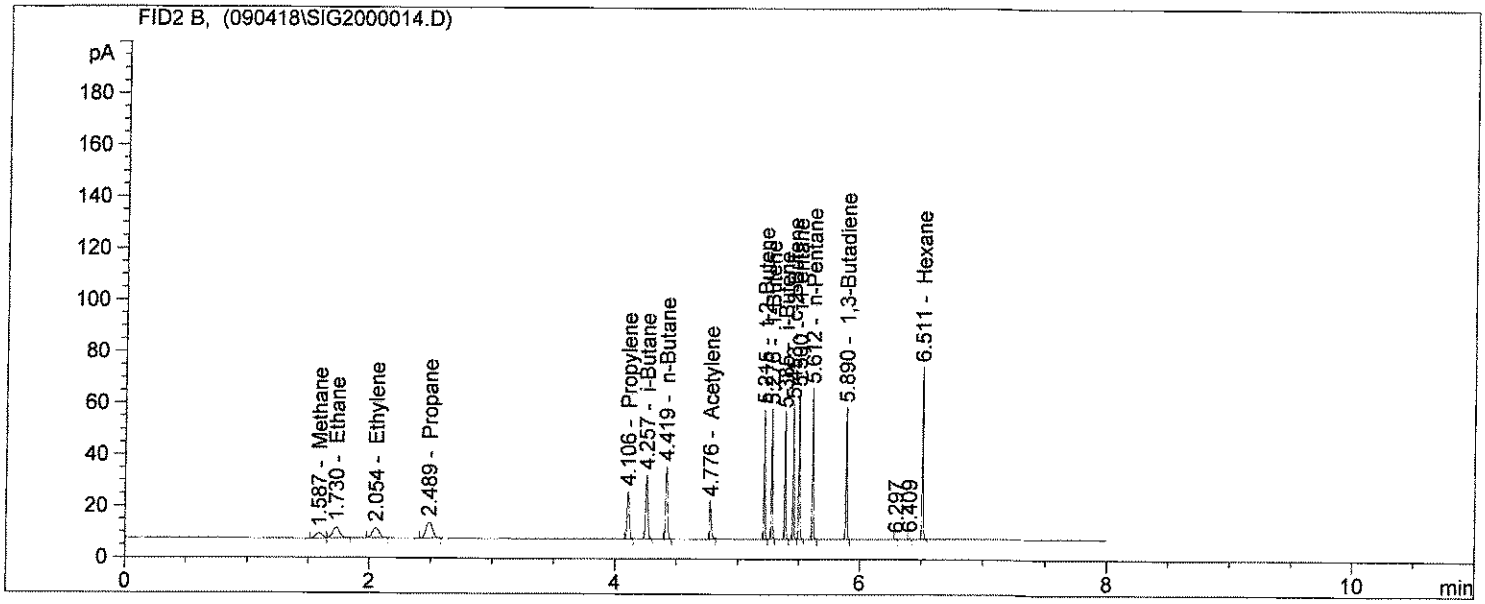
Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090418\SIG2000014.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 3:17:56 PM	Seq. Line :	1
Sample Name	: POST CCV	Location :	Vial 8
Acq. Operator	: dyeddula	Inj :	1
Acq. Instrument	: Instrument 1	Inj Volume :	Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 3:43:49 PM by dyeddula (modified after loading)		

HRVOC



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 9:19:25 AM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID2 B,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
1.587	BV	8.72026	1.12222	9.78609		Methane
1.730	VB	16.79139	5.89609e-1	9.90035		Ethane
2.054	BB	15.11666	6.45663e-1	9.76027		Ethylene
2.489	BB	22.70532	4.34024e-1	9.85464		Propane
4.106	BB	22.81761	4.30557e-1	9.82427		Propylene
4.257	BB	30.03901	3.29374e-1	9.89407		i-Butane
4.419	BB	30.09547	3.26258e-1	9.81890		n-Butane
4.776	BB	13.42242	6.47127e-1	8.68600		Acetylene
5.215	BB	29.72669	3.29413e-1	9.79236		t-2-Butene
5.276	BB	30.32413	3.26200e-1	9.89172		1-Butene
5.385	BB	29.88098	3.31334e-1	9.90058		i-Butene
5.453	BB	30.02889	3.40178e-1	10.21517		c-2-Butene
5.500	BB	37.85912	2.52648e-1	9.56503		i-Pentane
5.612	BB	37.64452	2.58175e-1	9.71886		n-Pentane
5.890	BB	29.89999	3.37185e-1	10.08182		1,3-Butadiene

9/5/18

Data File C:\CHEM32\1\DATA\090418\SIG2000014.D
Sample Name: POST CCV
POST CCV(10ppmv HRVOC+ALKANES)
Method:18

Injection Date	: 9/4/2018 3:17:56 PM	Seq. Line	: 1
Sample Name	: POST CCV	Location	: Vial 8
Acq. Operator	: dyeddula	Inj	: 1
Acq. Instrument	: Instrument 1	Inj Volume	: Manually
Acq. Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 7:35:50 AM by dyeddula		
Analysis Method	: C:\CHEM32\1\METHODS\ALKANES_HRVOC_M18_091117.M		
Last changed	: 9/4/2018 3:43:49 PM by dyeddula (modified after loading)		

HRVOC

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.511	BB	42.39031	2.30048e-1	9.75182		Hexane

Totals : 156.44196

Uncalibrated Peaks : using compound Hexane

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppmv]	Grp	Name
6.297	BB	1.58216e-1	2.30048e-1	3.63973e-2		?
6.409	BB	3.44649e-1	2.30048e-1	7.92859e-2		?

Uncalib. totals : 1.15683e-1

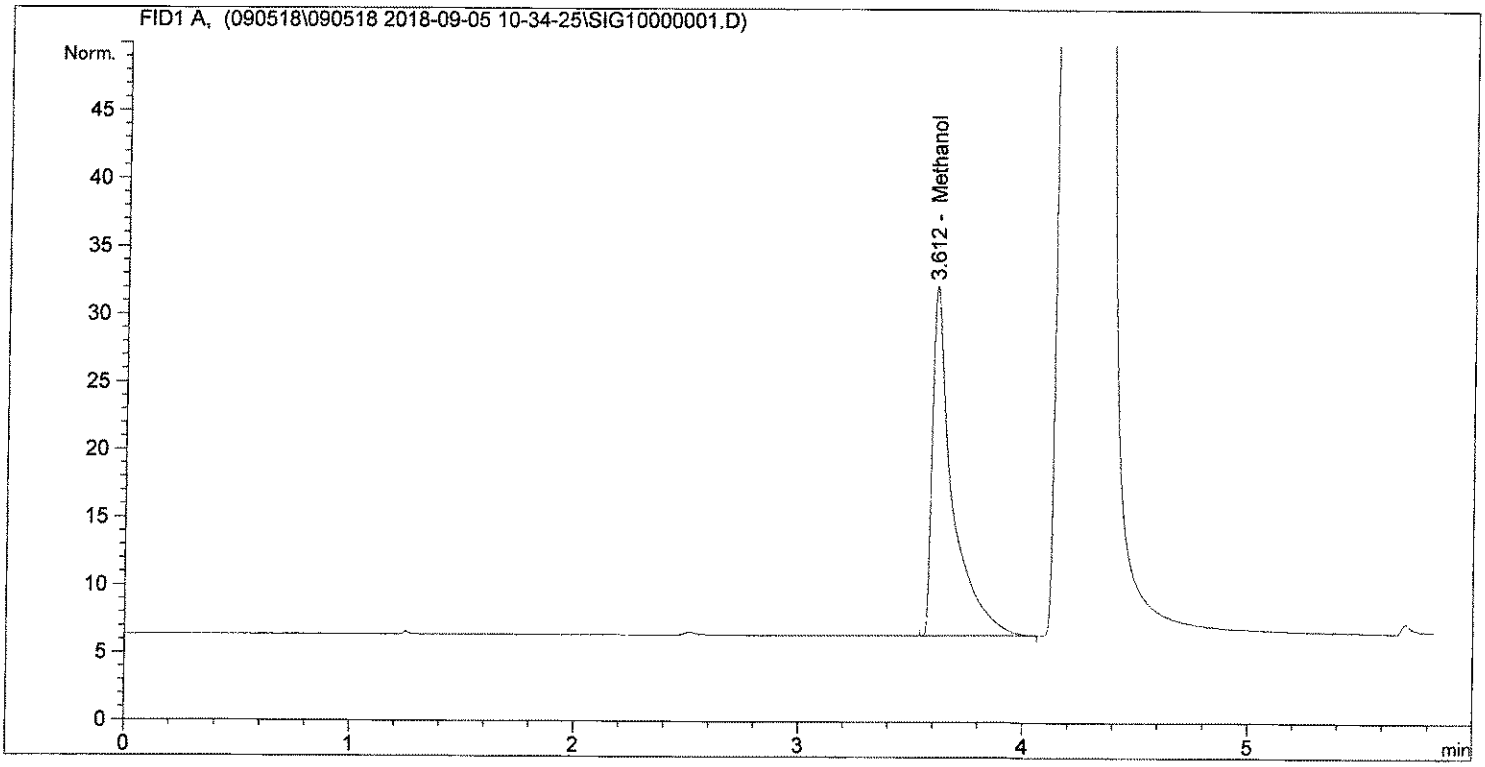
2 Warnings or Errors :

Warning : Calibration warnings (see calibration table listing)
Warning : Elution order of calibrated compounds may have changed

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000001.D
Sample Name: CCV

Acq. Operator	: edecker	Seq. Line	: 1
Acq. Instrument	: GC#10	Location	: Vial 1
Injection Date	: 9/5/2018 10:36:52 AM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\FRONT_MEOH_308_090418.M		
Last changed	: 9/4/2018 4:58:50 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 10:50:20 AM by edecker (modified after loading)		
Sample Info	: CCV(500ppm MeOH) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.612	BB	159.81555	2.97362	475.23023		Methanol
Totals :				475.23023		

GW 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000001.D
Sample Name: CCV

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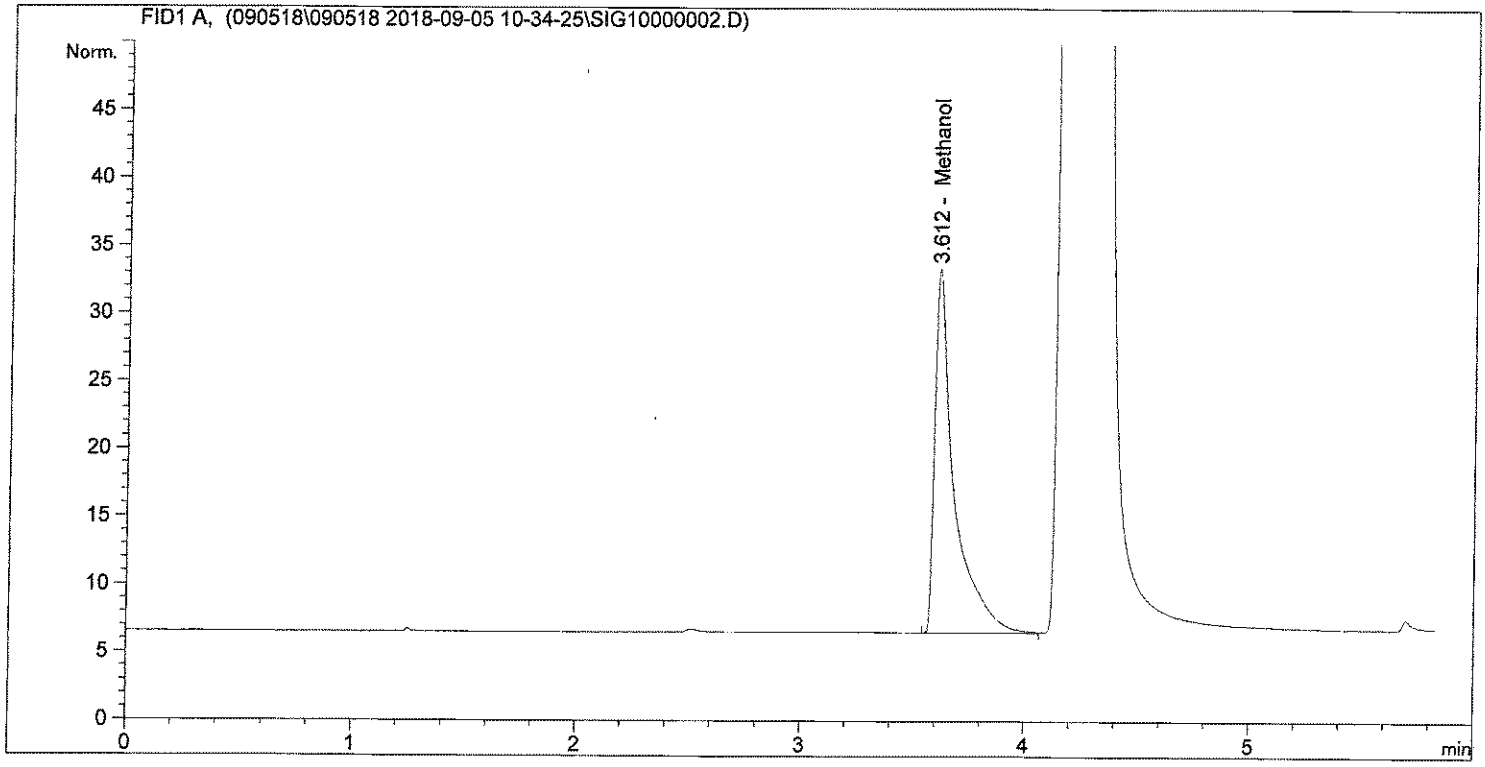
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000002.D
Sample Name: LCS

Acq. Operator	: edecker	Seq. Line	: 2
Acq. Instrument	: GC#10	Location	: Vial 2
Injection Date	: 9/5/2018 10:53:49 AM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\FRONT_MEOH_308_090418.M		
Last changed	: 9/4/2018 4:58:50 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 10:50:20 AM by edecker (modified after loading)		
Sample Info	: LCS(500ppm MeOH) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.612	BB	161.95314	2.97362	481.58660		Methanol
Totals :				481.58660		

aw 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000002.D
Sample Name: LCS

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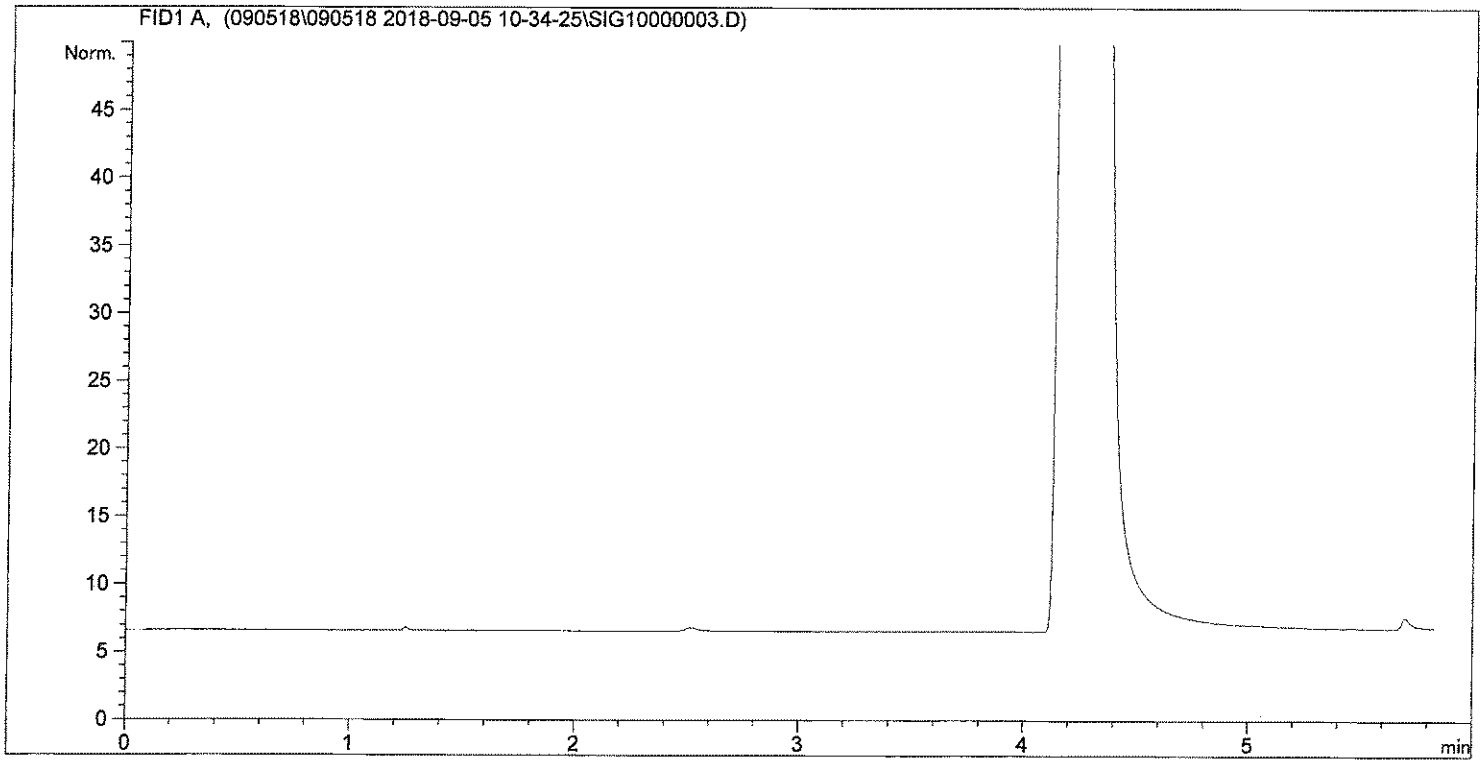
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000003.D
Sample Name: BLANK

Acq. Operator	: edecker	Seq. Line	: 3
Acq. Instrument	: GC#10	Location	: Vial 3
Injection Date	: 9/5/2018 11:10:59 AM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\FRONT_MEOH_308_090418.M		
Last changed	: 9/4/2018 4:58:50 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 10:50:20 AM by edecker (modified after loading)		
Sample Info	: BLANK(5%IPA) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

GVP 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 10-34-25\SIG10000003.D
Sample Name: BLANK

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

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Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

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*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000015.D
Sample Name: GSL_180834-012F

```
Acq. Operator    : edecker                          Seq. Line :   1
Acq. Instrument  : GC#10                             Location : Vial 9
Injection Date   : 9/5/2018 3:41:39 PM                    Inj :   1
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:51:22 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-012(Front)
                   Method:308
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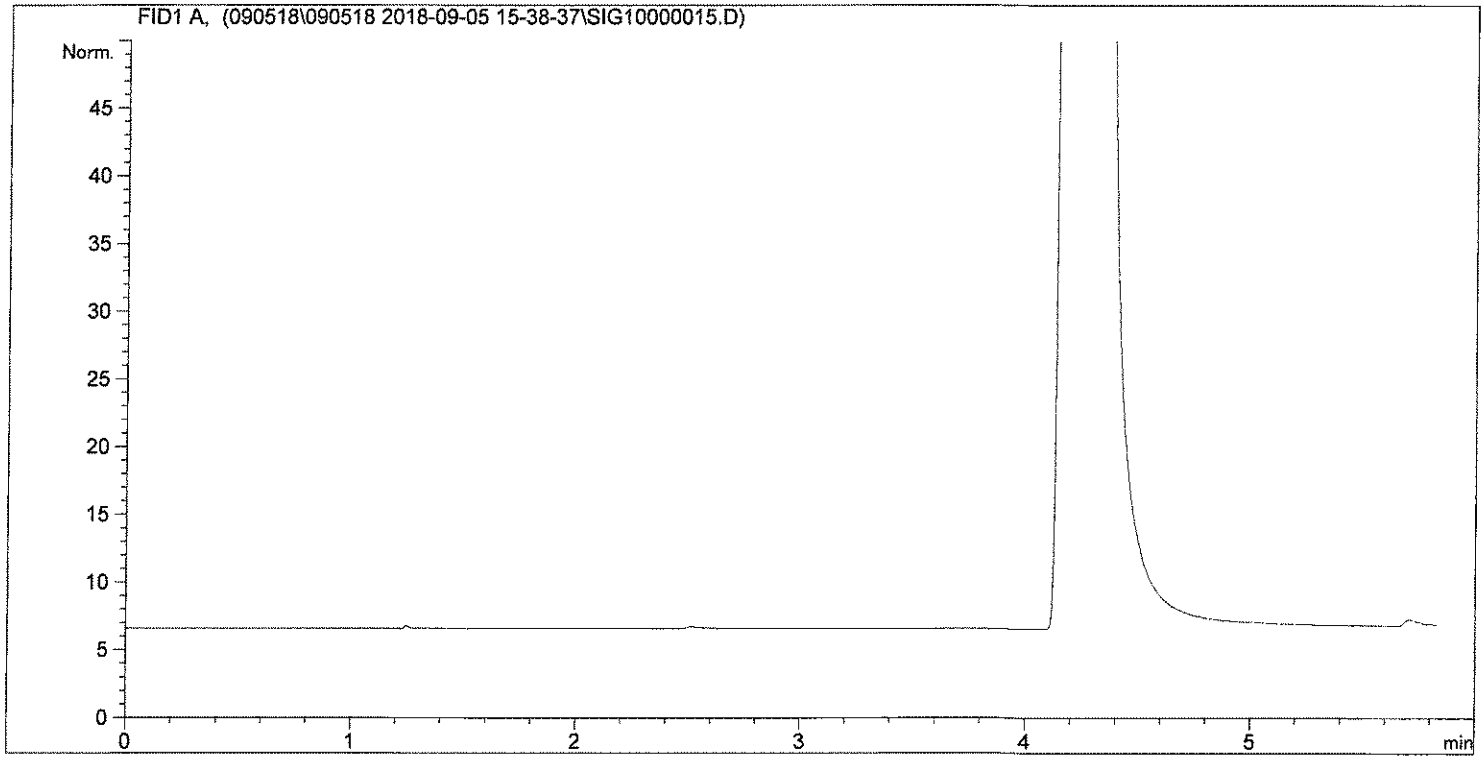

External Standard Report

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Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591            -           -          -          Methanol

Totals :                                 0.00000
```

9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000015.D
Sample Name: GSL_180834-012F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

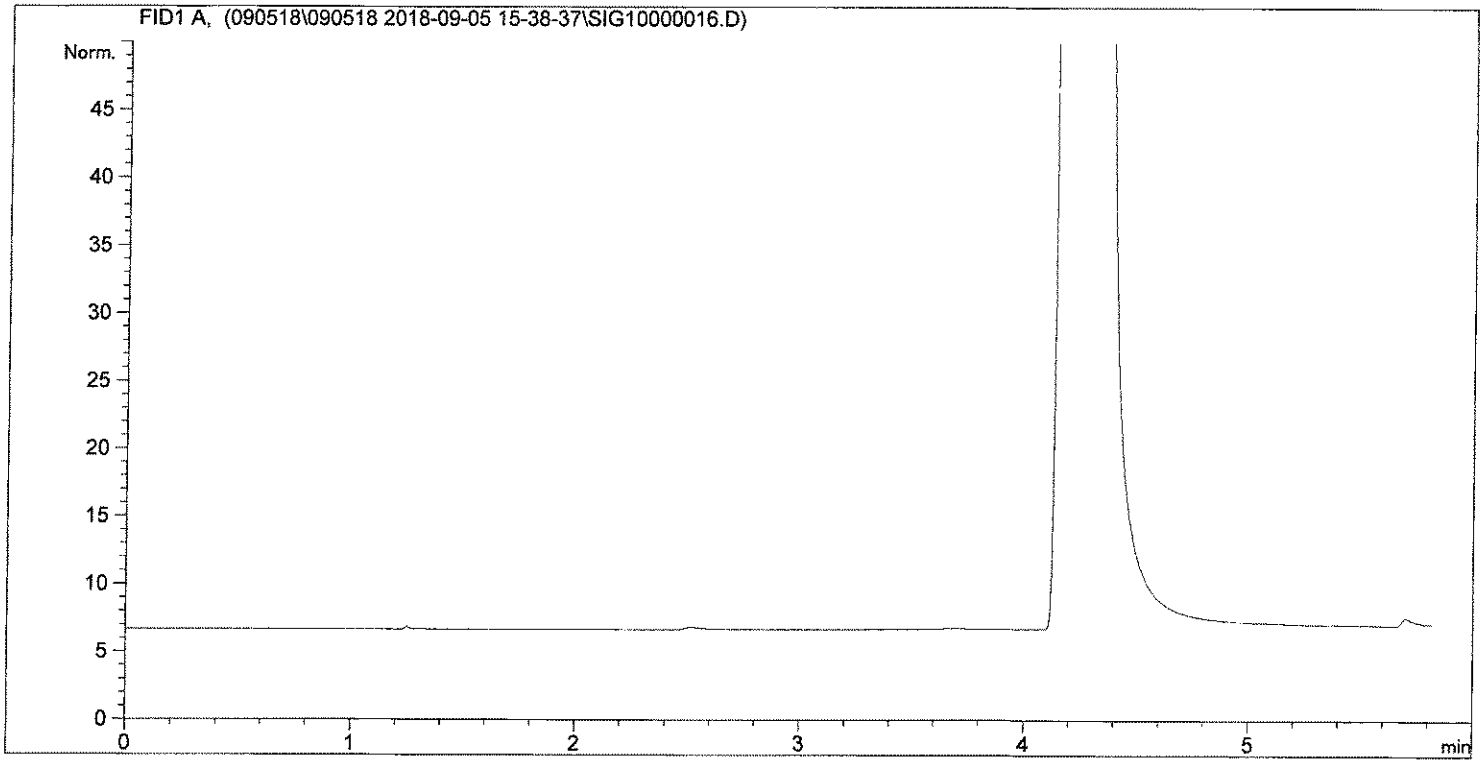
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000016.D
Sample Name: GSL_180834-012F

```
Acq. Operator    : edecker                          Seq. Line :   1
Acq. Instrument  : GC#10                             Location : Vial 9
Injection Date   : 9/5/2018 3:58:44 PM                    Inj :   2
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:51:49 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-012(Front)
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type     Area      Amt/Area    Amount    Grp   Name
 [min]          [pA*s]                  [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591           -           -          -          Methanol

Totals :                                 0.00000
```

9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10O00016.D
Sample Name: GSL_180834-012F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

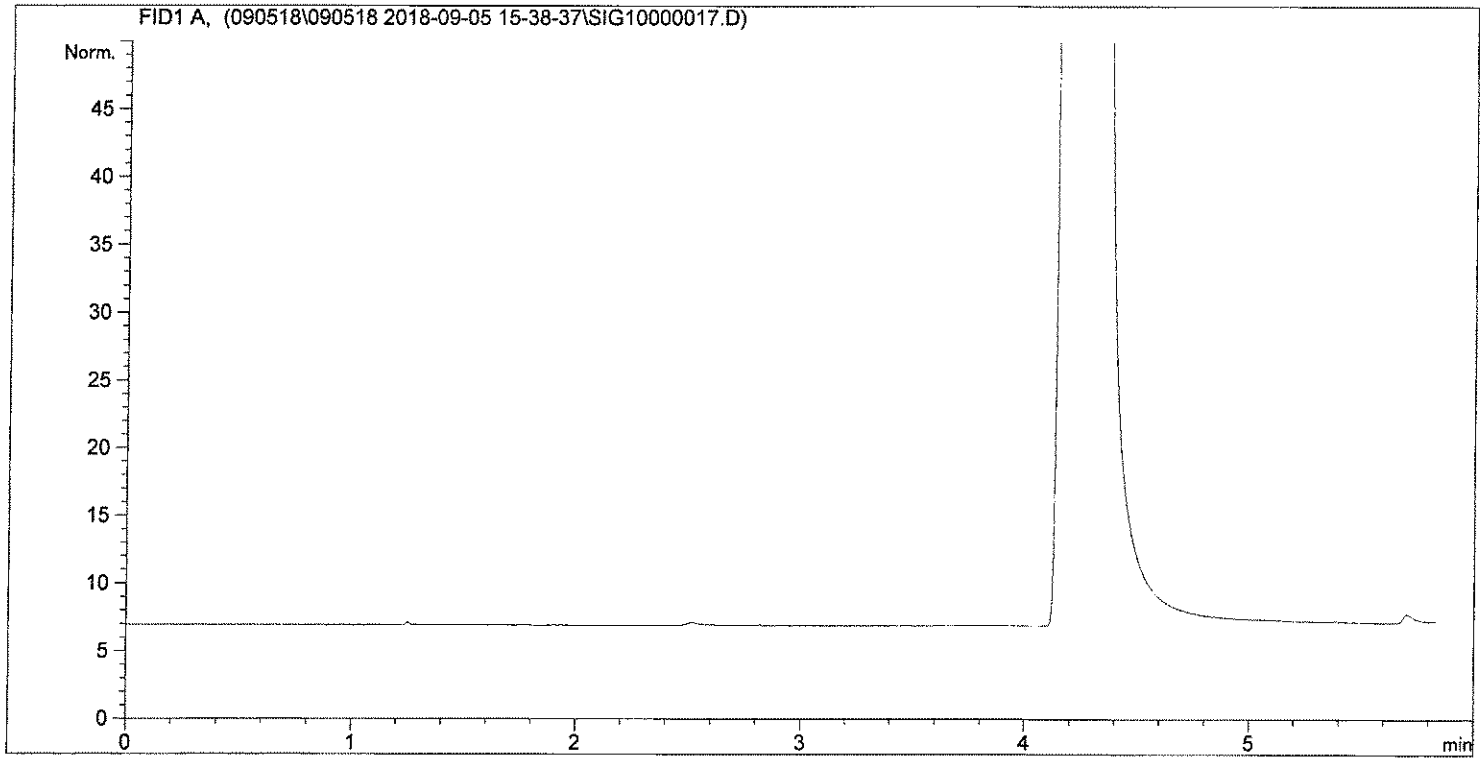
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000017.D
Sample Name: GSL_180834-012B

```
Acq. Operator    : edecker                          Seq. Line :   2
Acq. Instrument : GC#10                           Location : Vial 10
Injection Date  : 9/5/2018 4:16:06 PM                  Inj :   1
                                                  Inj Volume : 1 µl
Acq. Method     : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                  090418.M
Last changed    : 9/5/2018 3:32:14 PM by edecker
Analysis Method : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed    : 9/6/2018 8:51:49 AM by edecker
                  (modified after loading)
Sample Info     : GSL_180834-012(Back)
                  Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591            -           -          -          Methanol

Totals :                                  0.00000
```

GP 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000017.D
Sample Name: GSL_180834-012B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

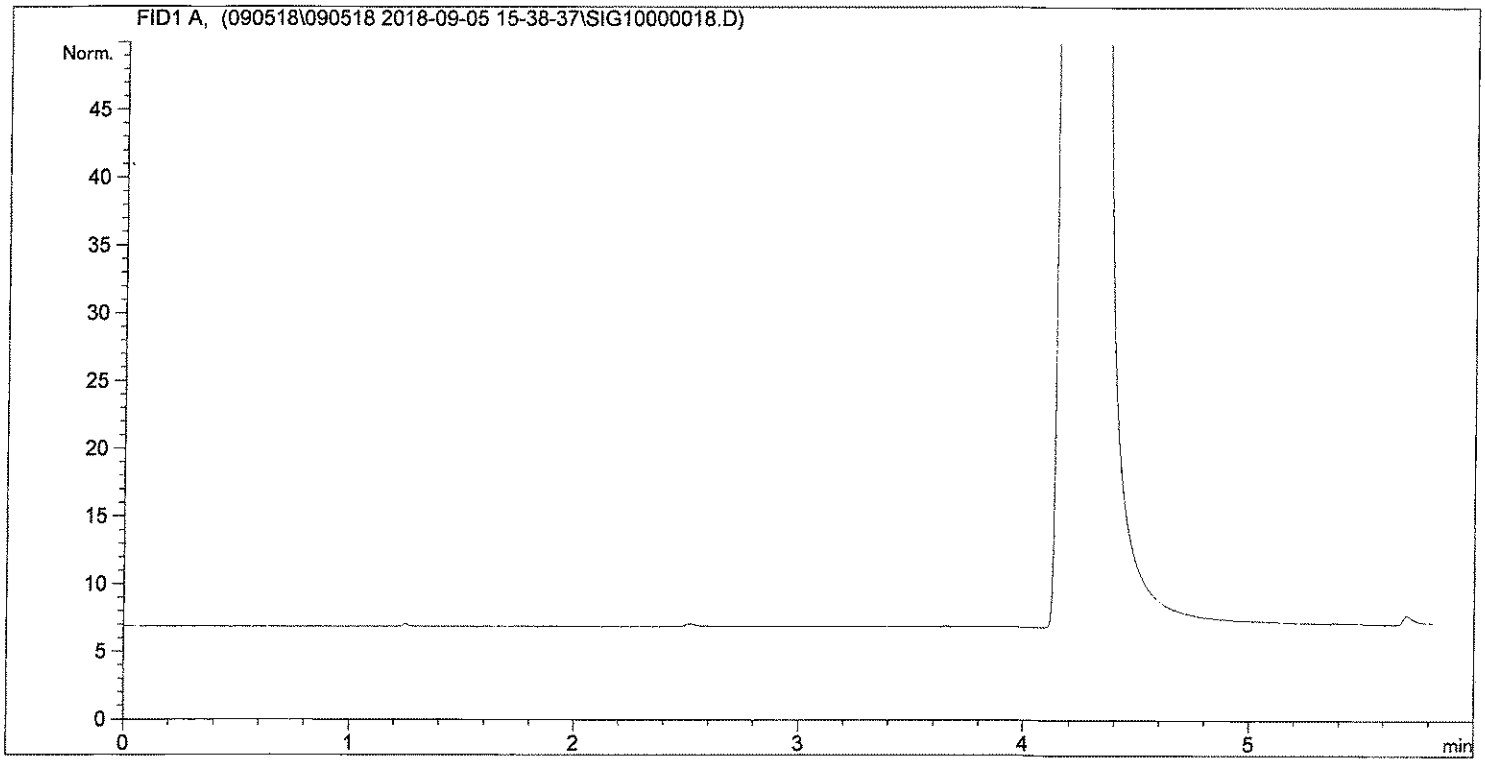
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000018.D
Sample Name: GSL_180834-012B

```
Acq. Operator    : edecker                          Seq. Line :   2
Acq. Instrument  : GC#10                             Location : Vial 10
Injection Date   : 9/5/2018 4:33:26 PM                   Inj :   2
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:51:49 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-012(Back)
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591            -           -          -          Methanol

Totals :                                  0.00000
```

9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000018.D
Sample Name: GSL_180834-012B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

Area Percent Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

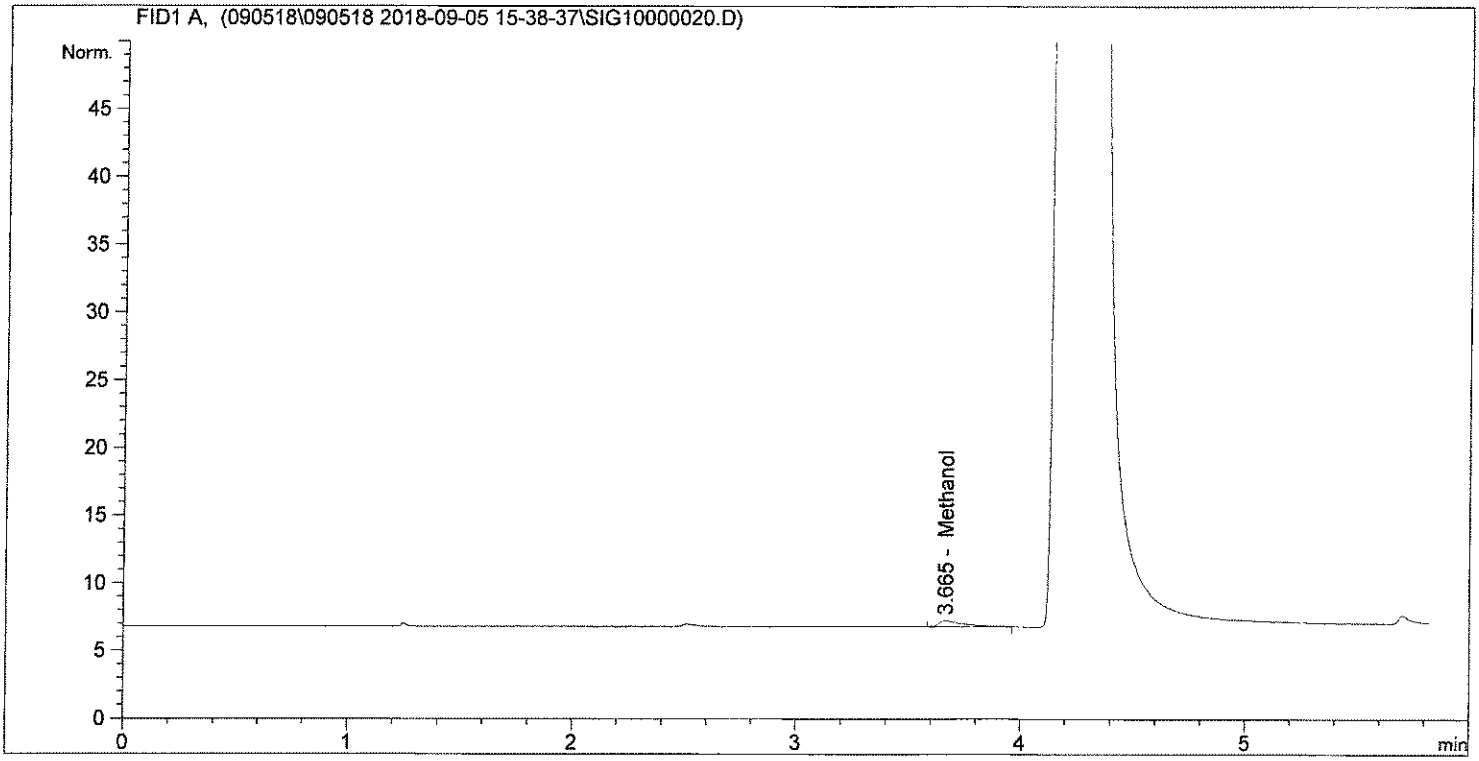
1 Warnings or Errors :

Warning : Calibrated compound(s) not found

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000020.D
Sample Name: GSL_180834-012BMS

```
Acq. Operator    : edecker                          Seq. Line :   3
Acq. Instrument  : GC#10                             Location : Vial 19
Injection Date   : 9/5/2018 5:08:15 PM                   Inj :   2
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:53:57 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-012(Back)MS(10ppm MeOH)
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type     Area      Amt/Area    Amount    Grp   Name
 [min]          [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.665 BBA       3.38297    2.97362   10.05965     Methanol

Totals :                                10.05965
```

AM 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000020.D
Sample Name: GSL_180834-012BMS

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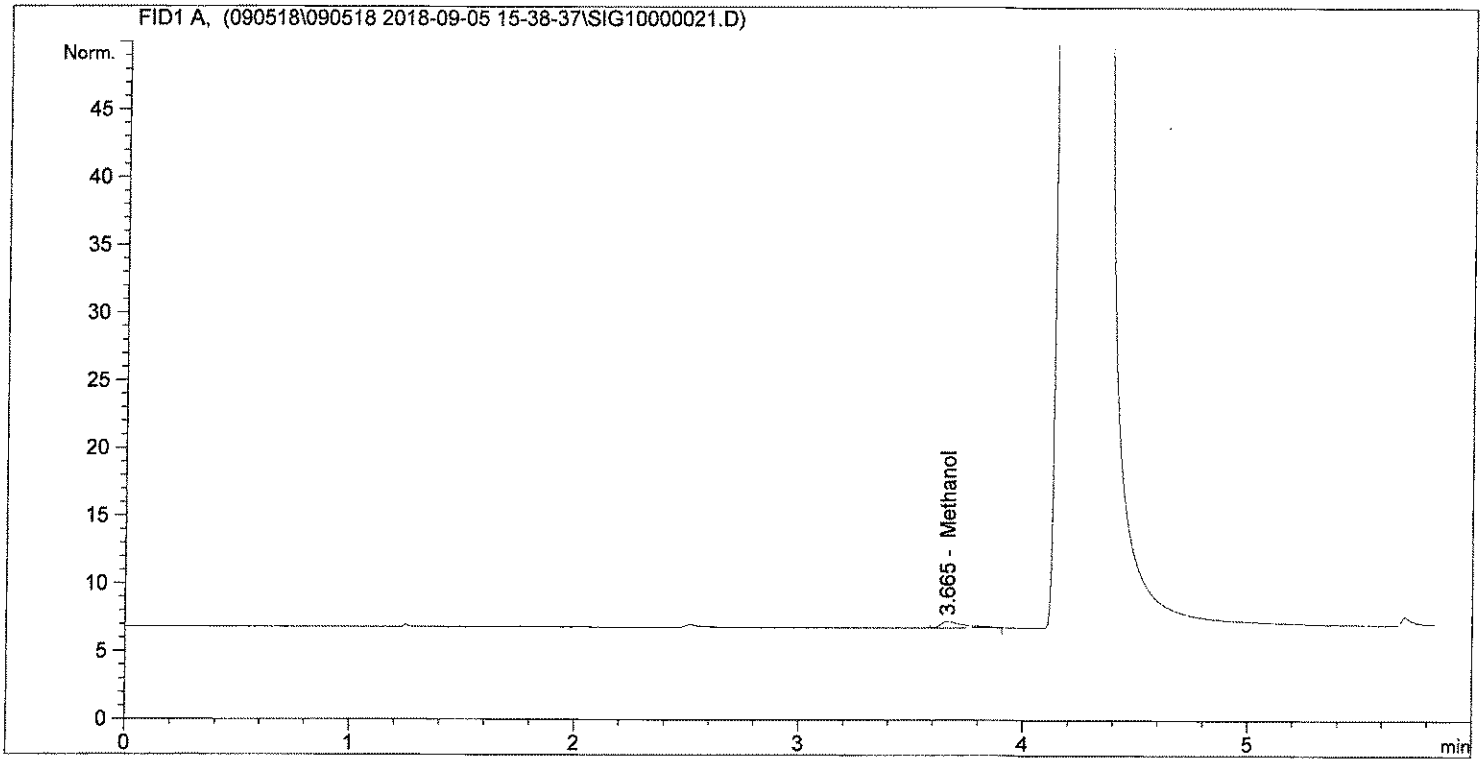
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000021.D
Sample Name: GSL_180834-012BMS

Acq. Operator	: edecker	Seq. Line	: 4
Acq. Instrument	: GC#10	Location	: Vial 19
Injection Date	: 9/5/2018 5:25:35 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:52:41 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-012(Back)MS(10ppm MeOH) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.665	BB	3.25232	2.97362	9.67116		Methanol
Totals :				9.67116		

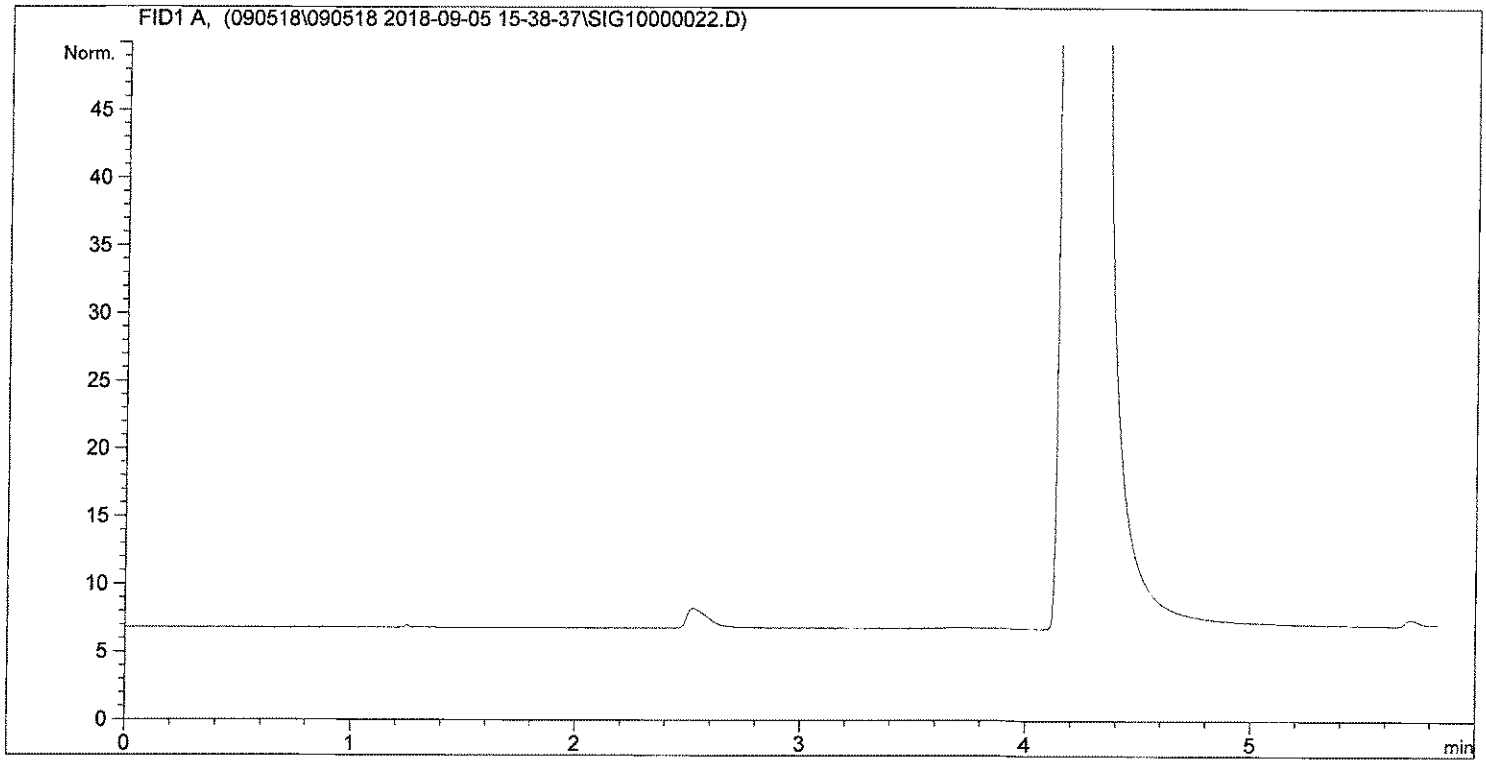
GS 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10O00021.D
Sample Name: GSL_180834-012BMS

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000022.D
Sample Name: GSL_180834-013F

Acq. Operator	: edecker	Seq. Line	: 5
Acq. Instrument	: GC#10	Location	: Vial 11
Injection Date	: 9/5/2018 5:42:58 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:54:15 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-013(Front) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

qs 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000022.D
Sample Name: GSL_180834-013F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

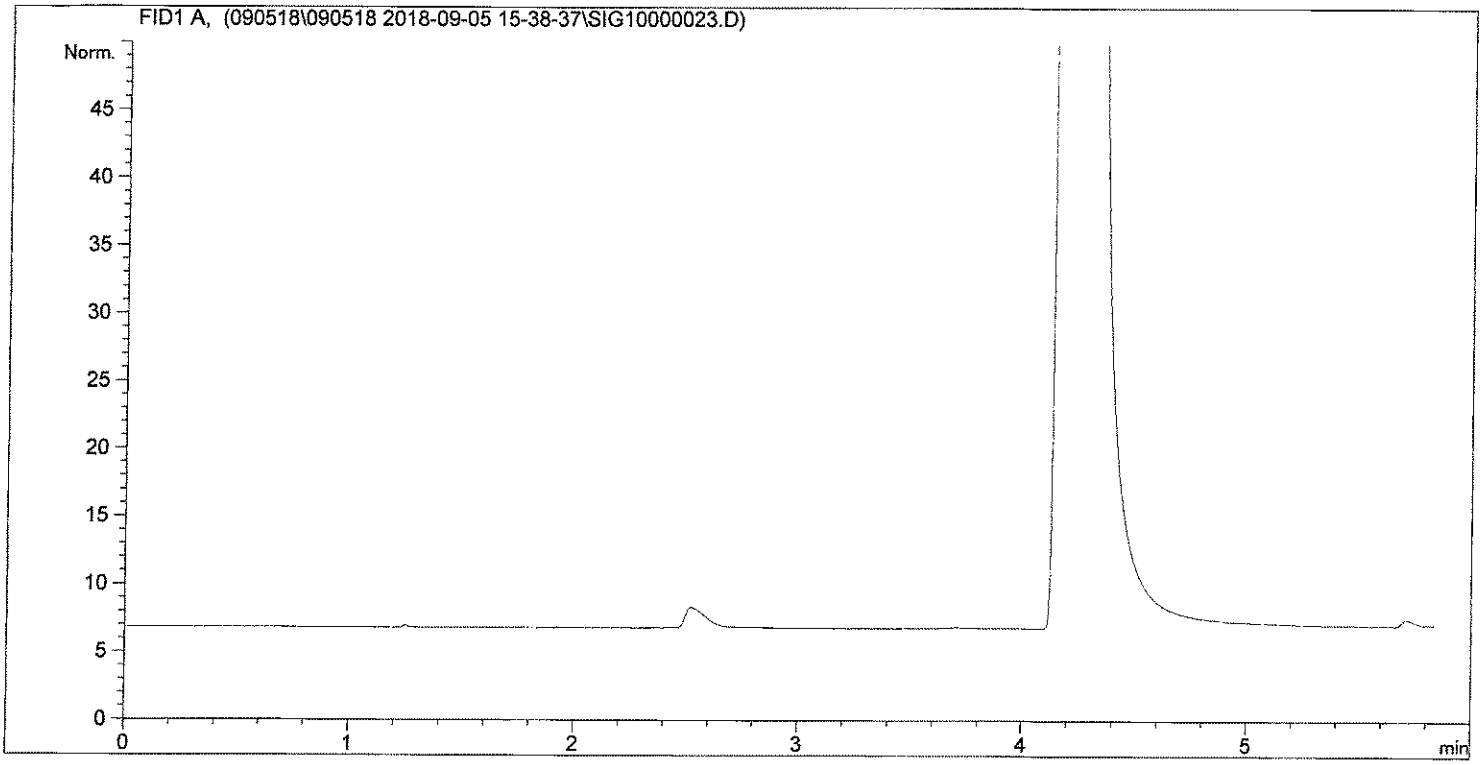
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000023.D
Sample Name: GSL_180834-013F

Acq. Operator : edecker Seq. Line : 5
Acq. Instrument : GC#10 Location : Vial 11
Injection Date : 9/5/2018 6:00:26 PM Inj : 2
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M
Last changed : 9/5/2018 3:32:14 PM by edecker
Analysis Method : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed : 9/6/2018 8:54:15 AM by edecker
(modified after loading)
Sample Info : GSL_180834-013(Front)
Method:308



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

EWS 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10OO0023.D
Sample Name: GSL_180834-013F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

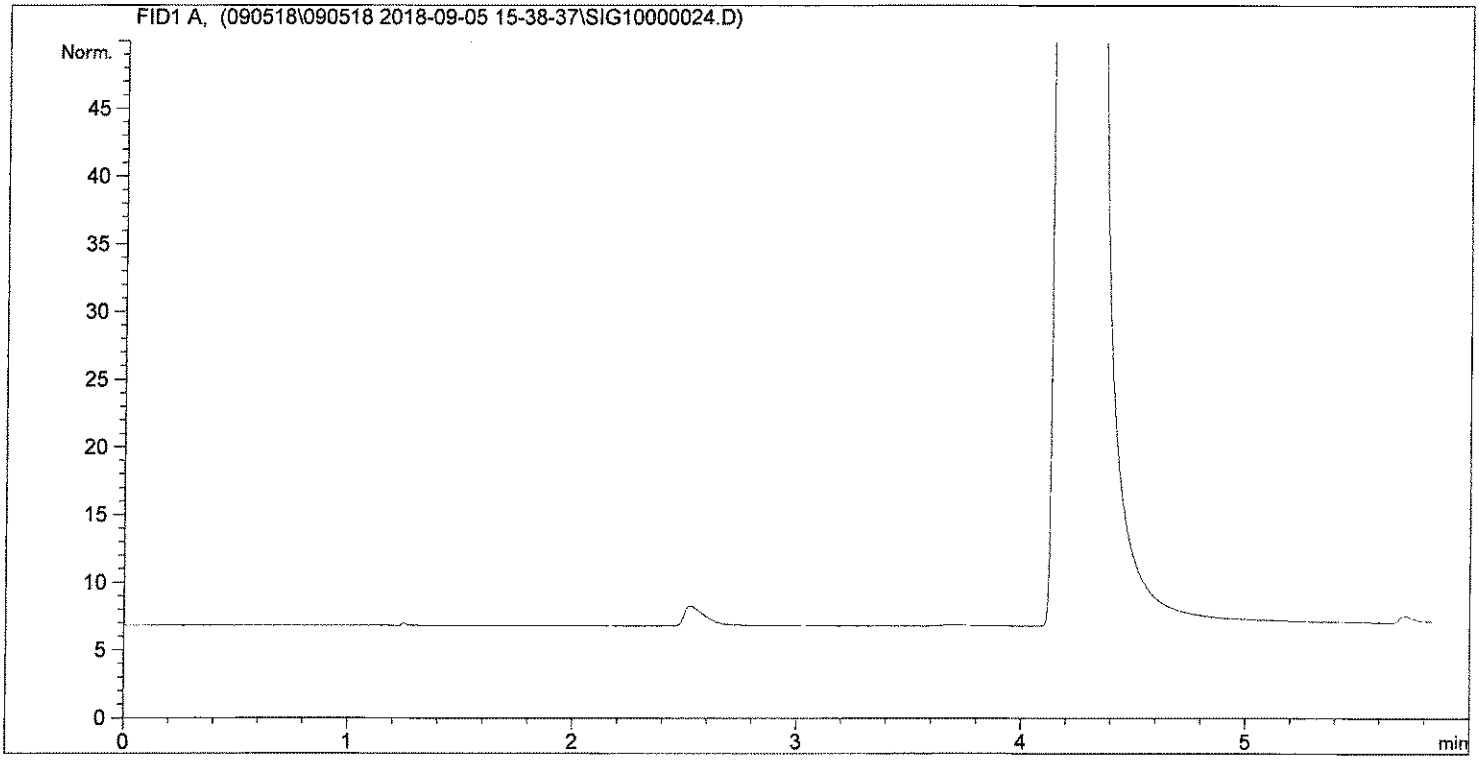
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000024.D
Sample Name: GSL_180834-013B

```
Acq. Operator    : edecker                          Seq. Line :   6
Acq. Instrument  : GC#10                             Location : Vial 12
Injection Date   : 9/5/2018 6:17:42 PM                   Inj :   1
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:54:15 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-013(Back)
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type     Area      Amt/Area    Amount    Grp   Name
 [min]          [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591           -           -          -          Methanol

Totals :                                0.00000
```

EVD 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000024.D
Sample Name: GSL_180834-013B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

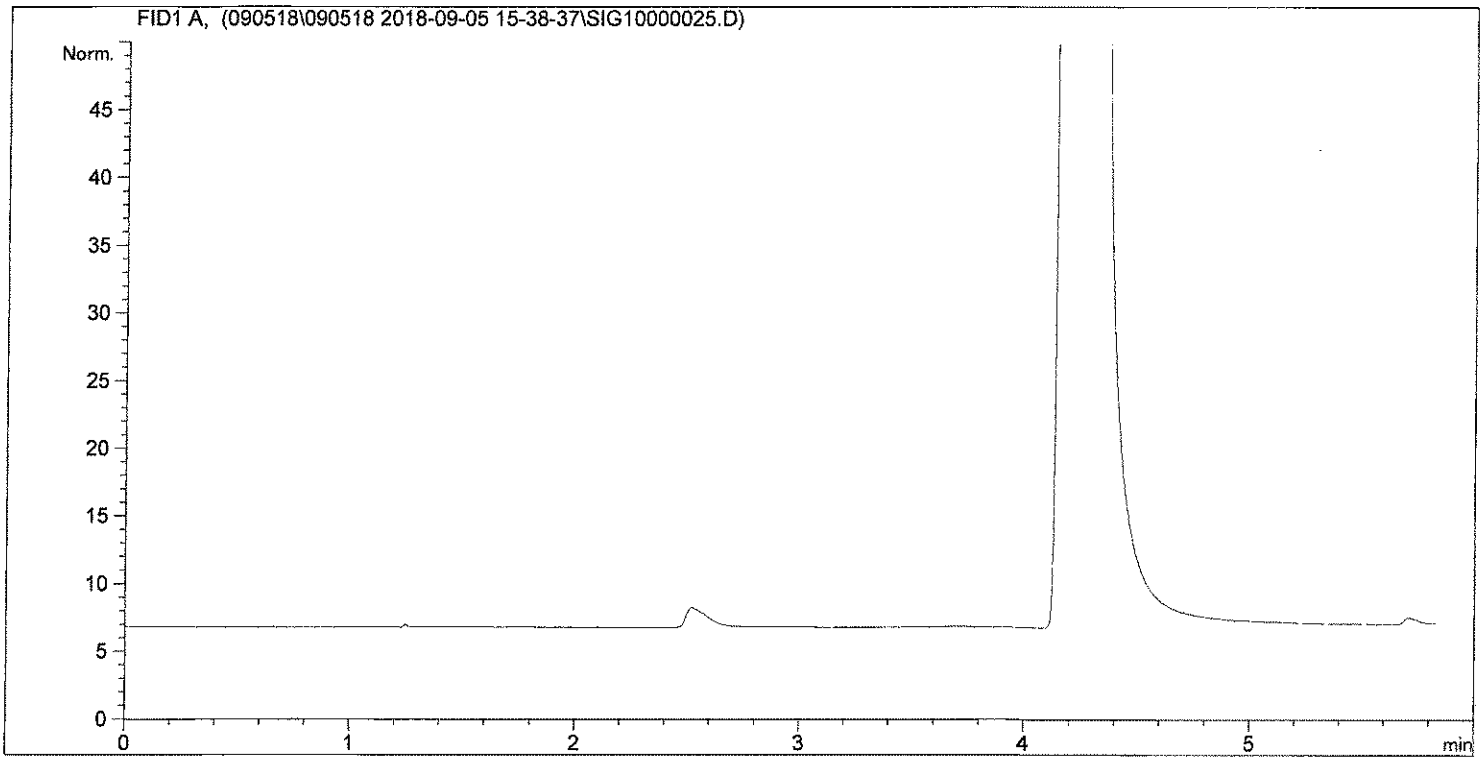
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000025.D
Sample Name: GSL_180834-013B

Acq. Operator	: edecker	Seq. Line	: 6
Acq. Instrument	: GC#10	Location	: Vial 12
Injection Date	: 9/5/2018 6:35:01 PM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:54:15 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-013(Back) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

ES 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000025.D
Sample Name: GSL_180834-013B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

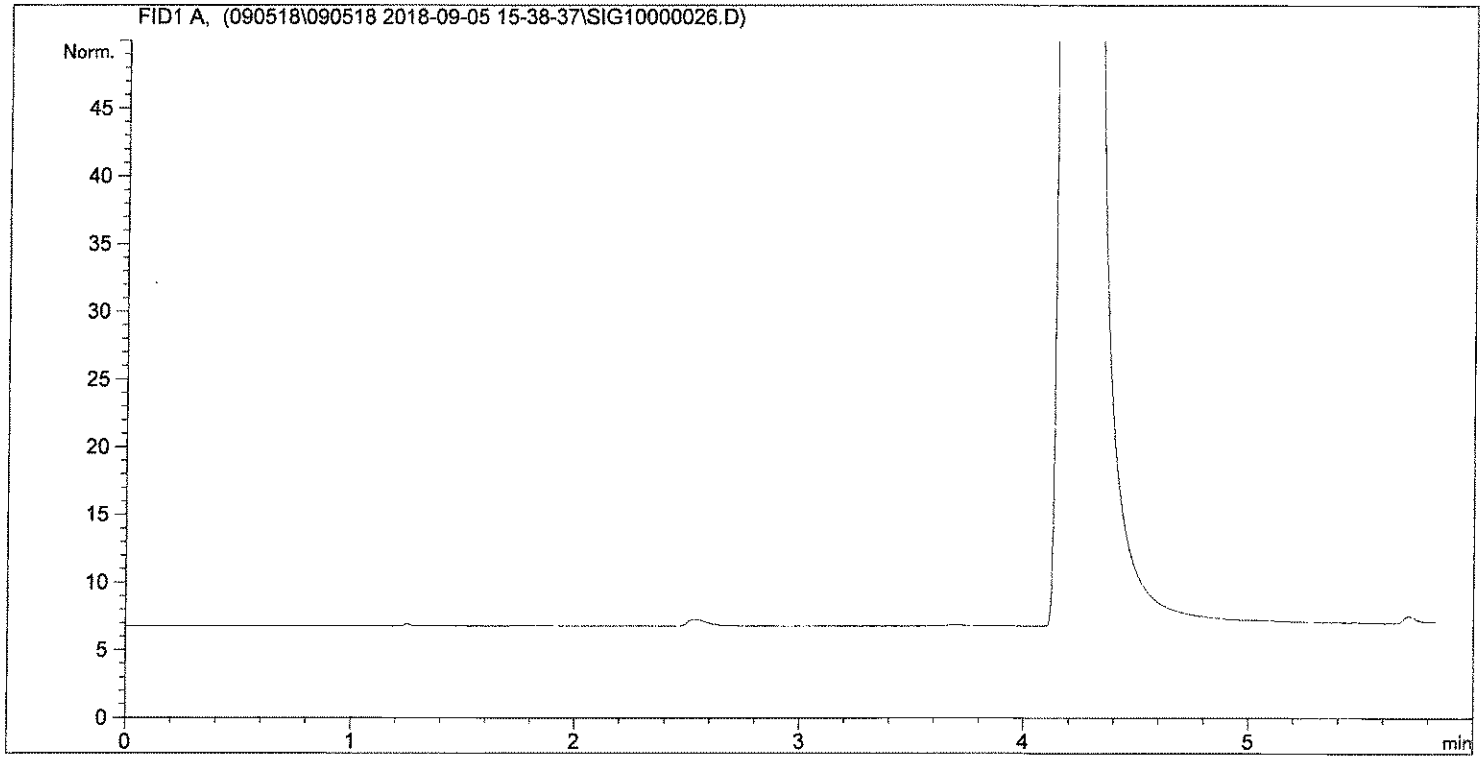
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000026.D
Sample Name: GSL_180834-014F

Acq. Operator	: edecker	Seq. Line	: 7
Acq. Instrument	: GC#10	Location	: Vial 13
Injection Date	: 9/5/2018 6:52:22 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:54:15 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-014(Front) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

GS 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000026.D
Sample Name: GSL_180834-014F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

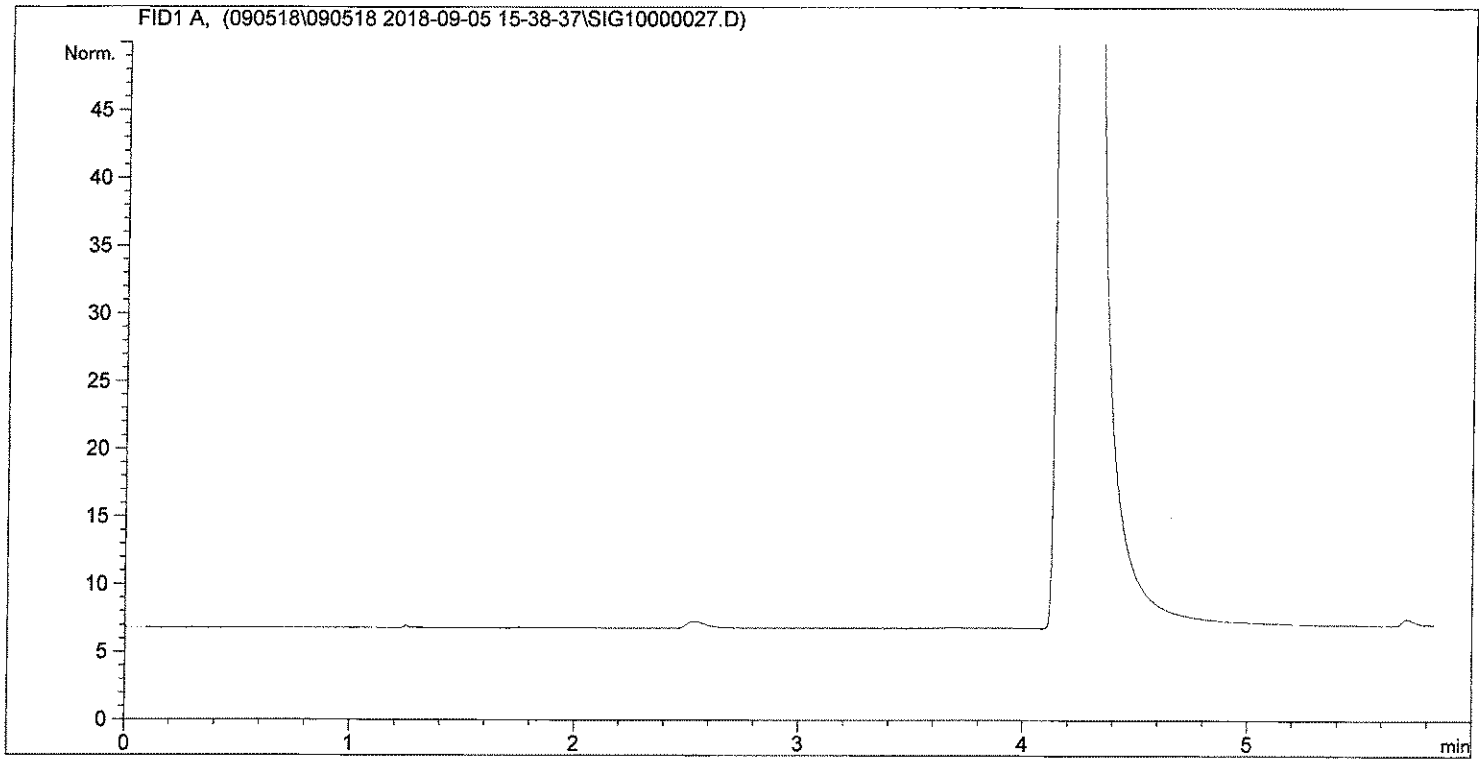
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000027.D
Sample Name: GSL_180834-014F

Acq. Operator	: edecker	Seq. Line	: 7
Acq. Instrument	: GC#10	Location	: Vial 13
Injection Date	: 9/5/2018 7:09:49 PM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:54:15 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-014(Front) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

EW 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000027.D
Sample Name: GSL_180834-014F

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

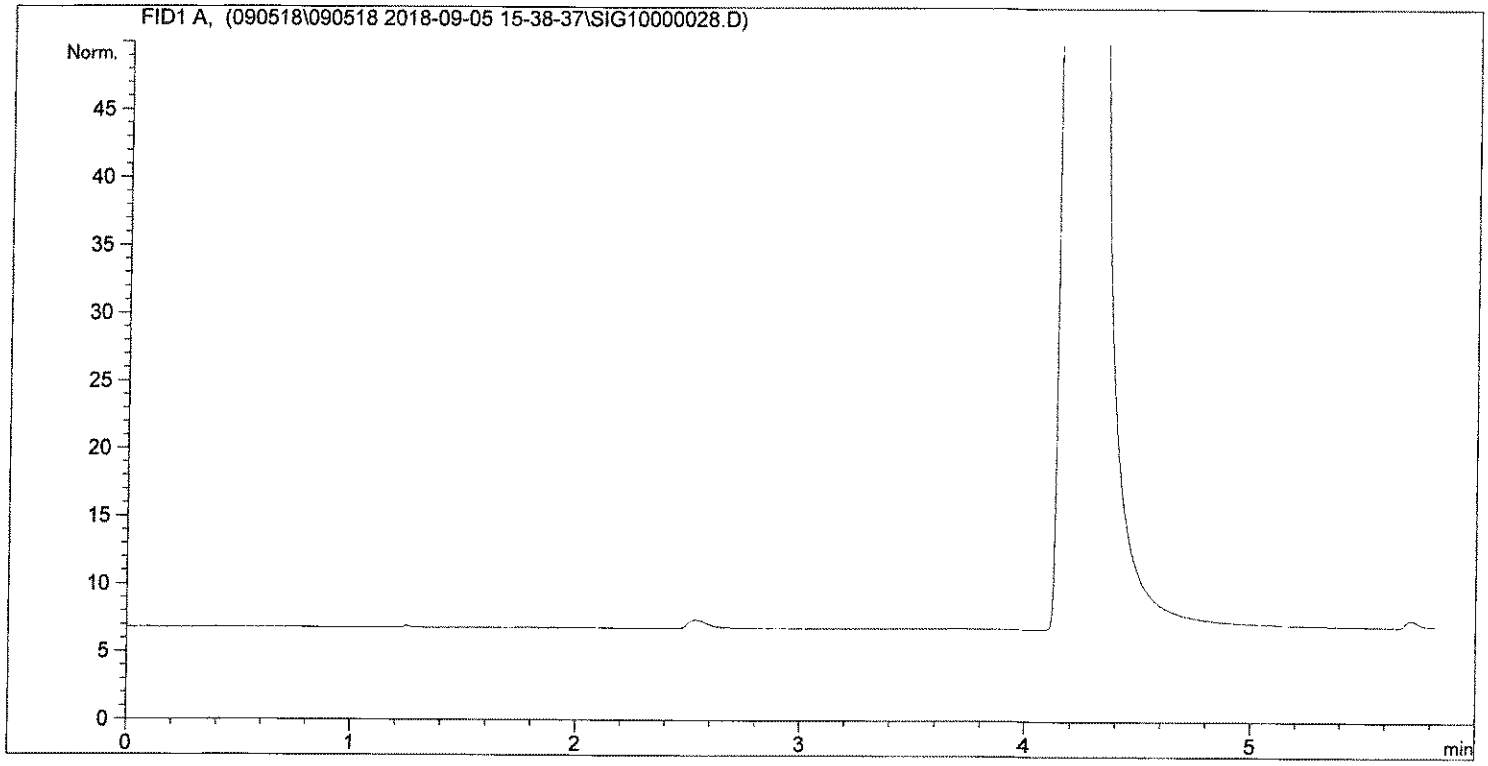
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000028.D
Sample Name: GSL_180834-014B

Acq. Operator	: edecker	Seq. Line	: 8
Acq. Instrument	: GC#10	Location	: Vial 14
Injection Date	: 9/5/2018 7:27:08 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:54:15 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-014(Back) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.591		-	-	-		Methanol

Totals : 0.00000

ES 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000028.D
Sample Name: GSL_180834-014B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

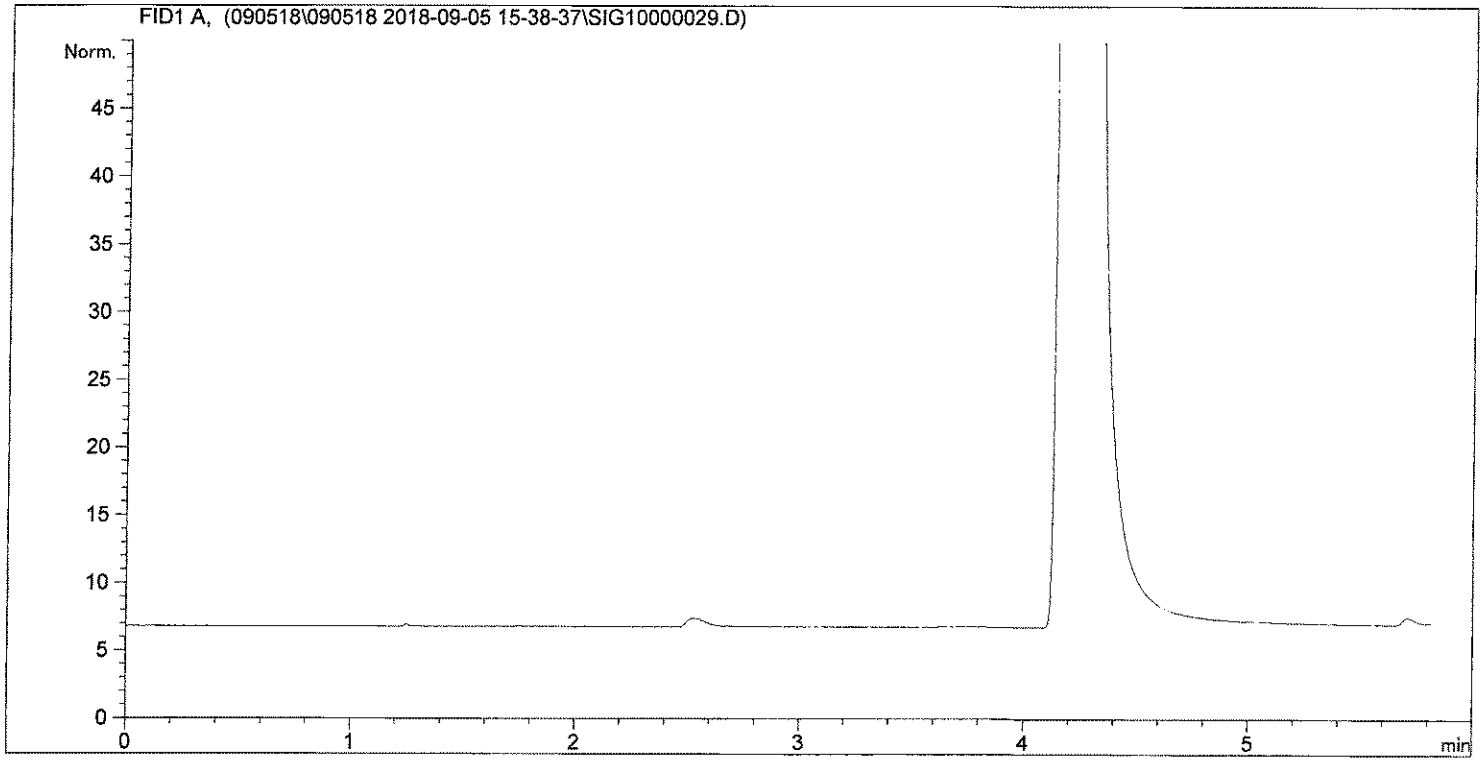
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000029.D
Sample Name: GSL_180834-014B

```
Acq. Operator    : edecker                          Seq. Line :   8
Acq. Instrument  : GC#10                             Location : Vial 14
Injection Date   : 9/5/2018 7:44:27 PM                   Inj :   2
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:54:15 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-014(Back)
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.591            -           -          -          Methanol

Totals :                                  0.00000
```

GS
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Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG100O0029.D
Sample Name: GSL_180834-014B

1 Warnings or Errors :

Warning : Calibrated compound(s) not found

==========

Area Percent Report

==========

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [pA*s]	Area %	Name
1	3.591		0.0000	0.00000	0.00000	Methanol

Totals : 0.00000 0.0000
Uncalibrated Peaks: n.a.

1 Warnings or Errors :

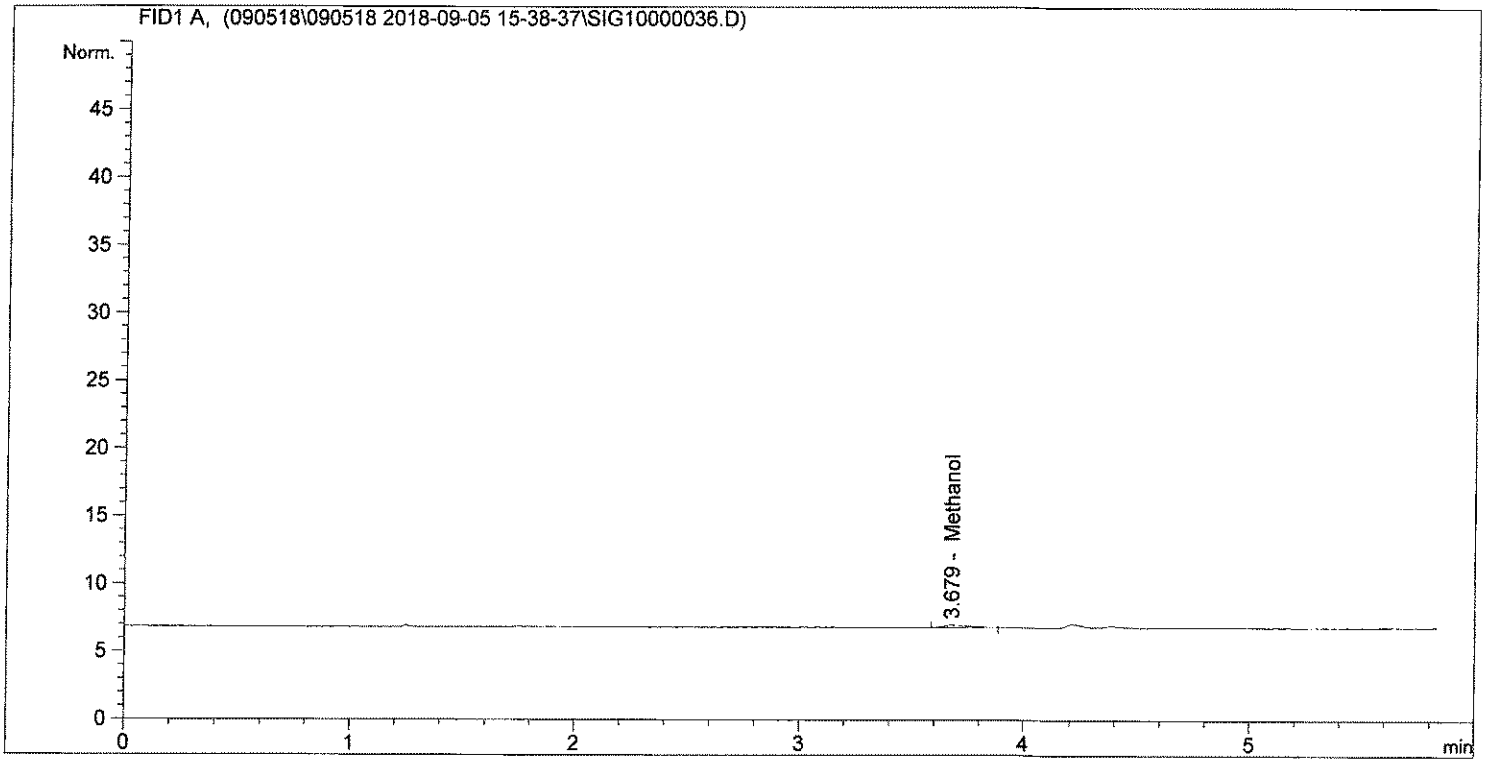
Warning : Calibrated compound(s) not found

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000036.D
Sample Name: GSL_180834-007

Acq. Operator	: edecker	Seq. Line	: 12
Acq. Instrument	: GC#10	Location	: Vial 20
Injection Date	: 9/5/2018 9:46:01 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:55:52 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-007 Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/4/2018 4:52:18 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.679	BB	1.28503	2.97362	3.82119		Methanol
Totals :				3.82119		

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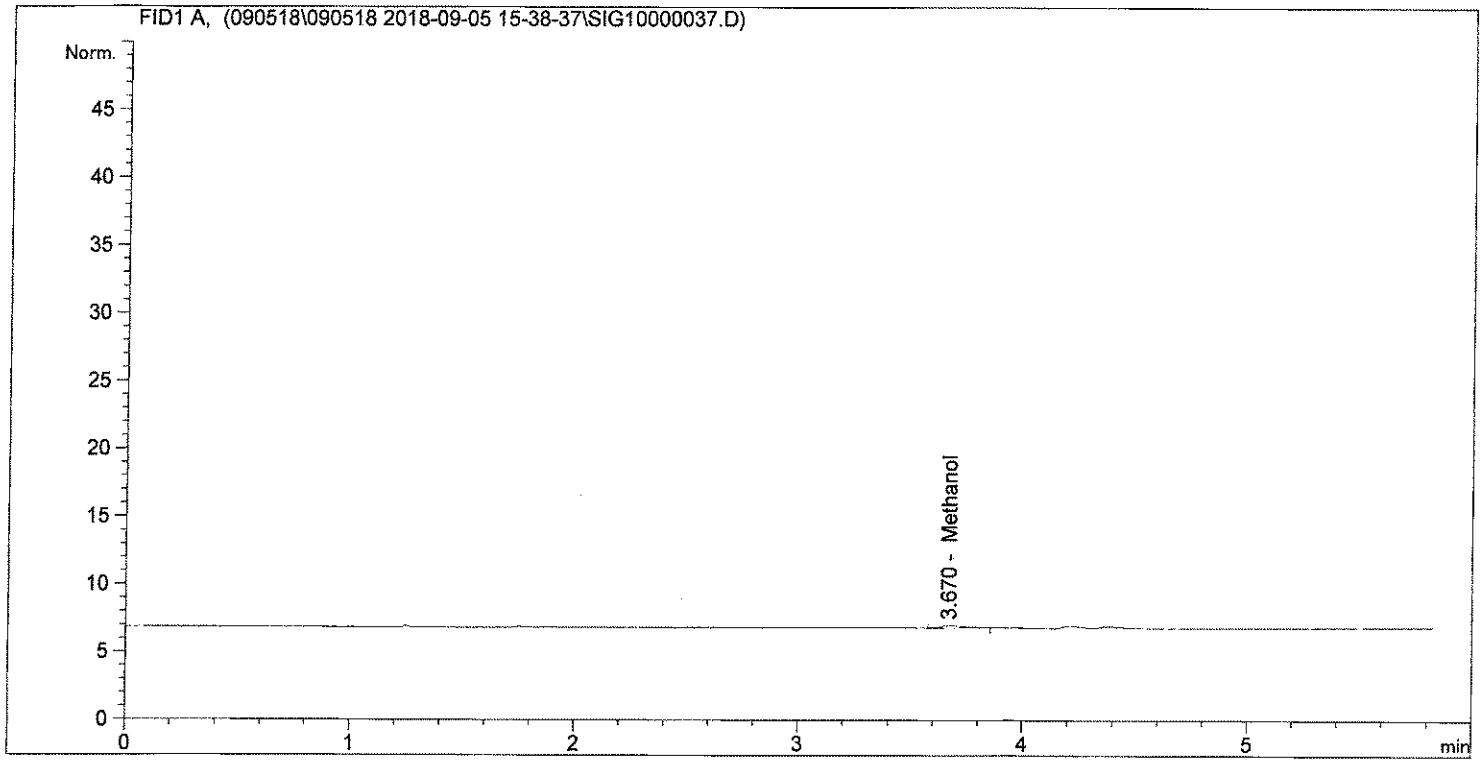
Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000036.D
Sample Name: GSL_180834-007

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000037.D
Sample Name: GSL_180834-007

```
Acq. Operator    : edecker                          Seq. Line :  12
Acq. Instrument  : GC#10                             Location : Vial 20
Injection Date   : 9/5/2018 10:03:12 PM                  Inj :   2
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:56:24 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-007
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/4/2018 4:52:18 PM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                 [ppm]
-------|------|----------|----------|----------|--|------------------
  3.670 BB        1.27640    2.97362    3.79553    Methanol

Totals :                                 3.79553
```

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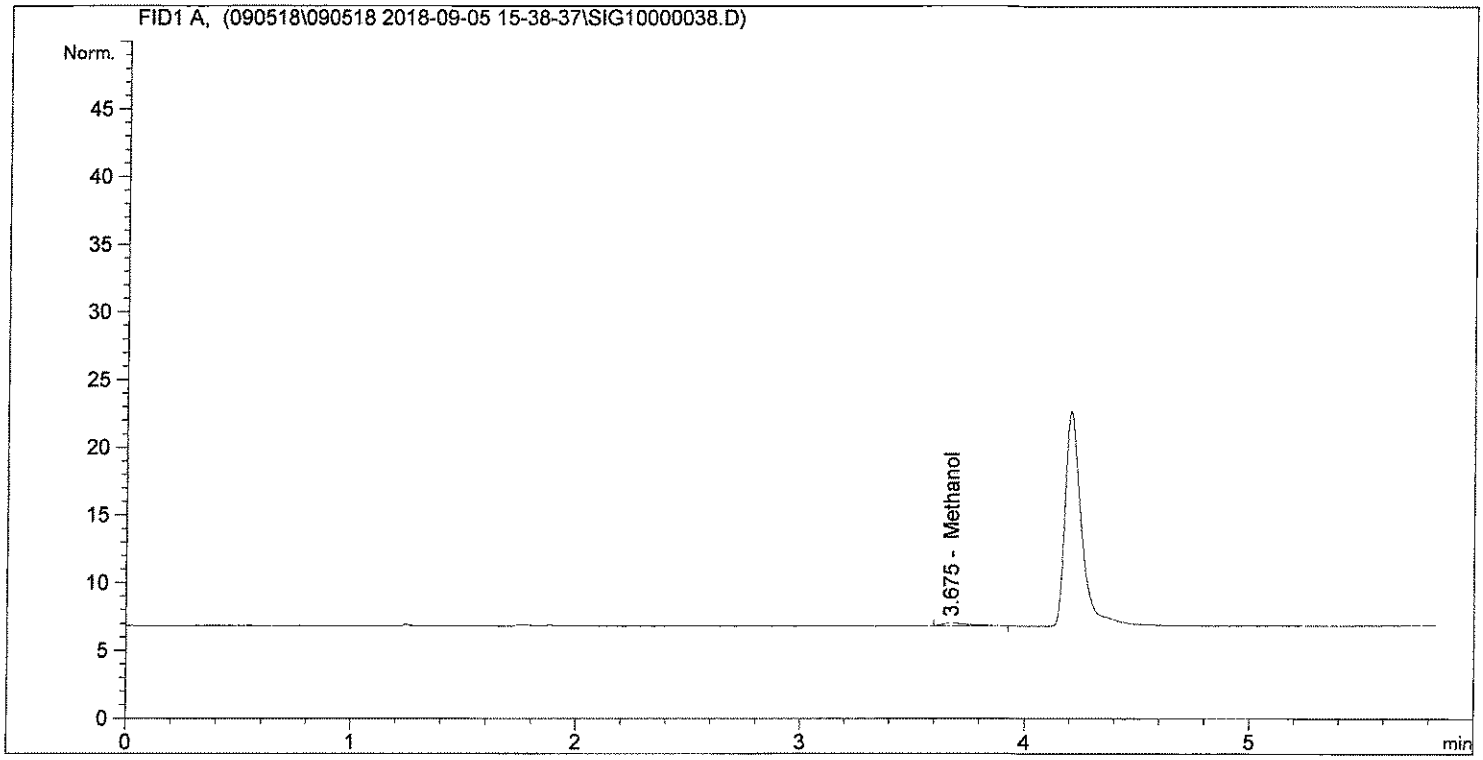
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10O00038.D
Sample Name: GSL_180834-008

```
Acq. Operator    : edecker                          Seq. Line :  13
Acq. Instrument  : GC#10                             Location : Vial 21
Injection Date   : 9/5/2018 10:20:39 PM                   Inj :   1
                                                   Inj Volume : 1 µl
Acq. Method      : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_
                   090418.M
Last changed     : 9/5/2018 3:32:14 PM by edecker
Analysis Method  : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed     : 9/6/2018 8:58:57 AM by edecker
                   (modified after loading)
Sample Info      : GSL_180834-008
                   Method:308
```



External Standard Report

```
Sorted By             :      Signal
Calib. Data Modified  :      9/6/2018 8:59:02 AM
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime  Type      Area      Amt/Area    Amount    Grp   Name
 [min]           [pA*s]                  [ppm]
-------|------|----------|----------|----------|--|-----------------
  3.675 BB        1.61439    2.97362    4.80057     Methanol

Totals :                                 4.80057
```

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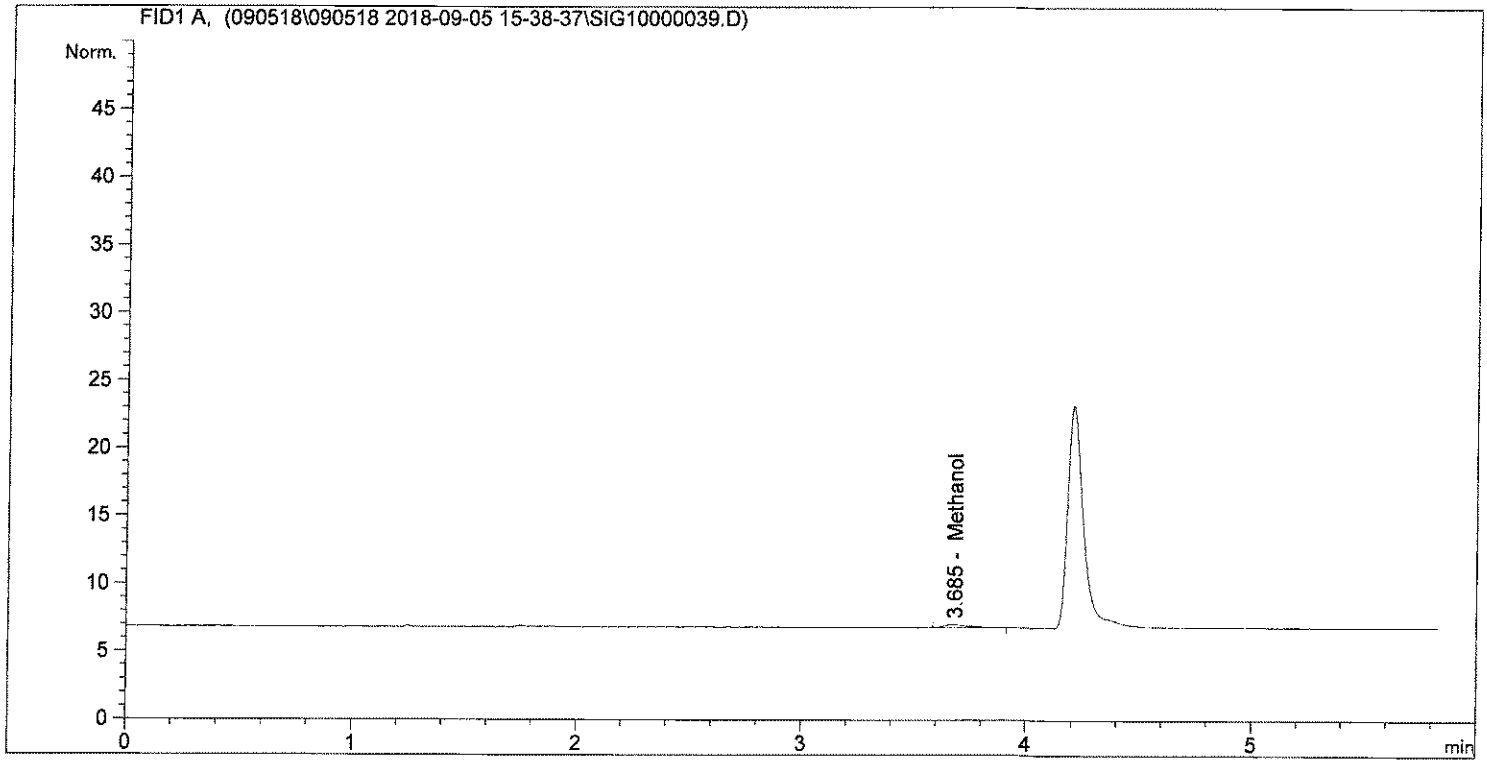
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000039.D
Sample Name: GSL_180834-008

Acq. Operator	: edecker	Seq. Line	: 13
Acq. Instrument	: GC#10	Location	: Vial 21
Injection Date	: 9/5/2018 10:38:00 PM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 8:58:57 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-008 Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:02 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.685	BB	1.64197	2.97362	4.88259		Methanol
Totals :				4.88259		

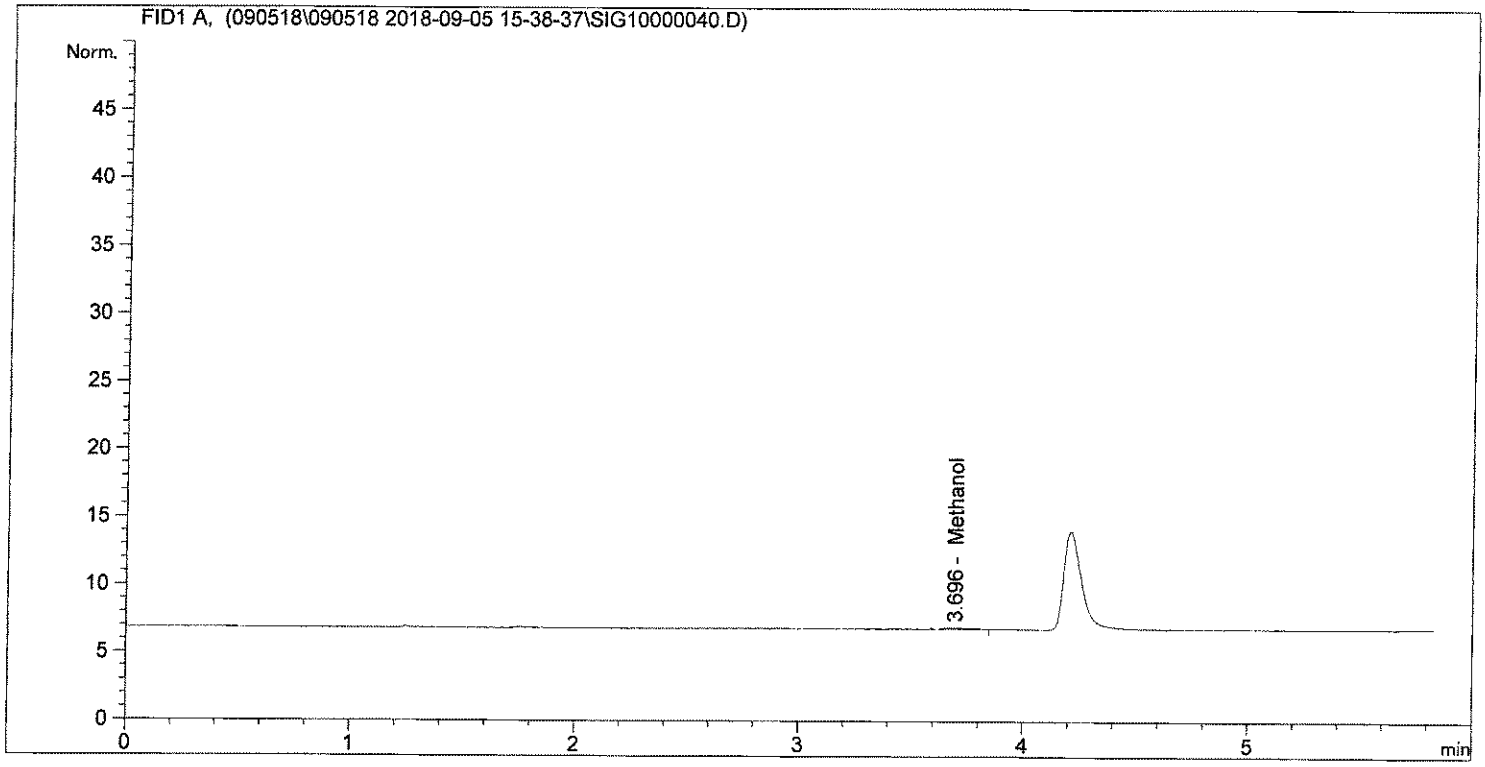
EW 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000039.D
Sample Name: GSL_180834-008

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000040.D
Sample Name: GSL_180834-009

Acq. Operator	: edecker	Seq. Line	: 14
Acq. Instrument	: GC#10	Location	: Vial 22
Injection Date	: 9/5/2018 10:55:21 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:00:04 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-009DL(5X) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.696	BB	5.65037e-1	2.97362	1.68020		Methanol
Totals :				1.68020		

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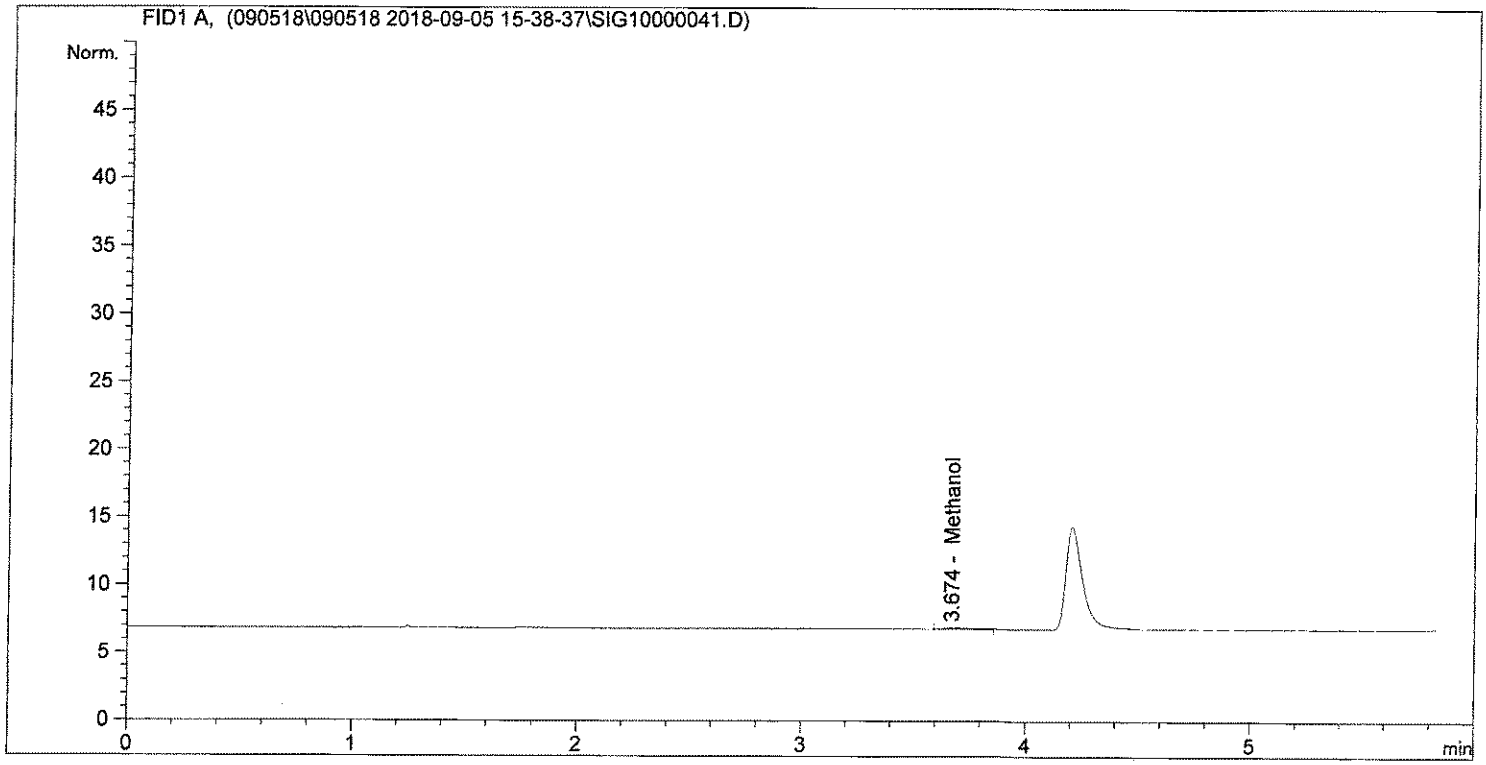
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000041.D
Sample Name: GSL_180834-009

Acq. Operator	: edecker	Seq. Line	: 14
Acq. Instrument	: GC#10	Location	: Vial 22
Injection Date	: 9/5/2018 11:12:38 PM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:00:04 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-009DL(5X) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.674	BB	5.84237e-1	2.97362	1.73730		Methanol
Totals :				1.73730		

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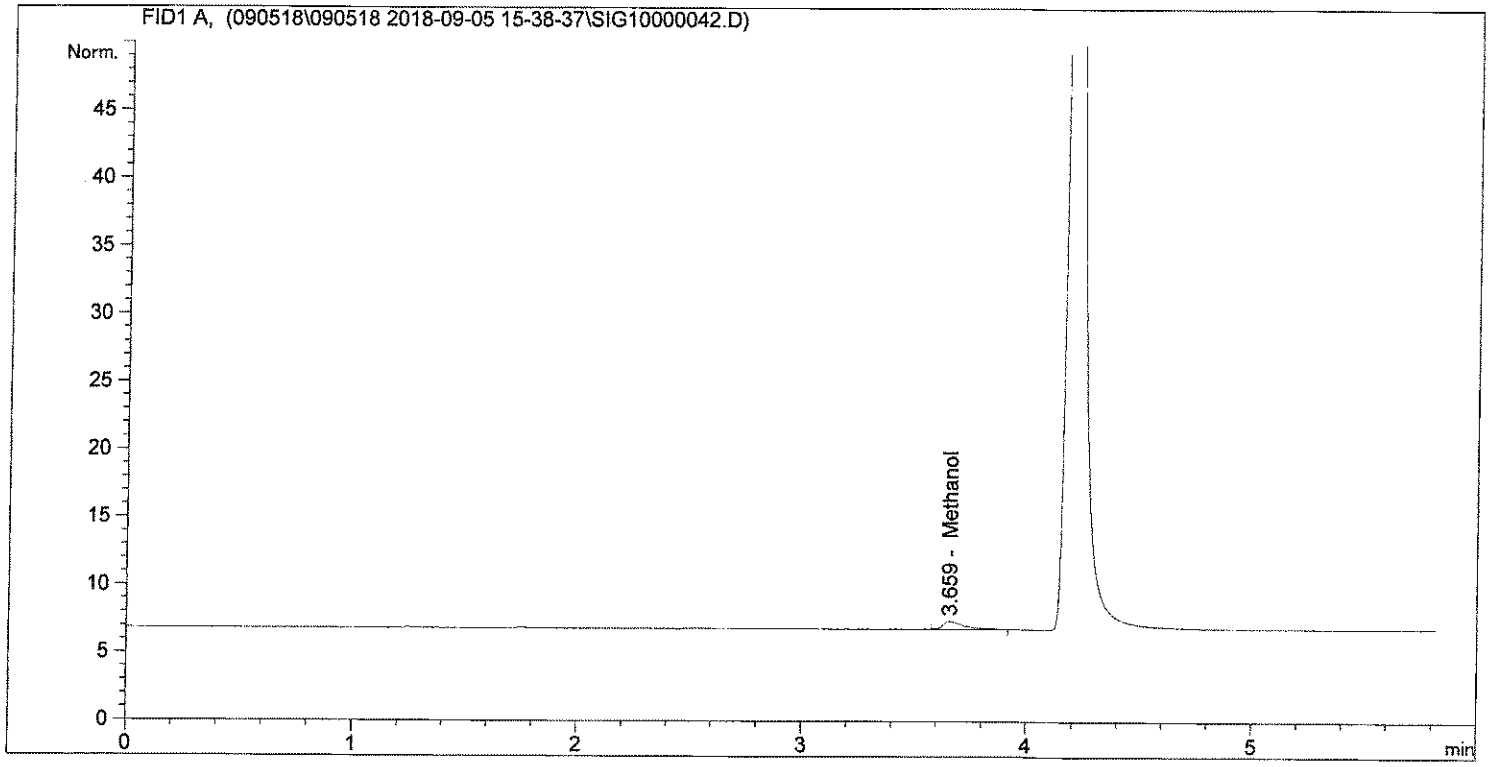
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000042.D
Sample Name: GSL_180834-009MS

Acq. Operator	: edecker	Seq. Line	: 15
Acq. Instrument	: GC#10	Location	: Vial 23
Injection Date	: 9/5/2018 11:30:03 PM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:01:19 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-009MS(10ppm MeOH) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.659	BV	3.85814	2.97362	11.47262		Methanol
Totals :				11.47262		

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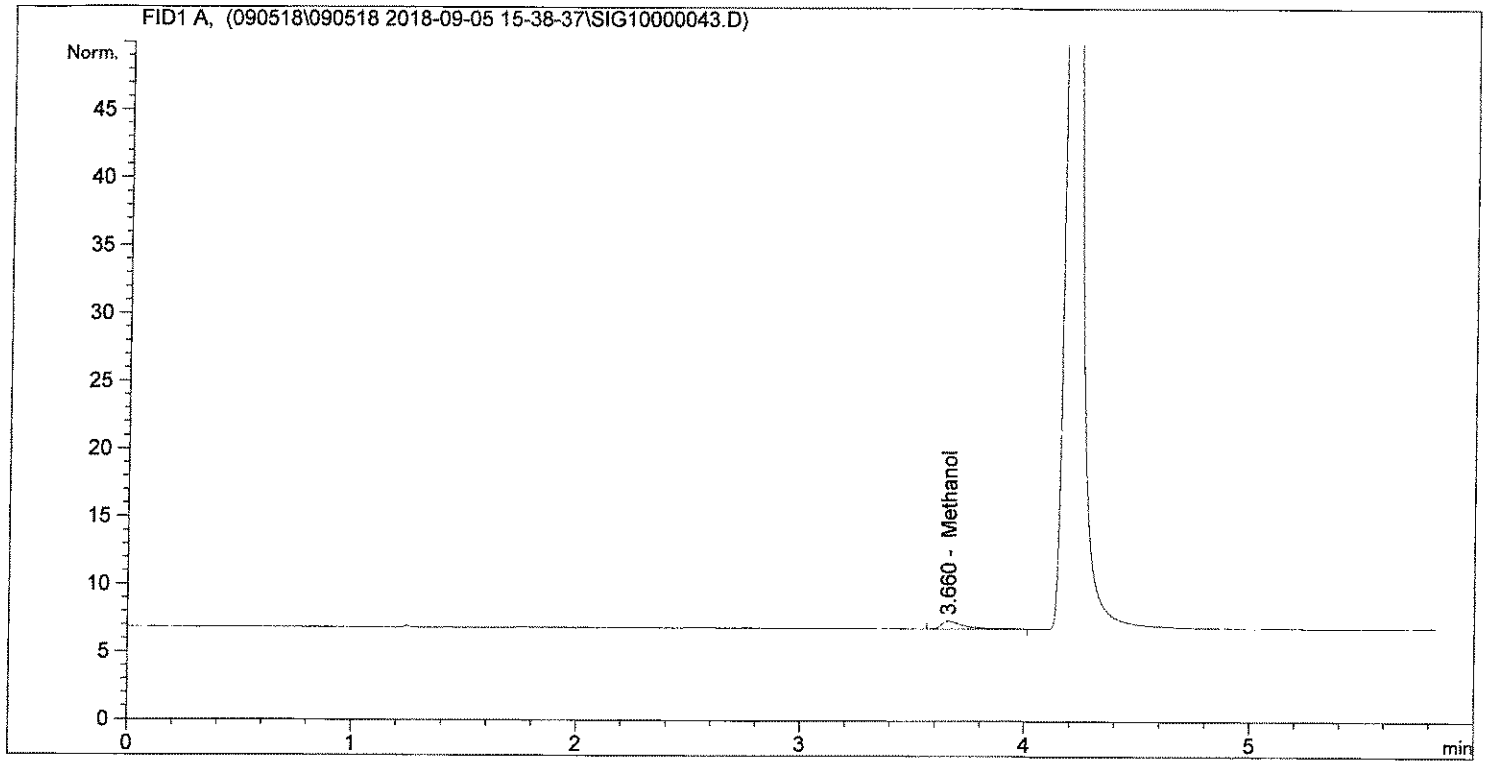
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000043.D
Sample Name: GSL_180834-009MS

Acq. Operator	: edecker	Seq. Line	: 15
Acq. Instrument	: GC#10	Location	: Vial 23
Injection Date	: 9/5/2018 11:47:22 PM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:01:19 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-009MS(10ppm MeOH) Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.660	BB	3.90894	2.97362	11.62368		Methanol
Totals :				11.62368		

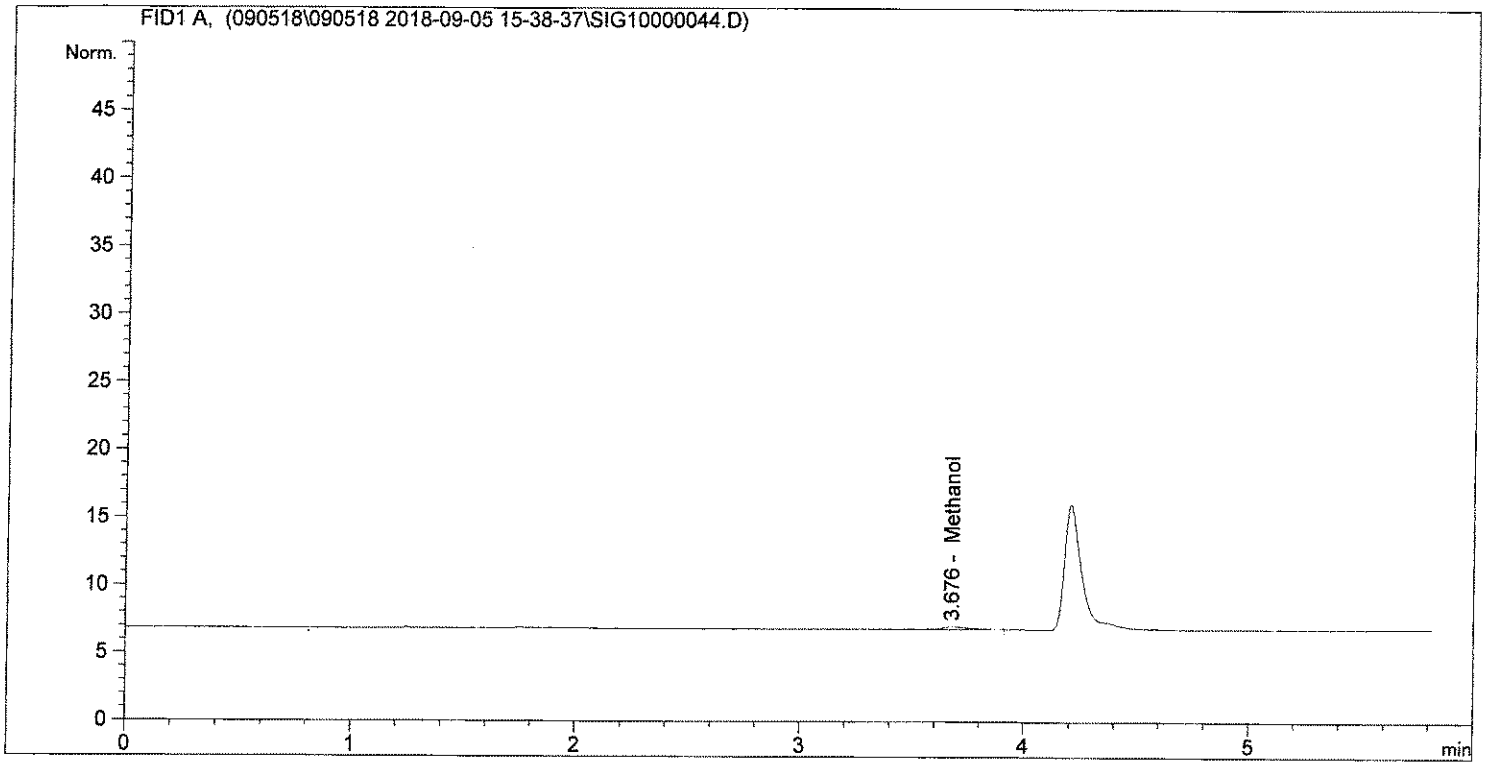
GVO 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10O0043.D
Sample Name: GSL_180834-009MS

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000044.D
Sample Name: GSL_180834-010

Acq. Operator : edecker Seq. Line : 16
Acq. Instrument : GC#10 Location : Vial 24
Injection Date : 9/6/2018 12:04:44 AM Inj : 1
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M
Last changed : 9/5/2018 3:32:14 PM by edecker
Analysis Method : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed : 9/6/2018 9:01:19 AM by edecker
(modified after loading)
Sample Info : GSL_180834-010
Method:308



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.676	BB	1.59270	2.97362	4.73607		Methanol
Totals :				4.73607		

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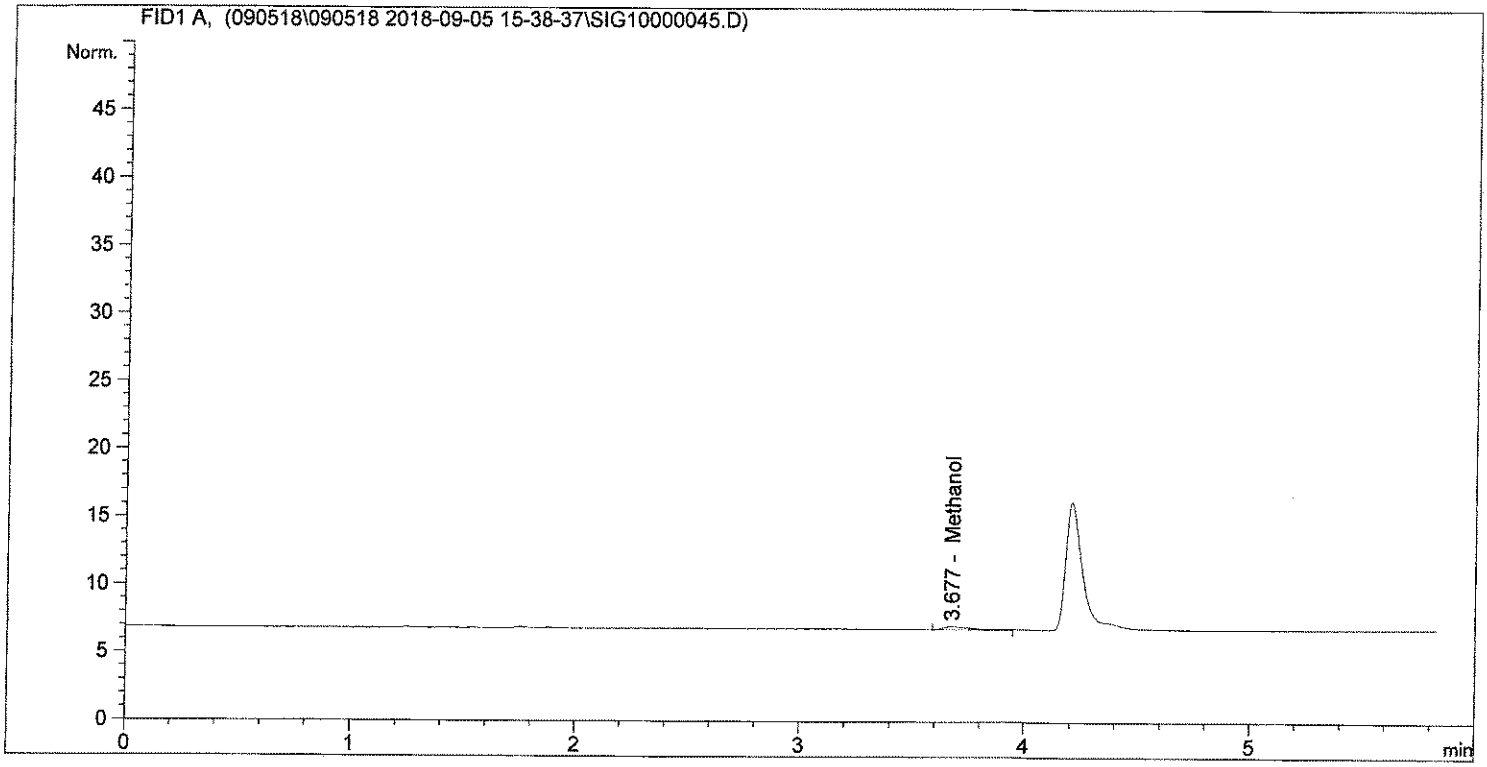
*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000045.D
Sample Name: GSL_180834-010

Acq. Operator : edecker
Acq. Instrument : GC#10
Injection Date : 9/6/2018 12:22:17 AM
Seq. Line : 16
Location : Vial 24
Inj : 2
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M
Last changed : 9/5/2018 3:32:14 PM by edecker
Analysis Method : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed : 9/6/2018 9:06:37 AM by edecker
(modified after loading)
Sample Info : GSL_180834-010
Method:308



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.677	BB	1.60720	2.97362	4.77920		Methanol
Totals :				4.77920		

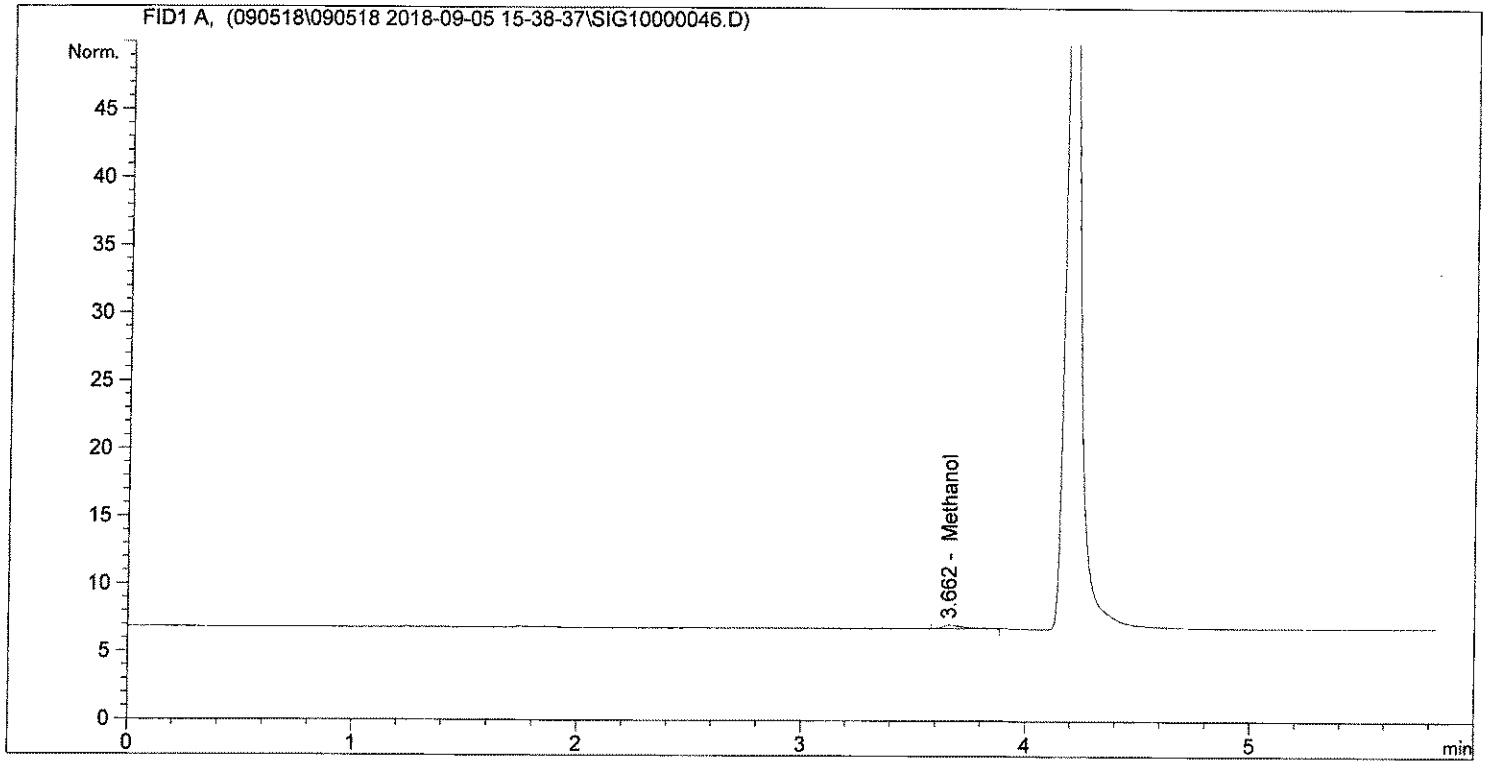
ES 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000045.D
Sample Name: GSL_180834-010

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000046.D
Sample Name: GSL_180834-011

Acq. Operator	: edecker	Seq. Line	: 17
Acq. Instrument	: GC#10	Location	: Vial 25
Injection Date	: 9/6/2018 12:39:30 AM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:06:37 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-011 Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.662	BB	1.74527	2.97362	5.18977		Methanol
Totals :				5.18977		

EVD 9/6/18

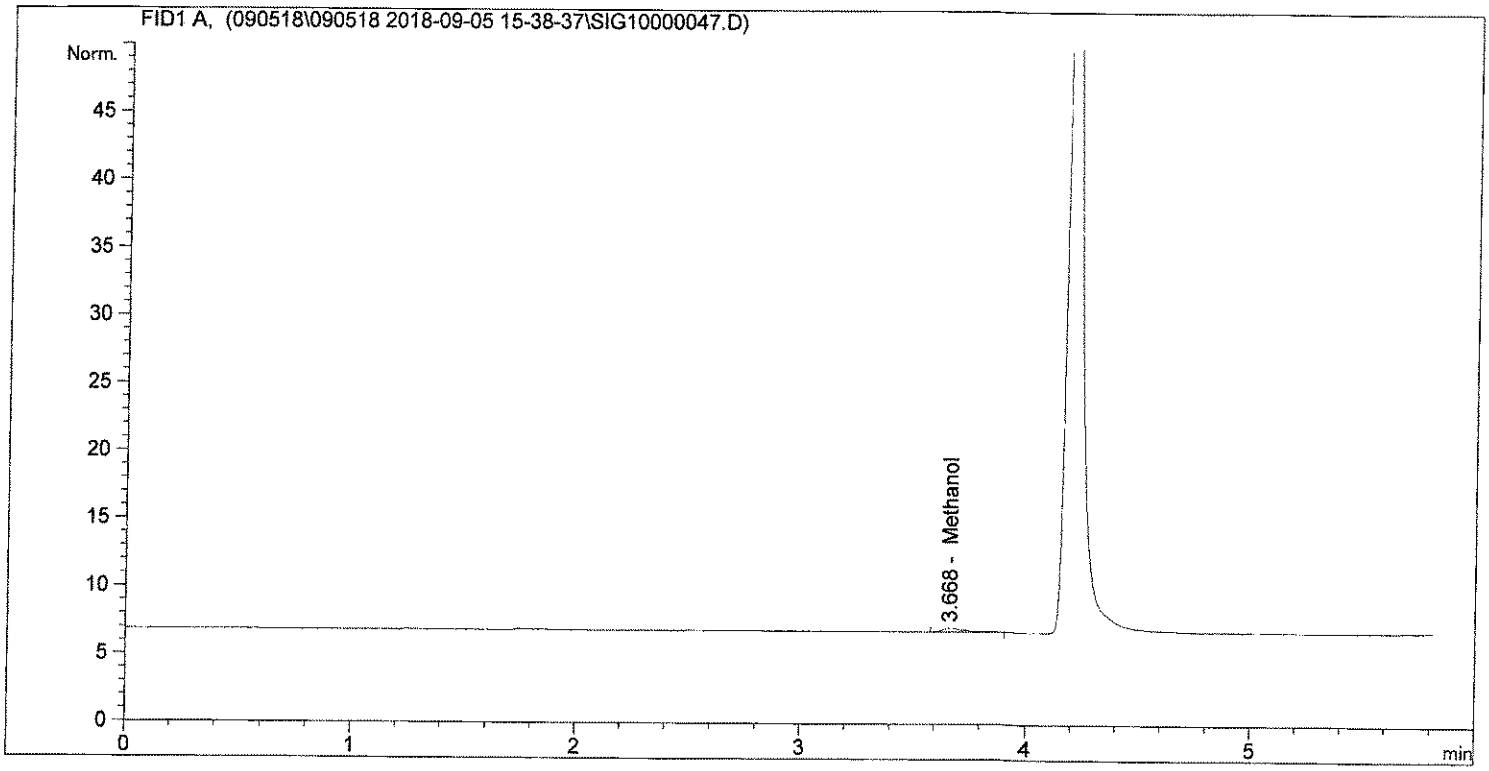
Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10OO0046.D
Sample Name: GSL_180834-011

==========

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG1OO00047.D
Sample Name: GSL_180834-011

Acq. Operator	: edecker	Seq. Line	: 17
Acq. Instrument	: GC#10	Location	: Vial 25
Injection Date	: 9/6/2018 12:56:58 AM	Inj	: 2
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M		
Last changed	: 9/5/2018 3:32:14 PM by edecker		
Analysis Method	: C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M		
Last changed	: 9/6/2018 9:07:13 AM by edecker (modified after loading)		
Sample Info	: GSL_180834-011 Method:308		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

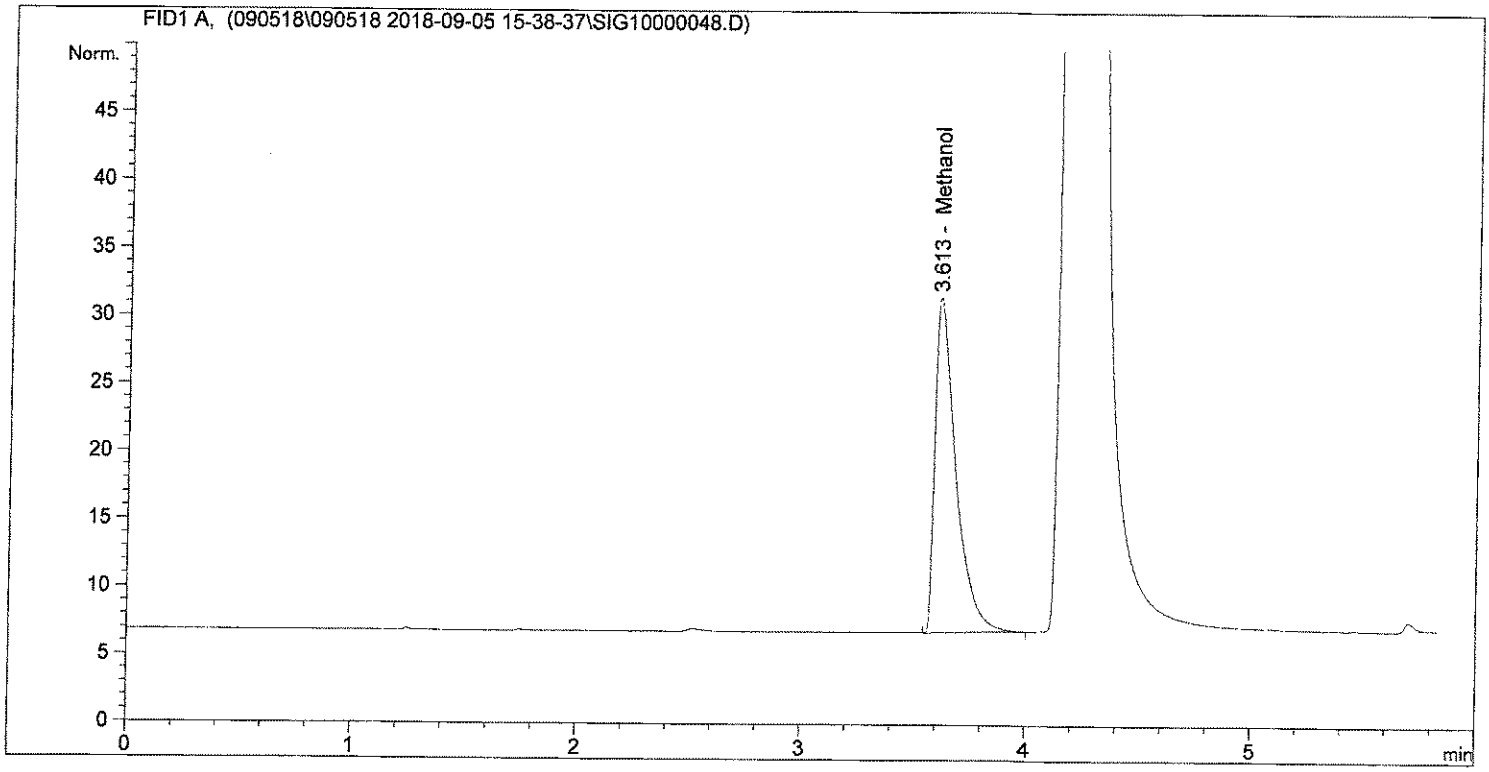
RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.668	BB	1.70067	2.97362	5.05713		Methanol
Totals :				5.05713		

ES 9/6/18

*** End of Report ***

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10000048.D
Sample Name: POST CCV

Acq. Operator : edecker
Acq. Instrument : GC#10
Injection Date : 9/6/2018 1:13:57 AM
Seq. Line : 18
Location : Vial 1
Inj : 1
Inj Volume : 1 µl
Acq. Method : C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\FRONT_MEOH_308_090418.M
Last changed : 9/5/2018 3:32:14 PM by edecker
Analysis Method : C:\CHEM32\1\METHODS\FRONT_MEOH_308_090418.M
Last changed : 9/6/2018 9:07:34 AM by edecker
(modified after loading)
Sample Info : POST CCV(500ppm MeOH)
Method:308



External Standard Report

Sorted By : Signal
Calib. Data Modified : 9/6/2018 8:59:33 AM
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A,

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [ppm]	Grp	Name
3.613	BB	157.69495	2.97362	468.92436		Methanol
Totals :				468.92436		

EW 9/6/18

Data File C:\CHEM32\1\DATA\090518\090518 2018-09-05 15-38-37\SIG10O00048.D
Sample Name: POST CCV

*** End of Report ***

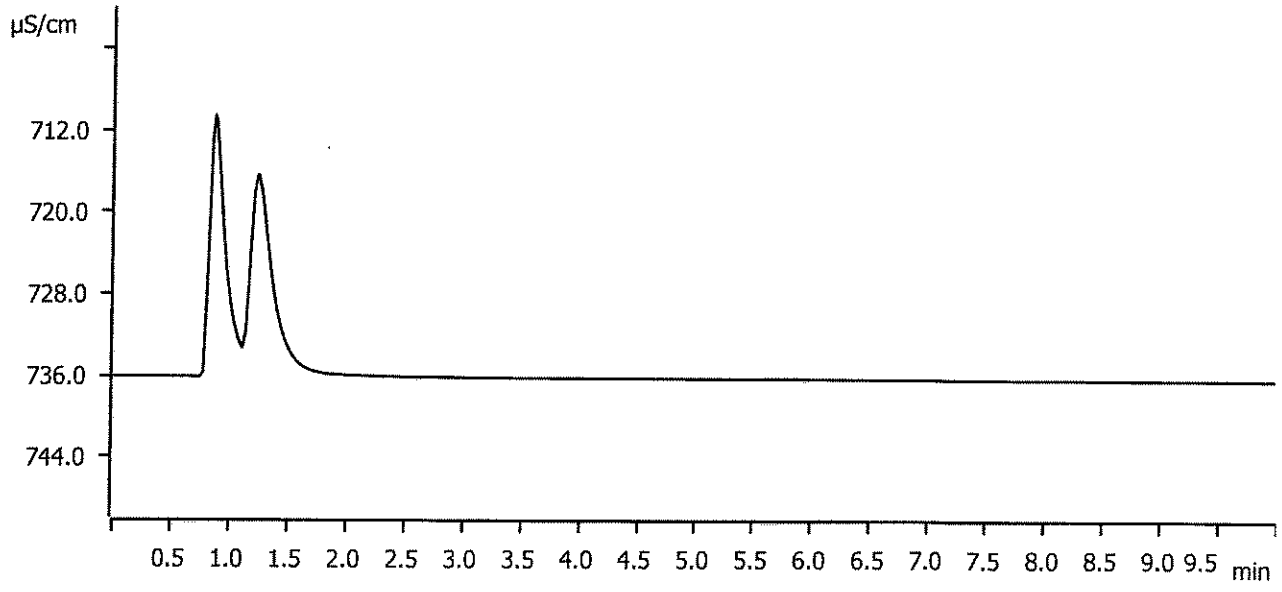
Sample data

Ident	BLANK
Sample type	Sample
Determination start	2018-08-28 13:09:24 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	9.01	MPa
Temperature	30.0	°C

Cations



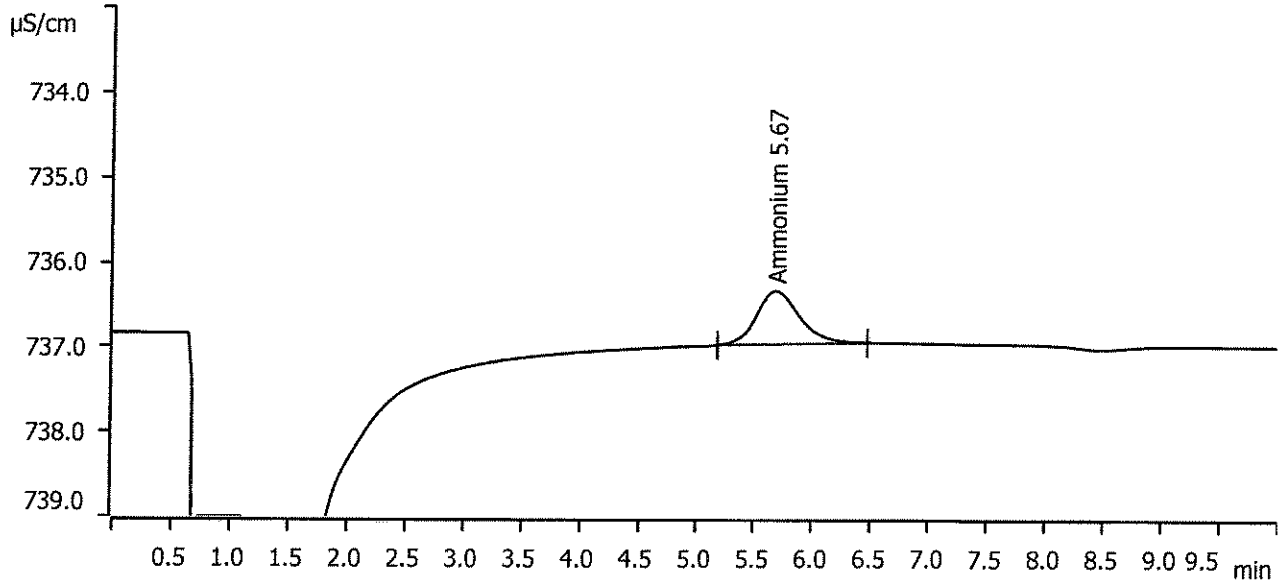
Sample data

Ident	CCV-2ppm
Sample type	Sample
Determination start	2018-08-28 13:48:41 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(µS/cm) x min	µS/cm	ppm	
1	5.673	0.2682	0.627	2.181	Ammonium

8/29/18

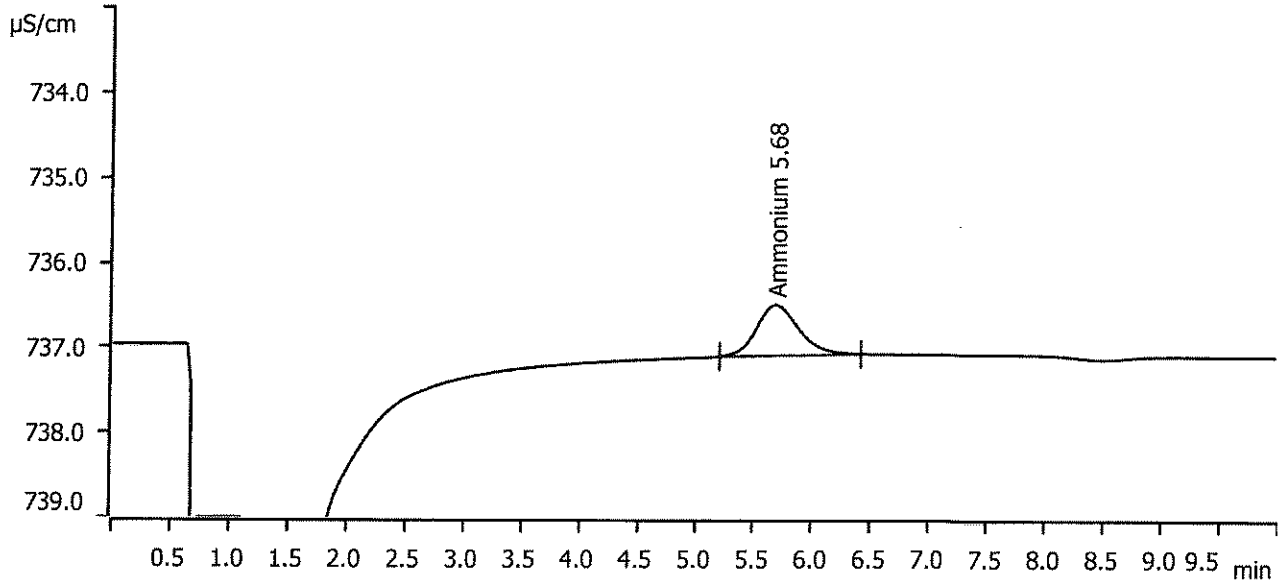
Sample data

Ident	LCS-2ppm
Sample type	Sample
Determination start	2018-08-28 14:01:46 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(µS/cm) x min	µS/cm	ppm	
1	5.678	0.2496	0.597	2.029	Ammonium

28729V8

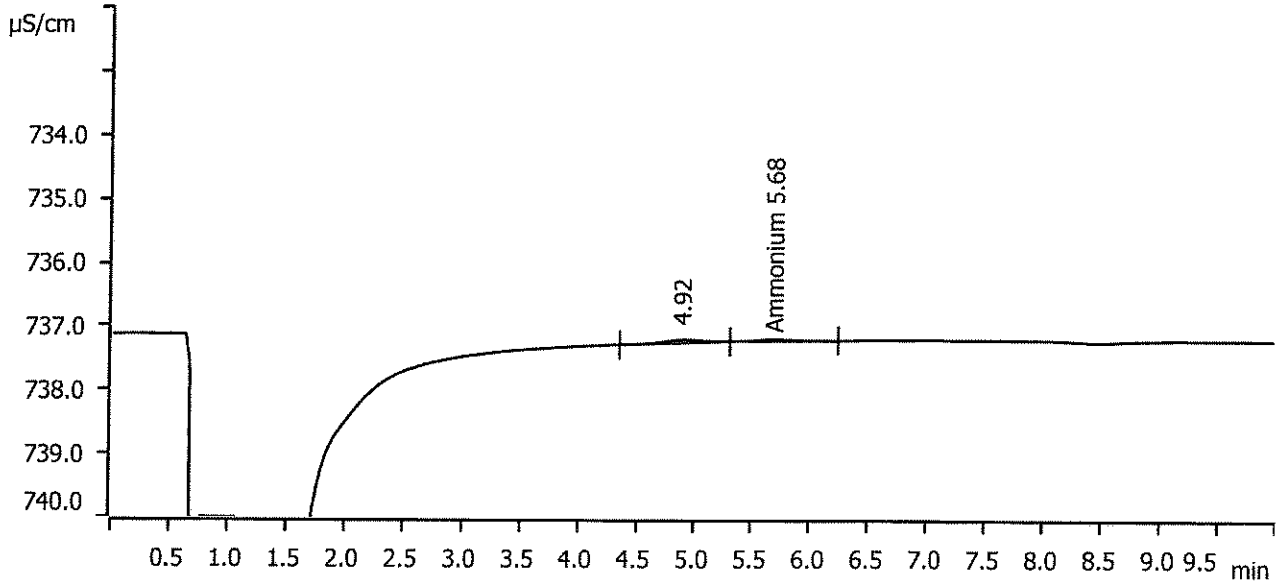
Sample data

Ident	GSL_180834-017
Sample type	Sample
Determination start	2018-08-28 14:27:57 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time min	Area (µS/cm) x min	Height µS/cm	Concentration ppm	Component name
1	4.922	0.0182	0.048	invalid	
2	5.675	0.0098	0.026	0.080	Ammonium

8/29/18

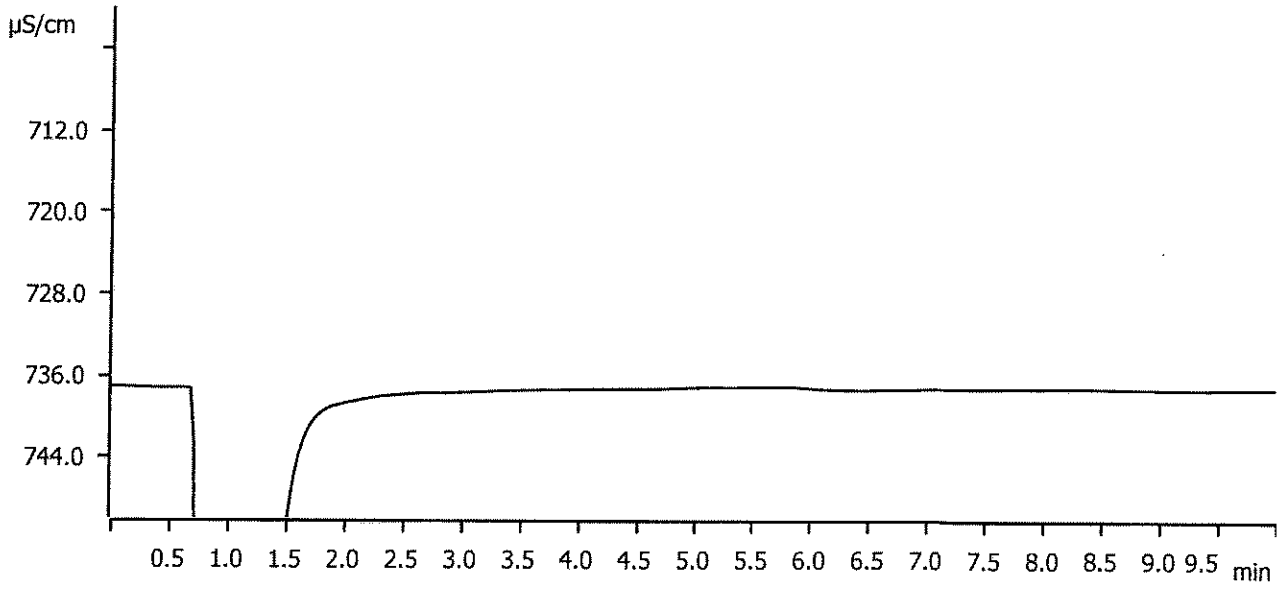
Sample data

Ident	GSL_180834-018
Sample type	Sample
Determination start	2018-08-28 14:41:03 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.67	MPa
Temperature	30.0	°C

Cations



28729R

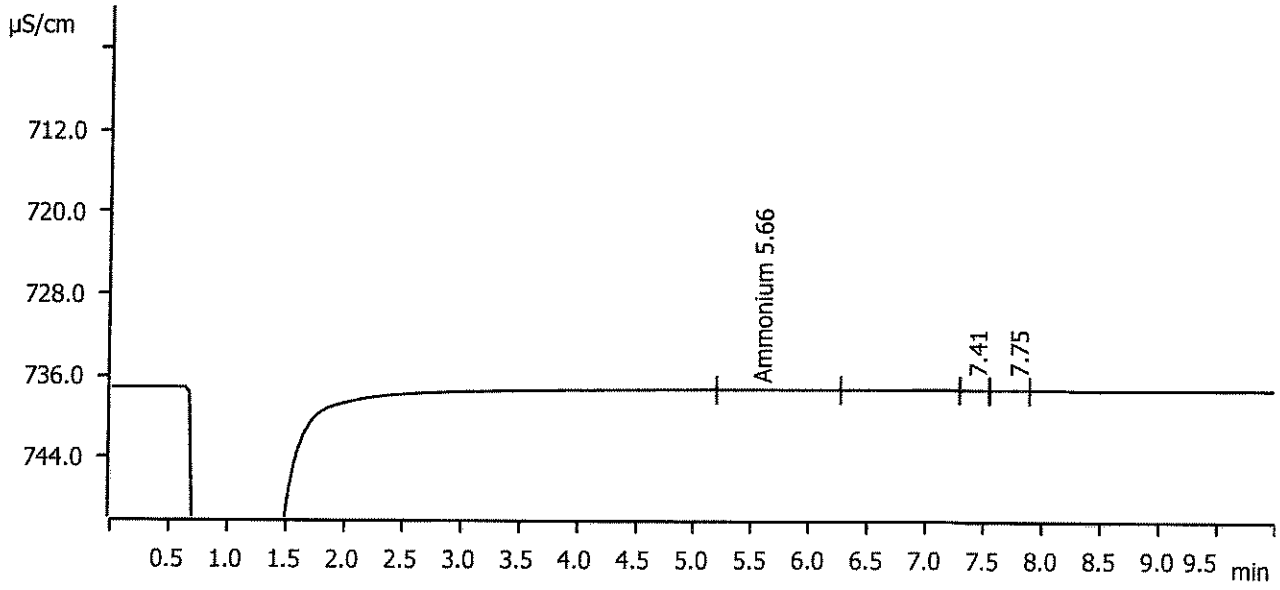
Sample data

Ident	GSL_180834-019
Sample type	Sample
Determination start	2018-08-28 14:54:09 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	9.01	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time min	Area (µS/cm) x min	Height µS/cm	Concentration ppm	Component name
1	5.657	0.0056	0.011	0.046	Ammonium
2	7.407	0.0007	0.005	invalid	
3	7.748	0.0021	0.013	invalid	

8/29/18

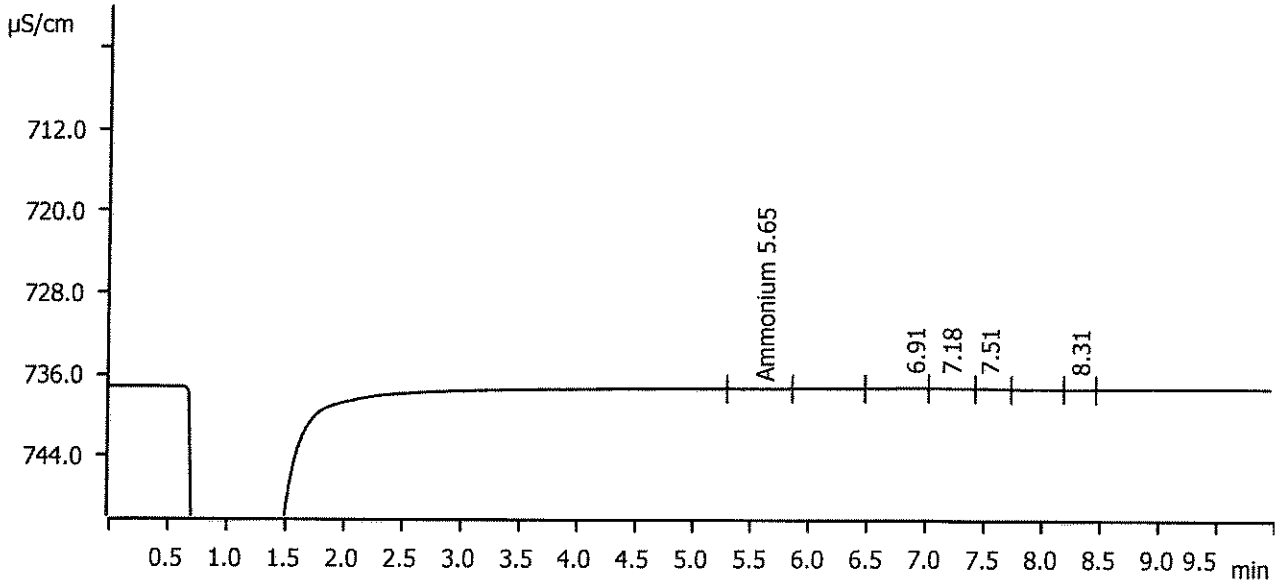
Sample data

Ident	GSL_180834-019Dup.
Sample type	Sample
Determination start	2018-08-28 15:07:15 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time min	Area (µS/cm) x min	Height µS/cm	Concentration ppm	Component name
1	5.647	0.0025	0.008	0.021	Ammonium
2	6.913	0.0044	0.020	invalid	
3	7.177	0.0048	0.024	invalid	
4	7.508	0.0047	0.030	invalid	
5	8.312	0.0009	0.006	invalid	

8/29/18

Metrohm

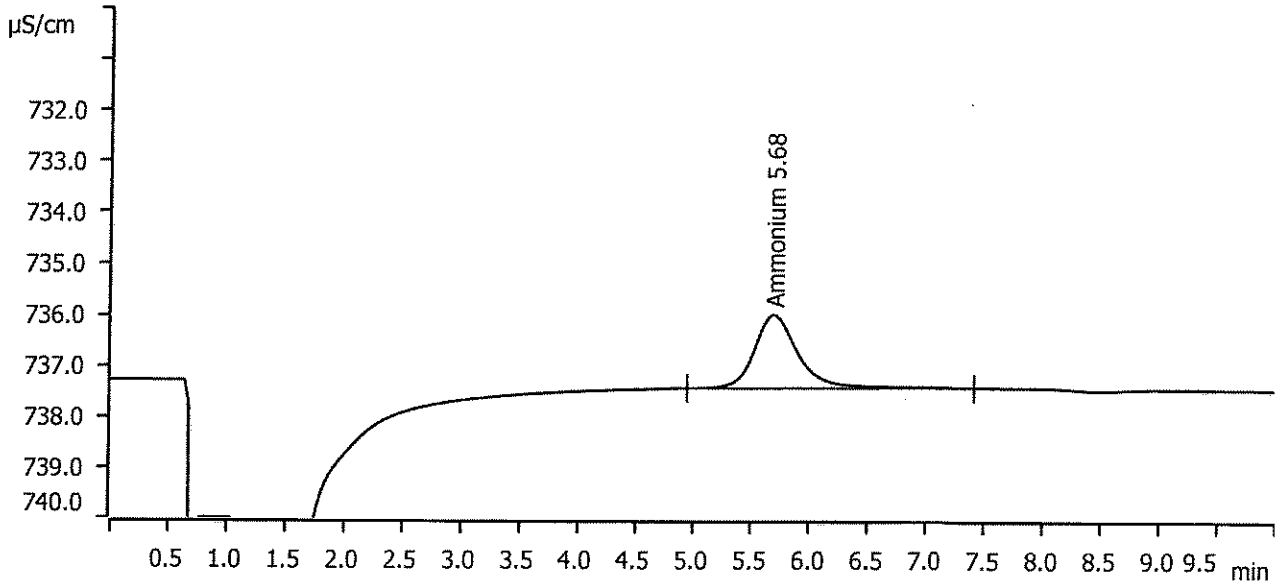
Sample data

Ident	GSL_180834-019MS
Sample type	Sample
Determination start	2018-08-28 15:20:21 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time min	Area (µS/cm) x min	Height µS/cm	Concentration ppm	Component name
1	5.678	0.6249	1.441	5.082	Ammonium

8/29/18

Metrohm

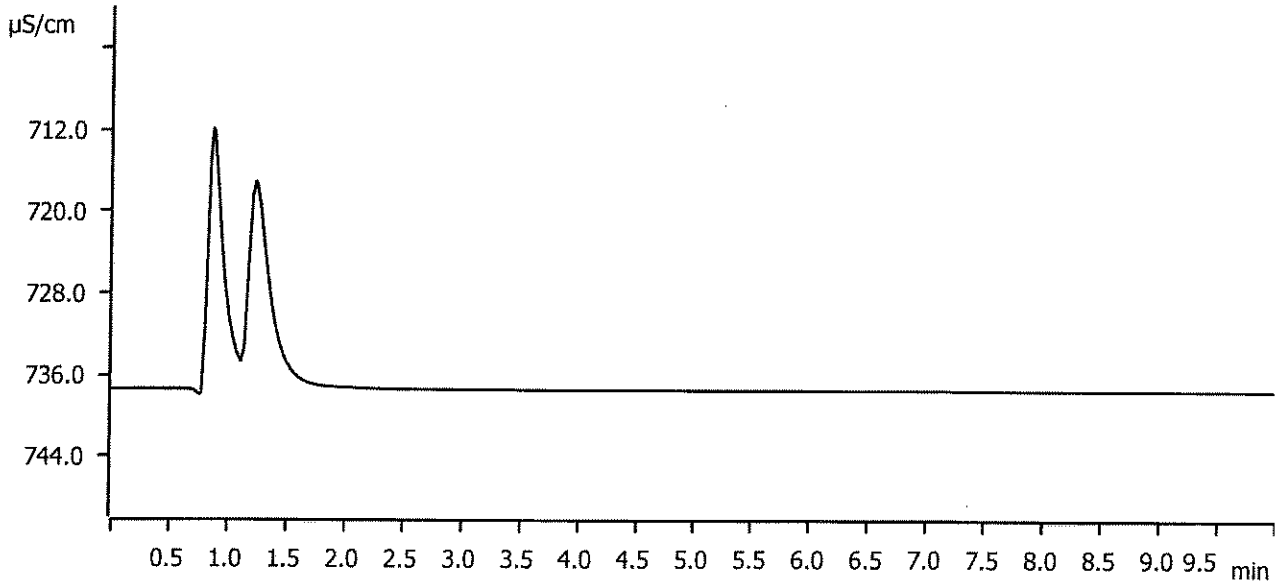
Sample data

Ident	GSL_180834-015
Sample type	Sample
Determination start	2018-08-28 15:33:26 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



8/29/18

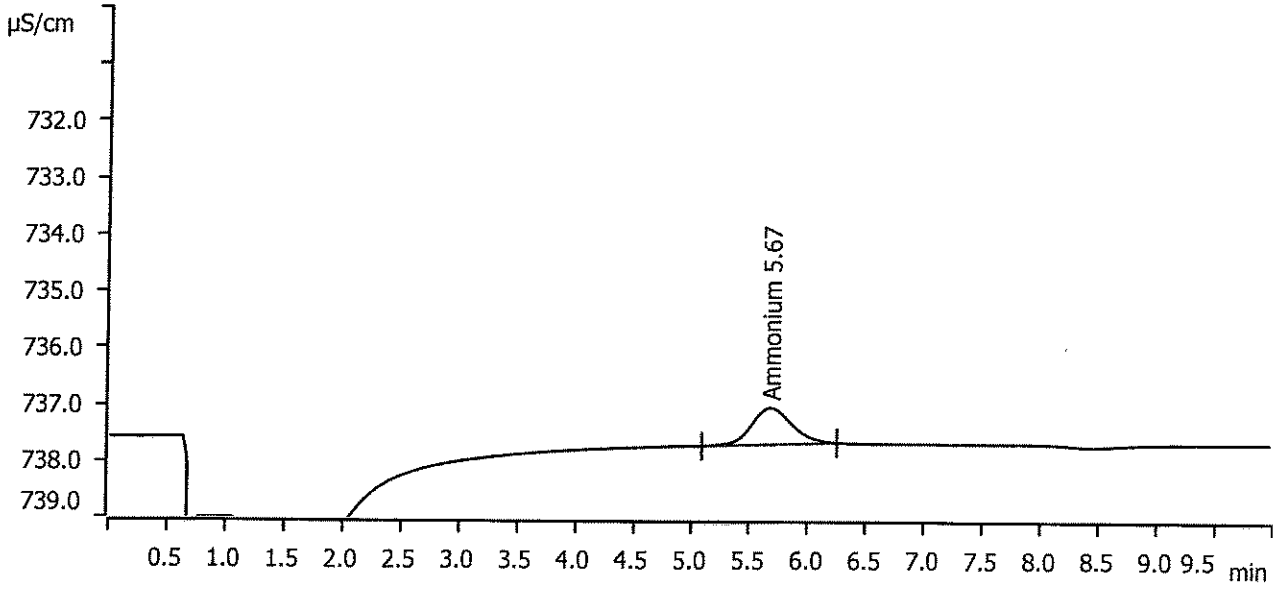
Sample data

Ident	POST CCV-2ppm
Sample type	Sample
Determination start	2018-08-28 16:12:43 UTC-5
Method	GSL_NH3_073117
Operator	Dhan Yeddula

Cations

Data source	Conductivity detector 2 (850 Professional IC 1)	
Channel	Conductivity	
Recording time	10.0	min
Integration	Automatically	
Column type	Metrosep C 6 - 100/4.0	
Eluent composition	C6_Cation eluent - 1.78Mmol Oxalic acid+1.01Mmol Dipicolinicacid	
Flow	0.900	mL/min
Pressure	8.95	MPa
Temperature	30.0	°C

Cations



Peak number	Retention time min	Area (µS/cm) x min	Height µS/cm	Concentration ppm	Component name
1	5.668	0.2594	0.648	2.110	Ammonium

3/8/29/18

Metrohm

Appendix D

Alliance
SOURCE TESTING

Dry Gas Meter Calibration				
Console ID	--	2026		
Meter S/N	--	2026		
Critical Orifice S/N	--	CO-1667s		
Initial Barometric Pressure, in. Hg	(Pb_I)	28.89		
Final Barometric Pressure, in. Hg	(Pb_F)	28.88		
Average Barometric Pressure, in. Hg	(Pb)	28.885		
Critifcal Orifice ID	(Y)	7	19	28
K' Factor, $ft^3 \cdot R^{1/2}$ / in. WC·min	(K')	0.1839	0.5111	0.7684
Vacuum Pressure, in. Hg	(V_P)	25.0	21.5	18.5
Initial DGM Volume, ft^3	(Vm_I)	945.950	951.310	960.650
Final DGM Volume, ft^3	(Vm_F)	951.310	960.650	968.790
Total DGM Volume, ft^3	(Vm)	5.360	9.340	8.140
Ambient Temperature, °F	(Ta)	76	76	77
Initial DGM Temperature, °F	(Tm_I)	76	77	78
Final DGM Temperature, °F	(Tm_F)	77	79	80
Average DGM Temperature, °F	(Tm)	77	78	79
Elapsed Time	(Θ)	22.0	14.0	8.0
Meter Orifice Pressure, in. WC	(ΔH)	0.19	1.40	3.10
Standard Meter volume, ft^3	(Vmstd)	5.0960	8.8824	7.7602
Standard Critical Orifice Volume, ft^3	(Vcr)	5.0492	8.930	7.6646
Meter Correction Factor	(Y)	0.991	1.005	0.988
Tolerance	--	0.004	0.011	0.007
Orifice Calibration Value	(ΔH @)	1.929	1.841	1.811
Tolerance	--	0.069	0.020	0.049
Meter Correction Factor	**(Y)**	**0.995**		
Orifice Calibration Value	**(ΔH @)**	**1.860**		

Thermocouple Sensor Calibration					
Reference Calibrator Make		Omega			
Reference Calibrator Model		CL3512A			
Reference Calibrator S/N		13000701			
Reference Temp.		Display Temp.		Accuracy	Difference
°F	°R	°F	°R	%	°F
0	460	0	460	0.0	0
68	528	68	528	0.0	0
100	560	100	560	0.0	0
223	683	223	683	0.0	0
248	708	249	709	-0.1	1
273	733	276	736	-0.4	3
300	760	302	762	-0.3	2
400	860	403	863	-0.3	3
500	960	503	963	-0.3	3
600	1,060	605	1,065	-0.5	5
700	1,160	706	1,166	-0.5	6
800	1,260	806	1,266	-0.5	6
900	1,360	906	1,366	-0.4	6
1,000	1,460	1,007	1,467	-0.5	7
1,100	1,560	1,106	1,566	-0.4	6
1,200	1,660	1,209	1,669	-0.5	9

Calibration Performed By KWR

Date 7/5/18

Alliance
SOURCE TESTING

Dry Gas Meter Calibration										
Console ID	--	Hg-220-2071								
Meter S/N	--	3604416								
Critical Orifice S/N	--	2700								
Initial Barometric Pressure, in. Hg	(Pb_I)	28.76								
Final Barometric Pressure, in. Hg	(Pb_F)	28.76								
Average Barometric Pressure, in. Hg	(Pb)	28.76								
Orifice Nominal Flow, lpm	(Q)	0.43			0.87			1.83		
Run No.	--	1	2	3	1	2	3	1	2	3
K' Factor, $ft^3 \cdot R^{1/2}$ / in. WC·min	(K')	0.3405			0.6878			1.4398		
Vacuum Pressure, in. Hg	(V_P)	21.0	21.0	21.0	20.0	20.0	20.0	17.0	17.0	17.0
Initial DGM Volume, ft^3	(Vm_I)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Final DGM Volume, ft^3	(Vm_F)	5.395	6.557	6.482	6.418	5.453	5.504	5.684	11.434	6.627
Total DGM Volume, ft^3	(Vm)	5.395	6.557	6.482	6.418	5.453	5.504	5.684	11.434	6.627
Ambient Temperature, °F	(Ta)	60	60	60	60	60	60	60	60	60
Initial Inlet DGM Temperature, °F	(Tm_{Ii})	71	71	71	70	71	70	71	70	70
Final Inlet DGM Temperature, °F	(Tm_{Fi})	71	71	70	71	70	70	70	70	70
Initial Outlet DGM Temperature, °F	(Tm_{Io})	71	71	71	70	71	70	71	70	70
Final Outlet DGM Temperature, °F	(Tm_{Fo})	71	71	70	71	70	70	70	70	70
Average Outlet DGM Temperature, °F	(Tm)	71	71	70.5	71	71	70	71	70	70
Elapsed Time	(Θ)	12.0	14.5	14.5	7.0	6.0	6.0	3.0	6.0	3.5
Meter Orifice Pressure, in. WC	(ΔH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard Meter volume, ft^3	(Vmstd)	5.1575	6.2683	6.2025	6.1412	5.2178	5.2716	5.4389	10.9513	6.3472
Standard Critical Orifice Volume, ft^3	(Vcr)	5.1548	6.2288	6.2288	6.0740	5.2063	5.2063	5.4493	10.8986	6.3575
Meter Correction Factor	(Y)	0.9995	0.9937	1.0042	0.9891	0.9978	0.9876	1.0019	0.9952	1.0016
Tolerance	--	0.03%	-0.55%	0.51%	-0.24%	0.64%	-0.39%	0.23%	-0.44%	0.20%
Meter Correction Factor	**(Y)**	**0.9991**			**0.9915**			**0.9996**		

Reference Calibrator Make	OMEGA
Reference Calibrator Model	CL3512A
Reference Calibrator S/N	13001011

Reference Temp.		Display Temp.		Accuracy	Difference
°F	°R	°F	°R	%	°F
0	460	1	461	-0.2	1
68	528	67	527	0.2	1
100	560	99	559	0.2	1
223	683	223	683	0.0	0
248	708	249	709	-0.1	1
273	733	274	734	-0.1	1
300	760	301	761	-0.1	1
400	860	400	860	0.0	0
500	960	500	960	0.0	0
600	1,060	601	1,061	-0.1	1
700	1,160	701	1,161	-0.1	1
800	1,260	802	1,262	-0.2	2
900	1,360	902	1,362	-0.1	2
1,000	1,460	1,003	1,463	-0.2	3
1,100	1,560	1,103	1,563	-0.2	3
1,200	1,660	1,204	1,664	-0.2	4

Calibration Performed By Kenji Kinoshita

Date 4/17/18

Dry Gas Meter Calibration										
Console ID	--	Hg-220-2071								
Meter S/N	--	3604417								
Critical Orifice S/N	--	2700								
Initial Barometric Pressure, in. Hg	(Pb_I)	29.02								
Final Barometric Pressure, in. Hg	(Pb_F)	29.02								
Average Barometric Pressure, in. Hg	(Pb)	29.02								
Orifice Nominal Flow, lpm	(Q)	0.43			0.87			1.83		
Run No.	--	1	2	3	1	2	3	1	2	3
K' Factor, $ft^3 \cdot R^{1/2}$ / in. WC·min	(K')	0.3405			0.6878			1.4398		
Vacuum Pressure, in. Hg	(V_P)	20.0	20.0	20.0	18.5	18.5	18.5	16.0	16.0	16.0
Initial DGM Volume, ft^3	(Vm_I)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Final DGM Volume, ft^3	(Vm_F)	5.803	5.357	5.355	7.273	13.230	7.761	6.629	10.331	8.384
Total DGM Volume, ft^3	(Vm)	5.803	5.357	5.355	7.273	13.230	7.761	6.629	10.331	8.384
Ambient Temperature, °F	(Ta)	60	60	60	60	60	60	60	60	60
Initial Inlet DGM Temperature, °F	(Tm_{Ii})	71	71	71	72	71	71	72	72	72
Final Inlet DGM Temperature, °F	(Tm_{Fi})	71	71	71	71	71	71	72	72	72
Initial Outlet DGM Temperature, °F	(Tm_{Io})	71	71	71	72	71	71	72	72	72
Final Outlet DGM Temperature, °F	(Tm_{Fo})	71	71	71	71	71	71	72	72	72
Average Outlet DGM Temperature, °F	(Tm)	71	71	71.0	72	71	71	72	72	72
Elapsed Time	(Θ)	13.0	12.0	12.0	8.0	14.5	8.5	3.5	5.5	4.5
Meter Orifice Pressure, in. WC	(ΔH)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard Meter volume, ft^3	(Vmstd)	5.5977	5.1675	5.1655	7.0091	12.7619	7.4864	6.3824	9.9467	8.0721
Standard Critical Orifice Volume, ft^3	(Vcr)	5.6349	5.2014	5.2014	7.0045	12.6957	7.4423	6.4150	10.0807	8.2478
Meter Correction Factor	(Y)	1.0066	1.0066	1.0070	0.9994	0.9948	0.9941	1.0051	1.0135	1.0218
Tolerance	--	-0.01%	-0.01%	0.02%	0.33%	-0.13%	-0.20%	-0.82%	0.00%	0.82%
Meter Correction Factor	**(Y)**	**1.0067**			**0.9961**			**1.0134**		

Calibration Performed By Kenji Kinoshita

Date 4/17/18

QA/QC Data

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Parameter NH3

Date	Nozzle ID	Nozzle Diameter (in.) #1	#2	#3	Dn (Average)	Difference	Criteria
8/22/18	TF-202	0.171	0.171	0.174	0.172	0.003	≤ 0.004 in.

Date	Pitot ID	Evidence of damage?	Evidence of mis-alignment?	Calibration or Repair required?
8/22/18	PT-404-4	no	no	no

Date	Probe ID	Reference Temp. (°F)	Indicated Temp. (°F)	Difference	Criteria	Probe Length
8/22/18	PR-404-0	78.0	79.0	0.2%	± 1.5 % (absolute)	4.0

Date	Barometric Pressure	Evidence of damage?	Reading Verified	Calibration or Repair required?
8/22/18	Weather Station	NA	NA	NA

Date	Meter Box ID	Positive Pressure Leak Check
8/22/18	2026	Pass

Alliance SOURCE TESTING

QA Data

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912

Parameter	O_2	CO_2	THC
Make	Servomex	Servomex	VIG
Model	4900	4900	20/2
S/N	653265	653265	5950814
Operating Range	25.0	25.0	100.0
Cylinder ID			
Low	NA	NA	SX58431
Mid	CC49879	CC49879	SX58431
High	CC49879	CC49879	SX58431
Cylinder Certifed Values			
Low	NA	NA	50.1
Mid	20	20	50.1
High	20	20	50.1
Cylinder Expiration Date			
Low	NA	NA	8/5/24
Mid	5/4/26	5/4/26	8/5/24
High	5/4/26	5/4/26	8/5/24

Alliance SOURCE TESTING

Calibration Data

Location Kronospan - Clarion, PA
Source Wet Scrubber Exhaust
Project No. 2018-0912
Date 8/23/18

Parameter	O_2	CO_2	THC
Expected Average Concentration	20.6	0.2	3.0
Span Between			
Low	20.6	0.2	4.5
High	103.0	1.0	7.5
Desired Span	20.0	10.0	20.0
Low Range Gas			
Low	NA	NA	5.0
High	NA	NA	7.0
Mid Range Gas			
Low	8.0	4.0	9.0
High	12.0	6.0	11.0
High Range Gas			
Low	NA	NA	16.0
High	NA	NA	18.0
Actual Concentration (% or ppm)			
Zero	0.0	0.0	0.0
Low	NA	NA	5.0
Mid	10.0	5.0	10.0
High	20.0	10.0	18.0
Response Time (seconds)	36	40	48
Instrument Response (% or ppm)			
Zero	0.0	0.0	0.0
Low	NA	NA	5.1
Mid	10.2	5.0	10.0
High	20.0	10.1	18.2
Performance (% of Span or Cal. Gas Conc.)			
Zero	0.0	0.0	0.0
Low	NA	NA	2.0
Mid	1.0	0.0	0.0
High	0.0	1.0	1.1
Status			
Zero	PASS	PASS	PASS
Low	NA	NA	PASS
Mid	PASS	PASS	PASS
High	PASS	PASS	PASS

Alliance SOURCE TESTING

Bias/Drift Determinations

Location: Kronospan - Clarion, PA
Source: Wet Scrubber Exhaust
Project No.: 2018-0912

Parameter		O_2	CO_2	THC
Run 1 Date 8/23/18				
Span Value		20.0	10.0	20.0
Instrument Zero Cal Response		0.0	0.0	0.0
Instrument Mid Cal Response		10.2	5.0	10.0
Pretest System Zero Response		0.1	0.0	0.0
Posttest System Zero Response		0.4	0.1	0.2
Pretest System Mid Response		9.9	5.0	10.0
Posttest System Mid Response		10.1	5.1	10.0
Bias (%)				
	Pretest Zero	0.5	0.4	NA
	Posttest Zero	1.9	0.5	NA
	Pretest Span	1.3	0.4	NA
	Posttest Span	0.6	1.1	NA
Drift (%)				
	Zero	1.4	0.1	0.9
	Mid	0.7	0.7	0.1
Run 2 Date 8/23/18				
Span Value		20.0	10.0	20.0
Instrument Zero Cal Response		0.0	0.0	0.0
Instrument Mid Cal Response		10.2	5.0	10.0
Pretest System Zero Response		0.4	0.1	0.2
Posttest System Zero Response		0.4	0.1	0.0
Pretest System Mid Response		10.1	5.1	10.0
Posttest System Mid Response		10.1	4.9	10.0
Bias (%)				
	Pretest Zero	1.9	0.5	NA
	Posttest Zero	2.2	0.5	NA
	Pretest Span	0.6	1.1	NA
	Posttest Span	0.3	1.3	NA
Drift (%)				
	Zero	0.3	0.0	1.0
	Mid	0.3	2.4	0.1
Run 3 Date 8/23/18				
Span Value		20.0	10.0	20.0
Instrument Zero Cal Response		0.0	0.0	0.0
Instrument Mid Cal Response		10.2	5.0	10.0
Pretest System Zero Response		0.4	0.1	0.0
Posttest System Zero Response		0.4	0.1	0.0
Pretest System Mid Response		10.1	4.9	10.0
Posttest System Mid Response		10.1	4.9	10.0
Bias (%)				
	Pretest Zero	2.2	0.5	NA
	Posttest Zero	2.2	0.5	NA
	Pretest Span	0.3	1.3	NA
	Posttest Span	0.3	1.3	NA
Drift (%)				
	Zero	0.0	0.0	0.0
	Mid	0.0	0.0	0.0

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1650 Enterprise Parkway
Twinsburg, OH 44087
215-648-4000

Certificate of Analysis – EPA Protocol Mixtures

Customer: MATHESON VALLEY
Cylinder Number: CC-49879
Cylinder pressure: 2000 psig
Last Analysis date: 5/9/2018
Expiration Date: 5/4/2026

Protocol:	Reference #	Lot #
G1	729702	109-96-40154

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

REPLICATE RESPONSES

Component :	Oxygen	Date: 5/4/2018	Date:
Certified Conc:	20.00% ± 0.04%	20.03%	
		20.00%	
		19.97%	
Component:	Carbon Dioxide	Date: 5/9/2018	Date:
Certified Conc:	20.01% ± 0.06%	20.01%	
		20.02%	
		20.01%	

BALANCE GAS: Nitrogen

REFERENCE STANDARDS

Component:	Oxygen	Carbon Dioxide
SRM #:	PRM-O2	NTRM-120916
Sample #:	C1399010.02	171101
Cylinder #:	M-692314	AM-11343
Concentration:	21.001%	19.405 %

CERTIFICATION INSTRUMENTS

Component:	Oxygen	Carbon Dioxide
Make/Model:	Horiba MPA-510	Varian 3800 GC
Serial Number:	9XUYXODW	LR-92489
Measurement Principle:	Paramagnetic	TCD, FID
Last Calibration:	5/2/2018	5/9/2018

Notes: G2688369

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D42018, PGVP Participation Date: 01/01/18, PGVP Renewal Date: 01/01/19. The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst Philip D. Mott Date 5/9/2018

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1650 Enterprise Parkway
Twinsburg, OH 44087
215-648-4000

Certificate of Analysis – EPA Protocol Mixtures

Customer: MATHESON VALLEY
Cylinder Number: SX-58431
Cylinder pressure: 2000 psig
Last Analysis date: 8/5/2016
Expiration Date: 8/5/2024

Protocol:	Reference #	Lot #
G1	693974	109-96-37289

DO NOT USE THIS CYLINDER WHEN THE PRESSURE FALLS BELOW 100 PSIG

REPLICATE RESPONSES

Component : Propane
Certified Conc: 50.1 PPM ± 0.2 PPM

Date: 8/5/2016	Date:
50.2 PPM	
50.0 PPM	
50.0 PPM	

BALANCE GAS: Nitrogen

REFERENCE STANDARDS

Component: Propane
SRM #: SRM-1667b
Sample #: 83-J-09
Cylinder #: CAL-017798
Concentration: 48.83 ppm

CERTIFICATION INSTRUMENTS

Component: Propane
Make/Model: Varian 3800 GC
Serial Number: LR-92489
Measurement Principle: TC, FID
Last Calibration: 7/28/2016

Notes: G2673356

The certification was performed according to EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards May 2012, using procedure G1 and/or G2. U.S EPA Vendor ID Number: D42016, PGVP Participation Date: 01/01/16, PGVP Renewal Date: 01/01/17. The expanded uncertainty listed for each component was calculated at a coverage factor of k=2 and at a level of confidence of 95%.

Analyst Phil D. Mott Date 8/8/2016

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Report for Dispersion Modeling Analysis

Kronospan OSB Plant Expansion

PREPARED FOR
Kronospan LLC

DATE
17 July 2025

REFERENCE
0691650

ERM

RECEIVED
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ADEM AIR DIVISION

Report for Dispersion Modeling Analysis

Kronospan OSB Plant Expansion

PREPARED FOR
Kronospan LLC

DATE
17 July 2025

REFERENCE
0691650

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SIGNATURE PAGE

Report for Dispersion Modeling Analysis

Kronospan OSB Plant Expansion

0691650

Jeff Twaddle
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1. OVERVIEW

On behalf of Kronospan, LLC (Kronospan) ERM is submitting this dispersion modeling report to the Alabama Department of Environmental Management (ADEM) summarizing the modeling methodology and results of a Prevention of Significant Deterioration (PSD) air quality analysis for the proposed expansion of Kronospan's Eastaboga, Alabama facility.

On April 7, 2025, ADEM approved a modeling protocol for this project. The PSD air quality analysis and results presented in this report were prepared in accordance with current U.S. Environmental Protection Agency Guideline on Air Quality Models (Appendix W) and ADEM's PSD Air Quality Analysis Modeling Guidelines and follows the methodology in the approved protocol.

2. FACILITY AND PROJECT DESCRIPTION

Kronospan operates a wood products manufacturing plant which includes particle board production, resin plant, medium density fiberboard (MDF) production, and other laminated wood production in their facility in Eastaboga, Alabama in Calhoun County. The facility is a major source with respect to PSD and Title V. Figure 2-1 shows an aerial overview map showing the location of the facility. The proposed project is an expansion of the facility to include construction and operation of an Oriented Strand Board (OSB) plant and modification to the facility wood handling operations which feed wood into the existing facility operations.

The air emission increases associated with the proposed plant expansion trigger requirements of major source permitting under PSD and require PSD review for VOC, NO_X, PM_{10}, $PM_{2.5}$, CO, and Greenhouse Gases (GHG). Table 2-1 shows the project's estimated potential to emit for each pollutant of concern which is included in the air quality modeling assessment.

TABLE 2-1 – PROJECT POTENTIAL TO EMIT

Pollutant*	Project Potential to Emit (TPY)	PSD Significant Emissions Rate (TPY)	Project Exceeds SER?
CO	435	100	Yes
NO_X	383	40	Yes
PM	218	25	Yes
PM_{10}	217	15	Yes
$PM_{2.5}$	103	10	Yes
SO_2	20	40	No
VOC	812	40	Yes

*PM includes filterable PM only; PM_{10} includes both filterable PM_{10} and condensable PM; $PM_{2.5}$ includes both filterable $PM_{2.5}$ and condensable PM.

FIGURE 2-1 – KRONOSPAN FACILITY AERIAL OVERVIEW

3. PSD MODELING METHODOLOGY

3.1 OVERVIEW

The first step in the PSD modeling analysis is to conduct screening modeling of project emissions to determine potential impacts on ambient air quality. In the screening modeling, the modeled concentrations resulting from the maximum potential emissions from the new and modified project sources alone are compared against the applicable significant impact levels (SILs). For any SIL thresholds that are exceeded, a full cumulative impacts analysis is done including a PSD increment analysis and National Ambient Air Quality Standard (NAAQS) analysis. For the PSD increment analysis, the project sources and emissions are modeled along with existing sources at the facility that consume or expand increment, as well as nearby offsite sources that consume or expand increment, based on the applicable baseline date for each pollutant. For Alabama, the major and minor source baseline dates for PM_{10} and SO_2 are January 6, 1975 and August 7, 1977, respectively; the major and minor source baseline date for NO_X is February 8, 1988; and the major and minor source baseline dates for $PM_{2.5}$ are October 20, 2010 and October 20, 2011, respectively. For the NAAQS analysis, project sources and emissions are modeled with the remainder of the existing facility sources, as well as nearby offsite sources, with a background

concentration added before comparing to the applicable NAAQS. Table 3-1 lists the applicable SILs, PSD increments, and NAAQS thresholds. This report summarizes the screening and cumulative modeling conducted for Kronospan.

Additional analyses summarized in this report include an analysis of project impacts on secondary $PM_{2.5}$ and ozone, a Class I area Air Quality Related Values (AQRV) analysis, and a growth analysis assessing potential additional impacts on visibility, soil, and vegetation.

TABLE 3-1 – THRESHOLDS APPLICABLE TO THE PROJECT

Pollutant	Averaging Time	SIL (µg/m³)	PSD Increment (µg/m³)	NAAQS (µg/m³)
CO	8-hour	500	-	10,000
	1-hour	2000	-	40,000
NO_2	Annual	1	25	100
	1-hour	7.5	-	188
PM_{10}	Annual	1	17	-
	24-hour	5	30	150
$PM_{2.5}$	Annual	0.13	4	9
	24-hour	1.2	9	35

Note: Emission increases for SO_2 do not trigger PSD requirements.

3.2 MODEL SELECTION AND MODELING OPTIONS

The dispersion modeling analysis was conducted using the latest version (24142) of USEPA's American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). AERMOD is recommended by the EPA's Appendix W Guidance for determining near-field impacts (impacts within a 50 km radius of the facility) and is approved for regulatory determinations. All model assessments were performed using the regulatory default options using the "MODELOPT DFAULT" keyword.

3.2.1 NO_2 MODELING OPTIONS

For NO_2 modeling, Kronospan used the regulatory default ambient ratio method 2 (ARM2) option with the default minimum and maximum NO_2/NO_X ratios of 0.5 and 0.9 to calculate conversion of NO_X to NO_2.

3.3 RECEPTOR NETWORK AND AMBIENT AIR BOUNDARY

The ambient air boundary for the facility is defined by a combination of physical fencing and signage to preclude public access from the facility. The ambient air boundary is shown in the facility aerial map in Figure 2-1 (physical fencing boundary in blue, signage boundary in yellow). As shown in the figure, the physical fence encloses most of the western and southern boundary of

the facility. Kronospan has then installed signage beginning approximately 190 feet east of the existing laminate plant near the southeast corner, extending around the eastern and northern boundary of the facility and terminating at the beginning of the physical fence near the northwest corner. The property boundary is not regularly patrolled; however, the northern boundary of the facility is directly adjacent to the Anniston Army Depot and the facility is fitted with multiple cameras around the processes.

An initial discrete Cartesian receptor grid was created extending from the ambient air boundary out to 10 km. Initial receptor spacing consisted of:

- 100-m spacing along the facility fence line,
- 100-m spacing from the fence line out to 4 km,
- 250-m spacing from 4 km to 7 km, and
- 500-m spacing from 7 km to 10 km.

This initial receptor grid was extended with 500-m spacing out to 20 km and a spacing of 1,000-m out to 50 km (the maximum range for which AERMOD is applicable for assessing ambient air impacts) to ensure that maximum impacts were captured in the SIL modeling (discussed in Section 4.1). This receptor grid was used to determine the Significant Impact Area (SIA) for each pollutant and averaging period that had a maximum modeled impact at or above the SIL. The SIA is defined as a circular area centered on the proposed sources with a radius equal to the distance to the farthest receptor at or above the SIL. The SIA was established for every averaging period of every applicable pollutant for every year of meteorological data, and the largest of these SIAs was used for each applicable pollutant for the NAAQS and/or increment compliance modeling. The NAAQS and PSD increment modeling domains included the entire SIA for each pollutant and averaging period, as applicable. All maximum concentrations in the modeling were resolved within 100-m grid spacing.

Figure 3-1through Figure 3-4 show maps of the receptor grid from the ambient air boundary out to 50 km.

FIGURE 3-1 – AMBIENT AIR BOUNDARY RECEPTORS

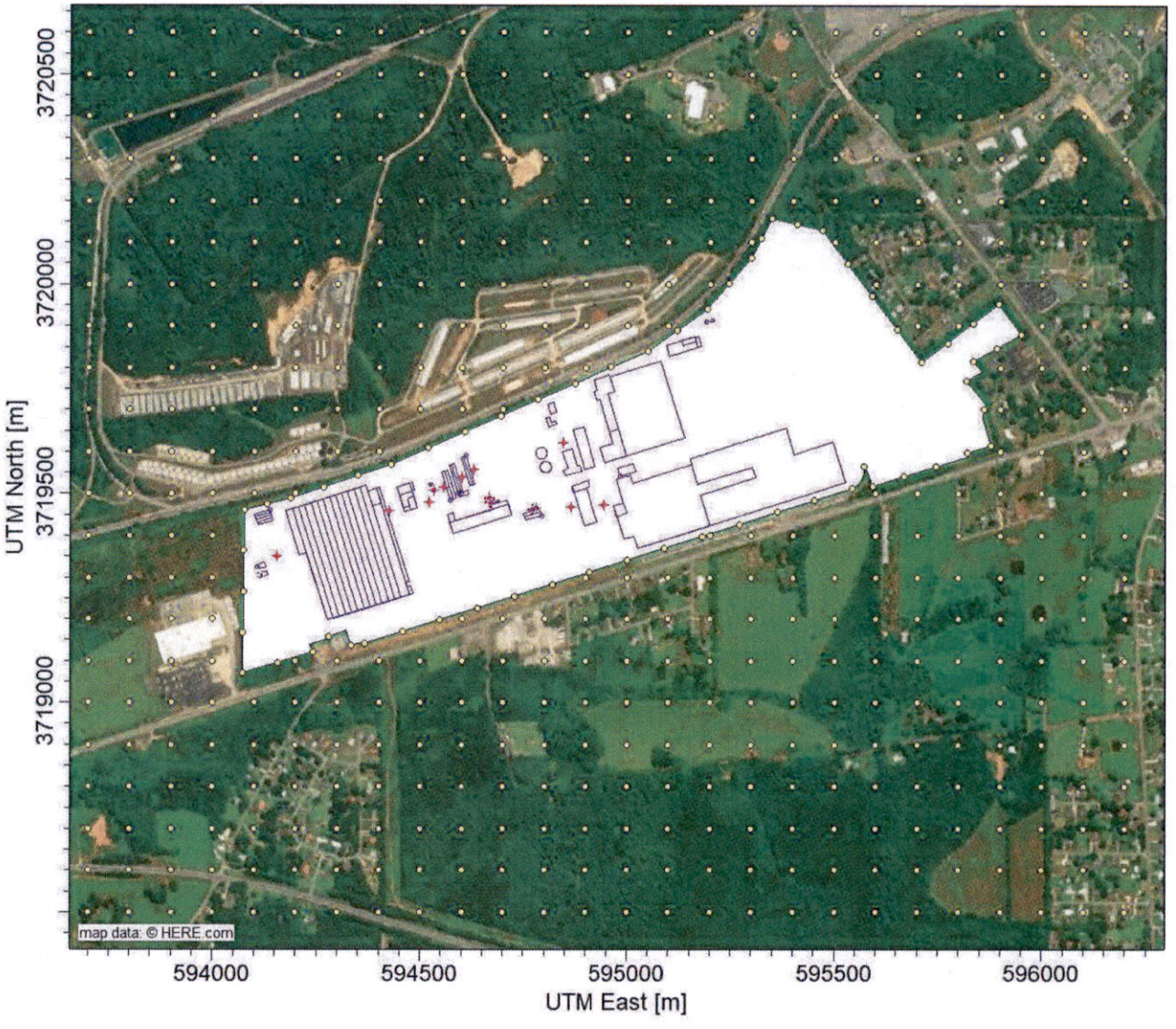


FIGURE 3-2 – NEAR-FIELD RECEPTORS

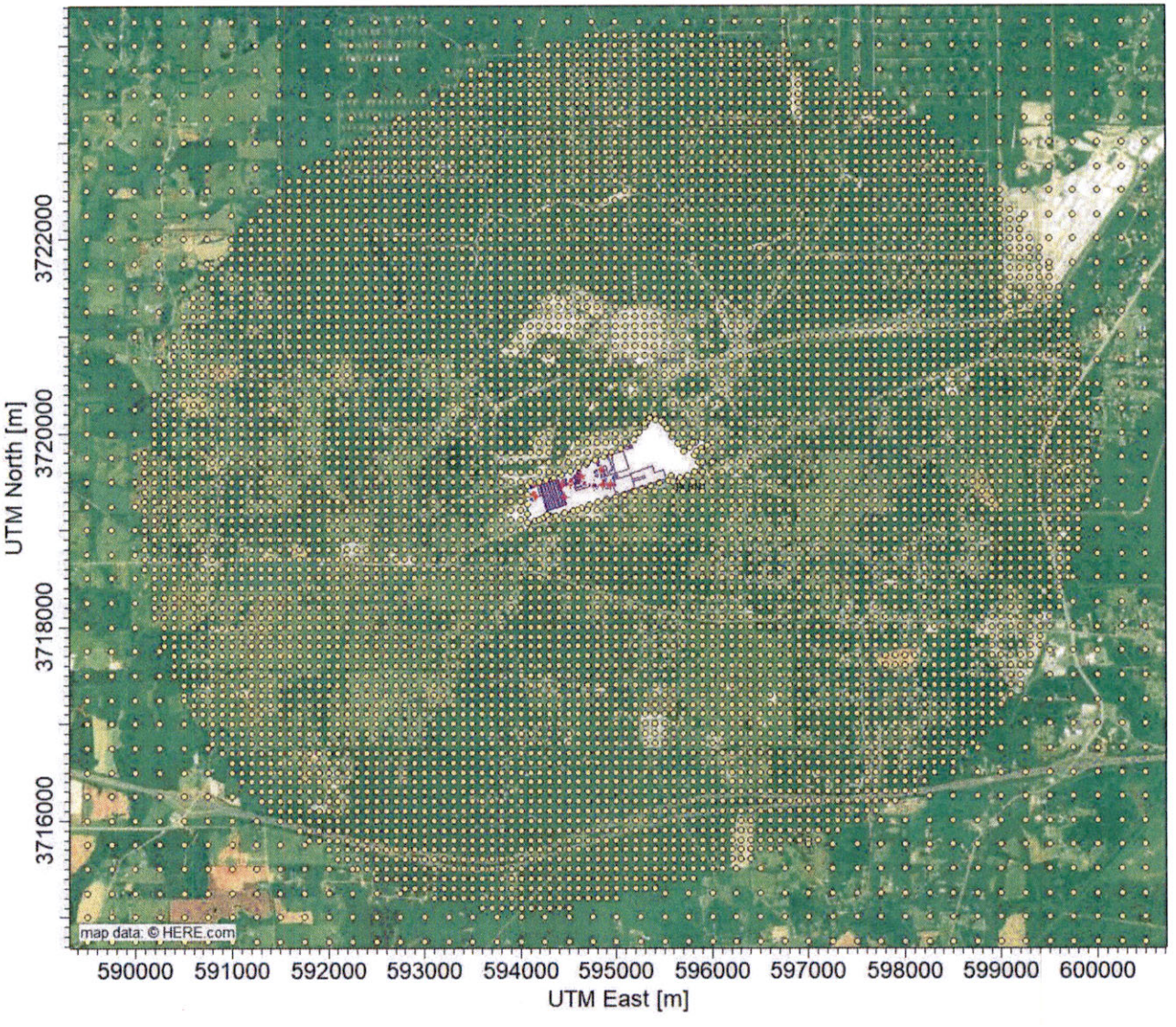


FIGURE 3-3 – INITIAL 10-KM RECEPTOR GRID

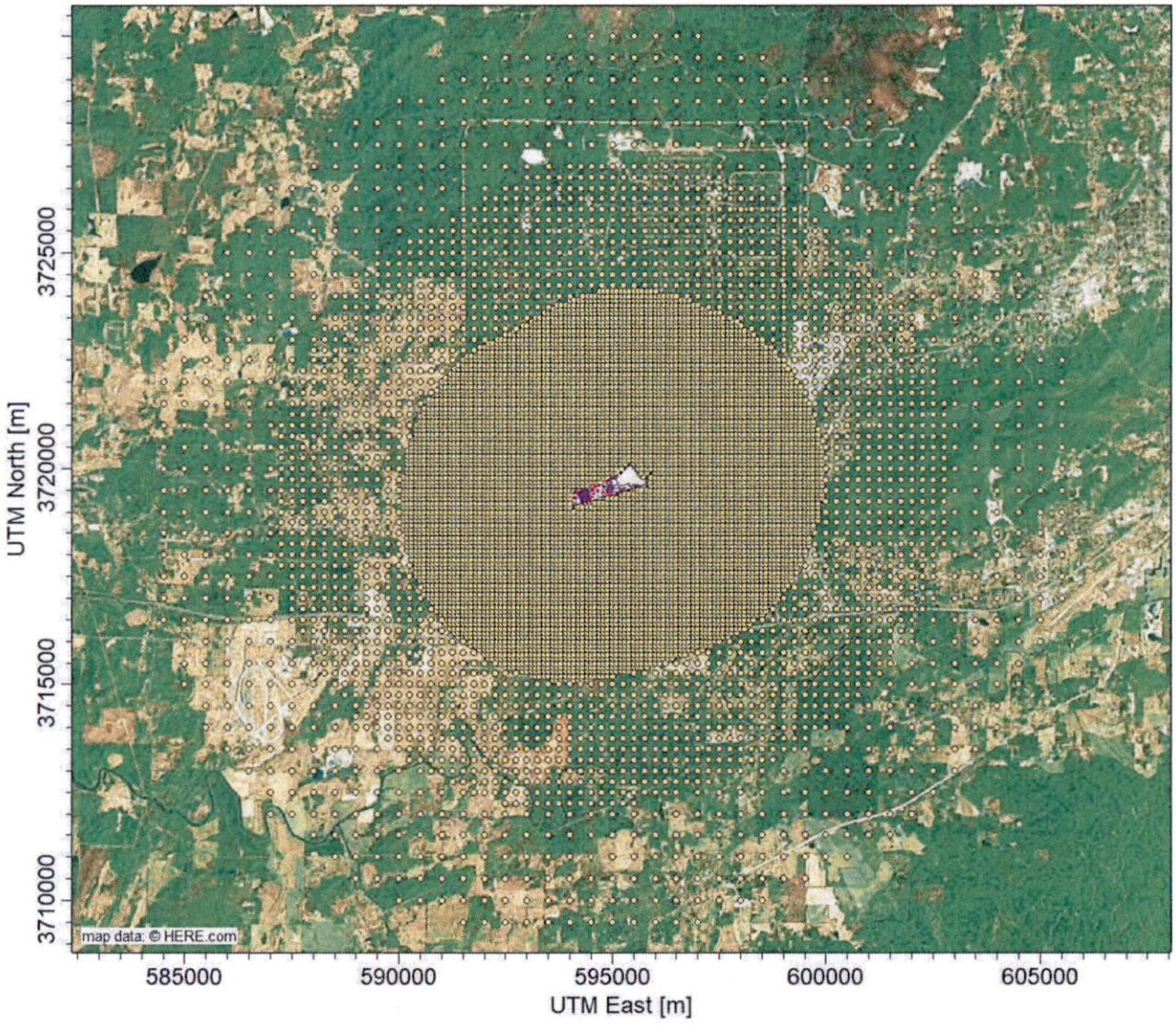
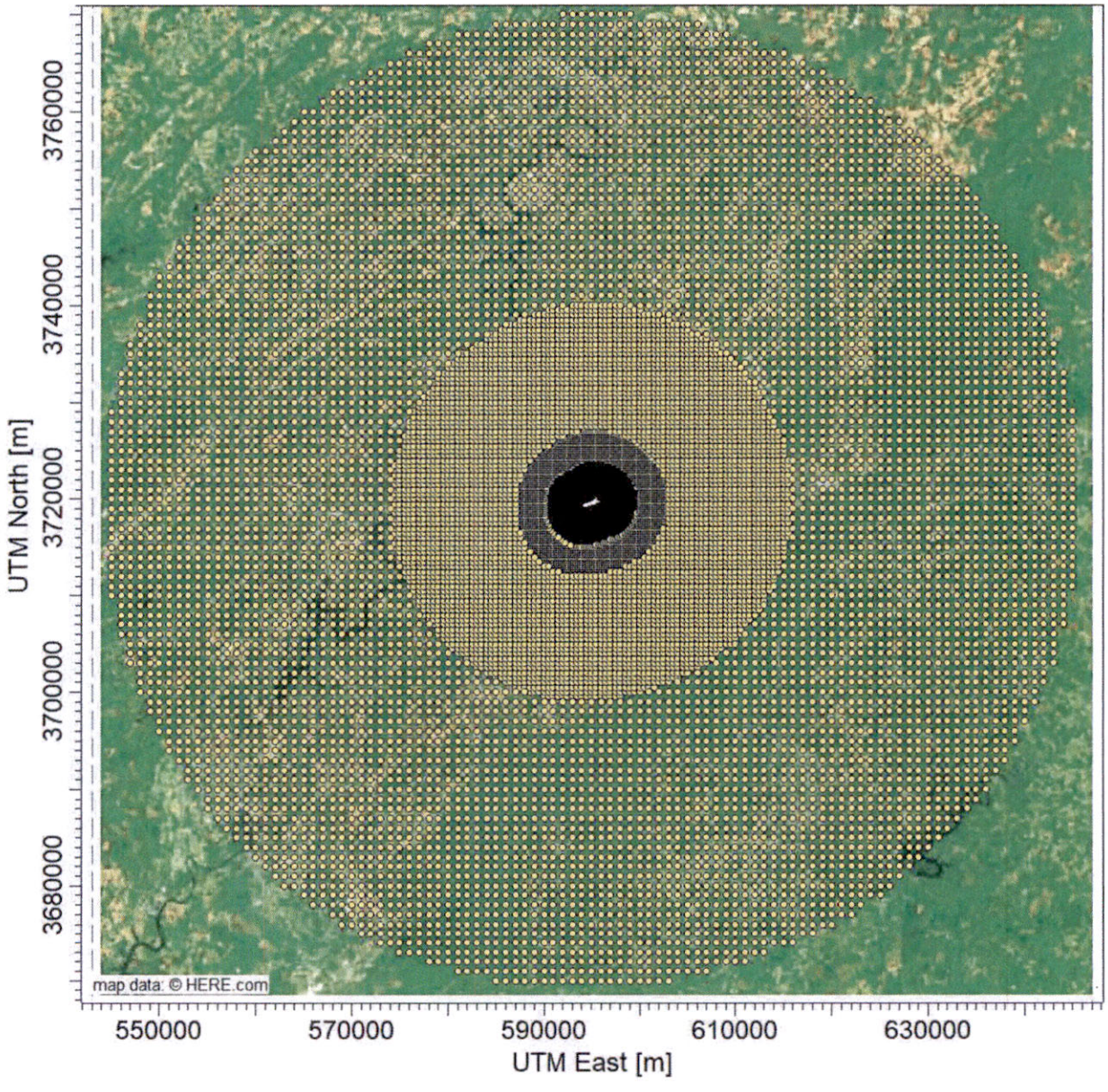


FIGURE 3-4 – 50-KM RECEPTOR GRID



3.4 TERRAIN

The latest version of the AERMAP program (version 24142) was used to process 1/3 arcsecond resolution USGS National Elevation Data (NED) terrain files to develop hill scale and terrain elevation inputs for each receptor. All coordinates for the project are based on the NAD83 datum.

3.5 LAND USE ANALYSIS

The selection of either rural or urban dispersion coefficients followed the procedures listed in 40 CFR 51 Appendix W Section 7.2.1. The preferred Land Use Procedure classifies the land use within a 3-km radius circle about the source using the Auer land use typing scheme. If the urban Auer land use types I1, I2, C1, R2, and R3 (Industrial, Commercial, and Compact Residential) account for 50 percent or more of the area within 3-km of the site, urban dispersion coefficients should be used. Sources located in areas defined as rural should be modeled using the rural dispersion parameters.

AERSURFACE (version 24142) was used to analyze 2021 NLCD land cover data within 3-km of the project site. The NLCD land use categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) are equivalent to the urban Auer land use types. The analysis indicated that 92 percent of the area around the site is rural (Table 3-2). Based on this assessment, the site will be characterized as rural in the modeling.

TABLE 3-2 – LAND USE ANALYSIS FOR 3-KM RADIUS AREA AROUND KRONOSPAN FACILITY

NLCD Category	Description	Area (m^2)	Percent
11	Open Water:	227,700	0.8%
12	Perennial Ice/Snow:	0	0.0%
21	Developed, Open Space:	4,085,100	14.4%
22	Developed, Low Intensity:	3,312,900	11.7%
23[a]	Developed, Medium Intensity:	1,449,900	5.1%
24[a]	Developed, High Intensity:	829,800	2.9%
31	Barren Land (Rock/Sand/Clay):	9,900	0.0%
32	Unconsolidated Shore:	0	0.0%
41	Deciduous Forest:	5,126,400	18.1%
42	Evergreen Forest:	3,069,900	10.9%
43	Mixed Forest:	2,746,800	9.7%
51	Dwarf Scrub:	0	0.0%
52	Shrub/Scrub:	318,600	1.1%
71	Grasslands/Herbaceous:	156,600	0.6%
72	Sedge/Herbaceous:	0	0.0%
73	Lichens:	0	0.0%
74	Moss:	0	0.0%
81	Pasture/Hay:	6,795,900	24.0%

NLCD Category	Description	Area (m^2)	Percent
82	Cultivated Crops:	0	0.0%
90	Woody Wetlands:	135,900	0.5%
91	Palustrine Forested Wetland:	0	0.0%
92	Palustrine Scrub/Shrub Wetland:	0	0.0%
93	Estuarine Forested Wetland:	0	0.0%
94	Estuarine Scrub/Shrub Wetland:	0	0.0%
95	Emergent Herbaceous Wetland:	5,400	0.0%
96	Palustrine Emergent Wetland:	0	0.0%
97	Estuarine Emergent Wetland:	0	0.0%
98	Palustrine Aquatic Bed:	0	0.0%
99	Estuarine Aquatic Bed:	0	0.0%
	Total:	**28,270,800**	**100.0%**
	Total Rural:	25,991,100	91.9%
	Total Urban:	2,279,700	8.1%

3.6 METEOROLOGICAL DATA

Based on the location of the facility in Calhoun County, Alabama, the representative NWS surface station for the project is Anniston, Alabama (ID: 13871) and the representative NWS upper air station for the project is Alabaster, Alabama (ID: 53823).

ADEM provided the most recently available five years (2019 – 2023) of meteorological data for these stations, preprocessed with AERMET version 24142. Kronospan used this meteorological data, without change, in the modeling analysis.

3.7 BACKGROUND CONCENTRATIONS

ADEM provided background concentrations for inclusion in the NAAQS modeling analysis. Table 3-3 summarizes the background concentrations for the pollutants and averaging periods that required cumulative NAAQS modeling.

TABLE 3-3 – AMBIENT BACKGROUND CONCENTRATION VALUES

Monitor Name	Monitor ID Number	Pollutant	Averaging Period	Rank	Years	Monitor Value ($\mu g/m^3$)
Ward, Sumter Co.	01-119-0003	$PM_{2.5}$	24-hour	98th percentile	2021-2023	16
			Annual	Arithmetic mean	2021-2023	6.2
Yorkville,	13-223-0003	NO_2	1-hour	98th percentile	2013-2015	31

3.8 PRECONSTRUCTION MONITORING

Table 3-4 shows the deminimis preconstruction monitoring concentrations applicable to the project. These are concentrations which may require monitoring if exceeded.

TABLE 3-4 – DE MINIMIS PRECONSTRUCTION MONITORING CONCENTRATIONS

Pollutant	Significant Monitoring Concentration (µg/m³)	Averaging Period
CO	575	8-hour average
NO_2	14	Annual average
PM_{10}	10	24-hour average
$PM_{2.5}$	Contact ADEM	24-hour average
Ozone	No specific concentration prescribed - Net increase of 100 TPY or more of VOCs triggers requirements	

The modeled impacts in the SIL analysis were below the deminimis concentrations for CO, NO_2, and PM_{10}, as shown in Section 4.1. To fulfill preconstruction monitoring requirements for $PM_{2.5}$ and pre-operation/post-operation monitoring requirements for ozone, ADEM provided representative ambient monitoring data from ADEM's existing air monitoring network, summarized in Air Quality System (AQS) reports (Appendix A). This existing monitoring data exempts Kronospan from any further monitoring requirements for $PM_{2.5}$ and ozone.

3.9 BUILDING DOWNWASH

To account for building downwash effects on emissions, building dimensions and locations for all existing buildings at the facility and all new buildings associated with the project were entered into USEPA's BPIP-PRIME (version 04274) software. BPIP-PRIME created direction-specific structure dimensions and dominant downwash structure parameters which were incorporated into the dispersion model for the purpose of estimating the impact of aerodynamic downwash. Through BPIP-PRIME a Good Engineering Practice (GEP) stack height analysis was also conducted. Releases below GEP stack height are potentially subject to building wake effects. Table 3-5 lists the structures associated with the new project that were included in the modeling, including building height and UTM coordinate locations. Table 3-6 lists the existing structures at the facility that were included in the modeling.

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TABLE 3-5 – NEW BUILDING DETAILS

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)
WKSHP	Workshop	57.50	4	594137.33	3719460.70	594101.41	3719449.74	594108.98	3719424.93	594144.90	3719435.89	-	-	-	-
		58.00	4	594137.33	3719460.70	594101.41	3719449.74	594107.09	3719431.13	594143.01	3719442.09	-	-	-	-
		58.49	4	594137.33	3719460.70	594101.41	3719449.74	594105.20	3719437.34	594141.12	3719448.30	-	-	-	-
		58.99	4	594137.33	3719460.70	594101.41	3719449.74	594103.30	3719443.54	594139.22	3719454.50	-	-	-	-
OSB	OSB Warehouse	32.25	6	594352.22	3719514.13	594356.75	3719499.87	594401.91	3719514.12	594482.25	3719261.56	594259.91	3719191.14	594175.23	3719457.96
		34.00	6	594352.22	3719514.13	594356.75	3719499.87	594401.91	3719514.12	594482.25	3719261.56	594289.41	3719200.50	594204.73	3719467.32
		35.75	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		37.50	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		39.25	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		41.00	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		42.70	10	594347.54	3719496.97	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09	594452.37	3719327.56
		54.60	6	594347.54	3719496.97	594394.03	3719511.63	594474.08	3719258.97	594379.07	3719228.89	594366.69	3719267.91	594415.24	3719283.20
		117.17	4	594372.55	3719417.99	594347.54	3719496.97	594394.03	3719511.63	594419.07	3719432.63	-	-	-	-
		118.84	4	594372.55	3719417.99	594347.54	3719496.97	594378.54	3719506.72	594403.58	3719427.72	-	-	-	-
		120.50	4	594372.55	3719417.99	594347.54	3719496.97	594363.04	3719501.81	594388.08	3719422.81	-	-	-	-
GLUE	Glue Hall	52.80	6	594480.12	3719527.28	594443.49	3719515.70	594462.45	3719455.76	594493.11	3719465.41	594480.36	3719505.65	594486.23	3719507.69
		67.70	4	594474.19	3719525.48	594443.49	3719515.70	594462.45	3719455.76	594493.11	3719465.41	-	-	-	-
		87.70	4	594480.14	3719506.49	594449.43	3719496.77	594462.45	3719455.76	594493.11	3719465.41	-	-	-	-
		99.70	6	594484.30	3719493.35	594468.23	3719488.14	594473.77	3719470.96	594459.02	3719466.61	594462.45	3719455.76	594493.11	3719465.41
		103.20	4	594484.30	3719493.35	594468.23	3719488.14	594477.12	3719460.41	594493.11	3719465.41	-	-	-	-
STRNDR	Strander Hall	49.20	8	594709.74	3719484.67	594671.03	3719472.63	594674.25	3719462.16	594585.59	3719434.37	594579.54	3719453.23	594565.10	3719448.93
		50.50	6	594713.00	3719474.31	594585.59	3719434.37	594579.54	3719453.23	594565.10	3719448.93	594579.39	3719404.14	594721.19	3719448.84
		73.15	4	594713.00	3719474.31	594571.11	3719429.85	594579.39	3719404.14	594721.19	3719448.84	-	-	-	-
DRYER1	Belt Dryer 1	75.00	4	594573.35	3719484.52	594552.04	3719551.49	594565.24	3719555.69	594586.55	3719488.72	-	-	-	-
		77.00	4	594573.35	3719484.52	594552.04	3719551.49	594558.64	3719553.59	594579.95	3719486.62	-	-	-	-
DRYER2	Belt Dryer 2	33.00	6	594593.40	3719492.24	594569.62	3719567.05	594582.82	3719571.25	594604.13	3719504.28	594614.19	3719507.44	594616.64	3719499.57
		73.00	4	594590.93	3719500.08	594569.62	3719567.05	594582.82	3719571.25	594604.13	3719504.28	-	-	-	-
		77.00	4	594597.51	3719502.18	594576.24	3719569.15	594582.82	3719571.25	594604.13	3719504.28	-	-	-	-
DRYER3	Belt Dryer 3	75.00	4	594610.63	3719590.02	594631.94	3719523.05	594618.74	3719518.85	594597.43	3719585.82	-	-	-	-
		77.00	4	594610.63	3719590.02	594631.94	3719523.05	594625.34	3719520.95	594604.03	3719587.92	-	-	-	-
ENERGY	Energy Center	35.25	4	594792.54	3719448.06	594754.96	3719436.28	594750.01	3719452.08	594787.59	3719463.86	-	-	-	-
		37.01	4	594792.54	3719448.06	594754.96	3719436.28	594752.49	3719444.18	594790.07	3719455.96	-	-	-	-

(Corners 7 through 10 continued for OSB Warehouse and Strander Hall):

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)	Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)
		35.75	10	594452.37	3719327.56	594474.08	3719258.97	594318.91	3719209.86	594234.23	3719476.68
		37.50	10	594452.37	3719327.56	594474.08	3719258.97	594348.41	3719219.23	594263.73	3719486.05
		39.25	10	594452.37	3719327.56	594474.08	3719258.97	594377.90	3719228.59	594293.22	3719495.41
		41.00	10	594452.37	3719327.56	594474.08	3719258.97	594407.40	3719237.95	594322.72	3719504.77
		42.70	10	594474.08	3719258.97	594379.07	3719228.89	594366.69	3719267.91	594415.24	3719283.20
STRNDR	Strander Hall	49.20	8	594579.39	3719404.14	594721.19	3719448.84	-	-	-	-
		50.50	6	-	-	-	-	-	-	-	-
		73.15	4	-	-	-	-	-	-	-	-

TABLE 3-6 – EXISTING BUILDING DETAILS

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)
PBplant	Particle Board Plant	38	14	595080.42	3719816.66	594957.96	3719778.54	594956.81	3719782.22	594921.16	3719770.66	594928.17	3719744.67	594920.13	3719742.20	594926.41	3719721.33	594934.21	3719723.86
		55.5	15	594957.96	3719778.54	594956.81	3719782.22	594921.16	3719770.66	594928.17	3719744.67	594920.13	3719742.20	594926.41	3719721.33	594934.21	3719723.86	594965.95	3719617.93
		70	8	594998.14	3719589.46	594978.50	3719653.49	594957.26	3719646.94	594965.95	3719617.93	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13
MDF	MDF Warehouse	38	14	595526.07	3719527.18	595497.09	3719623.09	595402.19	3719593.58	595382.73	3719657.05	595152.29	3719584.00	595156.33	3719568.99	595013.95	3719524.62	595008.12	3719544.30
		57	14	595201.08	3719424.51	595177.51	3719495.71	595310.69	3719538.20	595302.33	3719562.73	595169.21	3719521.90	595156.33	3719568.99	595013.95	3719524.62	595008.12	3719544.30
		70	4	594991.64	3719478.73	594967.72	3719470.59	594975.60	3719445.27	594999.91	3719453.30	-	-	-	-	-	-	-	-
Resin	Resin Plant	42	6	595161.75	3719875.24	595093.24	3719854.48	595102.03	3719828.7	595179.13	3719851.21	595171.43	3719874.23	595162.97	3719871.54	-	-	-	-
		57	4	595161.75	3719875.24	595093.24	3719854.48	595102.03	3719828.7	595169.98	3719848.54	-	-	-	-	-	-	-	-
		80	4	595130.52	3719865.79	595134.91	3719852.85	595165.76	3719862.22	595161.75	3719875.24	-	-	-	-	-	-	-	-
FPHouse1	Fire Pump House 1	30	4	594133.81	3719305.56	594130.52	3719316.18	594114.52	3719310.87	594118.34	3719300.12	-	-	-	-	-	-	-	-
FPHouse2	Fire Pump House 2	30	4	594127.70	3719324.95	594124.29	3719335.48	594108.24	3719330.27	594112.09	3719319.67	-	-	-	-	-	-	-	-
PAL	PAL Building	30	6	594926.45	3719432.47	594900.84	3719513.98	594909.73	3719516.79	594905.48	3719530.48	594865.45	3719517.94	594896.33	3719422.75	-	-	-	-
		45	5	594909.73	3719516.79	594905.48	3719530.48	594865.45	3719517.94	594869.88	3719504.32	594900.84	3719513.98	-	-	-	-	-	-
Mntnc	Maintenance Building	30	4	594897.47	3719557.04	594868.94	3719651.86	594894.3	3719659.49	594922.83	3719564.67	-	-	-	-	-	-	-	-
Flaker	Flaker Building	30	8	594889.30	3719553.80	594850.40	3719542.62	594846.48	3719555.87	594855.94	3719558.94	594843.29	3719600.58	594866.23	3719607.06	594879.38	3719566.15	594885.09	3719567.82
CYT	Cyclone Tower	80	4	594984.00	3719540.15	595021.51	3719552.14	595015.44	3719571.14	594977.94	3719559.15	-	-	-	-	-	-	-	-
DstBrnr	Dust Burner	60	6	594803.86	3719679.78	594810.08	3719658.66	594829.87	3719664.62	594826.95	3719673.47	594814.98	3719670.12	594811.24	3719681.98	-	-	-	-
WESP	Wet Electrostatic Precipitator	60	4	594808.84	3719711.95	594815.65	3719689.69	594829.76	3719694.02	594822.96	3719716.28	-	-	-	-	-	-	-	-

(Corners 9 through 15 continued for PBplant and MDF):

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)	Corner 11 East (X)	Corner 11 North (Y)	Corner 12 East (X)	Corner 12 North (Y)	Corner 13 East (X)	Corner 13 North (Y)	Corner 14 East (X)	Corner 14 North (Y)	Corner 15 East (X)	Corner 15 North (Y)
PBplant	Particle Board Plant	38	14	594965.95	3719617.93	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13	595137.98	3719633.03	-	-
		55.5	15	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13	594998.14	3719589.46	594952.55	3719738.13	594968.81	3719743.29
		70	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MDF	MDF Warehouse	38	14	594975.18	3719534.65	594991.64	3719478.73	594967.72	3719470.59	594993.37	3719391.84	595016.94	3719398.39	595027.06	3719369.54	-	-
		57	14	594975.18	3719534.65	594991.64	3719478.73	594967.72	3719470.59	594993.37	3719391.84	595016.94	3719398.39	595027.06	3719369.54	-	-
		70	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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3.10 SOURCE CHARACTERIZATION

3.10.1 PROJECT SOURCES

The proposed OSB plant expansion will include 26 new emission points of air pollutants to be modeled. Three new emergency generators (emergency generators 6, 7, and 8) associated with the project and included in the project emissions in Table 2-1 are excluded from the modeling as they will be operated as emergency only. Table 3-7 includes the stack parameters, locations, and base elevations of each new source associated with the proposed project included in the modeling. The Kronospan site will be graded and base elevations included in the modeling for sources and buildings have been provided by Kronospan. Table 3-8 includes the emission rates for each new source associated with the proposed project included in the modeling.

3.10.1.1 EMISSION POINT FOR PROPOSED HEATERS (BIOMASS)

The exhaust stack represented by the model source ID "BIOMASS" will be shared by six heaters proposed to be installed with the project (2 biomass heaters and 4 natural gas-fired thermal oil heaters). These six heaters will be run in only two potential combinations:

- Scenario 1: 2 biomass heaters running with 2 natural gas-fired thermal oil heaters
- Scenario 2: No biomass heaters running and all 4 natural gas-fired thermal oil heaters running

Table 3-9 shows a comparison of emissions from Scenario 1 and Scenario 2 and shows that Scenario 1 emits significantly more across all pollutants compared to Scenario 2. Therefore, Scenario 1 is the worst case for air emissions impacts and is the scenario modeled for the BIOMASS stack. Emissions in Table 2-1 include Scenario 1 emissions for the heaters as this represents the maximum potential to emit for the project. Kronospan has requested in the permit application for the project that the permit include an enforceable condition specifying that the operation of the heaters will be limited to only these two scenarios.

3.10.1.2 FUGITIVE EMISSION VOLUME SOURCES

Five of the proposed project sources are volume sources representing fugitive emissions from the Strander Hall building (modeled source IDs FSR_0001 through FSR_0005). These emissions will originate from four OSB flaker units, three OSB strander units, and a log chipper that will not exhaust directly to the atmosphere via stacks but will instead have the exhaust filtered (through cyclones/dust collectors for the flakers and cyclones/dust collectors for the stranders) and then vented into the Strander Hall building. The building enclosure is assumed to trap 90% of these filtered emissions from the flakers, stranders, and chipper, with the remaining 10% emitted to the atmosphere from the building as fugitive emissions, represented as volume sources in AERMOD. Detailed emission calculations are provided in the permit application for the project.

The part of the Strander Hall building that will emit the fugitive emissions is approximately 486 ft long by 88 ft wide by 73.15 ft tall (Figure 3-5). Because a volume source in AERMOD must have a square footprint, it was determined that 5 volume sources evenly spaced along the length of the building would maximize coverage of the building footprint and be more representative of the

building's fugitive emissions than one volume source. The total fugitive emissions for the building were divided evenly between the five volume sources. The release height, initial horizontal dimensions, and initial vertical dimensions were calculated based on U. S. EPA guidance for volume sources (Table 3-3 of the U. S. EPA User's Guide for AERMOD)[1]. Calculation details are provided in the footnotes for Table 3-7.

3.10.1.3 COMBINED STACK FOR CO-GEN ENGINES 7 - 10

Table 3-10 and Table 3-11 list four co-gen engine emission units that were previously permitted but will be changing location and will exhaust through a single exhaust stack. Although the four co-gen engines are not part of the project, ADEM required that they be included in the SIL modeling at their new location.

The associated PSD permit application provides additional details on the emission sources associated with the project.

3.10.2 EXISTING SOURCES

Existing sources at the Kronospan facility associated with the existing resin plant, medium density fiberboard (MDF) plant, and particle board (PB) plant were included in the cumulative modeling. Table 3-12 and Table 3-13 show the stack parameters and emission rates, respectively, of the existing sources. Existing Kronospan sources were modeled at their maximum PTE. Table 3-13 also identifies which sources are baseline sources, increment-consuming, or increment-expanding for the purposes of the PM_{10} and $PM_{2.5}$ increment modeling; the increment modeling is described further in Section 4.3.

Figure 3-6 and Figure 3-7 show scaled source location maps with the locations of all project sources and all buildings to be included in the model.

[1] U. S. EPA. User's Guide for the AMS/EPA Regulatory Model (AERMOD). November 2024. Available at: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_userguide.pdf

FIGURE 3-5 – STRANDER HALL DIMENSIONS USED TO CALCULATE VOLUME SOURCE PARAMETERS

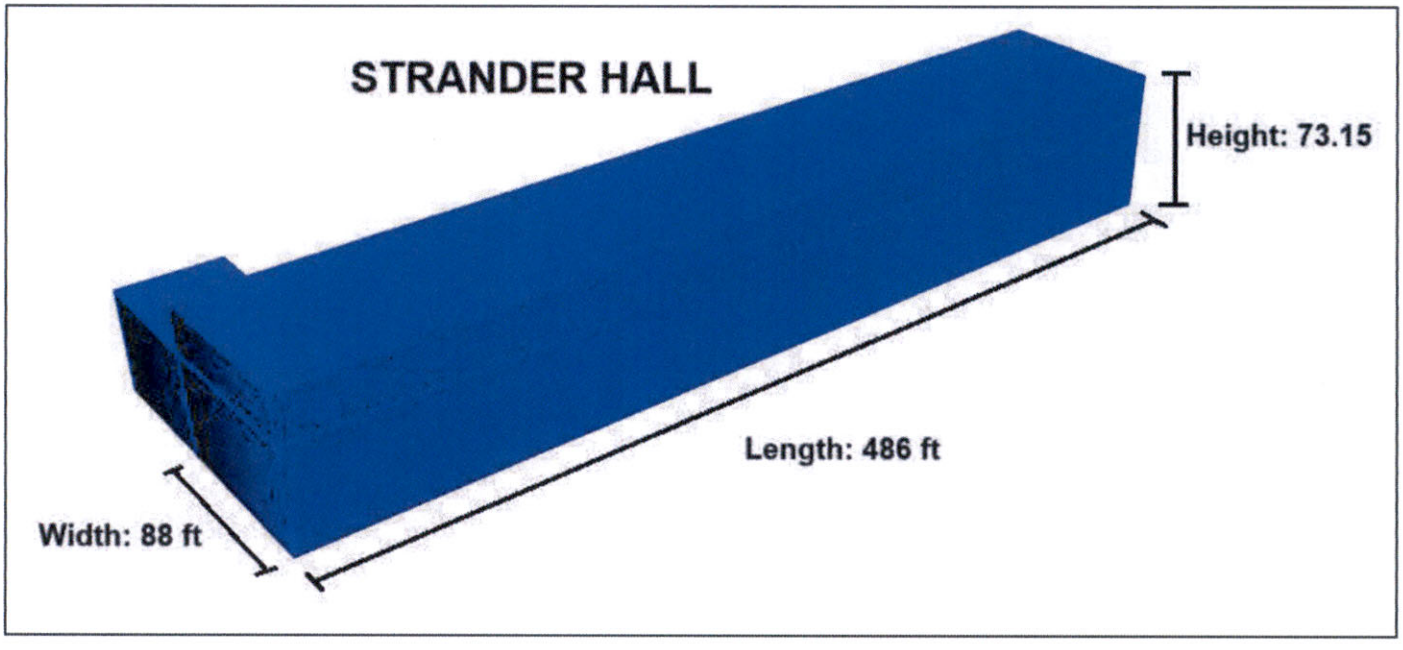


TABLE 3-7 – PROJECT SOURCE PARAMETERS

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Stack Temp (F)	Exit Diameter (ft)	Exit Velocity (ft/s)
POINT SOURCES									
GLUE	Glueing	Vertical	594425.49	3719457.94	603.33	100	86	2.95	86.11
SIFTER	Sifter / Screening	Vertical	594521.47	3719479.02	603.33	100	86	3.28	92.88
DUST1	HP Dust dryer 1-3	Vertical	594671.24	3719481.75	603.33	98.43	86	0.66	71.66
DUST2	HP Dust screening/gluing/forming	Vertical	594669.33	3719481.17	603.33	98.43	86	0.66	100.35
DUST3	HP Dust sanding	Vertical	594667.28	3719480.52	603.33	98.43	86	0.66	100.35
GRAN1	HP Granulate forming line	Vertical	594667.46	3719486.90	603.33	98.43	86	0.66	100.35
DUST4	HP OSB Dust to boiler dust	Vertical	594769.71	3719462.10	603.33	98.43	86	0.98	91.03
DUST5	HP boiler Dust to MDF dust	Vertical	594944.13	3719472.93	603.33	98.43	86	0.98	91.03
DUST6	HP MDF Dust to boiler dust	Vertical	594772.42	3719462.96	603.33	98.43	86	0.98	71.52
DUST7	HP dust strander to dust silo	Vertical	594672.11	3719478.99	603.33	98.43	86	0.66	100.35
GRAN2	HP MDF Granulate to boiler granulate	Vertical	594778.79	3719464.96	603.33	98.43	86	0.98	91.03
GRAN3	HP Granulate from PB to OSB	Vertical	594532.84	3719508.90	603.33	98.43	86	0.98	91.03
GRAN4	HP Granulate from OSB to PB flaker silo	Vertical	594845.15	3719621.21	603.33	98.43	86	0.98	91.03
GRAN5	HP Granulate saws	Vertical	594666.23	3719490.81	603.33	98.43	86	0.98	71.52
DUST8	HP dust from saw filter to dust silo	Vertical	594670.14	3719478.41	603.33	98.43	86	0.98	71.52
GRAN6	HP Granulate screening to granulate silo	Vertical	594666.85	3719488.86	603.33	98.43	86	0.98	91.03
GRAN7	HP Granulate screening dust to dust silo	Vertical	594668.13	3719477.82	603.33	98.43	86	0.66	100.35
BELTDRY1	Belt dryer 1	Vertical	594628.82	3719558.61	603.33	230	131	13.78	102.03
BELTDRY2	Belt dryer 2	Vertical	594600.88	3719539.74	603.33	230	131	13.78	102.03
BELTDRY3	Belt dryer 3 and Press exhaust	Vertical	594556.57	3719516.08	603.33	230	125	13.78	128.35
BIOMASS	Biomass Heaters #1 and #2 (K7 and K8), two of four[1] gas-fired thermal oil heaters (K9-K12)	Vertical	594867.12	3719479.78	603.33	230	338	8.5	72.02

1. Kronospan is proposing to install four gas-fired thermal oil heaters. The modeled parameters for the BIOMASS stack represent the worst-case scenario of 2 biomass heaters running with 2 gas-fired thermal oil heaters.

Source ID	Description	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Release Height[3] (ft)	Initial Horizontal Dimension[4] (ft)	Initial Vertical Dimension[5] (ft)
VOLUME SOURCES[2]							
FSR_0001	Fugitive emissions from Strander Hall	594589.91	3719420.28	603.33	36.575	20.465	34.023
FSR_0002	Fugitive emissions from Strander Hall	594618.22	3719428.99	603.33	36.575	20.465	34.023
FSR_0003	Fugitive emissions from Strander Hall	594646.53	3719437.70	603.33	36.575	20.465	34.023
FSR_0004	Fugitive emissions from Strander Hall	594674.83	3719446.41	603.33	36.575	20.465	34.023
FSR_0005	Fugitive emissions from Strander Hall	594703.14	3719455.12	603.33	36.575	20.465	34.023

2. Emissions from four (4) OSB flakers, three (3) OSB stranders, and the chipper vent into the Strander Hall. Fugitive emissions from the building are represented by five (5) volume sources along the length of the building.
3. Release height: Building height / 2 = 73.15 ft / 2 = 36.575 ft
4. Initial horizontal dimension: Building width / 4.3 = 88 ft / 4.3 = 20.465 ft
5. Initial vertical dimension: Building height / 2.15 = 73.15 ft / 2.15 = 34.023 ft

TABLE 3-8 – PROJECT SOURCE MODELED EMISSION RATES

Source ID	Description	CO (lb/hr)	NO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
GLUE	Glueing	-	-	0.45	0.08
SIFTER	Sifter / Screening	-	-	0.60	0.11
DUST1	HP Dust dryer 1-3	-	-	0.020	0.003
DUST2	HP Dust screening/gluing/forming	-	-	0.03	0.005
DUST3	HP Dust sanding	-	-	0.03	0.005
GRAN1	HP Granulate forming line	-	-	0.03	0.005
DUST4	HP OSB Dust to boiler dust	-	-	0.050	0.01
DUST5	HP boiler Dust to MDF dust	-	-	0.050	0.01
DUST6	HP MDF Dust to boiler dust	-	-	0.040	0.008
DUST7	HP dust strander to dust silo	-	-	0.03	0.005
GRAN2	HP MDF Granulate to boiler granulate	-	-	0.050	0.01
GRAN3	HP Granulate from PB to OSB	-	-	0.050	0.01
GRAN4	HP Granulate from OSB to PB flaker silo	-	-	0.050	0.01
GRAN5	HP Granulate saws	-	-	0.040	0.008
DUST8	HP dust from saw filter to dust silo	-	-	0.040	0.008
GRAN6	HP Granulate screening to granulate silo	-	-	0.050	0.01
GRAN7	HP Granulate screening dust to dust silo	-	-	0.03	0.005
BELTDRY1	Belt dryer 1	3.84	0.31	9.66	1.76
BELTDRY2	Belt dryer 2	3.84	0.31	9.66	1.76
BELTDRY3	Belt dryer 3 and Press exhaust	16.61	6.55	14.92	6.91
BIOMASS	Biomass Heaters #1 and #2 (K7 and K8), two of four[1] gas-fired thermal oil	73.82	78.30	13.32	12.67
FSR_0001	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0002	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0003	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0004	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0005	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112

1. Kronospan is proposing to install four gas-fired thermal oil heaters. The modeled parameters for the BIOMASS stack represent the worst-case scenario of 2 biomass heaters running with 2 gas-fired thermal oil heaters.

TABLE 3-9 – HEATER SCENARIO EMISSIONS

	Heater	CO (lb/hr)	CO TPY	NO_X (lb/hr)	NO_X TPY	PM (lb/hr)	PM TPY	PM_{10} (lb/hr)	PM_{10} TPY	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ TPY	SO_2 (lb/hr)	SO_2 TPY	VOC (lb/hr)	VOC TPY
Scenario 1	Biomass Heater K7	36.65	160.53	36.65	160.53	3.67	16.05	6.19	27.11	5.87	25.69	2.25	9.86	2.76	12.07
	Biomass Heater K8	36.65	160.53	36.65	160.53	3.67	16.05	6.19	27.11	5.87	25.69	2.25	9.86	2.76	12.07
	gas-fired thermal oil heater K9	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K10	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K11	-		-		-		-		-		-		-	
	gas-fired thermal oil heater K12	-		-		-		-		-		-		-	
Scenario 2	Biomass Heater K7	-		-		-		-		-		-		-	
	Biomass Heater K8	-		-		-		-		-		-		-	
	gas-fired thermal oil heater K9	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K10	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K11	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K12	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13

		CO (lb/hr)	CO TPY	NO_X (lb/hr)	NO_X TPY	PM (lb/hr)	PM TPY	PM_{10} (lb/hr)	PM_{10} TPY	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ TPY	SO_2 (lb/hr)	SO_2 TPY	VOC (lb/hr)	VOC TPY
Scenario 1	**Total Emissions**	73.82	323.33	78.30	342.95	7.63	33.42	13.32	58.34	12.67	55.49	4.57	20.01	5.57	24.40
Scenario 2	**Total Emissions**	1.04	4.56	10.00	43.80	0.60	2.63	1.88	8.23	1.88	8.23	0.14	0.60	0.12	0.53

TABLE 3-10 – CO-GEN ENGINES 7-10 COMBINED STACK PARAMETERS

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Stack Temp (F)	Exit Diameter (ft)	Exit Velocity (ft/s)
NGES_W	Co-gen 7, 8, 9, and 10	Vertical	594154.74	3719350.84	603.33	35	446	4.00	72.72

TABLE 3-11 – CO-GEN ENGINES 7-10 COMBINED STACK EMISSION RATES

Source ID	Description	CO (lb/hr)	NO_x (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
NGES_W	Co-gen 7, 8, 9, and 10 exhaust stack	4.64	3.91	2.28	2.04

TABLE 3-12 – KRONOSPAN EXISTING SOURCE PARAMETERS

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Stack Temp (F)	Exit Diameter (ft)	Exit Velocity (ft/s)
FP7	FP7 (Cutting/Trimming - MDF)	Vertical	594984.77	3719491.52	603.33	60.0	75	2.62	90.91
FP9	FP9 (Panel Sawing - MDF)	Vertical	594980.16	3719507.22	603.33	60.0	75	2.07	87.38
FP2	FP2 (Sifter - MDF)	Vertical	594976.13	3719515.06	603.33	60.0	120	4.60	72.16
RTO	RTO	Vertical	595048.96	3719567.23	603.33	82.1	238	10.96	70.00
RP1	Resin Plant - Primary	Vertical	595191.69	3719873.58	615.00	138.0	340	1.28	75.12
F6	Oversized Particle Sifter - PB	Vertical	594884.48	3719732.93	603.33	46.8	130.6	4.11	7.60
F5	Hammer Mills - PB	Vertical	594887.11	3719718.37	603.33	46.8	126.7	4.11	57.60
F9	Cutting/Trimming - PB	Vertical	594924.53	3719626.14	603.33	46.8	120	2.76	81.75
F4	Graders/Particle Transfer - PB	Vertical	594934.09	3719638.11	603.33	46.8	139.2	4.11	46.60
RF1	Reject Filter #1 - PB	Capped	594850.04	3719636.26	603.33	80.0	75	0.69	86.44
DHF1	Dust Handling Filter #1 - PB	Capped	594815.31	3719654.00	603.33	80.0	75	0.65	79.10
RTO2	RTO - PB	Vertical	594849.92	3719708.06	603.33	82.1	240	11.79	58.90
FP11	FP11 (K4 Dust Silo)	Capped	594959.12	3719507.67	603.33	99.5	75	1.48	28.51
FP14	FP14 (Mat Former Transfer Cyclone - MDF)	Horizontal	594959.12	3719507.67	603.33	110.0	100	4.10	96.52
NGE1	NGE-1 (CG Engine #1)	Vertical	594923.34	3719486.66	603.33	35.0	446	2.00	72.72
NGE2	NGE-2 (CG Engine #2)	Vertical	594920.50	3719495.58	603.33	35.0	446	2.00	72.72
NGE3	NGE-3 (CG Engine #3)	Vertical	594918.12	3719503.66	603.33	35.0	446	2.00	72.72
NGE4	NGE-4 (CG Engine #4)	Vertical	594915.63	3719512.30	603.33	35.0	446	2.00	72.72
RF2	RF-2 (Reject Filter #2 - PB)	Capped	594851.77	3719632.50	603.33	80.0	75	0.65	79.10
DHF2	DHF-2 (Dust Handling Filter #2 - PB)	Capped	594816.41	3719649.58	603.33	80.0	75	0.80	87.89
DHF3	DHF-3 (Dust Handling Filter #3 - PB)	Capped	594819.33	3719654.87	603.33	80.0	75	0.65	79.10
DHF4	DHF-4 (Dust Handling Filter #4 - PB)	Capped	594820.18	3719650.44	603.33	80.0	75	0.80	86.44
FP13	FP13 (K2 Dust Silo - MDF)	Capped	594945.90	3719470.73	603.33	92.0	75	1.48	28.51
K56	K5 and K6 heaters	Vertical	594971.42	3719405.08	603.33	73.3	618	4.27	60.50
NGE5	Cogen 5	Vertical	594912.39	3719521.50	603.33	35.0	446	2.00	72.72
NGE6	Cogen 6	Vertical	594909.36	3719532.30	603.33	35.0	446	2.00	72.72
DHF5	Dust Handling Filter #5 (MDF Flooring to PB Silo)	Capped	594819.80	3719652.61	603.33	80.0	75	1.48	28.51
DHF6	Dust Handling Filter #6 (MDF Sander Dust to PB Silo)	Capped	594816.05	3719651.76	603.33	80.0	75	1.48	28.51
DC_1	DC-1 (Truck Dumps / Silos)	Vertical	594816.50	3719556.56	603.33	63.7	75	5.26	40.63
K1	K1 Heater – Shut down	Vertical	595002.00	3719566.00	603.33	64.0	75	38.20	28.51

TABLE 3-13 – KRONOSPAN EXISTING SOURCE EMISSION RATES

Source ID	Description	NO_X (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	PM_{10} Increment Category[1]	$PM_{2.5}$ Increment Category[1]
FP7	FP7 (Cutting/Trimming - MDF)	-	0.62	0.07	C	B
FP9	FP9 (Panel Sawing - MDF)	-	0.45	0.04	C	B
FP2	FP2 (Sifter - MDF)	-	0.77	0.30	C	B
RTO	RTO	48.14	4.74	4.28	C	B
RP1	Resin Plant - Primary	-	0.07	0.03	C	C
F6	Oversized Particle Sifter - PB	-	0.07	0.06	C	C
F5	Hammer Mills - PB	-	0.49	0.42	C	C
F9	Cutting/Trimming - PB	-	0.75	0.07	C	C
F4	Graders/Particle Transfer - PB	-	0.91	0.55	C	C
RF1	Reject Filter #1 - PB	-	0.05	0.02	C	C
DHF1	Dust Handling Filter #1 - PB	-	0.04	0.02	C	C
RTO2	RTO - PB	96.50	9.90	9.19	C	C
FP11	FP11 (K4 Dust Silo)	-	0.08	0.03	C	B
FP14	FP14 (Mat Former Transfer Cyclone - MDF)	-	0.11	0.05	C	B
NGE1	NGE-1 (CG Engine #1)	0.9775	0.57	0.51	C	C
NGE2	NGE-2 (CG Engine #2)	0.9775	0.57	0.51	C	C
NGE3	NGE-3 (CG Engine #3)	0.9775	0.57	0.51	C	C
NGE4	NGE-4 (CG Engine #4)	0.9775	0.57	0.51	C	C
RF2	RF-2 (Reject Filter #2 - PB)	-	0.04	0.02	C	C
DHF2	DHF-2 (Dust Handling Filter #2 - PB)	-	0.07	0.03	C	C
DHF3	DHF-3 (Dust Handling Filter #3 - PB)	-	0.04	0.02	C	C
DHF4	DHF-4 (Dust Handling Filter #4 - PB)	-	0.05	0.02	C	C
FP13	FP13 (K2 Dust Silo - MDF)	-	0.05	0.02	C	B
K56	K5 and K6 heaters	5.00	0.94	0.94	C	C
NGE5	Cogen 5	0.9775	0.57	0.51	C	C
NGE6	Cogen 6	0.9775	0.57	0.51	C	C
DHF5	Dust Handling Filter #5 (MDF Flooring to PB Silo)	-	0.08	0.03	C	C
DHF6	Dust Handling Filter #6 (MDF Sander Dust to PB Silo)	-	0.08	0.03	C	C
DC_1	DC-1 (Truck Dumps / Silos)	-	0.14	0.07	C	C
K1	K1 Heater – Shut down[2]	-	-	-0.16	-	E

1. B = Baseline source; C = Increment-consuming source; E = Increment-expanding source.
2. The K1 heater was a PM_{10} increment-consuming source and a $PM_{2.5}$ baseline source until it was shut down in 2022. Therefore, it is not included in the PM_{10} increment modeling, but it is included in the $PM_{2.5}$ increment modeling with a negative emission rate as a $PM_{2.5}$ increment-expanding source.

FIGURE 3-6 – SCALED MAP WITH LAYOUT OF BUILDINGS AND PROJECT SOURCES AT THE KRONOSPAN FACILITY

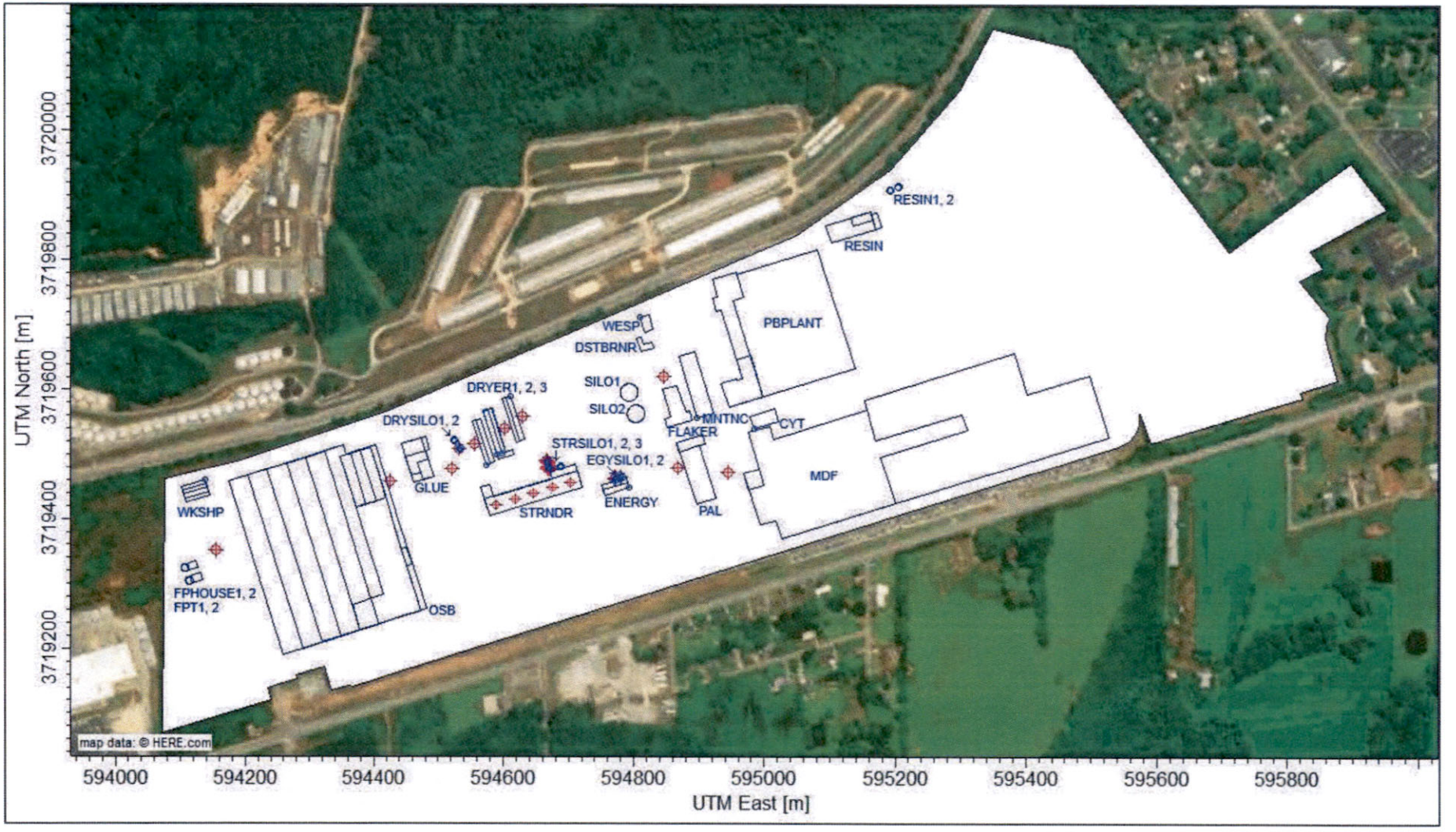
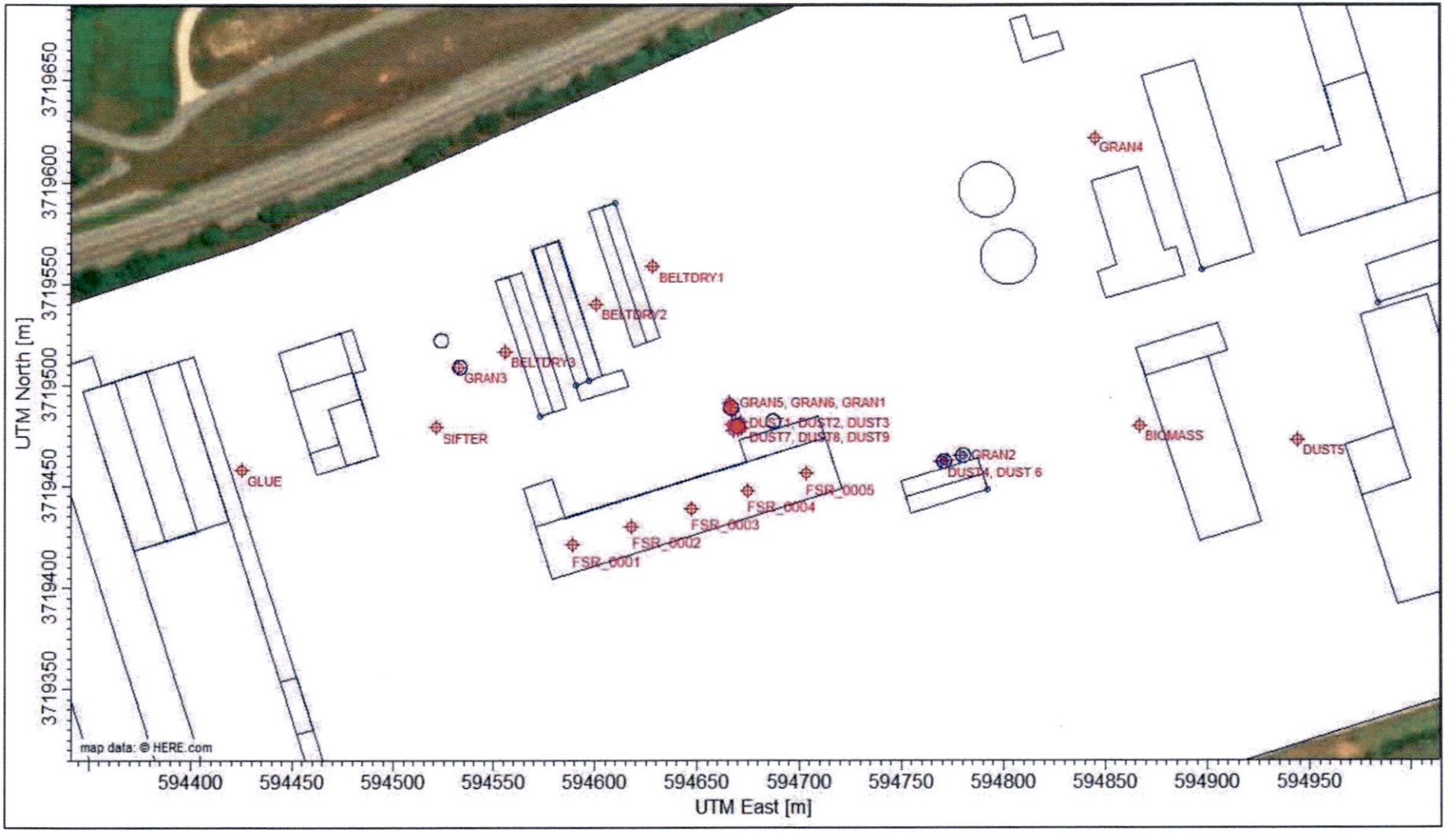


FIGURE 3-7 – SCALED MAP WITH LAYOUT OF PROJECT SOURCES AT THE KRONOSPAN FACILITY



3.10.3 OFFSITE SOURCES

ADEM provided an inventory of offsite baseline and increment sources that were required to be included in the NAAQS and PSD increment modeling. Appendix B includes tables listing all offsite sources, stack parameters, and emission rates. These sources were included in the cumulative modeling without change.

3.11 SECONDARY $PM_{2.5}$ AND OZONE ANALYSIS

3.11.1 PROJECT SECONDARY $PM_{2.5}$ AND OZONE IMPACTS

For estimating the project impacts on secondary $PM_{2.5}$ and ozone formation, Kronospan completed a Modeled Emission Rates for Precursors (MERPs) analysis. Ozone precursors are emissions of VOC and NO_X. Secondary $PM_{2.5}$ precursors are emissions of NO_X and SO_2. The analysis provided in the modeling protocol is provided again here and has not changed since modeling protocol approval.

Kronospan used U.S. EPA's MERPs Guidance[2] as a first-tier assessment of impacts on secondary $PM_{2.5}$ and ozone formation. The analysis requires identifying a representative hypothetical source from EPA's MERPs modeling results and using Equation 1 to estimate the project's air quality impacts for secondary Ozone and $PM_{2.5}$:

Eq 1. Project Air Quality Impact = $Project\ emission\ rate * \frac{Modeled\ air\ quality\ impact\ from\ hypothetical\ source}{Modeled\ emission\ rate\ from\ hypothetical\ source}$

The Tallapoosa, Alabama hypothetical source is the nearest hypothetical source, approximately 85 km south of the Kronospan facility. It is located in an area of similar terrain and land use, with at least 90% of the surrounding area around the project and around the hypothetical source comprised of rural land use such as pastures and forested land. Due to the relatively close proximity to the project site, it is expected that the hypothetical source will experience similar meteorological conditions and is therefore representative of the project site. Table 3-14 shows the modeled emission rates and maximum modeled air quality impact for the Tallapoosa hypothetical source.

TABLE 3-14 – TALLAPOOSA, ALABAMA HYPOTHETICAL SOURCE MODELED EMISSION RATES AND MODELED AIR QUALITY IMPACTS

Metric	Precursor	Emissions (TPY)	Stack Height (meters)	Maximum Modeled Air Quality Impact
8-hr Ozone	NO_X	500	10	1.87 ppb
8-hr Ozone	VOC	500	10	6.29E-02 µg/m³
Annual $PM_{2.5}$	NO_X	500	10	3.38E-03 µg/m³

[2] United States Environmental Protection Agency. 2024. Clarification 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.

Metric	Precursor	Emissions (TPY)	Stack Height (meters)	Maximum Modeled Air Quality Impact
Annual $PM_{2.5}$	SO_2	500	10	9.75E-03 µg/m³
Daily $PM_{2.5}$	NO_X	500	10	9.15E-02 µg/m³
Daily $PM_{2.5}$	SO_2	500	10	3.25E-01 µg/m³

Table 3-15 shows the project's estimated secondary air quality impacts using Equation 1 and the Tallapoosa hypothetical source details.

TABLE 3-15 – PROJECT SECONDARY AIR QUALITY IMPACTS

Metric	Project Air Quality Impact
8-hr Ozone	1.54 ppb
Annual $PM_{2.5}$	2.98E-03 µg/m³
Daily $PM_{2.5}$	0.083 µg/m³

The project's estimated ozone impacts are greater than the ozone SIL of 1 ppb. Table 3-16 shows the project's ozone impacts added to a background monitor ozone value. The nearest active monitor with three recent years of complete data is the Southside monitor (ID: 01-055-0011). Because of its proximity to the plant site, this monitor provides the best representative ozone data for the area of the Kronospan facility.

TABLE 3-16 – SUMMARY OF PROJECT OZONE IMPACTS AND BACKGROUND OZONE VALUE NAAQS COMPARISON

Background Ozone Value (2021-2023)	Project Ozone Impacts	Total Ozone Impacts	Ozone NAAQS	Exceeds NAAQS?
61 ppb	1.54 ppb	62.54 ppb	70 ppb	No

As shown in the table, the total ozone impact including the background ozone value is less than the NAAQS; therefore, this analysis shows that the project demonstrates compliance with the ozone NAAQS in all areas.

The project's estimated secondary annual and daily $PM_{2.5}$ impacts were added to the primary annual and daily $PM_{2.5}$ impacts modeled with AERMOD to obtain the total impacts on $PM_{2.5}$ before comparing to applicable thresholds, as discussed further in Section 4.

3.11.2 OFFSITE SECONDARY $PM_{2.5}$ IMPACTS

To address secondary $PM_{2.5}$ impacts in the cumulative NAAQS modeling, ADEM provided an estimate of secondary $PM_{2.5}$ impacts from offsite sources (Table 3-17) to be added to the modeled primary $PM_{2.5}$ impacts, in addition to adding the project's secondary $PM_{2.5}$ impacts.

TABLE 3-17 – OFFSITE SECONDARY AIR QUALITY IMPACTS

Metric	Offsite Air Quality Impact
Annual $PM_{2.5}$	0.032 µg/m^3
Daily $PM_{2.5}$	0.92 µg/m^3

For the increment analysis, ADEM provides the option of addressing secondary $PM_{2.5}$ impacts by demonstrating a downward trend in precursor emissions in the area since the $PM_{2.5}$ baseline dates (October 20, 2010 for major sources and October 20, 2011 for minor sources in Alabama).

Kronospan conducted a trends analysis using air pollutant emissions trends data from the U. S. EPA for the years 2011-2024.[3] Data for 2011, 2014, 2017, and 2020 are from the U. S. EPA National Emissions Inventory (NEI). EPA estimates emissions between NEI years by projecting, interpolating, or carrying forward NEI year emissions as applicable for individual source categories. Table 3-18 shows the emissions totals and Figure 3-8 shows a clear downward trend in emissions for both NO_X and SO_2 since 2011.

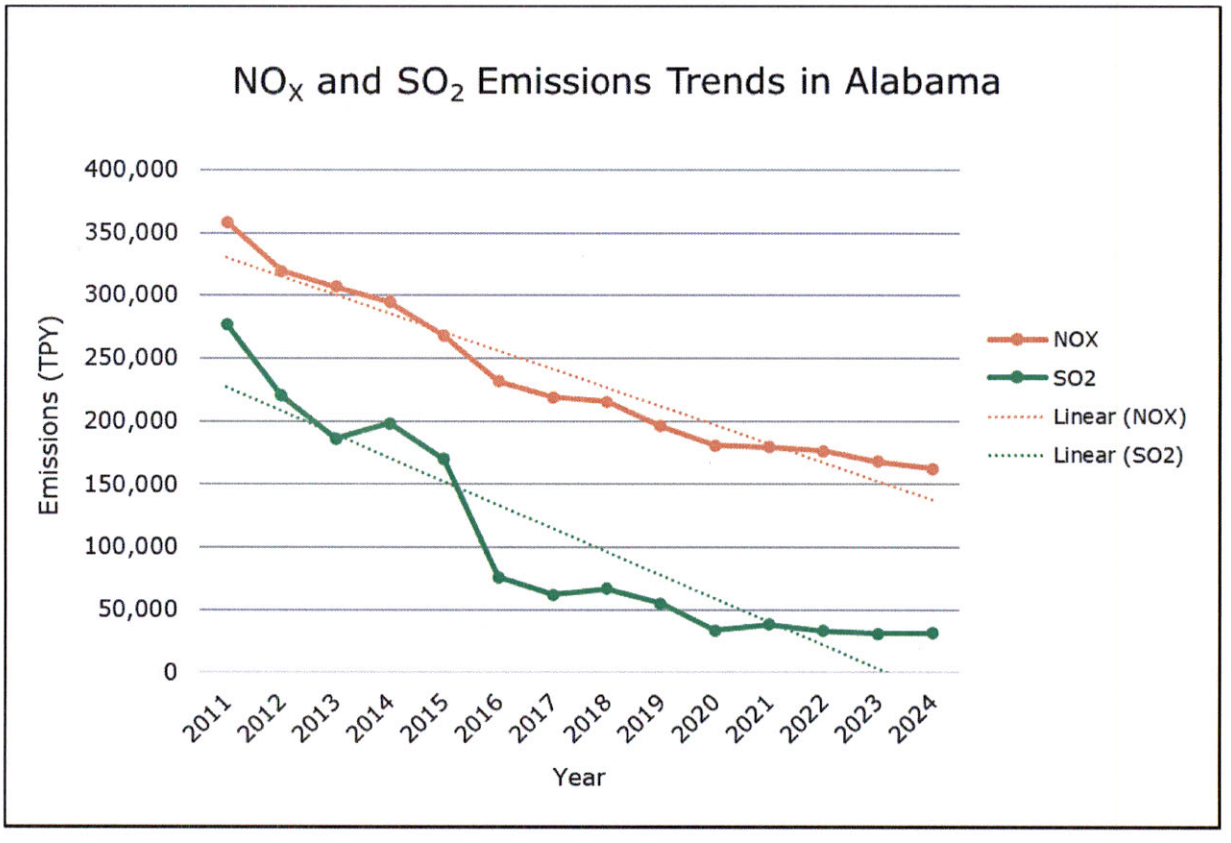
TABLE 3-18 – ALABAMA EMISSIONS TRENDS DATA

Year	NO_X (TPY)	SO_2 (TPY)
2011	358,447	277,013
2012	319,498	220,403
2013	306,928	185,829
2014	294,742	198,199
2015	267,915	169,924
2016	231,351	75,785
2017	218,991	62,059
2018	215,652	66,878
2019	195,983	54,949
2020	180,746	33,420

[3] U. S. EPA. Air Pollutant Emissions Trends Data. Updated February 21, 2025. Available at: https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data

Year	NO_X (TPY)	SO_2 (TPY)
2021	179,701	38,266
2022	176,559	33,058
2023	168,015	30,804
2024	162,563	31,339

FIGURE 3-8 – TRENDS OF NO_X AND SO_2 EMISSIONS IN ALABAMA



4. PSD MODELING AND RESULTS

4.1 CLASS II SIL ANALYSIS

The SIL analysis in AERMOD included the proposed project sources. The predicted maximum impacts for comparison to the SIL thresholds are presented in Table 4-1. For 1-hour NO_2, 24-hour $PM_{2.5}$, 1-hour CO, and 8-hour CO, the initial maximum impact was located outside of the 100-m spacing of the receptor grid along the nearby Coldwater Mountain terrain feature east of the facility; therefore, an additional SIL modeling run was completed for these pollutants to resolve the maximum to 100 m. Due to the terrain effects creating localized concentration peaks and areas of increasing concentrations around the border of Coldwater Mountain, the refined 100-m receptor grid used to resolve the maximum concentrations was extended to cover the entire terrain feature to ensure that concentrations were falling at the edges of the refined grid and to confirm that the maximum concentration was captured.

Based on the results from the SIL assessment, cumulative modeling was required for 1-hour NO_2, annual PM_{10}, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$. Table 4-1 also lists the maximum SIA radius for each pollutant and averaging period exceeding the SIL along with the UTM centroid of sources, which ADEM used to develop the offsite inventories for cumulative modeling. Appendix C includes plots showing a map of the SIL modeling results and the SIA radius for each pollutant and averaging period.

TABLE 4-1 – PREDICTED IMPACTS COMPARED TO SIL THRESHOLDS

Pollutant	Avg Period	Rank	Maximum Conc. ($\mu g/m^3$)	Maximum Conc. Refined to 100-m grid[1] ($\mu g/m^3$)	Secondary PM2.5[2] ($\mu g/m^3$)	Total ($\mu g/m^3$)	SIL ($\mu g/m^3$)	% of SIL	SIA Radius (km)	Centroid of Sources (for determining SIA Radius)		Max Impact Year
										UTM Easting (m)	UTM Northing (m)	
NO_2	1-hour	H1H	68.80	68.80	-	**68.80**	7.5	917%	50.0	594,510.9	3,719,455	NA
NO_2	Annual	MAX	0.58	N/A	-	**0.58**	1.0	58%	-	-	-	2021
PM_{10}	24-hour	H1H	5.37	N/A	-	**5.37**	5.0	107%	0.58	594,549.4	3,719,486	2023
PM_{10}	Annual	MAX	1.32	N/A	-	**1.32**	1.0	132%	0.71	594,549.4	3,719,486	2023
$PM_{2.5}$	24-hour	5-yr Avg H1H	1.25	N/A	0.08	**1.33**	1.2	111%	9.3	594,549.4	3,719,486	NA
$PM_{2.5}$	Annual	5-yr Avg	0.37	N/A	0.003	**0.37**	0.13	285%	1.66	594,549.4	3,719,486	NA
CO	1-hour	H1H	89.69	89.69	-	**89.69**	2000	4%	-	-	-	2019
CO	8-hour	H1H	24.70	29.83	-	**29.83**	500	6%	-	-	-	2022

1. Maximum concentrations for 1-hour NO_2, 1-hour CO, and 8-hour CO occurred outside of the 100-m receptor spacing of the initial receptor grid. A second simulation was run to resolve the maximum concentrations to 100 m.

2. From project emissions (see Section 3.11.1).

4.2 CUMULATIVE NAAQS ANALYSIS

Cumulative modeling was conducted with AERMOD for 1-hour NO_2, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$ to demonstrate compliance with the NAAQS. The NAAQS analysis was performed only at receptors located within the applicable SIA. Nearby sources were included as discussed in Section 3.10. Background concentration values discussed in Section 3.7 were added to the modeled concentration value before comparing to the NAAQS.

Table 4-2 shows the results of the NAAQS modeling analysis. For pollutants where the maximum concentration occurred outside the 100-m spacing of the receptor grid (1-hour NO_2 and 24-hour $PM_{2.5}$), an additional modeling run was conducted to resolve the maximum concentration to 100 m. Results for all pollutants demonstrated compliance with the NAAQS except for 1-hour NO_2.

TABLE 4-2 - NAAQS CUMULATIVE MODELING RESULTS

Pollutant	Avg Period	Rank	Maximum Conc.[1] (µg/m³)	Maximum Conc.[1][2] Refined to 100 m (µg/m3)	Secondary $PM_{2.5}$[3] (µg/m³)	Total (µg/m³)	NAAQS (µg/m³)	% of NAAQS
NO_2	1-hour	5-yr Avg H8H	920.11	920.11	-	**920.11**	188	489%
PM_{10}	24-hour	5-yr H6H	74.66	N/A	-	**74.66**	150	50%
$PM_{2.5}$	24-hour	5-yr Avg H8H	23.08	24.48	1.00	**25.48**	35	73%
$PM_{2.5}$	Annual	5-yr Avg	8.73	N/A	0.035	**8.77**	9	97%

1. Includes background concentration.
2. Maximum concentrations for 1-hour NO_2 and 24-hour $PM_{2.5}$ occurred outside of the 100-m receptor spacing of the initial receptor grid. A second simulation was run to resolve the maximum concentrations to 100 m.
3. From project emissions and offsite sources (see Section 3.11.1 and 3.11.2).

A MAXDCONT analysis was conducted in AERMOD to assess source culpability for all receptors predicting a violation of the 1-hour NO_2 NAAQS. A source is considered culpable if the source's contribution, paired in time and space with the modeled violation, is at or above the significance level for 1-hour NO_2 of 7.5 µg/m³.

The results of the MAXDCONT analysis show that Kronospan's maximum contribution to any violating receptor is below the significance level (see Table D-1 in Appendix D); therefore, Kronospan is not culpable for (e.g., does not cause or contribute to) any modeled violations and the proposed project demonstrates compliance with all applicable NAAQS. Appendix C includes modeled concentration plots of the NAAQS modeling results.

4.3 CUMULATIVE PSD INCREMENT ANALYSIS

Cumulative modeling was conducted with AERMOD for annual PM_{10}, 24-hour $PM_{2.5}$, and annual $PM_{2.5}$ to demonstrate compliance with the PSD increments. The increment analysis was performed

only at receptors located within the applicable SIA. Nearby increment-consuming and increment-expanding sources were included as discussed in Section 3.10, and results were compared to the applicable PSD increments.

Table 4-3 shows the results of the increment modeling analysis. For 24-hour $PM_{2.5}$, the maximum concentration occurred outside the 100-m spacing of the receptor grid; therefore, an additional modeling run was conducted to resolve the maximum concentration to 100 m. Results for all pollutants showed compliance with the increments except for 24-hour $PM_{2.5}$.

TABLE 4-3 – PSD INCREMENT CUMULATIVE MODELING RESULTS

Pollutant	Avg Period	Rank	Maximum Conc.[1] (µg/m³)	Maximum Conc. Refined to 100 m [1] (µg/m3)	Increment (µg/m³)	% of Increment	Max Impact Year
PM_{10}	24-hour	H2H	**19.34**	N/A	30	64%	2021
PM_{10}	Annual	Max Annual Avg	**5.91**	N/A	17	35%	2021
$PM_{2.5}$	24-hour	H2H	11.44	**15.96**	9	177%	2021
$PM_{2.5}$	Annual	Max Annual Avg	**2.16**	N/A	4	54%	2021

1. Maximum concentrations for 24-hour $PM_{2.5}$ occurred outside of the 100-m receptor spacing of the initial receptor grid. A second simulation was run to resolve the maximum concentration to 100 m.

AERMOD's EVENT processing option was used to calculate source contributions to all receptors that modeled a 24-hour concentration violating the 24-hour $PM_{2.5}$ increment. A source is considered culpable if the source's contribution, paired in time and space with the modeled violation, is at or above the significance level for 24-hour $PM_{2.5}$ of 1.2 µg/m³.

The results of the EVENT analysis show that Kronospan's maximum contribution to any violating receptor is below the significance level (see Table D-2 in Appendix D); therefore, Kronospan is not culpable for (e.g., does not cause or contribute to) any modeled violations and the proposed project demonstrates compliance with all applicable PSD increments. Appendix C includes modeled concentration plots of the increment modeling results.

5. CLASS I AREA AQRV ANALYSIS

An analysis was conducted to assess long range impacts of the project to Air Quality Related Values (AQRVs, such as visibility and deposition) in Class I Areas, following the procedures outlined in the Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase 1 Report – Revised (2010) for Class I areas. FLAG addresses assessments for sources proposed for locations at large distances (greater than 50 km) from these areas, which is applicable to the Kronospan facility.

Following FLAG guidance, Kronospan applied the Q/D test (Q = annual emissions in tons per year, D = distance in km, where Q/D<=10 warrants no further analysis) to determine whether or not any further analysis is necessary. Table 5-1 summarizes the results of the Q/D test which indicates that additional analysis of AQRV impacts will not be necessary. Kronospan notified the Federal Land Manager (FLM) of the project and the Q/D results using the ADEM-provided Applicability Request Form. ADEM did not require a Class I increment analysis for this project.

TABLE 5-1 – Q/D SUMMARY FOR SIPSEY WILDERNESS CLASS I AREA

Potential Project Emissions in TPY				Total (Q)	D (km)	Q/D
NO_X	SO_2	SAM	PM_{10}			
383	20	0	217	620	149	4.16

6. ADDITIONAL IMPACTS

An analysis was conducted to address the potential additional impacts that would occur on visibility, soils and vegetation that would occur as a result of the proposed project and general commercial, residential, industrial, and other growth associated with the project.

The proposed project is not expected to have any measurable effect on the surrounding population as the majority of employees hired as a result of the project are expected to be existing residents in the area. Additional industrial or residential growth is not expected. No sensitive aspects of the soil and vegetation surrounding the facility are known to occur; therefore, no harmful effects to either soil or vegetation are expected. The proposed project is not expected to significantly affect visibility in the area, based on similar types of facilities in other areas. Therefore, growth-related ambient air impacts are expected to be negligible, and no significant impacts are expected with respect to visibility, soils, and vegetation in the surrounding area.

7. CONCLUSION/SUMMARY

The air quality analysis has demonstrated that the proposed project will not cause or contribute to any exceedance of any applicable ambient air quality standard or increment and is not expected to significantly impact any Class I area or have other additional impacts. All input and output files from the modeling analysis will be provided to ADEM for review with the final modeling report.

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APPENDIX A AIR QUALITY SYSTEM (AQS) REPORTS

Appendix A-1 – 2021-2023 $PM_{2.5}$ and Ozone Hourly Data

Appendix A-2 – 2021-2023 $PM_{2.5}$ and Ozone NAAQS Averages

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Appendix A-1 – 2021-2023 $PM_{2.5}$ and Ozone Hourly Data

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: GCURVIN

RAW DATA REPORT

Report Request ID: 2228036 Report Code: AMP350 Sep. 30, 2024

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	01	055	0011								
	01	055	0010								
	01	027	0001								

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

AGENCY SELECTIONS

Al Dept Of Env Mgt

SELECTED OPTIONS

Option Type	Option Value
INCLUDE NULLS	YES
DAILY STATISTICS	MAXIMUM
UNITS	STANDARD
RAW DATA EVENTS	INCLUDE EVENTS
MERGE PDF FILES	YES
AGENCY ROLE	PQAO

SORT ORDER

Order	Column
1	STATE_CODE
2	COUNTY_CODE
3	SITE_ID
4	PARAMETER_CODE
5	POC

DATE CRITERIA

Start Date	End Date
2021 01 01	2023 12 31

APPLICABLE STANDARDS

Standard Description

CO 1-hour 1971
Lead 3-Month 2009
Lead 3-Month PM10 Surrogate 2009
NO2 Annual 1971
Ozone 1-hour 1979
PM10 24-hour 2006
PM25 Annual 2024
SO2 1-hour 2010

AIR QUALITY SYSTEM

REPORT

, 2024

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 1
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: THIS MONITOR HAS BEEN CLOSED FOR SAMPLING EFFECTIVE 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (145) R & P Model 2025 PM-2.5 Sequential
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: 2021

DURATION: 24 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

Day	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	4.7			AN	6.7				6.6	AF		
2			4.5					18.2				
3		5.8				7.4	7.0				5.7	12.3
4	3.9			AN	AG				7.1	AF		
5			6.9					11.3				
6		2.4				7.2	6.9				5.1	6.1
7	6.4			12.9	4.2				10.5	4.1		
8			9.0					11.9				
9		6.8				4.4	3.8				9.6	7.1
10	8.7			3.6	4.4				AF	8.0		
11			13.0					9.0				
12		2.5				8.7	2.9				4.2	3.5
13	9.2			10.3	3.2				AF	7.4		
14			AN					6.5				
15		2.8 6				9.1	6.8				3.9	9.3
16	3.2			3.8	7.5				2.0	4.4		
17			5.6					2.0				
18		4.0				10.5	3.4				8.6	4.0
19	5.9			7.0	5.6				5.0	11.0		
20			4.3					4.3				
21		5.3				AV	2.7				9.6	4.9
22	3.7			4.6	8.5				3.6	5.3		
23			12.6					7.7				
24		8.8				AV	19.5				7.0	4.7
25	AN			4.1	14.8				6.1	7.6		
26			7.1					9.5				
27		7.9				4.4	7.6 6				2.6	5.5
28	4.1			9.4	7.8				11.2	4.8		
29			AN					5.5				
30						4.1	15.9				12.8	3.3
31	7.9				5.8					4.9		
NO.:	10	9	8	8	10	8	10	10	8	9	10	10
MAX:	9.2	8.8	13.0	12.9	14.8	10.5	19.5	18.2	11.2	11.0	12.8	12.3
MEAN:	5.77	5.14	7.88	6.96	6.85	6.98	7.65	8.59	6.51	6.39	6.91	6.07

ANNUAL OBSERVATIONS: 110 ANNUAL MEAN: 6.81 ANNUAL MAX: 19.5

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 1
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: THIS MONITOR HAS BEEN CLOSED FOR SAMPLING EFFECTIVE 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (145) R & P Model 2025 PM-2.5 Sequential
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: 2022

DURATION: 24 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

Day	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1		17.5				8.5	6.3				8.8	2.6
2	2.7			6.7	7.2				AV	3.0		
3			18.4					4.7				
4		3.2				8.1	6.4				12.6	7.3
5	5.8			7.4	BJ				AV	4.9		
6			13.8					8.3				
7		8.2				7.6	7.4				6.3	4.9
8	4.9			4.1	3.3				8.7	5.4		
9			1.6					5.2				
10		12.7				6.2	6.1				4.0	4.8
11	1.9			5.1	14.6				2.5	11.7		
12			2.5					5.5				
13		6.0				12.0 6	7.1				3.5 6	7.2
14	4.4			4.1	5.0				6.4	6.1		
15			8.6					AG				
16		12.1				12.0	7.9				4.5 6	4.7
17	5.1 6			7.1	5.7				9.4	9.1		
18			4.0 6					9.6				
19		3.6				6.0	9.6				7.5	3.7
20	5.3			6.5	7.8				13.6	5.4		
21			10.9 6					4.8				
22		6.7				15.4	5.3				8.1	AS
23	6.2			12.6	6.2				5.2	13.4		
24			3.1					3.7				
25		3.4				10.5	5.9				4.7	2.2
26	10.2			AF	3.5				7.6	3.9		
27			3.3					6.5				
28		3.5				8.0	7.0				3.6	9.1
29	4.0			11.1	7.1				2.8	5.6		
30			10.4					7.6				
31							8.2					AU
NO.:	10	10	10	9	9	10	11	9	8	10	10	9
MAX:	10.2	17.5	18.4	12.6	14.6	15.4	9.6	9.6	13.6	13.4	12.6	9.1
MEAN:	5.05	7.69	7.66	7.19	6.71	9.43	7.02	6.21	7.03	6.85	6.36	5.17

ANNUAL OBSERVATIONS: 115 ANNUAL MEAN: 6.88 ANNUAL MAX: 18.4

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RA[redacted]TA REPORT

[redacted], 2024

(88101[redacted]5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER: [redacted]
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	12.4	9.2	11.4	10.9	14.1	11.3	8.4	13.8	12.6	14.1	12.4	9.5	10.1	8.8	6.0	9.7	11.5	9.1	11.6	7.8	9.9	13.0	10.7	11.8	24	14.1
2	11.3	8.5	9.2	9.3	8.1	6.7	7.8	10.5	12.5	21.0	12.2	14.4	17.4	13.4	10.7	12.3	6.9	14.2	5.5	7.7	12.8	9.0	11.3	9.1	24	21.0
3	13.5	13.5	11.3	13.5	11.1	8.6	10.4	11.1	9.4	9.9	10.2	8.2	11.9	8.1	11.5	10.9	6.4	8.8	6.2	7.7	6.6	4.9	4.7	9.8	24	13.5
4	7.7	11.6	8.9	14.6	5.4	7.1	6.1	2.7	3.3	3.5	3.1	8.4	10.4	8.9	4.3	12.3	5.9	9.4	9.7	8.4	6.5	12.4	8.0	11.4	24	14.6
5	5.6	4.9	5.0	4.4	11.5	7.8	9.4	10.7	2.6	10.1	8.3	BA	-1.4	4.5	8.9	5.1	4.5	3.0	5.8	4.9	8.0	8.3	7.3	11.0	23	11.5
6	7.6	6.5	9.4	13.7	6.1	11.7	7.7	8.4	1.0	9.8	7.8	8.9	5.9	2.3	10.9	7.8	6.8	6.8	10.8	11.3	7.1	11.4	7.7	8.0	24	13.7
7	8.2	11.2	5.8	7.4	5.0	5.2	7.6	7.1	3.1	4.8	5.7	11.7	10.5	8.1	13.8	9.7	14.7	11.7	9.9	9.2	11.8	12.6	13.3	16.0	24	16.0
8	15.1	11.4	11.2	13.5	16.5	14.7	15.3	12.3	15.2	12.5	10.9	11.6	9.2	8.8	12.0	9.8	11.8	4.5	7.5	6.7	5.7	10.8	8.8	13.6	24	16.5
9	14.0IF	14.3IF	13.3IF	8.1IF	15.4IF	14.8IF	18.7IF	13.3IF	14.7IF	21.1IF	9.2IF	9.8IF	14.1IF	7.7IF	65.8IF	30.1IF	13.3IF	13.5IF	11.3IF	8.1IF	10.3IF	15.0IF	10.1IF	7.7IF	24	65.8
10	9.1	8.5	9.7	8.9	13.2	12.3	13.1	8.6	5.5	11.8	12.8	7.4	6.8	7.3	8.9	6.8	7.2	10.7	8.1	11.7	12.4	6.8	13.8	9.4	24	13.8
11	10.6	13.4	9.8	11.0	14.7	12.8	9.1	13.9	10.7	13.2	13.1	15.6	12.1	16.4	12.8	16.1	9.9	13.5	11.7	13.6	10.2	11.9	5.7	13.8	24	16.4
12	16.0	14.3	11.8	12.8	12.8	11.7	9.0	9.9	9.7	9.6	8.1	3.7	5.8	7.4	11.0	3.9	6.0	7.2	13.1	10.4	16.8	14.2	7.9	6.7	24	16.8
13	4.8	10.4	8.8	8.1	9.4	13.9	13.3	8.6	9.3	6.1	7.6	3.8	6.6	6.5	10.3	8.7	8.4	4.3	9.7	7.4	11.2	13.1	10.7	9.6	24	13.9
14	8.0	10.1	7.7	7.1	5.6	6.5	5.2	10.7	5.9	9.6	10.2	14.2	8.3	7.8	11.0	9.8	9.5	11.0	7.9	8.3	11.8	9.9	7.7	12.0	24	14.2
15	12.0	6.9	12.3	12.1	9.4	11.3	7.7	6.3	3.4	12.1	5.2	6.4	6.4	4.4	3.2	4.0	7.5	10.2	6.0	9.6	7.7	9.3	10.2	10.7	24	12.3
16	8.6	8.0	8.1	7.1	4.9	7.1	6.4	5.9	.6	14.2	8.2	13.6	11.2	11.8	7.8	13.4	14.1	12.4	7.1	6.9	6.4	7.6	11.1	9.2	24	14.2
17	14.5	22.5	19.0	17.2	13.4	16.4	10.4	16.3	13.9	9.3	8.9	8.0	5.6	8.8	8.0	9.7	8.7	10.0	6.8	9.3	9.7	7.5	7.5	6.3	24	22.5
18	2.7	8.0	5.9	4.8	9.5	6.1	7.5	4.8	8.1	12.4	10.1	12.5	9.8	10.2	11.3	14.4	15.4	13.1	11.4	12.9	15.4	16.7	16.4	16.0	24	16.7
19	13.8	10.2	14.9	9.6	10.0	16.5	16.7	12.4	8.1	6.0	6.0	7.3	6.9	10.7	6.0	4.2	10.8	8.4	11.5	9.7	10.6	5.4	7.4	7.5	24	16.7
20	8.1	5.7	5.0	8.7	8.7	5.2	8.1	10.0	6.5	2.1	6.4	5.4	7.5	6.4	6.8	10.6	6.0	9.2	11.1	11.0	7.4	8.8	9.2	9.8	24	11.1
21	8.6 6	6.2 6	8.9 6	8.1 6	5.8 6	10.9 6	11.1 6	8.6 6	13.7 6	10.5 6	8.0 6	9.6 6	7.4 6	9.3 6	9.6 6	6.5 6	13.2 6	12.1 6	18.8 6	18.5 6	20.7 6	19.5 6	14.1 6	13.7 6	24	20.7
22	12.3 6	12.4 6	13.2 6	10.0 6	9.0 6	7.0 6	5.0 6	6.3 6	7.1 6	7.1 6	4.7 6	4.6 6	3.9 6	6.4 6	-.2 6	5.7 6	5.5 6	9.9 6	10.8 6	6.0 6	7.4 6	9.8 6	7.9 6	8.0 6	24	13.2
23	7.4 6	13.8 6	13.4 6	5.9 6	12.4 6	11.6 6	8.3 6	13.9 6	4.1 6	8.8 6	12.2 6	6.6 6	6.0 6	7.6 6	8.0 6	12.4 6	6.4 6	11.0 6	6.8 6	8.5 6	10.2 6	10.0 6	10.7 6	8.4 6	24	13.9
24	9.2 6	9.7 6	7.6 6	4.7 6	10.4 6	9.3 6	7.5 6	7.7 6	1.6 6	8.9 6	10.7 6	7.0 6	9.5 6	5.8 6	3.6 6	5.1 6	10.0 6	8.9 6	6.6 6	6.4 6	13.0 6	11.1 6	13.5 6	10.9 6	24	13.5
25	7.8 6	13.2 6	15.5 6	10.4 6	9.0 6	10.0 6	7.2 6	5.5 6	2.1 6	4.6 6	4.1 6	4.3 6	5.5 6	11.0 6	5.2 6	12.0 6	11.6 6	7.3 6	8.5 6	5.0 6	6.8 6	9.6 6	7.5 6	8.1 6	24	15.5
26	8.4 6	10.1 6	6.8 6	10.5 6	10.4 6	10.3 6	10.9 6	11.3 6	10.3 6	10.9 6	11.5 6	8.5 6	AX	6.3	8.9	3.9	5.5	7.4	6.2	4.2	9.2	9.1	8.3	6.3	23	11.5
27	10.9	6.9	8.3	3.6	7.9	5.1	7.4	4.4	3.0	2.5	5.3	8.1	4.5	2.8	5.7	9.8	4.4	6.2	3.3	6.4	6.1	8.6	6.7	6.9	24	10.9
28	7.7	8.1	7.5	5.8	6.0	10.3	8.4	4.9	3.3	4.6	8.1	11.3	11.1	8.9	4.5	5.3	5.8	6.4	6.8	5.8	3.3	10.0	9.7	9.5	24	11.3
29	10.7	12.5	13.2	10.4	10.7	16.9	10.9	15.1	7.9	9.3	20.8	15.6	12.4	12.3	14.5	14.9	10.2	13.3	14.4	9.0	8.9	9.6	9.2	6.9	24	20.8
30	6.8	6.8	7.9	4.3	7.3	10.3	4.1	7.2	4.5	5.7	5.9	3.1	4.9	4.6	4.1	4.1	8.3	7.9	3.2	5.9	3.9	2.9	2.6	5.4	24	10.3
31	12.8	7.5	6.0	2.8	7.0	7.6	1.5	7.1	5.3	5.7	5.0	6.3	5.4	4.1	8.0	6.9	10.5	10.0	10.4	10.0	8.1	7.8	11.2	.8	24	12.8
NO.:	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31		
MAX:	16.0	22.5	19.0	17.2	16.5	16.9	18.7	16.3	15.2	21.1	20.8	15.6	17.4	16.4	65.8	30.1	15.4	14.2	18.8	18.5	20.7	19.5	16.4	16.0		
AVG:	9.88	10.20	9.90	9.01	9.70	10.23	9.04	9.33	7.06	9.41	8.80	8.85	8.19	7.98	10.09	9.55	8.93	9.40	8.98	8.65	9.55	10.21	9.38	9.49		

MONTHLY OBSERVATIONS: 742 MONTHLY MEAN: 9.24 MONTHLY MAX: 65.8

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	6.7	6.5	6.2	3.1	2.5	5.0	1.8	2.4	2.1	2.2	5.0	BA	BA	4.6	11.8	10.1	4.9	2.5	9.8	5.5	7.5	7.9	8.9	5.3	22	11.8
2	7.7	7.1	6.1	4.5	7.4	3.9	7.0	5.3	8.9	4.5	6.3	3.4	7.0	7.1	2.8	7.2	6.4	4.6	8.6	5.8	8.2	7.4	4.6	6.3	24	8.9
3	8.8	1.9	7.0	7.3	7.9	6.5	8.5	8.8	1.1	9.6	7.4	12.7	8.9	12.1	10.2	12.6	7.2	5.7	6.8	12.2	11.3	11.1	7.3	10.4	24	12.7
4	11.1	9.5	11.3	8.0	9.7	13.0	12.9	9.5	6.1	14.1	12.9	10.2	12.9	8.0	10.3	16.5	9.1	11.0	10.0	7.5	9.0	7.7	10.9	13.5	24	16.5
5	14.8	10.7	7.6	11.8	11.3	9.1	11.9	11.5	9.2	13.1	7.6	12.5	7.0	7.3	7.8	11.4	8.4	6.9	6.7	11.5	9.6	7.4	6.6	13.5	24	14.8
6	9.6	10.6	10.2	8.7	13.7	10.5	15.0	11.4	4.2	8.8	9.1	6.6	2.5	6.2	8.0	4.7	5.5	10.1	8.8	9.8	8.2	8.1	6.7	12.9	24	15.0
7	9.0	5.1	8.6	9.8	8.2	13.3	7.9	9.1	4.8	12.3	13.3	13.9	15.3	11.6	11.0	10.1	14.9	13.8	9.9	12.5	15.2	13.1	10.6	10.5	24	15.3
8	13.4IF	13.2IF	15.6IF	16.8IF	15.8IF	16.5IF	14.6IF	15.7IF	18.1IF	21.4IF	28.0IF	22.8IF	14.0IF	15.5IF	13.0IF	15.0IF	17.3IF	16.9IF	14.7IF	17.8IF	17.8IF	20.4IF	17.2IF	19.6IF	24	28.0
9	33.8IF	27.1IF	25.8IF	23.0IF	18.9IF	20.9IF	18.3IF	15.5IF	13.0IF	12.9IF	11.5IF	6.0IF	10.6IF	6.9IF	8.6IF	AQ	6.7IF	5.8IF	6.8IF	9.2IF	5.0IF	7.3IF	8.5IF	6.8IF	23	33.8
10	2.3	6.9	5.5	7.0	10.2	8.3	5.7	11.9	5.2	5.7	7.7	4.2	4.4	12.3	3.7	9.4	10.7	7.9	6.0	6.8	3.8	11.0	11.6	11.2	24	12.3
11	8.1	6.3	9.4	8.2	6.4	9.7	8.4	12.1	11.2	3.3	6.4	11.4	5.8	10.4	7.5	8.1	7.7	5.5	6.6	6.7	AV	AV	-6.4	6.6	22	12.1
12	5.3	4.9	5.3	4.8	3.7	9.8	8.0	3.5	9.1	6.8	4.5	1.8	9.7	8.4	7.3	6.3	7.4	8.8	8.1	9.9	8.8	12.5	5.8	11.2	24	12.5
13	7.2	7.9	7.7	10.5	6.9	9.5	7.7	6.6	1.0	7.8	11.0	12.2	7.3	8.6	9.2	8.2	3.0	9.5	10.4	9.5	9.3	8.4	12.5	8.9	24	12.5
14	7.0	8.1	14.6	14.3	5.0	9.4	9.6	6.3	6.1	15.2	3.0	13.8	6.0	5.5	11.3	12.3	13.0	13.5	12.4	18.9	14.2	11.8	15.0	12.9	24	18.9
15	6.8	9.3	3.1	4.7	6.7	9.6	6.0	8.2	7.3	6.9	9.1	9.2	6.2	6.3	7.7	13.7	13.0	13.0	11.2	13.2	16.7	21.3	19.1	20.0	24	21.3
16	16.8	19.5	15.0	14.0	14.2	15.7	13.8	12.8	12.3	13.9	11.5	10.7	10.5	19.7	18.0	16.3	16.8	14.9	18.4	15.9	11.2	12.8	11.9	9.3	24	19.7
17	5.8	7.3	12.7	5.8	7.3	4.1	5.1	2.9	11.1	10.8	8.3	8.6	7.3	4.0	6.5	8.4	8.1	7.2	9.5	7.8	8.9	7.2	7.6	6.3	24	12.7
18	8.8	7.9	6.5	7.1	9.1	11.4	9.9	8.5	3.1	6.3	8.0	6.9	6.2	6.3	6.8	7.9	6.7	8.9	11.5	7.1	12.1	6.7	7.8	10.2	24	12.1
19	17.9	13.6	12.9	10.5	8.9	12.1	15.3	9.1	5.8	14.0	10.1	7.1	14.0	9.9	10.2	11.3	9.0	10.8	9.7	13.7	12.9	8.4	10.2	12.2	24	17.9
20	16.9	14.5	18.2	15.1	16.2	16.2	16.0	14.0	13.9	14.8	11.3	20.2	11.0	11.3	18.5	16.3	14.2	7.6	7.2	13.6	12.7	8.8	12.5	22.8	24	22.8
21	22.2	19.3	21.4	19.0	18.1	18.0	14.7	13.3	14.7	7.6	9.6	8.2	10.6	5.9	13.4	17.3	9.8	11.4	13.2	10.6	11.3	14.8	13.6	17.3	24	22.2
22	15.0	13.8	14.1	11.5	7.7	4.9	9.1	12.2	6.2	9.4	10.7	AX	AX	15.6	16.2	10.7	22.6	17.1	17.2	15.1	14.9	14.2	11.0	16.0	22	22.6
23	18.2	15.6	18.1	11.4	13.5	11.3	16.0	16.3	8.5	14.2	14.8	12.1	16.0	18.8	20.4	15.1	16.8	17.0	12.5	12.0	13.1	14.4	12.1	10.6	24	20.4
24	15.3	15.8	13.1	15.1	11.5	12.8	9.7	12.4	9.5	15.7	17.0	14.0	18.0	14.3	6.2	11.1	13.2	9.4	10.4	9.2	9.9	9.7	13.0	10.3	24	18.0
25	8.8	10.9	10.6	11.7	11.4	10.7	8.5	10.6	6.9	7.2	7.7	10.5	8.0	12.5	13.2	16.8	17.6	20.0	14.1	13.5	11.0	15.2	13.2	12.6	24	20.0
26	12.5	12.3	13.0	9.2	11.3	16.2	14.2	9.7	12.3	7.5	16.0	15.6	11.8	16.8	15.7	11.1	17.1	16.6	16.2	14.1	11.4	13.3	11.7	11.4	24	17.1
27	10.4	8.1	9.1	13.6	15.0	10.4	14.2	10.1	13.0	7.9	12.7	10.7	13.5	12.2	13.2	10.7	14.6	12.1	12.7	13.2	15.2	13.1	15.4	15.6	24	15.6
28	11.8IF	13.0IF	13.2IF	23.6IF	19.8IF	22.0IF	16.5IF	16.4IF	14.0IF	26.5IF	21.7IF	19.7IF	15.9IF	24.3IF	28.0IF	27.4IF	30.7IF	31.9IF	29.4IF	28.3IF	31.9IF	28.6IF	28.2IF	23.7IF	24	31.9
29																									0	
30																									0	
31																									0	
NO.:	28	28	28	28	28	28	28	28	28	28	28	26	26	28	28	27	28	28	28	28	27	27	28	28		
MAX:	33.8	27.1	25.8	23.6	19.8	22.0	18.3	16.4	18.1	26.5	28.0	22.8	18.0	24.3	28.0	27.4	30.7	31.9	29.4	28.3	31.9	28.6	28.2	23.7		
AVG:	11.86	10.95	11.50	11.08	10.65	11.46	10.94	10.22	8.53	10.73	10.79	10.96	10.02	10.80	11.30	12.07	11.87	11.44	11.39	11.82	11.89	11.95	10.97	12.43		

MONTHLY OBSERVATIONS: 665 MONTHLY MEAN: 11.15 MONTHLY MAX: 33.8

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	21.2IF	21.2IF	21.6IF	27.9IF	34.0IF	34.6IF	27.8IF	25.7IF	25.8IF	22.1IF	14.9IF	18.1IF	14.0IF	11.9IF	12.2IF	17.2IF	21.4IF	20.0IF	16.3IF	13.5IF	15.3IF	14.2IF	12.2IF	9.2IF	24	34.6
2	13.4	9.2	10.7	9.0	12.7	6.3	3.8	3.5	2.8	3.6	8.3	2.5	BA	BA	7.7	9.8	6.1	9.2	6.7	6.8	11.7	7.2	8.2	7.4	22	13.4
3	6.4	7.1	4.1	7.3	14.2	14.4	19.3	19.7	21.6	18.2	22.9	21.2	26.1	16.5	16.4	27.1	4.9	13.6	9.1	5.3	8.1	6.7	9.6	9.4	24	27.1
4	5.6	10.7	6.5	5.6	5.4	9.2	3.2	6.7	-2.5	7.2	10.7	11.1	7.1	7.7	7.5	9.8	2.8	5.5	7.0	10.3	8.8	10.3	8.4	8.4	24	11.1
5	8.2	7.3	10.0	11.4	6.5	7.0	9.3	4.1	.7	10.8	11.4	9.8	9.8	10.8	7.0	8.1	7.5	10.1	12.1	7.5	5.4	13.6	15.4	12.6	24	15.4
6	15.1	14.4	18.1	12.5	12.6	12.0	12.4	12.5	2.9	24.1	24.3	23.3	18.9	18.8	19.0	14.4	15.5	20.7	15.7	17.8	20.1	21.4	21.6	20.6	24	24.3
7	24.8IF	26.6IF	24.2IF	19.8IF	21.7IF	19.1IF	22.0IF	21.9IF	21.7IF	23.2IF	20.5IF	22.6IF	23.4IF	23.1IF	19.2IF	19.7IF	23.5IF	25.4IF	25.3IF	20.3IF	16.0IF	12.1IF	19.7IF	11.6IF	24	26.6
8	12.7IF	14.3IF	20.4IF	20.6IF	20.9IF	22.7IF	20.6IF	16.5IF	12.7IF	11.8IF	8.7IF	11.6IF	9.9IF	15.2IF	5.3IF	15.4IF	15.8IF	17.2IF	22.9IF	31.2IF	29.2IF	26.9IF	24.5IF	20.4IF	24	31.2
9	28.0IF	26.4IF	28.0IF	27.3IF	28.7IF	30.4IF	23.4IF	24.7IF	17.5IF	18.3IF	16.8IF	15.3IF	16.6IF	18.7IF	20.9IF	20.8IF	20.1IF	27.7IF	21.9IF	22.5IF	19.4IF	22.3IF	19.7IF	23.3IF	24	30.4
10	19.1	21.8	22.3	24.6	25.2	25.6	22.2	28.0	22.8	16.1	15.1	10.3	12.8	10.7	9.8	10.8	6.1	3.8	8.8	7.1	7.6	3.7	10.4	5.8	24	28.0
11	5.0	7.4	8.7	9.2	8.0	8.5	6.4	5.8	2.5	6.1	7.1	6.9	5.1	2.9	10.6	5.1	6.1	4.7	6.8	6.4	8.0	8.8	6.7	11.3	24	11.3
12	12.9	11.6	16.7	18.9	15.6	17.5	13.9	8.0	1.6	8.2	6.1	7.7	5.8	5.5	12.9	6.7	6.5	9.2	6.4	8.4	8.5	7.5	9.4	5.5	24	18.9
13	6.2	5.7	3.9	7.0	6.2	6.4	7.2	2.6	-.6	7.0	7.0	6.6	4.3	7.2	6.7	14.4	9.1	3.5	8.9	5.4	5.6	4.5	7.1	6.4	24	14.4
14	4.9	7.1	8.9	6.1	8.8	9.0	7.7	5.3	7.0	6.0	6.5	7.9	4.2	4.0	6.2	6.2	5.6	7.3	10.9	7.0	8.4	10.9	6.9	6.9	24	10.9
15	8.5	8.6	5.3	6.7	12.6	10.5	8.3	3.1	6.3	5.9	7.5	7.5	3.9	4.3	7.7	1.7	4.1	3.3	9.6	2.9	7.3	3.9	10.2	7.1	24	12.6
16	12.6IF	12.5IF	14.4IF	12.9IF	13.2IF	12.4IF	15.4IF	3.1IF	9.0IF	27.5IF	21.7IF	27.5IF	22.2IF	16.0IF	27.7IF	36.4IF	24.4IF	25.5IF	31.0IF	24.5IF	22.7IF	27.8IF	27.4IF	19.5IF	24	36.4
17	12.9	7.4	13.2	11.2	12.9	10.0	12.0	8.5	9.1	4.6	7.5	11.0	9.8	8.8	6.1	5.0	7.9	3.2	5.7	3.5	4.4	6.1	2.7	7.0	24	13.2
18	6.7	6.8	7.9	8.5	8.1	7.3	5.3	6.5	1.9	6.7	8.0	6.5	5.8	5.5	2.9	6.3	4.8	7.3	3.8	8.3	6.0	4.1	9.4	6.8	24	9.4
19	6.8IF	8.4IF	8.6IF	7.3IF	6.4IF	7.9IF	5.7IF	5.6IF	6.9IF	7.6IF	7.9IF	6.9IF	8.6IF	101.7 V	66.2IF	32.9IF	12.6IF	15.0IF	9.9IF	7.1IF	16.2IF	22.2IF	12.0IF	6.2IF	24	101.7
20	6.9	9.6	8.0	9.0	8.4	7.9	7.9	4.9	9.6	6.7	7.2	6.8	6.6	7.6	6.4	4.3	7.1	9.2	15.5	18.0	21.4	26.1	24.3	20.1	24	26.1
21	20.3IF	20.0IF	18.2IF	14.4IF	12.2IF	14.2IF	12.0IF	3.2IF	12.6IF	22.4IF	11.6IF	13.6IF	14.1IF	11.8IF	9.8IF	11.3IF	9.3IF	18.9IF	14.4IF	15.9IF	27.4IF	43.6IF	46.9IF	42.4IF	24	46.9
22	36.0IF	35.2IF	31.6IF	31.9IF	34.1IF	28.7IF	33.1IF	37.2IF	35.8IF	22.4IF	20.6IF	AX	BA	9.6IF	20.9IF	18.2IF	15.4IF	11.9IF	16.8IF	14.9IF	15.2IF	23.6IF	40.2IF	70.7IF	22	70.7
23	39.9IF	34.0IF	32.5IF	29.9IF	20.1IF	20.7IF	AV	8.6IF	15.0IF	15.8IF	10.9IF	12.1IF	13.7IF	8.5IF	12.7IF	13.3IF	16.8IF	12.0IF	13.7IF	13.8IF	24.4IF	16.3IF	10.6IF	9.3IF	23	39.9
24	17.5	26.3	21.2	19.8	18.8	12.8	17.0	11.8	12.2	9.6	4.7	10.5	6.7	12.4	12.6	9.8	9.2	11.0	13.2	18.0	18.0	12.6	7.4	14.3	24	26.3
25	14.0	4.7	8.0	14.1	6.6	3.4	7.2	4.7	4.9	9.5	9.4	15.3	13.3	12.3	10.9	7.9	13.1	10.6	14.0	11.7	11.7	16.1	11.5	14.4	24	16.1
26	20.2	21.4	17.5	16.3	20.2	20.1	9.6	5.7	13.9	13.5	11.3	14.4	13.2	8.5	14.7	7.0	9.0	12.9	11.9	12.8	16.2	9.3	.4	5.5	24	21.4
27	7.2	5.5	4.6	2.5	3.9	6.6	6.1	2.8	6.8	6.8	8.2	8.2	10.2	11.1	11.1	12.1	12.9	12.1	13.4	8.0	7.1	9.4	12.7	9.0	24	13.4
28	12.5	9.6	11.1	7.2	8.2	9.1	11.7	8.4	2.1	10.5	9.0	11.1	10.1	13.7	8.5	11.9	11.7	10.1	10.8	11.1	9.8	12.9	10.0	9.3	24	13.7
29	9.5	10.0	8.3	6.7	9.1	9.5	6.6	7.0	8.5	5.7	6.5	5.9	7.2	7.5	6.1	6.9	3.9	10.2	6.2	7.6	6.2	7.6	9.2	6.8	24	10.2
30	5.8	9.3	7.9	8.2	8.8	8.7	8.2	-1.0	7.9	12.6	BA	BA	6.3	10.8	AQ	10.5	10.6	10.8	12.6	13.6	17.7	9.9	8.9	12.9	21	17.7
31	16.3	17.3	18.4	16.1	11.2	19.3	14.8	13.5	17.2	10.2	7.8	14.9	9.7	10.6	13.2	13.4	12.3	11.6	7.3	11.7	13.8	11.2	13.1	12.8	24	19.3
NO.:	31	31	31	31	31	31	30	31	31	31	30	29	29	30	30	31	31	31	31	31	31	31	31	31		
MAX:	39.9	35.2	32.5	31.9	34.1	34.6	33.1	37.2	35.8	27.5	24.3	27.5	26.1	101.7	66.2	36.4	24.4	27.7	31.0	31.2	29.2	43.6	46.9	70.7		
AVG:	14.10	14.11	14.22	13.87	14.04	13.93	12.67	10.28	10.20	12.28	11.34	11.97	11.01	13.79	13.30	12.72	10.84	12.05	12.54	12.03	13.47	13.96	14.09	13.96		

MONTHLY OBSERVATIONS: 736 MONTHLY MEAN: 12.79 MONTHLY MAX: 101.7

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	9.8	9.3	11.2	7.5	9.6	13.7	11.6	13.5	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	8	13.7
2	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
3	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
4	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
5	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
6	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
7	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
8	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
9	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
10	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
11	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
12	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
13	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
14	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
15	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
16	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
17	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
18	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
19	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
20	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	11.1 6	11.9 6	9.1 6	12.2 6	8.4 6	12.9 6	9.7 6	8.4 6	10.1 6	9.8 6	10	12.9
21	9.0IF	9.4IF	8.4IF	6.6IF	13.2IF	11.9IF	13.6IF	5.9IF	BE	BE	BE	19.3IF	15.8IF	13.4IF	13.6IF	11.1IF	13.0IF	11.7IF	11.5IF	49.9IF	15.1IF	16.2IF	17.5IF	15.0IF	21	49.9
22	11.6 6	3.6 6	5.3 6	8.4 6	3.3 6	4.6 6	1.8 6	3.1 6	4.4 6	8.7 6	4.4 6	8.4 6	2.6 6	5.7 6	5.4 6	5.5 6	4.1 6	8.3 6	7.0 6	4.2 6	7.4 6	5.3 6	5.9 6	6.5 6	24	11.6
23	8.9 6	3.8 6	5.0 6	6.1 6	8.3 6	7.7 6	5.2 6	7.2 6	8.0 6	10.7 6	7.4 6	10.9 6	8.9 6	4.0 6	6.4 6	4.9 6	7.8 6	9.4 6	3.4 6	4.5 6	7.1 6	7.2 6	8.0 6	3.5 6	24	10.9
24	8.0 6	5.9 6	6.8 6	6.2 6	5.1 6	7.7 6	6.3 6	6.4 6	5.8 6	9.4 6	8.7 6	7.2 6	6.0 6	8.8 6	7.3 6	9.5 6	9.8 6	8.1 6	8.6 6	5.4 6	10.4 6	8.8 6	11.8 6	7.2 6	24	11.8
25	5.8 6	5.7 6	9.2 6	10.2 6	11.7 6	11.2 6	11.3 6	12.1 6	10.8 6	14.5 6	15.0 6	17.3 6	13.5 6	11.2 6	14.0 6	11.1 6	12.3 6	20.8 6	13.3 6	15.9 6	11.4 6	15.9 6	9.4 6	12.6 6	24	20.8
26	12.2 6	18.0 6	21.9 6	20.2 6	15.6 6	16.2 6	17.2 6	15.7 6	18.6 6	21.1 6	9.8 6	13.9 6	19.9 6	15.8 6	14.7 6	19.5 6	14.3 6	23.3 6	18.8 6	22.9 6	21.8 6	20.6 6	17.5 6	12.7 6	24	23.3
27	15.3 6	13.4 6	14.5 6	13.1 6	12.7 6	11.8 6	12.5 6	14.4 6	14.9 6	11.2 6	16.7 6	10.9 6	9.0 6	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	13	16.7
28	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	BC	BA	11.3	4.5	6.6	5.6	6.2	4.9	3.4	5.5	8	11.3
29	8.1	6.9	3.3	4.5	5.7	2.6	2.4	-.3	5.3	3.2	2.9	2.8	7.1	5.9	7.5	9.8	2.1	9.6	8.9	6.8	7.9	3.8	9.9	5.6	24	9.9
30	4.3	8.2	8.2	1.8	6.9	2.9	4.5	6.5	7.3	6.8	8.0	6.0	7.9	5.8	7.5	1.1	3.9	4.9	3.0	4.1	.0	6.1	2.3	2.7	24	8.2
31																									0	
NO.:	10	10	10	10	10	10	10	10	8	8	8	9	9	8	9	9	10	10	10	10	10	10	10	10		
MAX:	15.3	18.0	21.9	20.2	15.6	16.2	17.2	15.7	18.6	21.1	16.7	19.3	19.9	15.8	14.7	19.5	14.3	23.3	18.8	49.9	21.8	20.6	17.5	15.0		
AVG:	9.30	8.42	9.38	8.46	9.21	9.03	8.64	8.45	9.39	10.70	9.11	10.74	10.08	8.83	9.72	9.38	8.77	11.28	8.95	13.22	9.70	9.72	9.58	8.11		

MONTHLY OBSERVATIONS: 228 MONTHLY MEAN: 9.50 MONTHLY MAX: 49.9

Note: Qualifier codes with regional concurrence are shown in upper-case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	1.6	3.8	4.9	2.7	4.6	4.3	1.7	6.7	4.9	3.6	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	10	6.7
2	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
3	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
4	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	1.3	4.9	4.4	3.6	8.0	3.3	5.0	8.2	3.8	2.8	5.9	11	8.2
5	3.6	2.2	6.5	2.1	5.8	5.5	6.8	3.2	7.5	3.8	4.7	5.0	4.0	6.5	5.2	7.0	7.2	6.0	6.8	4.6	4.1	6.9	8.8	8.4	24	8.8
6	10.1	10.6	7.4	6.9	12.2	9.4	9.5	9.1	9.2	6.2	7.8	10.2	8.8	11.4	7.9	7.3	12.5	8.8	9.6	7.3	6.7	10.7	7.0	9.3	24	12.5
7	7.8	5.5	7.6	7.0	1.5	2.0	1.8	9.6	3.3	6.2	5.0	9.6	15.6	17.4	10.4	13.0	12.6	14.1	7.9	11.1	5.6	9.6	9.8	10.7	24	17.4
8	12.2	7.7	6.3	8.5	6.9	11.0	9.5	6.3	14.3	6.8	11.9	6.5	10.4	9.9	14.5	18.3	17.1	13.8	11.8	14.2	14.4	16.2	12.3	14.6	24	18.3
9	9.8	15.7	12.8	9.7	11.8	14.4	7.5	12.1	18.1	18.3	14.0	21.1	16.2	17.5	13.3	10.8	9.2	8.6	4.0	20.6	6.1	11.0	10.1	5.7	24	21.1
10	8.8	11.0	6.6	10.3	9.4	11.2	8.2	8.5	9.7	11.4	5.4	BL	2.6	1.8	11.0	11.2	8.5	15.8	16.4	6.9	8.5	4.3	2.3	1.8	23	16.4
11	4.7	5.0	9.7	5.1	5.7	11.1	13.6	13.5	15.3	8.7	6.5	15.0	10.3	12.4	15.9	11.7	13.8	14.1	10.9	12.6	9.3	11.3	12.2	14.3	24	15.9
12	6.9	14.0	.5	7.0	3.4	2.7	2.8	6.9	2.3	8.0	3.0	4.4	7.3	4.6	5.7	1.4	12.6	4.3	8.0	4.0	6.5	7.2	9.0	11.0	24	14.0
13	7.8	9.6	10.4	11.9	12.6	10.4	11.3	8.8	4.9	5.7	2.4	9.3	7.8	5.7	3.6	3.5	2.3	14.6	7.0	6.9	7.4	6.7	3.8	9.4	24	14.6
14	5.5	7.0	5.1	9.3	5.8	4.2	2.5	1.3	6.0	7.5	6.4	8.5	9.1	10.3	11.2	10.9	7.9	12.2	5.9	7.7	5.8	8.7	6.6	8.2	24	12.2
15	8.2	5.8	4.2	5.6	11.6	8.9	6.4	10.5	6.7	8.0	11.2	8.9	10.1	12.2	19.2	9.6	.1	9.1	19.6	3.6	4.1	3.5	12.0	11.6	24	19.6
16	3.1	6.4	5.2	13.2	4.8	5.8	.9	2.9	6.6	11.1	8.3	11.6	13.3	13.9	13.9	19.0	3.5	3.5	9.0	4.7	6.6	9.1	3.8	5.7	24	19.0
17	5.5	.6	3.1	5.1	4.6	1.4	5.2	9.2	7.4	12.0	6.0	12.1	14.9	8.7	5.8	20.8	2.2	6.8	4.7	5.9	6.4	6.3	6.5	6.1	24	20.8
18	2.6	5.6	6.6	12.3	10.0	7.1	8.0	7.4	3.6	6.6	6.3	1.7	13.9	2.7	9.8	.1	8.7	10.0	6.5	13.8	4.4	3.9	5.8	5.5	24	13.9
19	3.1	1.6	3.5	1.7	-1.4	2.6	2.3	-.5	3.5	-.9	.6	3.2	5.3	6.5	-.1	3.4	5.0	6.3	4.9	7.7	4.8	3.6	5.1	6.4	24	7.7
20	7.6	3.0	6.5	6.5	4.9	4.9	5.3	7.8	9.4	2.5	6.5	11.2	8.9	1.9	10.5	9.7	8.1	12.4	16.7	3.3	7.8	7.8	.0	3.2	24	16.7
21	-3.2IF	3.6IF	.5IF	2.5IF	-.7IF	2.7IF	5.1IF	11.2IF	6.0IF	11.9IF	7.1IF	5.3IF	6.0IF	6.9IF	4.3IF	8.0IF	8.9IF	15.2IF	13.2IF	9.1IF	11.7IF	8.5IF	9.4IF	9.9IF	24	15.2
22	14.9IF	10.2IF	13.7IF	8.6IF	4.2IF	8.3IF	5.4IF	5.5IF	9.7IF	8.6IF	5.8IF	6.6IF	7.5IF	15.8IF	16.2IF	8.1IF	9.1IF	9.1IF	10.9IF	14.4IF	12.3IF	14.4IF	13.5IF	10.7IF	24	16.2
23	12.5IF	13.3IF	13.8IF	14.1IF	16.1IF	16.0IF	11.3IF	13.6IF	15.3IF	14.7IF	12.8IF	15.6IF	11.5IF	15.1IF	16.9IF	12.8IF	20.0IF	14.3IF	19.7IF	12.0IF	17.7IF	16.2IF	17.1IF	16.1IF	24	20.0
24	16.8IF	14.6IF	16.4IF	14.0IF	18.8IF	11.3IF	14.1IF	18.8IF	15.3IF	11.3IF	AX	17.3IF	15.7IF	13.6IF	17.2IF	14.6IF	17.2IF	18.6IF	18.6IF	17.0IF	15.5IF	16.8IF	17.8IF	16.5IF	23	18.8
25	10.0IF	14.1IF	11.7IF	13.5IF	18.6IF	10.5IF	8.3IF	10.9IF	14.8IF	13.1IF	7.3IF	10.9IF	11.5IF	14.7IF	10.8IF	14.2IF	12.4IF	14.5IF	9.8IF	12.3IF	13.3IF	11.2IF	13.3IF	14.1IF	24	18.6
26	8.7IF	12.8IF	10.0IF	11.6IF	9.7IF	13.5IF	16.4IF	19.8IF	11.9IF	9.2IF	17.9IF	7.3IF	12.4IF	10.8IF	10.2IF	13.2IF	13.7IF	19.3IF	17.7IF	17.7IF	13.4IF	15.8IF	13.8IF	9.7IF	24	19.8
27	7.7IF	9.2IF	8.4IF	10.1IF	7.4IF	7.0IF	8.0IF	4.2IF	7.3IF	6.4IF	1.4IF	.2IF	7.6IF	3.3IF	6.0IF	7.3IF	10.0IF	10.8IF	4.3IF	9.0IF	8.9IF	8.5IF	7.4IF	5.2IF	24	10.8
28	6.3IF	5.4IF	1.1IF	6.1IF	1.3IF	4.1IF	-.6IF	1.3IF	4.9IF	1.2IF	4.5IF	6.4IF	6.2IF	5.2IF	5.6IF	11.7IF	12.2IF	11.6IF	7.6IF	10.5IF	9.3IF	9.4IF	12.6IF	10.2IF	24	12.6
29	12.7IF	10.3IF	8.9IF	10.0IF	10.5IF	8.2IF	4.1IF	AQ	AV	AV	3.0IF	7.7IF	4.6IF	-1.9IF	.4IF	3.4IF	5.0IF	5.6IF	6.1IF	7.7IF	4.0IF	3.4IF	1.3IF	6.2IF	21	12.7
30	3.1IF	.6IF	-.6IF	3.7IF	1.0IF	3.7IF	-1.2IF	1.8IF	6.0IF	4.6IF	3.3IF	3.8IF	3.5IF	2.4IF	5.4IF	6.1IF	10.9IF	17.6IF	7.7IF	8.1IF	5.0IF	4.3IF	6.7IF	7.2IF	24	17.6
31	5.8	6.2	5.6	6.9	7.8	5.5	3.7	7.5	3.5	8.1	11.7	11.8	11.7	9.7	12.9	14.2	12.7	13.4	12.2	11.0	8.9	10.6	9.7	8.4	24	14.2
NO.:	28	28	28	28	28	28	28	27	27	27	26	26	27	28	28	28	28	28	28	28	28	28	28	28		
MAX:	16.8	15.7	16.4	14.1	18.8	16.0	16.4	19.8	18.1	18.3	17.9	21.1	16.2	17.5	19.2	20.8	20.0	19.3	19.7	20.6	17.7	16.8	17.8	16.5		
AVG:	7.29	7.69	7.01	8.07	7.46	7.42	6.35	8.07	8.42	7.95	6.95	8.89	9.51	8.58	9.59	9.85	9.54	11.37	10.03	9.60	8.45	8.92	8.59	9.00		

MONTHLY OBSERVATIONS: 664 MONTHLY MEAN: 8.53 MONTHLY MAX: 21.1

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	12.9	11.4	12.5	7.9	11.4	12.4	12.5	10.1	7.4	7.3	7.9	7.9	11.6	5.5	7.2	9.8	7.9	15.1	6.6	7.5	5.0	7.1	5.4	6.0	24	15.1
2	7.7	7.3	7.3	10.0	5.6	5.8	4.6	8.6	15.3	11.0	9.2	10.4	9.3	13.5	10.8	10.7	12.0	15,6	9.2	13.5	14.4	10.5	13.3	12.2	24	15.6
3	14.6	10.6	9.3	22.8	10.1	7.3	2.5	3.1	9.5	10.5	12.5	9.6	15.4	10.0	8.9	9.5	11.1	10.8	4.0	13.7	9.0	10.5	9.5	11.6	24	22.8
4	7.7	11.5	10.9	13.3	13.4	12.2	10.6	14.6	11.1	13.2	16.3	11.8	13.8	11.1	12.3	9.4	17.3	11.1	12.2	12.6	9.8	12.8	11.1	14.6	24	17.3
5	11.9	12.5	12.9	10.1	7.8	6.7	12.1	11.5	11.4	12.1	4.8	13.1	12.4	8.8	13.3	9.9	13.5	12.1	11.3	13.8	12.6	14.5	8.4	12.0	24	14.5
6	14.9	11.8	12.6	14.6	14.9	12.1	6.0	11.3	9.0	11.2	9.3	9.0	9.9	11.0	8.3	9.1	9.5	14.4	13.2	12.7	13.3	9.6	17.0	13.1	24	17.0
7	9.2	9.7	9.8	10.6	7.0	8.6	2.0	4.0	7.6	9.4	12.9	11.8	14.8	13.1	11.9	13.8	18.2	24.5	20.3	25.3	25.8	21.8	21.4	21.1	24	25.8
8	21.8	19.1	17.3	19.1	21.0	19.9	18.8	16.8	21.1	22.2	21.4	20.4	16.1	13.9	16.3	15.7	13.6	16.7	12.5	16.4	12.0	12.8	11.8	14.4	24	22.2
9	17.5IF	15.1IF	10.6IF	16.9IF	16.5IF	17.6IF	12.8IF	19.6IF	16.1IF	19.5IF	17.6IF	19.4IF	16.2IF	14.7IF	13.3IF	15.5IF	15.7IF	25.9IF	21.5IF	25.1IF	19.5IF	20.3IF	19.9IF	20.7IF	24	25.9
10	17.8	18.3	19.2	21.7	17.5	20.3	17.8	16.5	20.8	19.9	18.6	17.3	18.0	15.8	17.2	19.1	17.3	21.3	15.5	15.3	15.2	18.2	18.0	19.7	24	21.7
11	18.3	14.3	13.6	10.5	11.3	12.8	12.5	12.5	12.3	10.3	6.3	10.9	10.7	10.8	7.6	11.8	14.8	13.1	11.8	12.5	8.9	9.7	10.1	8.6	24	18.3
12	11.9	1.9	-.6	3.5	4.5	2.0	3.5	.1	.3	8.3	12.2	8.4	7.4	8.4	6.2	8.9	8.1	11.2	9.9	10.0	9.0	14.5	14.1	15.8	24	15.8
13	10.3	10.7	20.5	12.3	12.1	10.8	9.5	13.1	11.8	10.4	12.0	10.1	13.3	11.2	13.9	10.6	7.9	14.8	10.6	11.7	7.1	8.2	4.5	6.8	24	20.5
14	4.9	10.0	10.3	11.3	7.2	8.5	11.6	11.3	AV	AH	AH	12.3	7.7	-1.8	13.0	-5.3	3.4	7.2	-.1	4.1	5.0	6.8	.9	6.0	21	13.0
15	5.8	8.1	7.2	9.3	3.6	7.2	6.9	3.0	6.5	.7	-.6	7.7	-3.4	.8	2.9	7.9	12.4	15.6	4.5	10.7	9.8	4.3	5.3	10.8	24	15.6
16	8.5	8.5	2.7	4.8	10.4	15.0	11.1	10.1	8.5	4.6	11.2	9.3	9.9	9.3	10.8	6.7	9.5	10.2	24.4	7.9	2.4	3.7	7.1	5.4	24	24.4
17	6.8	4.0	7.2	6.9	9.3	5.5	-.8	2.1	8.6	3.7	6.9	6.8	9.5	12.4	11.8	5.5	7.1	14.4	10.6	16.2	16.7	15.7	14.4	12.8	24	16.7
18	12.5	12.7	10.8	13.7	12.0	10.8	8.5	6.6	20.4	24.5	20.5	21.7	10.3	13.2	13.1	4.4	9.1	7.2	7.5	6.9	7.0	7.8	2.9	1.6	24	24.5
19	3.7	3.3	9.5	1.9	4.2	3.2	6.4	1.5	5.9	6.1	3.2	-.1	8.2	-1.4	5.9	3.0	7.5	11.6	8.7	4.6	8.6	9.2	2.4	3.6	24	11.6
20	2.2	5.4	6.6	-1.2	6.2	4.6	1.3	.3	6.4	7.2	5.7	9.0	9.3	13.0	19.1	16.7	7.1	23.4	-.8	8.2	8.9	6.3	8.0	5.2	24	23.4
21	7.1	11.1	5.4	8.6	5.4	8.5	10.2	5.8	2.1	3.2	8.4	5.1	3.9	8.2	1.4	3.3	5.9	1.0	3.4	4.6	.1	1.8	.1	2.5	24	11.1
22	2.4	-1.4	-.8	-.8	2.1	-1.7	.0	-.8	-1.3	2.5	-.1	3.6	AX	4.6	4.4	4.6	3.5	5.4	2.2	6.2	3.4	4.4	1.1	6.9	23	6.9
23	.9	6.4	1.4	.0	4.6	2.7	.5	1.6	4.0	4.4	7.2	7.4	11.1	9.9	14.3	5.1	4.9	8.6	4.6	6.4	8.3	9.5	9.7	4.1	24	14.3
24	10.4	8.4	3.9	5.2	6.8	6.1	1.8	4.9	11.9	11.2	13.7	15.9	AV	10.0	7.1	14.8	21.4	19.2	13.8	20.8	16.4	15.4	16.3	17.5	23	21.4
25	12.1	18.8	20.1	14.8	13.4	11.8	5.7	9.7	19.4	16.5	13.3	17.3	18.0	13.9	16.3	12.4	10.4	15.9	16.0	4.3	10.6	3.1	5.7	8.6	24	20.1
26	10.8	7.0	4.7	10.8	5.2	9.7	8.0	5.7	9.2	1.6	4.9	10.3	9.7	10.6	5.3	14.1	12.6	18.7	15.5	14.9	12.5	12.7	12.3	9.7	24	18.7
27	7.1	9.7	7.5	13.6	11.1	7.6	9.7	10.1	17.2	16.6	19.3	19.9	18.9	13.8	15.2	19.8	21.4	18.8	21.5	20.8	20.8	20.5	20.6	14.8	24	21.5
28	17.2IF	17.2IF	14.7IF	17.5IF	19.6IF	12.5IF	7.9IF	8.8IF	9.4IF	7.2IF	11.9IF	14.4IF	15.5IF	13.4IF	12.2IF	14.0IF	13.8IF	15.3IF	11.4IF	14.0IF	12.1IF	9.0IF	8.8IF	13.1IF	24	19.6
29	12.2IF	14.1IF	12.1IF	7.9IF	11.1IF	8.8IF	3.3IF	5.4IF	15.7IF	22.0IF	20.0IF	15.7IF	16.8IF	17.4IF	15.0IF	14.8IF	18.1IF	18.6IF	18.7IF	20.8IF	22.5IF	23.6IF	28.4IF	28.3IF	24	28.4
30	30.6IF	27.7IF	30.2IF	34.9IF	29.1IF	30.8IF	27.6IF	25.4IF	42.0IF	31.3IF	20.2IF	18.5IF	19.8IF	15.3IF	28.2IF	6.2IF	7.2IF	12.2IF	4.1IF	7.5IF	9.3IF	13.1IF	7.0IF	6.4IF	24	42.0
31																									0	
NO.:	30	30	30	30	30	30	30	30	29	29	29	30	28	30	30	30	30	30	30	30	30	30	30	30		
MAX:	30.6	27.7	30.2	34.9	29.1	30.8	27.6	25.4	42.0	31.3	21.4	21.7	19.8	17.4	28.2	19.8	21.4	25.9	24.4	25.3	25.8	23.6	28.4	28.3		
AVG:	11.06	10.84	10.31	11.15	10.48	10.00	8.16	8.44	11.71	11.33	11.27	11.83	11.93	10.35	11.44	10.06	11.41	14.33	10.82	12.30	11.20	11.25	10.52	11.13		

MONTHLY OBSERVATIONS: 715 MONTHLY MEAN: 10.97 MONTHLY MAX: 42.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	12.0IF	9.5IF	6.1IF	8.7IF	14.5IF	10.3IF	5.7IF	.8IF	8.5IF	23.3IF	12.9IF	20.8IF	16.2IF	19.5IF	21.6IF	24.9IF	32.0IF	15.8IF	4.3IF	8.0IF	6.8IF	10.7IF	10.2IF	10.1IF	24	32.0
2	6.0IF	5.7IF	8.9IF	6.1IF	7.3IF	3.2IF	2.1IF	10.1IF	11.0IF	8.7IF	18.9IF	16.5IF	13.9IF	15.9IF	20.5IF	26.4IF	11.3IF	9.8IF	7.6IF	11.7IF	10.5IF	5.4IF	4.4IF	8.4IF	24	26.4
3	3.4	7.9	5.3	2.7	4.6	7.8	5.0	6.3	9.7	7.0	11.0	AH	12.1	15.6	18.3	17.8	16.9	15.8	13.3	6.6	8.3	4.0	7.6	8.6	23	18.3
4	8.8	6.1	4.8	4.3	3.4	3.8	2.6	6.6	1.7	7.2	6.5	27.9	11.3	9.6	9.3	10.4	11.7	10.8	10.3	8.1	6.7	11.1	9.5	8.2	24	27.9
5	6.0	5.9	4.6	1.4	1.5	1.7	3.9	10.9	11.7	12.5	11.8	7.5	11.7	11.1	8.3	4.2	11.2	22.2	12.2	6.7	18.7	2.4	1.5	-.9	24	22.2
6	2.7	2.4	2.1	3.2	2.8	6.4	2.0	3.3	7.6	9.0	16.6	14.3	8.2	9.1	6.6	7.5	5.2	19.2	4.9	7.3	4.0	3.1	4.8	1.0	24	19.2
7	1.1	3.9	1.4	2.8	5.5	7.2	-1.8	1.6	1.7	6.9	5.5	8.9	7.6	12.0	AH	AH	10.2	2.2	3.5	9.2	3.6	4.5	4.5	9.3	22	12.0
8	6.9	7.9	5.4	9.5	5.1	5.9	.9	2.1	11.4	4.1	3.9	7.4	8.9	8.0	5.1	BR	8.7	4.0	7.3	8.2	4.8	5.4	5.5	6.7	23	11.4
9	3.4	7.8	6.4	5.5	6.1	8.2	4.1	4.6	1.0	.1	9.7	7.8	3.9	5.4	5.6	8.5	4.5	7.8	8.8	AH	AV	-2.9	4.9	-2.2	22	9.7
10	-.3	5.2	.6	1.3	-.3	2.4	1.8	.1	.2	-1.1	-1.5	5.1	1.4	-2.3	1.3	1.0	5.3	11.5	4.4	7.9	5.1	2.8	6.7	4.2	24	11.5
11	3.6	2.7	4.9	7.0	2.5	1.2	-2.7	-.3	5.1	10.8	6.0	3.7	3.1	4.4	8.3	5.2	8.2	11.7	3.6	10.7	10.4	10.1	5.7	5.5	24	11.7
12	8.5	6.4	4.2	6.2	5.5	8.5	4.3	7.1	7.4	9.7	8.5	14.8	6.3	4.0	9.4	9.2	10.5	12.2	8.1	11.3	7.8	3.5	5.4	6.3	24	14.8
13	5.3	5.6	6.8	3.0	8.3	3.7	3.0	-.2	10.2	1.4	9.1	7.5	2.8	8.8	4.6	7.2	6.6	4.1	6.6	7.9	3.1	3.5	5.7	8.4	24	10.2
14	6.2	3.7	9.5	4.0	4.4	.8	7.7	.3	4.2	6.5	7.1	7.9	4.4	7.5	5.4	10.6	10.1	11.0	10.7	9.0	9.9	9.9	6.6	10.8	24	11.0
15	6.9	6.2	7.9	6.0	6.2	7.8	6.8	3.4	1.3	4.1	3.7	11.3	8.0	7.5	3.0	7.2	7.5	3.9	5.9	7.7	4.5	10.2	8.0	6.5	24	11.3
16	5.4	5.0	4.6	10.6	6.1	6.9	8.3	2.3	4.0	7.0	11.4	9.1	6.0	8.4	5.2	8.6	10.8	9.7	10.7	8.9	13.1	16.4	14.1	15.7	24	16.4
17	16.1IF	18.0IF	21.5IF	19.9IF	21.9IF	26.3IF	24.7IF	31.0IF	5.5IF	29.5IF	8.0IF	26.2IF	30.5IF	30.2IF	32.2IF	37.7IF	16.7IF	BK	BK	BK	BK	BK	BK	BK	17	37.7
18	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	0	
19	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	0	
20	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	AX	BK	BK	BK	BK	16.0	15.5	17.9	16.9	9.5	10.1	9.7	7	17.9
21	7.2	6.8	7.2	13.4	15.7	16.8	19.5	14.2	11.6	18.6	13.8	15.6	18.1	12.7	17.3	14.0	18.8	19.2	15.1	.0	3.6	2.5	6.9	3.7	24	19.5
22	4.8	7.7	4.9	2.5	7.5	1.9	5.8	6.8	4.6	5.5	5.6	-1.6	6.2	3.6	2.6	8.9	9.0	7.9	7.5	4.2	10.6	7.7	5.8	6.0	24	10.6
23	5.2	8.7	8.4	9.3	6.2	5.6	3.0	6.4	6.9	8.0	7.7	9.1	7.5	7.4	5.2	5.2	5.2	9.6	11.7	11.6	10.5	7.9	6.0	5.2	24	11.7
24	9.8	10.0	4.1	7.6	8.7	7.7	3.7	2.3	7.1	2.7	7.8	7.8	9.6	9.0	7.9	7.4	8.0	14.1	17.1	12.4	10.6	8.0	9.5	11.9	24	17.1
25	14.1	10.1	6.7	10.3	10.3	10.3	11.3	2.1	14.0	11.6	13.6	12.1	10.8	11.8	5.5	14.6	16.0	16.1	16.6	18.2	15.0	16.9	12.9	15.1	24	18.2
26	17.1	13.2	11.7	12.7	7.7	8.8	6.5	9.3	14.7	14.9	18.2	14.1	15.7	16.3	11.0	11.9	16.7	AV	19.4	8.3	18.4	15.7	13.7	16.2	23	19.4
27	14.4	11.3	14.1	11.6	10.9	10.9	10.6	8.0	12.8	10.6	18.1	19.4	18.7	17.1	17.4	14.2	15.3	18.0	14.8	20.1	14.7	21.5	18.1	15.2	24	21.5
28	19.0	19.3	14.3	15.2	15.2	10.9	14.6	11.7	11.2	18.6	11.0	17.7	16.4	15.2	12.9	20.4	20.5	12.0	21.8	13.2	12.6	11.7	12.6	7.6	24	21.8
29	10.3	12.1	10.8	9.5	11.6	9.9	3.6	12.5	13.5	13.1	13.0	20.6	14.8	16.5	15.7	15.8	19.3	18.7	17.2	16.7	15.7	14.5	11.9	16.3	24	20.6
30	16.4	11.0	15.4	15.4	17.8	17.3	17.5	15.4	20.4	17.1	15.8	19.1	7.5	3.0	4.6	7.1	6.8	7.1	10.4	10.2	2.9	10.6	8.6	9.3	24	20.4
31	4.1	9.4	6.8	15.2	11.9	9.5	4.8	3.4	3.1	4.7	8.5	2.9	6.6	6.5	5.8	5.8	5.0	10.8	10.4	8.7	7.6	6.7	6.1	4.6	24	15.2
NO.:	28	28	28	28	28	28	28	28	28	28	28	27	28	28	27	26	28	27	28	27	27	28	28	28		
MAX:	19.0	19.3	21.5	19.9	21.9	26.3	24.7	31.0	20.4	29.5	18.9	27.9	30.5	30.2	32.2	37.7	32.0	22.2	21.8	20.1	18.7	21.5	18.1	16.3		
AVG:	8.01	8.20	7.48	8.03	8.18	7.92	6.40	6.50	7.93	9.72	10.08	12.35	10.29	10.49	10.02	11.99	11.71	11.90	10.70	10.03	9.50	8.33	8.12	8.12		

MONTHLY OBSERVATIONS: 665 MONTHLY MEAN: 9.23 MONTHLY MAX: 37.7

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	1.5	9.0	8.1	7.4	8.2	8.0	2.6	7.5	4.4	7.3	8.8	7.1	9.1	5.2	6.8	4.1	5.6	12.3	10.3	6.8	4.8	7.8	10.1	11.0	24	12.3
2	4.8	9.5	7.5	8.2	8.6	7.5	7.3	8.6	9.3	9.9	12.8	12.0	13.7	12.9	8.4	2.1	13.4	10.8	6.8	8.4	9.0	10.0	11.2	11.4	24	13.7
3	8.5	9.4	11.2	8.6	8.9	8.7	9.2	13.1	6.5	4.0	9.3	18.3	12.0	14.3	8.9	19.8	10.9	5.4	7.7	7.1	4.4	4.2	10.1	6.3	24	19.8
4	8.3	6.8	7.6	9.9	10.8	7.4	4.3	-1.0	-1.3	.3	-4.5	.6	4.3	5.0	.3	4.4	7.2	8.8	5.9	7.7	5.1	6.7	2.3	10.2	24	10.8
5	3.7	4.7	3.3	4.9	3.5	2.4	.0	-5.4	4.9	5.7	1.4	5.3	1.9	4.0	4.6	3.5	8.2	12.2	12.2	11.5	7.9	10.1	8.6	11.3	24	12.2
6	7.7	8.4	7.8	7.6	1.9	8.4	5.4	5.0	9.2	11.9	10.7	10.8	5.5	6.8	7.4	11.7	4.6	1.5	.6	4.2	7.3	6.2	5.4	8.9	24	11.9
7	4.2	7.6	.6	4.6	6.9	2.5	4.0	6.0	6.9	5.6	8.8	9.2	10.7	12.0	4.6	13.3	15.6	-2.1	5.7	3.3	.5	3.9	-1.2	3.8	24	15.6
8	3.3	7.3	3.6	5.2	4.7	1.3	.8	2.3	10.6	2.6	7.8	6.2	BK	BK	BK	BK	5.4	10.0	6.5	9.0	9.5	4.2	7.3	8.9	20	10.6
9	4.1	7.1	7.9	1.4	3.1	5.3	.5	-3.2	6.5	6.6	BK	4.9	3.5	4.8	5.7	5.8	8.9	7.6	AV	AV	AV	AV	AV	6.8	18	8.9
10	5.3	-.8	4.1	7.0	7.6	8.7	15.3	5.8	.2	-5.6	8.9	5.5	-.1	3.9	3.7	BK	BK	BK	BK	BK	BK	BK	BK	BK	15	15.3
11	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	4.3	3.4	1.2	7.3	1.0	5.5	8.1	2.2	3.4	3.9	6.9	.7	.8	13	8.1
12	1.0	8.2	2.6	3.2	7.1	6.2	4.4	2.4	11.0	5.8	8.5	9.0	8.1	7.9	10.1	6.3	27.3	-6.6	.5	2.0	2.3	4.8	5.0	2.5	24	27.3
13	.9	1.6	4.5	2.5	1.0	.7	2.2	-2.3	.6	7.5	9.3	10.5	10.2	1.4	7.3	5.9	4.5	-.8	3.7	10.0	5.2	2.8	3.5	3.8	24	10.5
14	3.3	4.4	4.0	3.2	1.2	4.3	3.3	1.8	8.0	8.4	9.9	12.1	11.1	10.8	8.1	14.6	9.8	9.6	7.5	11.4	14.2	4.8	12.6	8.2	24	14.6
15	9.8	9.9	8.3	10.0	7.6	8.1	6.3	2.7	10.4	5.4	6.4	9.7	3.4	4.1	9.9	8.0	7.4	11.7	8.7	7.2	3.8	3.4	5.9	5.3	24	11.7
16	.9	-.2	6.1	5.6	1.4	1.1	-.2	-4.4	4.8	7.4	2.6	7.4	2.2	1.4	.2	6.9	1.2	2.4	7.8	2.7	8.6	1.9	6.1	5.5	24	8.6
17	4.3	3.6	-1.2	1.9	-2.9	2.3	4.9	-5.3	2.9	2.9	2.1	7.7	4.2	4.2	7.6	5.5	12.2	15.5	9.7	7.9	8.2	7.4	7.9	12.6	24	15.5
18	11.9	10.6	5.5	1.2	6.0	5.5	1.5	-2.4	5.4	10.8	10.6	7.8	6.8	6.3	7.6	7.9	4.4	10.9	6.2	11.4	8.5	5.0	5.5	2.7	24	11.9
19	5.8	8.0	3.8	3.4	5.6	6.1	2.1	4.1	7.9	11.8	11.3	8.5	9.3	9.0	6.9	24.1	22.4	9.8	5.4	9.7	5.9	7.4	4.7	5.5	24	24.1
20	7.9 6	10.6 6	6.9 6	10.1 6	10.0 6	8.4 6	8.4 6	3.8 6	12.5 6	10.9 6	9.0 6	9.0 6	10.1 6	7.8 6	7.1 6	9.0 6	8.1 6	12.6 6	10.9 6	13.9 6	8.6 6	9.8 6	11.8 6	11.8 6	24	13.9
21	7.2 6	9.2 6	7.3 6	11.1 6	7.7 6	7.3 6	5.3 6	1.6 6	13.2 6	8.8 6	AX	10.5	12.5	6.4	2.8	9.5	7.3	8.4	4.1	10.8	5.1	9.5	10.1	8.6	23	13.2
22	9.7	7.2	3.5	5.6	6.5	7.7	4.2	3.2	13.8	13.7	13.7	13.5	10.1	12.1	12.7	12.6	13.3	16.5	15.2	16.4	16.6	11.5	14.4	10.9	24	16.6
23	12.4	10.5	9.4	9.4	12.1	15.4	13.8	12.9	14.8	16.3	17.6	16.0	17.2	12.1	13.3	16.7	14.0	17.6	19.2	23.5	14.1	16.0	17.5	13.6	24	23.5
24	18.3	13.6	16.5	15.8	10.9	15.9	12.8	14.9	22.4	17.8	16.0	13.9	15.4	15.9	18.7	13.7	16.9	17.8	16.0	17.2	12.4	13.7	13.3	11.6	24	22.4
25	12.0	12.0	12.3	14.5	11.3	15.3	12.7	9.8	12.9	15.0	16.6	18.6	13.7	17.9	16.5	15.4	13.6	14.1	19.6	17.2	15.2	16.1	13.9	10.7	24	19.6
26	11.0	8.3	10.0	13.7	11.4	14.8	10.2	6.0	11.0	17.6	13.1	14.9	10.9	10.9	11.1	10.6	13.6	12.2	12.8	10.9	12.7	10.8	8.9	11.7	24	17.6
27	11.6	9.0	10.4	7.8	8.2	11.2	9.3	3.8	5.6	5.2	7.7	10.3	5.6	7.9	23.0	3.4	5.3	12.4	9.7	13.7	12.0	6.1	4.2	4.8	24	23.0
28	13.9	8.8	7.5	6.0	6.7	8.3	7.7	4.2	4.7	12.8	6.2	11.0	13.7	14.3	11.9	7.9	.6	5.3	6.8	3.2	.2	2.7	6.1	6.5	24	14.3
29	6.9	4.0	5.2	5.3	5.7	5.3	4.4	3.6	-.5	4.9	4.1	5.5	7.9	8.5	10.1	-.3	4.6	3.2	.2	.2	1.4	-3.7	.9	1.8	24	10.1
30	3.9	2.1	2.5	2.1	5.4	1.5	1.5	5.8	.5	-2.2	-1.8	.2	.9	2.5	6.2	1.7	4.3	8.5	2.9	10.0	4.5	4.3	5.3	2.0	24	10.0
31	3.4	4.5	5.7	7.1	5.8	5.5	.9	3.5	5.0	6.5	5.6	9.7	6.5	4.1	5.1	5.9	-3.9	14.6	7.8	10.3	8.1	10.6	4.4	7.7	24	14.6
NO.:	30	30	30	30	30	30	30	30	30	30	28	31	30	30	30	29	30	30	29	29	29	29	29	30		
MAX:	18.3	13.6	16.5	15.8	12.1	15.9	15.3	14.9	22.4	17.8	17.6	18.6	17.2	17.9	23.0	24.1	27.3	17.8	19.6	23.5	16.6	16.1	17.5	13.6		
AVG:	6.92	7.22	6.42	6.81	6.43	7.04	5.50	3.61	7.47	7.85	8.30	9.35	8.13	7.85	8.46	8.66	9.07	9.01	8.02	9.34	7.59	7.07	7.47	7.57		

MONTHLY OBSERVATIONS: 713 MONTHLY MEAN: 7.54 MONTHLY MAX: 27.3

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
R[illegible] REPORT

[illegible], 2024

(88101[illegible] - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER: [illegible]
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	7.1	10.0	10.8	6.7	7.5	8.0	6.8	9.2	9.9	5.9	5.1	5.7	8.0	3.9	7.8	7.8	9.1	9.8	8.4	7.3	8.0	8.0	6.7	3.8	24	10.8
2	7.3	5.5	3.4	3.8	2.4	6.9	4.3	3.9	2.4	3.4	2.4	2.5	.3	3.3	3.5	4.8	4.1	7.1	8.3	7.8	4.7	2.1	1.5	6.5	24	8.3
3	2.0	5.7	4.9	6.3	9.4	2.9	2.6	5.3	5.3	4.1	4.2	5.6	6.8	4.3	2.2	2.4	5.5	9.4	5.3	7.2	4.7	3.8	5.0	5.9	24	9.4
4	1.6	-.1	4.4	2.9	2.0	2.7	2.4	1.0	3.5	5.3	4.6	5.1	6.3	5.7	2.6	5.5	2.6	10.3	4.7	7.8	4.3	5.7	2.3	6.7	24	10.3
5	9.1	4.8	3.2	3.2	6.3	3.6	-.6	-1.2	5.2	1.5	9.7	11.7	10.1	6.4	.4	4.2	6.7	7.8	8.8	6.4	3.3	7.9	4.8	4.7	24	11.7
6	6.4	4.6	4.3	2.9	1.0	2.5	-1.3	-1.8	7.9	-1.4	6.5	1.0	6.2	8.3	10.2	5.6	10.2	4.9	11.3	9.1	6.2	5.1	4.0	7.6	24	11.3
7	3.8	5.5	3.3	5.6	4.4	9.0	4.7	1.4	5.8	7.7	7.9	1.2	6.4	.7	2.8	3.5	5.2	8.8	7.8	3.2	2.9	3.3	4.5	1.0	24	9.0
8	8.3	4.0	3.3	6.7	10.2	10.0	8.5	5.6	11.9	8.7	12.7	14.7	10.2	16.6	11.2	4.7	11.0	11.1	7.4	8.7	4.1	8.2	7.6	8.9	24	16.6
9	7.8	4.0	7.5	5.8	4.3	7.3	3.3	1.6	15.1	13.9	6.0	11.1	12.6	11.4	11.6	10.3	8.4	14.3	13.8	9.1	7.7	8.8	11.2	9.6	24	15.1
10	9.3	7.3	6.9	10.4	6.1	3.2	4.3	5.2	4.2	4.9	5.5	11.7	11.5	10.3	10.8	9.3	5.7	10.9	12.2	7.9	6.7	9.3	9.9	8.4	24	12.2
11	8.5	11.0	8.1	9.0	11.1	6.9	7.0	2.6	7.7	3.6	7.6	5.7	8.4	2.5	12.0	3.9	11.0	7.1	9.5	9.1	4.8	4.5	8.1	5.9	24	12.0
12	7.5	3.8	5.3	10.0	5.1	8.0	8.3	.9	12.0	8.7	13.3	15.1	7.1	10.5	11.1	5.7	14.9	10.4	10.1	7.7	7.7	9.9	10.8	10.5	24	15.1
13	6.0	8.1	6.8	7.0	3.3	9.7	3.6	6.7	-.2	-2.9	11.4	8.0	5.6	11.8	10.2	8.2	8.7	11.0	9.1	2.7	9.6	5.5	6.0	9.1	24	11.8
14	3.3	3.3	2.8	3.3	1.2	6.1	2.9	-.9	4.1	5.5	7.4	7.8	10.2	5.2	9.6	6.2	-.9	15.8	6.0	13.7	5.4	6.8	6.8	8.4	24	15.8
15	10.3	4.5	6.8	9.7	12.5	11.4	14.8	5.5	10.2	8.5	10.0	7.1	11.2	5.4	7.6	14.1	8.2	8.2	5.4	5.0	2.3	1.9	2.2	3.3	24	14.8
16	7.1	6.9	8.2	3.6	5.9	4.7	7.7	7.0	2.8	4.7	2.9	4.0	3.3	4.1	9.2	9.5	5.7	.1	6.6	8.2	5.9	5.0	6.7	5.6	24	9.5
17	1.5	.8	1.9	5.1	.3	7.6	3.7	1.0	-1.6	4.5	8.7	5.8	11.4	7.8	5.8	4.7	5.7	11.5	5.1	6.4	7.8	4.6	AQ	AQ	22	11.5
18	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AX	14.7	10.4	7.5	9.1	9.4	12.8	4.8	4.0	4.9	5.2	4.2	3.9	12	14.7
19	1.2	3.5	2.9	.8	.5	3.1	3.3	-4.5	.2	8.1	7.5	3.2	8.8	2.8	6.9	5.9	3.2	9.7	10.5	4.6	4.6	3.1	7.0	7.9	24	10.5
20	7.1	4.8	7.5	2.0	2.3	6.7	2.9	6.7	6.2	5.6	10.7	10.1	8.5	7.1	16.5	12.6	21.3	15.0	11.8	9.1	9.4	5.6	6.7	9.6	24	21.3
21	7.5	10.2	14.4	8.6	12.3	11.3	10.9	4.9	7.2	13.1	5.6	8.0	7.0	8.2	7.2	2.4	9.1	7.5	7.7	7.6	3.5	6.4	7.4	6.3	24	14.4
22	6.3	8.4	6.3	1.9	10.6	8.2	8.5	3.3	8.6	11.4	10.3	9.5	11.0	9.4	6.9	8.3	7.7	10.8	9.0	6.8	5.7	6.6	5.4	4.1	24	11.4
23	5.4	4.9	4.0	6.5	4.0	2.0	3.7	.9	4.3	7.8	11.2	7.3	11.0	4.1	5.0	6.5	5.2	9.4	6.8	6.0	7.8	7.5	6.2	4.5	24	11.2
24	2.4	5.5	2.1	.3	4.3	5.8	1.3	-1.8	1.3	7.2	5.6	8.3	4.5	6.7	4.2	7.8	3.7	12.4	7.1	7.7	9.2	6.2	6.2	8.5	24	12.4
25	2.0	7.3	2.8	.7	5.4	6.1	4.1	2.4	3.4	4.9	7.1	10.2	9.7	11.6	6.1	10.7	11.5	9.8	18.4	10.4	9.9	12.0	10.8	8.8	24	18.4
26	9.3	11.5	10.8	6.1	7.6	3.4	5.5	-.3	1.1	4.5	1.5	10.1	9.9	9.5	11.1	8.6	10.8	16.5	13.1	10.3	9.7	5.8	10.8	7.9	24	16.5
27	3.3	7.7	7.3	4.7	5.6	10.3	7.6	9.3	6.7	9.3	6.2	8.5	9.9	13.8	10.7	11.1	11.7	3.3	9.2	7.8	8.8	6.9	3.5	4.3	24	13.8
28	2.0	4.9	5.9	4.8	.8	5.6	7.0	2.7	-.3	5.6	3.1	1.0	2.2	2.6	3.4	3.2	7.4	6.3	5.0	5.2	8.4	5.0	4.6	5.6	24	8.4
29	2.1	4.3	6.7	6.5	5.0	4.4	2.6	2.4	3.3	3.6	.6	.7	.2	4.1	5.5	4.6	8.1	6.1	7.7	8.4	10.6	6.6	7.0	4.8	24	10.6
30	2.4	.9	3.9	6.1	3.0	4.8	6.0	3.1	2.9	3.9	7.5	8.5	4.5	6.9	-1.2	11.2	9.9	10.6	8.4	7.7	5.3	8.7	8.7	5.0	24	11.2
31																									0	
NO.:	29	29	29	29	29	29	29	29	29	29	29	29	30	30	30	30	30	30	30	30	30	30	29	29		
MAX:	10.3	11.5	14.4	10.4	12.5	11.4	14.8	9.3	15.1	13.9	13.3	15.1	14.7	16.6	16.5	14.1	21.3	16.5	18.4	13.7	10.6	12.0	11.2	10.5		
AVG:	5.44	5.64	5.74	5.21	5.32	6.28	5.05	2.83	5.21	5.92	6.99	7.21	7.92	7.18	7.28	7.08	8.03	9.62	8.64	7.43	6.46	6.20	6.43	6.45		

MONTHLY OBSERVATIONS: 706 MONTHLY MEAN: 6.50 MONTHLY MAX: 21.3

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	3.1	9.1	7.3	3.3	7.0	4.6	1.8	-.5	8.1	3.3	7.7	4.6	1.3	3.9	3.3	2.4	3.3	1.1	8.4	4.2	3.7	6.9	7.0	1.8	24	9.1
2	4.0	3.6	1.9	1.7	1.3	-.3	.2	2.7	2.8	5.6	4.5	1.2	.7	4.2	3.1	4.8	2.6	3.3	7.8	2.8	5.4	13.6	4.0	10.8	24	13.6
3	5.6	2.9	9.6	2.2	3.6	2.4	3.0	2.4	6.7	7.3	6.6	15.8	1.1	.9	8.2	4.9	4.7	4.1	9.1	5.2	7.9	8.9	7.0	9.9	24	15.8
4	6.3	8.5	7.7	10.3	6.1	8.4	3.4	6.4	6.4	19.9	18.3	7.7	5.9	9.2	6.2	11.3	11.9	11.9	10.7	10.4	10.1	12.0	5.9	10.9	24	19.9
5	6.3	6.1	7.3	11.2	8.1	7.4	3.9	4.3	5.8	10.4	10.9	8.4	6.5	10.7	5.7	3.9	2.8	9.2	5.9	6.8	10.4	9.9	7.4	7.6	24	11.2
6	8.9	5.2	9.5	7.5	9.7	8.7	8.5	7.3	4.0	6.4	13.0	13.3	12.6	4.5	6.3	8.4	14.6	12.4	14.1	10.6	9.7	4.6	8.0	2.1	24	14.6
7	8.8	7.4	6.9	9.4	1.8	3.3	1.0	-1.8	1.4	3.9	4.0	1.6	-3.6	.1	-1.5	1.2	1.1	2.7	-.7	-1.3	1.6	-.7	.1	.7	24	9.4
8	1.2	3.1	-.2	.9	3.1	2.3	2.7	-4.3	.1	3.8	.2	-1.8	-.2	1.6	4.6	8.7	5.2	4.9	2.1	.8	3.0	1.6	2.8	7.3	24	8.7
9	1.4	5.4	1.0	3.1	-.5	-.9	2.5	.5	-1.8	2.4	5.4	4.7	2.6	.1	4.2	.7	3.8	4.3	7.1	4.7	-.4	6.0	4.1	4.1	24	7.1
10	3.1	4.7	.7	3.5	3.6	5.3	5.5	-1.0	.6	8.1	9.4	10.8	2.3	5.7	6.9	10.0	7.6	9.0	9.6	8.4	10.2	11.4	5.0	7.7	24	11.4
11	7.0	5.2	5.7	8.4	7.8	8.9	6.1	5.9	7.9	6.1	11.3	9.9	9.4	8.7	14.1	16.9	12.0	14.1	13.4	9.6	2.1	5.1	2.5	2.6	24	16.9
12	1.6	1.3	.0	-3.2	-2.8	-5.8	-.8	-1.2	.7	-1.5	-2.2	-1.5	.0	2.2	-.2	1.7	2.2	2.5	3.2	8.1	2.7	8.7	4.6	3.8	24	8.7
13	2.3	4.7	1.1	4.9	-1.8	.3	-1.8	1.0	-.5	1.1	2.7	-1.0	2.8	-4.2	-1.0	1.8	1.8	2.7	.1	4.8	2.9	-.4	1.4	2.0	24	4.9
14	-.5	-.5	-2.1	-3.7	-.8	-1.7	-.8	4.0	3.1	5.2	9.1	8.1	3.2	2.8	7.9	8.4	-2.8	7.5	.2	-1.6	1.3	2.7	1.6	1.0	24	9.1
15	-2.5	-.6	-2.3	-1.4	1.2	1.0	.8	-.2	.1	4.3	-4.0	5.3	.5	-.2	.8	4.3	-1.4	3.3	1.3	-.6	-2.6	1.5	1.3	2.1	24	5.3
16	.6	.3	.4	2.2	1.7	3.5	2.2	3.5	-1.1	-1.2	.3	2.7	1.2	.2	-.8	-1.1	-3.5	2.6	1.4	.8	5.2	6.5	2.9	1.7	24	6.5
17	-2.2	.6	2.4	1.4	3.3	1.7	.3	-3.7	-5.0	.3	2.7	-.8	.8	2.5	.3	1.8	-.9	1.8	-.2	.7	-1.6	.8	1.8	-.4	24	3.3
18	-.2IF	.9IF	.7IF	5.4IF	1.0IF	1.2IF	-.1IF	-7.1IF	-3.0IF	-1.0IF	AX	8.2IF	2.7IF	7.5IF	40.0IF	79.0IF	20.1IF	9.5IF	7.5IF	5.1IF	7.2IF	8.3IF	7.3IF	8.1IF	23	79.0
19	5.6	2.8	3.1	2.5	3.6	.9	5.5	-4.4	4.5	11.2	9.5	5.7	7.5	10.8	4.2	4.8	8.5	7.4	8.3	6.3	6.4	6.9	9.0	7.4	24	11.2
20	8.7	14.6	6.6	7.9	7.4	3.2	7.1	6.9	5.9	6.1	5.5	3.9	3.7	3.7	.9	.7	1.4	3.9	3.4	-.5	.4	2.2	-.2	3.7	24	14.6
21	-.9	5.4	3.0	2.4	5.5	.5	-.2	3.1	-.9	2.3	7.3	4.2	1.3	2.1	1.6	3.0	6.2	6.6	6.1	4.3	5.9	4.5	1.7	5.9	24	7.3
22	3.7	8.0	7.1	5.4	4.4	4.3	7.7	5.9	-.6	3.1	7.3	4.9	.5	2.5	.9	.8	-.6	4.0	-.4	.2	2.6	7.3	3.8	1.2	24	8.0
23	3.0	6.8	2.8	5.3	6.4	1.3	6.0	1.0	.7	7.2	4.1	3.6	5.2	1.0	2.6	7.7	12.3	13.4	8.8	8.4	14.3	13.0	8.9	7.2	24	14.3
24	9.7	2.2	8.1	3.9	6.2	6.2	9.1	2.5	-.2	6.7	1.0	11.2	10.4	10.5	11.1	23.6	18.4	16.5	15.2	4.3	4.1	5.1	3.0	4.8	24	23.6
25	6.2	2.8	3.3	5.9	8.5	5.9	7.2	5.4	6.6	4.7	AV	-7.7	4.8	2.6	4.1	3.7	7.3	1.6	1.4	2.2	2.6	2.7	4.2	5.9	23	8.5
26	3.2	5.4	6.5	2.3	3.5	2.1	-.6	-1.0	-1.4	2.2	3.5	12.5	30.0	19.1	9.2	3.6	6.4	5.4	7.5	5.9	3.6	5.1	3.1	3.6	24	30.0
27	-3.0	3.5	2.8	4.6	4.9	-.1	1.3	-1.0	.0	1.8	3.0	1.2	2.6	1.7	4.4	.0	7.4	4.5	4.0	4.9	2.9	1.1	-1.0	8.3	24	8.3
28	.1	5.1	2.5	1.2	-1.3	6.8	.8	-.7	-4.2	6.3	5.3	6.2	2.5	4.4	7.0	7.7	2.8	7.7	4.5	6.3	6.1	2.2	1.8	4.0	24	7.7
29	1.8	-1.7	.0	2.7	-1.2	.1	-2.0	1.1	2.3	4.8	10.8	1.8	3.3	1.9	2.9	9.6	4.1	6.7	5.3	.8	2.9	5.6	3.1	.6	24	10.8
30	5.3	4.0	4.7	4.2	3.6	3.0	1.1	3.4	2.0	1.0	4.3	8.8	2.6	4.7	14.6	4.8	-2.8	2.4	.7	-1.5	.2	1.7	-4.6	.7	24	14.6
31	-2.3	.2	-2.8	1.1	-.7	-3.2	.8	-.9	.2	-.8	-2.6	-.3	-3.4	2.2	5.4	3.5	.4	6.3	.1	4.3	3.0	1.8	-.7	1.5	24	6.3
NO.:	31	31	31	31	31	31	31	31	31	31	29	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:	9.7	14.6	9.6	11.2	9.7	8.9	9.1	7.3	8.1	19.9	18.3	15.8	30.0	19.1	40.0	79.0	20.1	16.5	15.2	10.6	14.3	13.6	9.0	10.9		
AVG:	3.09	4.10	3.40	3.76	3.36	2.62	2.65	1.27	1.65	4.55	5.48	4.94	3.90	4.12	5.71	7.83	5.06	6.24	5.35	4.05	4.32	5.37	3.45	4.47		

MONTHLY OBSERVATIONS: 742 MONTHLY MEAN: 4.19 MONTHLY MAX: 79.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	1.3	2.8	4.7	5.7	2.9	.1	2.1	4.4	-.5	1.3	1.2	-.2	.1	-1.2	.4	-.7	5.3	6.9	3.0	-1.9	3.6	.8	1.7	1.4	24	6.9
2	-.1	-2.6	1.6	.9	.6	3.0	3.4	-.7	-.5	10.5	5.7	1.4	-.2	2.2	3.3	2.6	-.6	6.5	1.3	3.0	4.2	1.7	1.8	1.2	24	10.5
3	-1.7	6.3	2.2	-.4	2.1	3.9	3.0	-.3	.0	14.2	5.9	6.5	.5	.0	.5	1.8	.9	5.7	1.6	.6	4.1	-1.2	5.1	-1.3	24	14.2
4	3.4	1.5	2.8	5.0	4.0	3.6	3.5	4.2	-4.4	6.8	6.9	6.3	5.5	3.8	3.1	2.5	.7	10.1	2.1	3.4	.9	3.1	3.8	3.6	24	10.1
5	5.6	3.4	5.4	7.7	3.4	3.0	11.2	6.9	4.6	7.2	8.5	8.1	3.8	3.0	6.5	5.0	9.2	6.7	4.6	5.1	4.9	8.9	9.4	8.3	24	11.2
6	3.9	6.8	4.6	5.2	6.7	6.3	6.5	4.4	3.3	6.3	10.5	6.1	7.2	6.0	7.5	7.9	10.8	9.6	12.8	8.7	10.4	7.6	12.4	7.1	24	12.8
7	8.5	9.6	12.0	6.6	6.2	9.0	6.2	5.1	1.7	11.1	11.0	7.2	8.9	3.6	5.7	9.2	9.7	10.0	5.4	12.1	9.3	9.4	9.9	8.8	24	12.1
8	9.7	9.6	2.9	7.4	6.6	5.2	2.6	.0	3.1	11.8	11.8	3.7	5.8	3.5	2.7	7.6	5.6	9.0	3.4	4.8	4.9	5.5	2.0	3.6	24	11.8
9	1.1	7.1	4.5	3.7	8.3	7.0	2.9	4.8	7.1	6.1	5.4	9.9	5.5	3.7	6.9	7.7	9.2	6.3	9.2	6.9	9.8	5.5	7.4	2.2	24	9.9
10	1.0	1.6	4.1	6.2	5.9	7.2	6.3	3.8	5.7	7.4	6.1	7.9	7.4	5.9	6.3	8.3	8.7	6.9	7.0	4.0	6.1	5.3	4.5	2.2	24	8.7
11	4.5	4.8	6.3	4.8	2.7	3.6	2.8	.3	-.6	2.4	-1.5	-.8	-.5	-.3	-2.9	-1.0	.3	-1.5	1.2	-1.7	4.0	-4.2	-.1	3.9	24	6.3
12	2.5	2.8	-1.3	.0	2.3	2.9	1.3	1.7	3.3	-.3	4.8	2.9	.6	1.2	3.8	4.9	7.9	2.0	2.8	5.8	7.4	2.3	7.5	6.8	24	7.9
13	1.1	3.7	6.6	5.9	8.7	5.6	5.3	7.5	8.0	8.8	6.6	6.6	BL	10.1	11.9	7.9	6.3	8.2	8.3	6.5	5.5	9.9	5.1	6.3	23	11.9
14	5.3	6.2	7.5	4.2	6.3	7.2	2.0	7.2	9.2	8.1	7.2	7.8	6.0	5.5	8.0	5.3	11.2	6.1	7.2	2.3	6.9	5.5	5.3	7.5	24	11.2
15	7.3	7.5	10.6	5.6	2.3	3.7	3.9	5.2	3.1	4.6	2.4	5.5	5.0	1.1	4.0	2.4	3.2	3.5	2.9	4.8	9.4	3.6	7.6	3.9	24	10.6
16	5.5	5.9	9.8	5.5	4.4	4.4	8.1	1.9	3.7	3.7	6.2	6.8	AX	-1.6	2.8	4.0	10.8	2.4	5.5	5.1	4.3	5.3	1.8	7.3	23	10.8
17	4.4	4.4	5.5	6.2	4.9	8.6	3.9	6.3	6.8	6.2	4.3	3.2	6.4	4.7	2.6	-.6	6.4	2.5	1.2	6.4	3.5	3.9	1.9	6.1	24	8.6
18	5.4	6.8	6.7	2.0	3.3	2.8	.9	2.3	-3.2	4.4	4.0	2.3	4.9	-1.1	3.3	3.6	4.4	4.8	4.0	3.5	4.4	2.4	3.8	3.1	24	6.8
19	6.6	5.1	7.3	3.6	2.7	5.5	2.2	-1.6	1.9	6.1	6.1	6.0	5.7	3.4	6.0	6.0	6.1	5.7	3.5	4.3	4.6	5.8	6.3	6.6	24	7.3
20	-1.0	4.9	3.5	-1.3	3.9	5.2	1.7	9.8	6.8	9.9	11.6	7.8	6.4	7.5	7.4	5.0	2.3	9.8	5.8	6.3	8.8	6.1	8.5	8.7	24	11.6
21	2.1	8.3	2.8	.5	.9	-.4	1.5	.1	-1.0	5.4	.3	-3.5	2.2	-1.3	-3.5	1.5	2.1	1.6	1.8	6.9	2.4	2.7	4.4	3.9	24	8.3
22	1.2	3.1	-.1	2.8	1.4	-2.0	3.0	1.1	4.1	1.8	-3.6	3.5	1.8	-1.8	2.2	1.3	-2.6	1.1	2.4	3.7	-1.6	1.4	3.9	4.1	24	4.1
23	.7	3.6	3.5	3.6	7.8	4.8	5.4	5.9	3.7	6.4	1.9	3.3	3.2	-1.2	3.7	2.6	1.4	3.3	1.7	4.3	5.8	5.0	5.9	4.9	24	7.8
24	2.4	3.3	6.9	4.6	5.5	3.1	7.3	7.6	8.0	4.2	5.6	5.7	1.9	-1.0	1.2	5.6	4.2	7.4	5.3	5.3	5.9	.2	3.2	4.8	24	8.0
25	4.4	4.6	4.2	3.9	3.8	1.9	5.2	.8	1.9	9.5	10.4	8.8	9.0	7.3	3.2	7.6	3.5	4.4	9.4	6.6	7.6	13.1	16.5	7.9	24	16.5
26	9.4	14.3	13.0	14.8	11.8	8.5	7.8	11.1	8.3	5.5	8.7	9.6	8.2	7.8	9.4	5.7	4.0	4.7	4.4	4.8	1.9	4.1	2.3	5.1	24	14.8
27	3.5	5.6	3.8	5.6	.9	4.4	3.9	-2.3	1.5	5.9	5.2	4.1	2.2	-1.4	1.3	3.1	3.9	2.7	1.4	1.9	2.7	.8	8.3	3.2	24	8.3
28	2.3	6.2	5.9	.8	5.3	4.6	4.6	4.8	-.5	1.7	2.8	.0	2.7	.2	.8	.7	1.0	4.6	2.9	.7	2.4	-1.3	.0	-.9	24	6.2
29	1.3	2.0	-2.6	1.3	1.6	.0	1.4	-3.4	-1.1	3.0	5.4	4.5	1.7	-.9	-.6	2.6	3.1	2.5	2.7	AQ	AQ	AQ	AQ	AQ	19	5.4
30	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	AQ	BA	5.5	8.0	4.0	3.7	2.0	2.0	8.5	10.4	8.9	12.3	10	12.3
31																									0	
NO.:	29	29	29	29	29	29	29	29	29	29	29	29	27	29	30	30	30	30	30	29	29	29	29	29		
MAX:	9.7	14.3	13.0	14.8	11.8	9.0	11.2	11.1	9.2	14.2	11.8	9.9	9.0	10.1	11.9	9.2	11.2	10.1	12.8	12.1	10.4	13.1	16.5	12.3		
AVG:	3.50	5.14	4.99	4.22	4.39	4.23	4.13	3.41	2.90	6.21	5.57	4.86	4.14	2.37	3.77	4.27	4.77	5.24	4.23	4.35	5.26	4.26	5.49	4.92		

MONTHLY OBSERVATIONS: 699 MONTHLY MEAN: 4.44 MONTHLY MAX: 16.5

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	12.7	17.0	13.3	12.9	15.3	13.4	20.3	13.2	11.5	10.4	9.0	4.9	5.3	6.3	7.1	7.4	9.7	7.3	6.8	6.6	8.0	8.1	5.8	5.8	24	20.3
2	4.6	4.3	2.7	1.8	5.5	3.9	1.7	.8	4.2	3.9	.5	2.7	1.7	3.8	-.9	1.2	3.5	.5	.4	-.2	-3.8	1.4	-5.1	-1.9	24	5.5
3	-5.8	-1.1	-1.4	-2.0	-3.6	-2.0	2.8	3.6	1.0	-.4	.2	1.1	-2.2	-.7	6.5	1.8	4.0	6.0	1.3	.7	5.9	3.3	4.4	4.7	24	6.5
4	-1.2	2.3	3.6	3.7	4.2	2.0	2.6	5.5	2.2	8.3	5.0	4.7	2.3	2.3	1.4	.4	1.1	3.4	-1.0	-3.5	.1	1.4	2.0	2.3	24	8.3
5	3.2	4.4	1.9	.3	2.4	2.8	3.4	1.5	-1.0	4.8	3.6	-.3	1.6	2.5	-1.3	1.1	2.0	2.1	-1.3	.7	2.9	2.0	5.8	2.9	24	5.8
6	-1.4	-1.2	.8	2.1	1.4	4.2	4.4	2.3	2.7	.4	5.6	1.0	4.7	3.3	4.5	-.9	.6	2.6	3.9	-1.2	1.7	-2.6	3.5	2.6	24	5.6
7	-.1	.9	.3	4.1	3.1	4.2	-2.1	-1.3	-2.5	3.9	5.5	4.4	-1.2	-2.0	.7	4.4	5.0	6.1	4.0	6.5	3.9	4.9	5.6	4.7	24	6.5
8	7.8	5.0	5.0	6.8	9.6	6.2	8.7	9.3	2.2	12.3	8.5	8.2	1.0	5.1	4.7	5.6	7.5	10.3	4.0	5.3	23.3	12.0	9.7	4.6	24	23.3
9	5.0	3.2	5.7	4.7	8.4	7.4	7.5	5.6	1.5	1.5	6.1	5.8	3.1	3.5	5.5	5.6	4.1	5.7	5.3	4.8	1.4	4.4	3.4	3.4	24	8.4
10	.5	2.1	3.3	-5.7	-3.2	-2.4	.2	-.4	-3.3	.3	-3.6	3.7	-4.6	.1	2.2	-.1	1.5	.7	1.9	3.7	5.3	2.8	1.6	.2	24	5.3
11	-2.4	.6	3.3	.3	.0	7.0	1.5	4.4	2.4	4.4	1.7	-3.0	1.2	.9	.5	-.3	1.8	2.2	.0	-1.6	-3.7	3.7	-1.9	-.9	24	7.0
12	-.7	-.2	-1.3	.0	-1.4	2.2	-2.2	2.2	-2.5	.3	-1.1	5.6	4.8	2.8	2.3	-.9	2.9	.6	5.0	21.4	2.3	10.4	26.8	6.9	24	26.8
13	40.7 V	9.3IF	10.2IF	5.3IF	13.9IF	5.2IF	6.0IF	4.9IF	-1.3IF	1.9IF	5.7IF	6.3IF	1.6IF	-.7IF	6.2IF	2.9IF	5.4IF	1.8IF	4.0IF	4.3IF	7.8IF	3.9IF	5.6IF	5.7IF	24	40.7
14	4.4	3.8	6.9	5.2	8.9	8.6	10.2	8.0	-.9	7.9	6.7	3.9	3.8	AX	5.8	4.6	2.2	1.1	3.8	1.8	4.9	2.0	3.6	3.0	23	10.2
15	1.9	2.2	5.7	6.1	2.6	3.3	3.0	1.6	1.5	8.9	4.0	-.1	-2.9	3.1	-.7	.7	2.2	3.3	4.5	3.6	-.2	3.6	3.8	6.0	24	8.9
16	2.9	4.7	7.7	5.4	2.5	4.5	6.3	9.6	3.1	5.8	1.4	2.7	2.9	2.2	3.0	6.4	6.5	1.2	2.3	1.2	3.1	1.1	.7	6.8	24	9.6
17	5.4	2.5	.7	4.9	6.8	4.0	5.6	7.3	6.6	4.2	4.0	1.6	4.0	3.5	1.9	2.6	4.7	5.7	4.5	2.1	-1.8	.6	.7	4.5	24	7.3
18	.2	3.0	.7	1.7	-.8	2.0	1.0	2.8	.6	8.9	2.0	2.0	8.0	3.8	3.0	1.7	-.1	.9	-1.5	2.2	2.9	6.6	2.1	4.8	24	8.9
19	1.0	.5	-1.5	1.6	1.7	2.4	.4	.2	1.7	3.4	2.3	1.1	-3.0	1.6	-.5	1.8	2.7	2.7	.6	-.3	1.0	5.5	-.3	2.2	24	5.5
20	-2.7	.1	2.4	1.8	1.2	1.6	8.0	5.3	-3.6	11.9	6.6	3.7	1.5	3.6	-2.1	1.8	.9	2.9	8.8	6.0	.4	.3	.9	4.6	24	11.9
21	1.0	2.3	2.3	3.1	1.1	-1.3	.4	.6	-.8	7.5	7.2	5.7	3.1	2.3	3.9	1.2	-1.3	2.7	3.0	5.7	6.1	1.7	.2	2.7	24	7.5
22	1.1	7.3	6.4	1.4	5.0	5.5	5.3	4.9	2.0	10.5	17.4	BA	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	11	17.4
23	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
24	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
25	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
26	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	BA	3.7	7.3	5.2	3.6	2.1	3.7	4.7	3.5	4.1	1.1	10	7.3
27	6.2	4.6	6.7	3.5	5.8	5.6	4.1	.2	-1.4	4.4	1.7	-.7	6.2	.1	-.3	-2.1	1.8	1.5	1.8	4.5	2.8	5.1	6.5	4.1	24	6.7
28	3.6	3.5	9.7	4.6	4.5	9.7	6.2	5.1	-2.3	5.2	5.2	5.1	3.4	1.0	3.4	2.5	3.7	5.0	-.3	3.9	3.8	3.1	3.5	2.8	24	9.7
29	3.9	3.8	4.4	6.1	6.3	7.3	5.8	7.0	3.8	2.2	4.6	3.9	2.1	4.2	4.6	1.6	5.5	1.5	6.6	4.9	5.7	5.5	7.0	5.1	24	7.3
30	.5	5.5	5.8	4.3	1.6	3.3	2.4	2.0	3.6	1.1	1.5	.1	.6	5.2	.2	.9	3.5	5.5	3.5	7.7	11.6	11.0	14.7	9.4	24	14.7
31	15.7IF	13.9IF	10.1IF	10.6IF	6.4IF	8.2IF	3.1IF	6.0IF	-1.9IF	7.0IF	6.1IF	5.2IF	7.6IF	2.3IF	5.1IF	4.1IF	4.6IF	4.1IF	6.3IF	5.8IF	5.1IF	58.1IF	61.9IF	28.5IF	24	61.9
NO.:	27	27	27	27	27	27	27	27	27	27	27	26	26	25	27	27	27	27	27	27	27	27	27	27		
MAX:	40.7	17.0	13.3	12.9	15.3	13.4	20.3	13.2	11.5	12.3	17.4	8.2	8.0	6.3	7.1	7.4	9.7	10.3	8.8	21.4	23.3	58.1	61.9	28.5		
AVG:	4.00	3.86	4.27	3.50	4.04	4.40	4.32	4.16	1.08	5.22	4.35	3.05	2.18	2.40	2.61	2.34	3.38	3.37	2.97	3.71	3.90	6.05	6.54	4.69		

MONTHLY OBSERVATIONS: 644 MONTHLY MEAN: 3.77 MONTHLY MAX: 61.9

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 1
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS:

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (145) R & P Model 2025 PM-2.5 Sequential
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: 2021

DURATION: 24 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 2

Day	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	5.3			3.5	6.7				7.1	15.5		
2			3.4					21.1 6				
3		TS				AG	9.4				AN	
4	7.9 6			10.7 6	4.2				7.9	4.6 6		
5			4.8					13.1				
6		TS				AG	8.4				AN	
7	7.8			20.2 6	4.8				12.1	AN		
8			13.3					12.5				
9		9.5				5.6	6.3				AN	
10	9.9			4.8	3.9				6.2	AN		
11			16.4					11.1				
12		6.2				9.0	6.3				AN	
13	14.2			13.8	4.1				10.2	AN		
14			12.3					5.5				
15		3.4				8.1	10.9				AN	
16	3.1			4.7	10.8				4.7	AN		
17			4.9					2.8				
18		5.8				13.8	4.5				AN	
19	14.4			8.1	6.8				5.8	AN		
20			4.5					4.5				
21		7.8				5.7	5.0				AN	
22	5.1			6.7	12.0				3.2	AN		
23			13.6					8.5				
24		10.5				8.3	24.5				AN	
25	7.5			5.7	17.6				7.8	AN		
26			7.0					9.6				
27		9.8				4.5	AG				AN	
28	TS			10.9	9.8				12.7	AN		
29			5.2					6.3				
30						4.4	15.9				AN	
31	7.9				6.1					AN		
NO.:	10	7	10	10	11	8	9	10	10	2	0	0
MAX:	14.4	10.5	16.4	20.2	17.6	13.8	24.5	21.1	12.7	15.5		
MEAN:	8.31	7.57	8.54	8.91	7.89	7.43	10.13	9.50	7.77	10.05		

ANNUAL OBSERVATIONS: 87 ANNUAL MEAN: 8.51 ANNUAL MAX: 24.5

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2021

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1																									0	
2																									0	
3																									0	
4	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
5	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
6	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
7	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	5.0	3.0	7.0	5.0	6.0	7.0	10.0	10.0	9.0	9	10.0
8	9.0	4.0	10.0	10.0	10.0	9.0	9.0	8.0	6.0	8.0	7.0	10.0	8.0	9.0	6.0	7.0	5.0	4.0	5.0	9.0	6.0	12.0	12.0	11.0	24	12.0
9	10.0	12.0	11.0	11.0	10.0	8.0	8.0	10.0	11.0	16.0	9.0	5.0	9.0	4.0	11.0	9.0	8.0	7.0	6.0	11.0	9.0	13.0	8.0	14.0	24	16.0
10	14.0	11.0	11.0	8.0	6.0	10.0	7.0	10.0	4.0	4.0	8.0	19.0	8.0	19.0	10.0	18.0	17.0	18.0	16.0	10.0	9.0	13.0	11.0	12.0	24	19.0
11	9.0	7.0	5.0	6.0	6.0	6.0	8.0	8.0	5.0	9.0	9.0	BR	3.0	2.0	4.0	7.0	.0	-1.0	1.0	3.0	4.0	5.0	2.0	1.0	23	9.0
12	5.0	5.0	.0	3.0	4.0	3.0	4.0	3.0	-3.0	9.0	7.0	3.0	6.0	2.0	.0	1.0	3.0	-2.0	1.0	5.0	7.0	2.0	5.0	4.0	24	9.0
13	8.0	5.0	8.0	10.0	8.0	10.0	6.0	7.0	6.0	13.0	10.0	8.0	10.0	8.0	11.0	8.0	4.0	6.0	4.0	8.0	10.0	11.0	10.0	14.0	24	14.0
14	13.0	14.0	12.0	11.0	14.0	13.0	11.0	12.0	11.0	13.0	12.0	13.0	15.0	15.0	17.0	11.0	9.0	8.0	6.0	8.0	10.0	16.0	15.0	17.0	24	17.0
15	19.0	18.0	21.0	19.0	19.0	18.0	19.0	17.0	14.0	15.0	14.0	11.0	14.0	11.0	8.0	7.0	9.0	3.0	12.0	20.0	12.0	13.0	16.0	12.0	24	21.0
16	13.0	12.0	16.0	14.0	15.0	19.0	16.0	14.0	17.0	16.0	21.0	26.0	22.0	12.0	9.0	13.0	5.0	3.0	17.0	14.0	8.0	8.0	7.0	7.0	24	26.0
17	10.0	16.0	15.0	9.0	10.0	13.0	12.0	11.0	15.0	18.0	9.0	12.0	AV	AV	AV	AV	42.0	-10.0	9.0	13.0	8.0	10.0	16.0	14.0	20	42.0
18	13.0	15.0	18.0	13.0	8.0	7.0	6.0	3.0	-1.0	3.0	2.0	10.0	6.0	12.0	4.0	3.0	-1.0	.0	.0	7.0	4.0	3.0	2.0	1.0	24	18.0
19	2.0	2.0	-2.0	-1.0	.0	2.0	7.0	.0	-1.0	3.0	-2.0	1.0	3.0	4.0	3.0	1.0	3.0	5.0	3.0	.0	2.0	1.0	3.0	-2.0	24	7.0
20	6.0	5.0	3.0	2.0	2.0	2.0	1.0	.0	1.0	7.0	4.0	6.0	5.0	5.0	7.0	4.0	1.0	3.0	7.0	5.0	6.0	5.0	9.0	6.0	24	9.0
21	6.0	8.0	7.0	9.0	6.0	6.0	7.0	9.0	8.0	5.0	6.0	7.0	6.0	6.0	6.0	6.0	4.0	10.0	1.0	7.0	8.0	10.0	11.0	9.0	24	11.0
22	9.0	9.0	7.0	7.0	9.0	9.0	8.0	9.0	6.0	12.0	10.0	8.0	6.0	7.0	10.0	3.0	4.0	-5.0	-2.0	2.0	5.0	8.0	3.0	9.0	24	12.0
23	10.0	9.0	9.0	9.0	8.0	9.0	5.0	9.0	-1.0	16.0	12.0	8.0	8.0	10.0	10.0	7.0	7.0	3.0	-1.0	10.0	19.0	8.0	17.0	25.0	24	25.0
24	27.0	15.0	16.0	15.0	16.0	18.0	16.0	10.0	20.0	15.0	11.0	12.0	4.0	10.0	14.0	4.0	8.0	2.0	6.0	5.0	1.0	4.0	6.0	8.0	24	27.0
25	2.0	3.0	4.0	4.0	3.0	1.0	5.0	1.0	2.0	3.0	4.0	3.0	6.0	10.0	8.0	7.0	6.0	4.0	4.0	3.0	6.0	4.0	4.0	4.0	24	10.0
26	2.0	2.0	5.0	9.0	1.0	7.0	5.0	3.0	4.0	15.0	10.0	24.0	9.0	9.0	5.0	14.0	8.0	6.0	21.0	15.0	12.0	10.0	10.0	9.0	24	24.0
27	13.0	12.0	12.0	8.0	10.0	10.0	7.0	11.0	8.0	8.0	5.0	6.0	6.0	7.0	7.0	7.0	5.0	1.0	5.0	5.0	6.0	10.0	9.0	10.0	24	13.0
28	8.0	7.0	11.0	11.0	11.0	13.0	10.0	8.0	6.0	11.0	8.0	-2.0	16.0	14.0	13.0	7.0	8.0	6.0	4.0	3.0	4.0	4.0	5.0	6.0	24	16.0
29	4.0	5.0	.0	2.0	7.0	2.0	3.0	1.0	5.0	8.0	9.0	13.0	13.0	14.0	12.0	13.0	14.0	6.0	8.0	6.0	4.0	13.0	-1.0	4.0	24	14.0
30	3.0	3.0	5.0	1.0	.0	6.0	1.0	3.0	.0	1.0	3.0	5.0	4.0	8.0	5.0	5.0	9.0	7.0	1.0	1.0	4.0	3.0	4.0	2.0	24	9.0
31	4.0	6.0	4.0	4.0	3.0	5.0	7.0	2.0	4.0	3.0		7.0	10.0	13.0	13.0	11.0	8.0	9.0	5.0	14.0	18.0	17.0	17.0	9.0	23	18.0
NO.:	24	24	24	24	24	24	24	24	24	24	23	23	23	23	23	24	25	25	25	25	25	25	25	25		
MAX:	27.0	18.0	21.0	19.0	19.0	19.0	19.0	17.0	20.0	18.0	21.0	26.0	22.0	19.0	17.0	18.0	42.0	18.0	21.0	20.0	19.0	17.0	17.0	25.0		
AVG:	9.13	8.54	8.67	8.08	7.75	8.58	7.83	7.04	6.13	9.63	8.17	9.35	8.57	9.17	8.39	7.42	7.56	4.00	5.76	7.60	7.56	8.52	8.44	8.60		

MONTHLY OBSERVATIONS: 579 MONTHLY MEAN: 7.92 MONTHLY MAX: 42.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) [illegible] - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	6.0	5.0	7.0	6.0	6.0	7.0	5.0	4.0	4.0	5.0	8.0	8.0	5.0	9.0	4.0	4.0	5.0	4.0	9.0	10.0	9.0	6.0	7.0	3.0	24	10.0
2	9.0	4.0	4.0	-1.0	-1.0	-4.0	3.0	2.0	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	8	9.0
3	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	-3.0	5.0	-3.0	1.0	1.0	5.0	6	5.0
4	3.0	5.0	3.0	4.0	3.0	4.0	6.0	6.0	7.0	9.0	11.0	8.0	7.0	6.0	2.0	2.0	5.0	3.0	1.0	4.0	4.0	4.0	6.0	5.0	24	11.0
5	11.0	9.0	10.0	8.0	7.0	6.0	7.0	9.0	10.0	6.0	8.0	8.0	19.0	14.0	8.0	9.0	14.0	9.0	8.0	12.0	21.0	14.0	15.0	13.0	24	21.0
6	11.0	10.0	12.0	11.0	14.0	7.0	12.0	8.0	10.0	13.0	11.0	14.0	7.0	15.0	7.0	7.0	1.0	-4.0	1.0	.0	2.0	5.0	.0	6.0	24	15.0
7	4.0	8.0	6.0	1.0	7.0	1.0	3.0	2.0	.0	4.0	4.0	7.0	5.0	7.0	2.0	5.0	3.0	8.0	3.0	8.0	4.0	5.0	4.0	7.0	24	8.0
8	5.0	6.0	4.0	6.0	8.0	7.0	9.0	8.0	6.0	10.0	10.0	10.0	10.0	11.0	8.0	7.0	7.0	5.0	4.0	6.0	5.0	6.0	7.0	9.0	24	11.0
9	10.0	11.0	13.0	10.0	9.0	12.0	12.0	11.0	8.0	12.0	10.0	10.0	14.0	11.0	12.0	7.0	6.0	2.0	4.0	.0	.0	-2.0	.0	-3.0	24	14.0
10	-2.0	1.0	.0	-1.0	.0	2.0	1.0	2.0	2.0	4.0	6.0	4.0	5.0	5.0	3.0	3.0	5.0	2.0	-7.0	3.0	1.0	4.0	2.0	2.0	24	6.0
11	4.0	-3.0	6.0	1.0	1.0	1.0	4.0	-1.0	-4.0	13.0	7.0	6.0	6.0	5.0	4.0	5.0	3.0	5.0	2.0	1.0	5.0	5.0	7.0	7.0	24	13.0
12	10.0	14.0	12.0	9.0	6.0	9.0	7.0	9.0	6.0	16.0	21.0	13.0	11.0	9.0	12.0	5.0	2.0	3.0	3.0	10.0	13.0	15.0	11.0	12.0	24	21.0
13	15.0	17.0	12.0	15.0	13.0	11.0	14.0	13.0	12.0	20.0	17.0	12.0	9.0	5.0	2.0	6.0	5.0	4.0	.0	2.0	-2.0	6.0	5.0	7.0	24	20.0
14	6.0	7.0	9.0	10.0	7.0	6.0	5.0	5.0	6.0	12.0	16.0	13.0	10.0	8.0	4.0	5.0	-1.0	1.0	2.0	9.0	12.0	8.0	11.0	13.0	24	16.0
15	10.0	13.0	13.0	17.0	18.0	21.0	12.0	18.0	15.0	17.0	15.0	16.0	21.0	14.0	18.0	13.0	11.0	9.0	16.0	15.0	17.0	13.0	15.0	14.0	24	21.0
16	14.0	15.0	9.0	5.0	5.0	8.0	2.0	4.0	1.0	1.0	2.0	.0	.0	-1.0	6.0	2.0	2.0	1.0	-3.0	-1.0	8.0	9.0	8.0	9.0	24	15.0
17	10.0	6.0	10.0	8.0	5.0	5.0	4.0	8.0	6.0	2.0	6.0	4.0	7.0	7.0	6.0	9.0	5.0	9.0	6.0	7.0	7.0	4.0	8.0	4.0	24	10.0
18	2.0	5.0	9.0	4.0	7.0	10.0	11.0	7.0	10.0	12.0	9.0	8.0	11.0	5.0	5.0	5.0	6.0	4.0	-3.0	3.0	7.0	5.0	12.0	9.0	24	12.0
19	6.0	12.0	6.0	13.0	8.0	13.0	9.0	6.0	9.0	17.0	11.0	10.0	11.0	9.0	7.0	3.0	2.0	4.0	1.0	4.0	3.0	2.0	3.0	11.0	24	17.0
20	1.0	6.0	4.0	5.0	-1.0	-4.0	1.0	-3.0	1.0	5.0	2.0	2.0	2.0	5.0	8.0	8.0	9.0	13.0	7.0	6.0	7.0	8.0	6.0	6.0	24	13.0
21	3.0	1.0	1.0	3.0	3.0	3.0	8.0	8.0	6.0	5.0	7.0	6.0	8.0	6.0	8.0	9.0	8.0	10.0	7.0	7.0	9.0	10.0	9.0	8.0	24	10.0
22	7.0	8.0	4.0	8.0	6.0	4.0	4.0	8.0	8.0	7.0	8.0	5.0	7.0	9.0	10.0	8.0	7.0	8.0	1.0	7.0	6.0	9.0	11.0	10.0	24	11.0
23	11.0	13.0	8.0	10.0	10.0	12.0	8.0	7.0	5.0	17.0	11.0	12.0	12.0	7.0	9.0	10.0	4.0	6.0	3.0	3.0	5.0	6.0	7.0	9.0	24	17.0
24	9.0	8.0	11.0	11.0	6.0	8.0	7.0	6.0	4.0	16.0	17.0	13.0	15.0	16.0	17.0	10.0	9.0	1.0	1.0	5.0	9.0	9.0	7.0	10.0	24	17.0*
25	11.0	13.0	9.0	9.0	11.0	14.0	11.0	14.0	12.0	16.0	14.0	BA	BA	BA	19.0	12.0	8.0	7.0	2.0	10.0	11.0	11.0	9.0	7.0	21	19.0
26	AV	AV	12.0	11.0	10.0	13.0	12.0	14.0	10.0	14.0	17.0	13.0	10.0	12.0	5.0	6.0	4.0	3.0	-2.0	2.0	7.0	7.0	8.0	7.0	22	17.0
27	7.0	7.0	8.0	10.0	7.0	6.0	10.0	9.0	4.0	18.0	18.0	19.0	17.0	19.0	16.0	16.0	11.0	10.0	6.0	18.0	15.0	17.0	21.0	17.0	24	21.0
28	20.0	24.0	22.0	22.0	24.0	28.0	41.0	24.0	22.0	16.0	15.0	14.0	14.0	12.0	12.0	5.0	3.0	4.0	2.0	-1.0	4.0	6.0	5.0	3.0	24	41.0
29	4.0	4.0	5.0	6.0	4.0	.0	3.0	2.0	3.0	5.0	8.0	6.0	7.0	4.0	4.0	6.0	2.0	2.0	-1.0	3.0	5.0	9.0	8.0	11.0	24	11.0
30	11.0	13.0	10.0	9.0	9.0	11.0	9.0	10.0	3.0	17.0	14.0	16.0	13.0	11.0	9.0	10.0	11.0	8.0	3.0	3.0	7.0	11.0	11.0	12.0	24	17.0
31	13.0	13.0	9.0	8.0	13.0	15.0	13.0	11.0	12.0	16.0	10.0*	13.0	13.0	7.0	8.0	6.0	5.0	4.0	-2.0	6.0	10.0	11.0	13.0	11.0	24	16.0
NO.:	29	29	30	30	30	30	30	30	29	29	29	28	28	28	29	29	29	29	30	30	30	30	30	30		
MAX:	20.0	24.0	22.0	22.0	24.0	28.0	41.0	24.0	22.0	20.0	21.0	19.0	21.0	19.0	19.0	16.0	14.0	13.0	16.0	18.0	21.0	17.0	21.0	17.0		
AVG:	7.97	8.79	8.27	7.93	7.50	7.87	8.43	7.70	6.83	11.21	10.79	9.64	9.86	8.82	8.10	7.00	5.59	5.00	2.37	5.57	6.93	7.47	7.90	8.13		

MONTHLY OBSERVATIONS: 705 MONTHLY MEAN: 7.72 MONTHLY MAX: 41.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	18.0	12.0	13.0	15.0	13.0	14.0	18.0	15.0	13.0	18.0	21.0	19.0	21.0	10.0	14.0	15.0	23.0	12.0	12.0	12.0	26.0	25.0	24.0	26.0	24	26.0
2	25.0	26.0	29.0	23.0	17.0	17.0	12.0	13.0	8.0	8.0	8.0	12.0	9.0	4.0	9.0	9.0	8.0	3.0	8.0	10.0	13.0	13.0	15.0	11.0	24	29.0
3	11.0	16.0	12.0	7.0	12.0	8.0	13.0	14.0	13.0	13.0	11.0	14.0	12.0	9.0	8.0	9.0	3.0	8.0	3.0	.0	1.0	1.0	-4.0	-5.0	24	16.0
4	-2.0	1.0	-2.0	1.0	2.0	1.0	1.0	.0	2.0	2.0	3.0	4.0	3.0	4.0	3.0	2.0	1.0	6.0	2.0	4.0	6.0	7.0	4.0	6.0	24	7.0
5	6.0	4.0	5.0	5.0	1.0	3.0	4.0	2.0	.0	11.0	10.0	8.0	6.0	7.0	6.0	8.0	5.0	7.0	-1.0	.0	1.0	5.0	4.0	5.0	24	11.0
6	1.0	7.0	6.0	11.0	5.0	7.0	9.0	9.0	9.0	14.0	10.0	9.0	14.0	8.0	6.0	7.0	6.0	3.0	-3.0	2.0	6.0	10.0	9.0	8.0	24	14.0
7	7.0	9.0	8.0	9.0	9.0	16.0	10.0	11.0	10.0	12.0	19.0	16.0	13.0	13.0	13.0	6.0	12.0	8.0	.0	4.0	9.0	11.0	13.0	12.0	24	19.0
8	14.0	8.0	9.0	8.0	6.0	8.0	10.0	8.0	5.0	13.0	8.0	8.0	8.0	8.0	4.0	2.0	2.0	.0	-4.0	-1.0	4.0	1.0	7.0	8.0	24	14.0
9	8.0	10.0	9.0	8.0	7.0	9.0	12.0	7.0	10.0	20.0	18.0	14.0	14.0	11.0	5.0	9.0	4.0	1.0	-2.0	.0	3.0	4.0	7.0	9.0	24	20.0
10	11.0	6.0	10.0	11.0	11.0	10.0	8.0	8.0	13.0	24.0	28.0	BA	BA	2.0	10.0	7.0	3.0	4.0	-1.0	-1.0	2.0	8.0	6.0	11.0	22	28.0
11	9.0	14.0	16.0	15.0	15.0	16.0	16.0	18.0	19.0	27.0	23.0	21.0	19.0	16.0	14.0	11.0	13.0	9.0	7.0	10.0	17.0	14.0	13.0	14.0	24	27.0
12	17.0	17.0	15.0	19.0	19.0	20.0	17.0	18.0	19.0	26.0	16.0	20.0	15.0	9.0	6.0	5.0	5.0	1.0	-3.0	-1.0	1.0	1.0	4.0	5.0	24	26.0
13	6.0	4.0	11.0	6.0	4.0	5.0	2.0	7.0	6.0	10.0	10.0	10.0	5.0	8.0	8.0	9.0	5.0	5.0	-1.0	4.0	7.0	4.0	7.0	9.0	24	11.0
14	8.0	7.0	6.0	12.0	9.0	11.0	11.0	6.0	10.0	20.0	13.0	14.0	8.0	6.0	7.0	12.0	6.0	6.0	-1.0	3.0	7.0	7.0	10.0	13.0	24	20.0
15	14.0	15.0	18.0	20.0	39.0	40.0	21.0	19.0	25.0	30.0	29.0	24.0	30.0	23.0	25.0	29.0	16.0	8.0	8.0	26.0	19.0	19.0	21.0	20.0	24	40.0
16	17.0	16.0	12.0	15.0	14.0	16.0	17.0	20.0	21.0	19.0	18.0	16.0	21.0	17.0	24.0	14.0	11.0	6.0	2.0	.0	7.0	11.0	12.0	23.0	24	24.0
17	17.0	17.0	15.0	16.0	19.0	14.0	12.0	13.0	12.0	17.0	12.0	15.0	8.0	9.0	10.0	5.0	3.0	8.0	1.0	1.0	2.0	3.0	4.0	4.0	24	19.0
18	-2.0	-7.0	-4.0	-3.0	.0	.0	-1.0	-1.0	.0	4.0	3.0	6.0	6.0	4.0	5.0	3.0	8.0	4.0	-3.0	2.0	2.0	4.0	9.0	6.0	24	9.0
19	6.0	11.0	7.0	11.0	9.0	9.0	9.0	9.0	8.0	17.0	12.0	7.0	6.0	9.0	8.0	7.0	11.0	6.0	-5.0	-2.0	6.0	6.0	8.0	10.0	24	17.0
20	4.0	8.0	8.0	9.0	9.0	11.0	10.0	9.0	10.0	10.0	9.0	9.0	8.0	10.0	8.0	11.0	7.0	5.0	-5.0	-4.0	3.0	9.0	8.0	18.0	24	18.0
21	23.0	21.0	16.0	11.0	17.0	12.0	13.0	15.0	22.0	25.0	19.0	22.0	21.0	18.0	16.0	15.0	19.0	8.0	8.0	7.0	6.0	5.0	6.0	6.0	24	25.0
22	5.0	8.0	9.0	5.0	12.0	10.0	9.0	11.0	11.0	11.0	8.0	10.0	BA	BA	10.0	11.0	9.0	7.0	5.0	8.0	10.0	-2.0	9.0	10.0	22	12.0
23	9.0	4.0	7.0	6.0	9.0	8.0	6.0	-2.0	1.0	3.0	3.0	10.0	10.0	11.0	8.0	6.0	5.0	.0	-4.0	.0	2.0	3.0	4.0	3.0	24	11.0
24	.0	5.0	5.0	6.0	5.0	2.0	3.0	3.0	1.0	7.0	9.0	8.0	12.0	11.0	9.0	10.0	18.0	14.0	9.0	9.0	13.0	10.0	11.0	11.0	24	18.0
25	12.0	7.0	9.0	8.0	7.0	-6.0	-8.0	-3.0	-1.0	5.0	-2.0	3.0	-1.0	2.0	2.0	2.0	3.0	2.0	-1.0	-2.0	7.0	8.0	6.0	12.0	24	12.0
26	9.0	7.0	9.0	5.0	8.0	6.0	9.0	7.0	6.0	6.0	9.0	9.0	8.0	8.0	6.0	1.0	5.0	9.0	4.0	5.0	7.0	3.0	3.0	3.0	24	9.0
27	3.0	7.0	2.0	3.0	4.0	-3.0	2.0	2.0	-3.0	5.0	3.0	1.0	2.0	5.0	1.0	8.0	1.0	-3.0	1.0	1.0	4.0	2.0	3.0	3.0	24	8.0
28	4.0	4.0	3.0	-1.0	.0	5.0	3.0	2.0	6.0	13.0	9.0	5.0	2.0	6.0	7.0	8.0	7.0	4.0	-8.0	-1.0	4.0	4.0	7.0	6.0	24	13.0
29																									0	
30																									0	
31																									0	
NO.:	28	28	28	28	28	28	28	28	28	28	28	27	26	27	28	28	28	28	28	28	28	28	28	28		
MAX:	25.0	26.0	29.0	23.0	39.0	40.0	21.0	20.0	25.0	30.0	29.0	24.0	30.0	23.0	25.0	29.0	23.0	14.0	12.0	26.0	26.0	25.0	24.0	26.0		
AVG:	9.29	9.43	9.39	9.32	10.07	9.61	8.86	8.57	9.14	13.93	12.11	11.63	10.77	9.19	9.00	8.61	7.82	5.39	1.00	3.43	6.96	7.00	8.21	9.54		

MONTHLY OBSERVATIONS: 668 MONTHLY MEAN: 8.67 MONTHLY MAX: 40.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	7.0	3.0	8.0	7.0	6.0	9.0	8.0	8.0	14.0	17.0	13.0	9.0	11.0	8.0	11.0	5.0	5.0	3.0	-6.0	-5.0	2.0	5.0	6.0	8.0	24	17.0
2	10.0	9.0	8.0	6.0	7.0	10.0	10.0	7.0	9.0	17.0	17.0	14.0	12.0	17.0	12.0	7.0	4.0	1.0	-4.0	-2.0	8.0	14.0	11.0	12.0	24	17.0
3	15.0	13.0	16.0	13.0	12.0	12.0	12.0	5.0	17.0	18.0	20.0	8.0	10.0	9.0	6.0	9.0	5.0	5.0	3.0	5.0	8.0	25.0	32.0	18.0	24	32.0
4	21.0	24.0	17.0	16.0	17.0	21.0	22.0	17.0	21.0	19.0	16.0	17.0	19.0	19.0	24.0	21.0	17.0	19.0	18.0	20.0	18.0	32.0	46.0	50.0	24	50.0
5	44.0	36.0	33.0	31.0	31.0	29.0	26.0	28.0	26.0	33.0	33.0	24.0	27.0	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	13	44.0
6	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	0	
7	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	AJ	9.0	10.0	14.0	-9.0	-1.0	4.0	4.0	2.0	2.0	-2.0	.0	-1.0	4.0	13	14.0
8	4.0	2.0	8.0	4.0	6.0	8.0	3.0	2.0	2.0	3.0	7.0	.0	8.0	7.0	-1.0	4.0	5.0	5.0	4.0	5.0	3.0	-1.0	5.0	3.0	24	8.0
9	2.0	2.0	6.0	3.0	2.0	1.0	-5.0	-1.0	3.0	5.0	.0	2.0	4.0	1.0	4.0	1.0	2.0	1.0	-2.0	-2.0	2.0	1.0	3.0	4.0	24	6.0
10	.0	3.0	2.0	2.0	4.0	3.0	2.0	3.0	6.0	5.0	9.0	9.0	8.0	6.0	4.0	6.0	4.0	2.0	-2.0	-2.0	1.0	4.0	6.0	8.0	24	9.0
11	7.0	11.0	10.0	11.0	9.0	10.0	12.0	8.0	13.0	15.0	11.0	14.0	12.0	13.0	12.0	10.0	9.0	9.0	4.0	3.0	6.0	8.0	6.0	2.0	24	15.0
12	-1.0	-1.0	-1.0	-3.0	-2.0	.0	2.0	2.0	6.0	4.0	4.0	5.0	2.0	3.0	5.0	7.0	1.0	1.0	1.0	-1.0	3.0	-1.0	3.0	3.0	24	7.0
13	.0	4.0	4.0	.0	2.0	2.0	5.0	2.0	8.0	7.0	6.0	4.0	2.0	4.0	4.0	8.0	5.0	2.0	3.0	2.0	3.0	11.0	19.0	11.0	24	19.0
14	13.0	11.0	11.0	12.0	11.0	12.0	8.0	5.0	15.0	18.0	13.0	17.0	9.0	9.0	5.0	8.0	12.0	27.0	47.0	51.0	25.0	9.0	18.0	12.0	24	51.0
15	9.0	10.0	13.0	14.0	11.0	15.0	18.0	16.0	18.0	14.0	11.0	13.0	11.0	9.0	14.0	7.0	10.0	8.0	8.0	8.0	6.0	8.0	10.0	10.0	24	18.0
16	7.0	7.0	9.0	10.0	6.0	1.0	3.0	6.0	3.0	6.0	9.0	9.0	7.0	11.0	-1.0	8.0	-7.0	.0	5.0	1.0	1.0	1.0	3.0	.0	24	11.0
17	5.0	1.0	-2.0	AV	AV	AV	AV	8.0	4.0	5.0	4.0	8.0	14.0	14.0	10.0	12.0	6.0	7.0	-1.0	-1.0	2.0	5.0	11.0	11.0	20	14.0
18	13.0	9.0	11.0	13.0	8.0	6.0	11.0	14.0	8.0	7.0	5.0	4.0	2.0	6.0	3.0	3.0	5.0	4.0	2.0	7.0	1.0	4.0	7.0	6.0	24	14.0
19	2.0	5.0	2.0	-1.0	-2.0	3.0	4.0	2.0	1.0	3.0	4.0	3.0	2.0	3.0	3.0	-1.0	2.0	1.0	.0	-5.0	.0	.0	2.0	3.0	24	5.0
20	5.0	7.0	4.0	6.0	4.0	7.0	7.0	5.0	9.0	8.0	9.0	13.0	6.0	6.0	7.0	7.0	1.0	.0	-5.0	-3.0	3.0	5.0	36.0	21.0	24	36.0
21	14.0	11.0	23.0	7.0	9.0	7.0	7.0	7.0	12.0	12.0	8.0	BA	BA	BA	9.0	13.0	10.0	4.0	-3.0	11.0	25.0	21.0	33.0	30.0	21	33.0
22	23.0	18.0	19.0	15.0	17.0	12.0	8.0	7.0	12.0	12.0	11.0	9.0	10.0	12.0	7.0	10.0	13.0	19.0	19.0	17.0	19.0	15.0	20.0	22.0	24	23.0
23	16.0	14.0	15.0	15.0	13.0	6.0	3.0	5.0	6.0	4.0	5.0	10.0	6.0	6.0	3.0	5.0	4.0	3.0	.0	-1.0	1.0	.0	2.0	-2.0	24	16.0
24	.0	4.0	1.0	1.0	1.0	3.0	4.0	3.0	11.0	5.0	7.0	7.0	3.0	9.0	4.0	2.0	5.0	1.0	1.0	1.0	1.0	7.0	2.0	7.0	24	11.0
25	5.0	5.0	8.0	5.0	2.0	4.0	3.0	5.0	5.0	7.0	6.0	5.0	8.0	2.0	2.0	3.0	9.0	13.0	10.0	4.0	7.0	5.0	2.0	11.0	24	13.0
26	7.0	10.0	6.0	10.0	4.0	7.0	2.0	2.0	6.0	4.0	5.0	4.0	3.0	5.0	2.0	2.0	3.0	.0	.0	3.0	3.0	2.0	.0	.0	24	10.0
27	1.0	5.0	2.0	4.0	4.0	3.0	4.0	5.0	6.0	1.0	5.0	1.0	1.0	4.0	7.0	3.0	-2.0	5.0	4.0	.0	1.0	5.0	5.0	8.0	24	8.0
28	7.0	11.0	8.0	11.0	13.0	10.0	7.0	10.0	4.0	6.0	8.0	10.0	12.0	11.0	11.0	7.0	5.0	6.0	2.0	2.0	9.0	9.0	7.0	7.0	24	13.0
29	11.0	8.0	7.0	7.0	6.0	7.0	7.0	5.0	11.0	11.0	14.0	16.0	18.0	17.0	15.0	16.0	18.0	13.0	13.0	15.0	21.0	22.0	22.0	27.0	24	27.0
30	16.0	9.0	8.0	4.0	4.0	3.0	4.0	8.0	11.0	13.0	8.0	12.0	19.0	23.0	12.0	13.0	11.0	16.0	14.0	11.0	11.0	15.0	10.0	7.0	24	23.0
31	11.0	6.0	4.0	1.0	7.0	6.0	8.0	7.0	11.0	5.0	11.0	6.0	9.0	9.0	8.0	6.0	6.0	1.0	4.0	-1.0	3.0	6.0	2.0	4.0	24	11.0
NO.:	29	29	29	28	28	28	28	29	29	29	29	29	29	28	29	29	29	29	29	29	29	29	29	29		
MAX:	44.0	36.0	33.0	31.0	31.0	29.0	26.0	28.0	26.0	33.0	33.0	24.0	27.0	23.0	24.0	21.0	18.0	27.0	47.0	51.0	25.0	32.0	46.0	50.0		
AVG:	9.45	8.86	8.97	8.00	7.57	7.75	7.32	6.93	9.59	9.79	9.62	9.03	9.14	9.18	6.66	6.93	5.93	6.21	4.86	5.00	6.59	8.17	11.31	10.59		

MONTHLY OBSERVATIONS: 691 MONTHLY MEAN: 8.06 MONTHLY MAX: 51.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	3.0	4.0	5.0	2.0	5.0	4.0	4.0	-2.0	7.0	6.0	7.0	5.0	3.0	4.0	5.0	6.0	7.0	2.0	4.0	1.0	1.0	9.0	14.0	11.0	24	14.0
2	7.0	11.0	8.0	13.0	11.0	9.0	8.0	4.0	12.0	10.0	5.0	5.0	11.0	6.0	AX	5.0	1.0	10.0	2.0	1.0	4.0	9.0	11.0	10.0	23	13.0
3	14.0	14.0	10.0	12.0	11.0	12.0	9.0	15.0	12.0	10.0	9.0	6.0	6.0	6.0	3.0	6.0	-1.0	-2.0	-3.0	-4.0	3.0	7.0	9.0	5.0	24	15.0
4	10.0	9.0	6.0	8.0	11.0	9.0	10.0	9.0	12.0	14.0	15.0	13.0	9.0	10.0	9.0	15.0	9.0	7.0	4.0	-2.0	7.0	15.0	10.0	13.0	24	15.0
5	14.0	16.0	12.0	16.0	17.0	18.0	20.0	18.0	22.0	22.0	24.0	17.0	19.0	10.0	11.0	3.0	5.0	5.0	5.0	2.0	8.0	10.0	7.0	4.0	24	24.0
6	10.0	7.0	9.0	9.0	8.0	6.0	9.0	9.0	12.0	15.0	12.0	11.0	25.0	19.0	24.0	11.0	9.0	11.0	7.0	6.0	2.0	-1.0	1.0	2.0	24	25.0
7	-3.0	3.0	-1.0	3.0	.0	4.0	1.0	6.0	8.0	5.0	8.0	1.0	4.0	4.0	7.0	6.0	3.0	-2.0	2.0	-2.0	3.0	4.0	3.0	4.0	24	8.0
8	7.0	5.0	3.0	3.0	3.0	2.0	2.0	8.0	9.0	3.0	4.0	1.0	2.0	-2.0	-1.0	7.0	4.0	-1.0	1.0	2.0	3.0	-3.0	-1.0	2.0	24	9.0
9	1.0	.0	4.0	2.0	3.0	4.0	-1.0	5.0	1.0	3.0	5.0	3.0	8.0	4.0	3.0	2.0	3.0	3.0	2.0	1.0	-3.0	4.0	6.0	8.0	24	8.0
10	8.0	8.0	9.0	10.0	11.0	18.0	11.0	12.0	15.0	12.0	14.0	12.0	8.0	10.0	11.0	11.0	8.0	9.0	5.0	2.0	4.0	5.0	9.0	7.0	24	18.0
11	5.0	7.0	6.0	8.0	5.0	3.0	4.0	9.0	4.0	6.0	8.0	9.0	10.0	8.0	7.0	19.0	23.0	13.0	32.0	26.0	29.0	47.0	47.0	62.0	24	62.0
12	53.0	16.0	18.0	29.0	24.0	25.0	43.0	28.0	17.0	10.0	17.0	13.0	11.0	14.0	12.0	10.0	10.0	7.0	23.0	28.0	10.0	11.0	11.0	21.0	24	53.0
13	26.0	26.0	17.0	12.0	12.0	11.0	7.0	9.0	7.0	11.0	13.0	22.0	14.0	10.0	29.0	8.0	19.0	6.0	5.0	7.0	5.0	9.0	7.0	4.0	24	29.0
14	4.0	.0	1.0	3.0	1.0	4.0	4.0	-5.0	4.0	1.0	6.0	7.0	8.0	9.0	3.0	2.0	1.0	1.0	-2.0	-7.0	-3.0	3.0	7.0	-2.0	24	9.0
15	.0	5.0	9.0	6.0	11.0	6.0	2.0	7.0	10.0	10.0	12.0	14.0	10.0	7.0	11.0	8.0	8.0	5.0	.0	-6.0	3.0	9.0	13.0	14.0	24	14.0
16	20.0	19.0	10.0	12.0	14.0	16.0	18.0	22.0	12.0	11.0	12.0	10.0	8.0	6.0	6.0	9.0	10.0	7.0	8.0	5.0	3.0	4.0	7.0	8.0	24	22.0
17	8.0	8.0	5.0	5.0	6.0	6.0	5.0	12.0	14.0	11.0	9.0	5.0	8.0	18.0	15.0	16.0	14.0	9.0	3.0	7.0	9.0	10.0	10.0	8.0	24	18.0
18	6.0	10.0	9.0	11.0	12.0	9.0	10.0	9.0	5.0	4.0	3.0	5.0	-1.0	2.0	6.0	-1.0	8.0	3.0	2.0	-1.0	3.0	3.0	3.0	4.0	24	12.0
19	2.0	3.0	5.0	1.0	6.0	2.0	2.0	6.0	8.0	5.0	4.0	4.0	5.0	5.0	8.0	3.0	-1.0	3.0	-3.0	-6.0	5.0	4.0	6.0	9.0	24	9.0
20	5.0	11.0	9.0	5.0	7.0	8.0	5.0	5.0	11.0	10.0	10.0	8.0	9.0	10.0	3.0	7.0	7.0	8.0	4.0	1.0	7.0	7.0	8.0	11.0	24	11.0
21	10.0	7.0	10.0	11.0	7.0	7.0	10.0	7.0	9.0	10.0	15.0	14.0	11.0	15.0	14.0	11.0	9.0	9.0	5.0	-2.0	6.0	14.0	9.0	11.0	24	15.0
22	10.0	14.0	15.0	9.0	12.0	13.0	13.0	17.0	16.0	16.0	19.0	14.0	16.0	12.0	12.0	11.0	11.0	9.0	6.0	-2.0	7.0	11.0	16.0	15.0	24	19.0
23	16.0	20.0	15.0	14.0	17.0	16.0	10.0	19.0	18.0	16.0	16.0	17.0	13.0	13.0	10.0	10.0	6.0	5.0	.0	4.0	4.0	1.0	6.0	11.0	24	20.0
24	10.0	8.0	8.0	5.0	9.0	6.0	7.0	9.0	10.0	11.0	16.0	16.0	7.0	11.0	11.0	11.0	11.0	12.0	5.0	3.0	8.0	10.0	7.0	5.0	24	16.0
25	8.0	9.0	7.0	12.0	15.0	17.0	13.0	22.0	21.0	14.0	16.0	9.0	13.0	11.0	10.0	12.0	12.0	10.0	2.0	.0	7.0	4.0	12.0	14.0	24	22.0
26	13.0	11.0	12.0	9.0	1.0	-3.0	3.0	-3.0	.0	5.0	3.0	5.0	6.0	12.0	6.0	8.0	3.0	1.0	.0	-2.0	-1.0	4.0	3.0	1.0	24	13.0
27	4.0	5.0	4.0	2.0	4.0	4.0	-1.0	4.0	9.0	5.0	12.0	6.0	7.0	12.0	BA	BA	4.0	4.0	2.0	3.0	4.0	11.0	12.0	11.0	22	12.0
28	10.0	9.0	11.0	8.0	5.0	10.0	10.0	13.0	15.0	13.0	13.0	21.0	17.0	18.0	13.0	15.0	14.0	8.0	11.0	6.0	11.0	14.0	12.0	16.0	24	21.0
29	11.0	16.0	16.0	16.0	16.0	19.0	17.0	13.0	20.0	18.0	18.0	14.0	12.0	10.0	12.0	14.0	11.0	11.0	10.0	8.0	6.0	12.0	17.0	22.0	24	22.0
30	21.0	16.0	19.0	15.0	20.0	13.0	16.0	18.0	15.0	18.0	13.0	13.0	13.0	12.0	15.0	8.0	6.0	6.0	-1.0	-2.0	2.0	5.0	6.0	8.0	24	21.0
31																									0	
NO.:	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	29	30	30	30	30	30	30	30	30		
MAX:	53.0	26.0	19.0	29.0	24.0	25.0	43.0	28.0	22.0	22.0	24.0	22.0	25.0	19.0	29.0	19.0	23.0	13.0	32.0	28.0	29.0	47.0	47.0	62.0		
AVG:	10.43	9.90	9.03	9.03	9.47	9.27	9.03	10.17	11.17	10.17	11.27	10.00	9.73	9.53	9.82	8.72	7.80	5.97	4.70	2.57	5.23	8.40	9.60	10.63		

MONTHLY OBSERVATIONS: 717 MONTHLY MEAN: 8.82 MONTHLY MAX: 62.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	7.0	6.0	7.0	9.0	9.0	6.0	10.0	12.0	8.0	-1.0	11.0	7.0	10.0	12.0	13.0	8.0	12.0	7.0	4.0	6.0	7.0	7.0	6.0	9.0	24	13.0
2	6.0	10.0	7.0	4.0	9.0	6.0	8.0	11.0	16.0	16.0	10.0	16.0	12.0	13.0	12.0	10.0	8.0	3.0	7.0	6.0	7.0	10.0	7.0	7.0	24	16.0
3	11.0	20.0	10.0	10.0	11.0	6.0	8.0	9.0	8.0	16.0	13.0	9.0	12.0	AX	16.0	13.0	10.0	11.0	3.0	4.0	8.0	9.0	9.0	10.0	23	20.0
4	7.0	8.0	9.0	10.0	3.0	7.0	4.0	9.0	12.0	14.0	16.0	14.0	12.0	14.0	13.0	6.0	12.0	11.0	3.0	9.0	10.0	9.0	9.0	10.0	24	16.0
5	11.0	10.0	7.0	11.0	8.0	13.0	8.0	10.0	15.0	17.0	BA	14.0	17.0	20.0	15.0	11.0	9.0	12.0	8.0	5.0	7.0	7.0	12.0	10.0	23	20.0
6	9.0	9.0	11.0	8.0	4.0	10.0	7.0	10.0	10.0	9.0	10.0	9.0	7.0	8.0	7.0	7.0	1.0	1.0	1.0	.0	4.0	4.0	-2.0	4.0	24	11.0
7	4.0	1.0	2.0	3.0	1.0	1.0	2.0	4.0	5.0	3.0	6.0	2.0	2.0	3.0	1.0	4.0	4.0	3.0	1.0	1.0	3.0	.0	6.0	5.0	24	6.0
8	4.0	3.0	3.0	5.0	7.0	2.0	5.0	2.0	6.0	1.0	1.0	3.0	3.0	7.0	8.0	4.0	2.0	.0	1.0	-3.0	-3.0	7.0	3.0	3.0	24	8.0
9	4.0	5.0	6.0	7.0	3.0	5.0	6.0	10.0	4.0	6.0	6.0	10.0	7.0	5.0	6.0	5.0	8.0	.0	3.0	-5.0	1.0	.0	7.0	5.0	24	10.0
10	9.0	10.0	6.0	5.0	5.0	9.0	7.0	14.0	14.0	12.0	12.0	14.0	8.0	6.0	8.0	7.0	8.0	6.0	-2.0	.0	5.0	7.0	9.0	9.0	24	14.0
11	10.0	12.0	9.0	12.0	9.0	11.0	12.0	18.0	19.0	21.0	16.0	13.0	13.0	20.0	17.0	14.0	16.0	12.0	11.0	8.0	14.0	20.0	18.0	17.0	24	21.0
12	20.0	21.0	19.0	19.0	14.0	18.0	13.0	23.0	19.0	17.0	15.0	13.0	13.0	11.0	13.0	11.0	8.0	3.0	6.0	-1.0	3.0	10.0	14.0	7.0	24	23.0
13	8.0	5.0	3.0	5.0	6.0	6.0	8.0	10.0	8.0	9.0	13.0	2.0	5.0	7.0	7.0	6.0	6.0	-1.0	-1.0	-1.0	4.0	7.0	5.0	8.0	24	13.0
14	6.0	5.0	7.0	7.0	6.0	4.0	3.0	8.0	9.0	13.0	8.0	10.0	6.0	9.0	10.0	4.0	1.0	7.0	1.0	-1.0	1.0	4.0	8.0	11.0	24	13.0
15	9.0	10.0	8.0	8.0	6.0	6.0	8.0	10.0	11.0	10.0	10.0	15.0	12.0	10.0	9.0	13.0	6.0	11.0	1.0	4.0	5.0	8.0	9.0	9.0	24	15.0
16	7.0	7.0	7.0	10.0	11.0	8.0	9.0	15.0	17.0	11.0	16.0	14.0	15.0	11.0	9.0	11.0	5.0	3.0	-1.0	-4.0	-2.0	2.0	4.0	-2.0	24	17.0
17	5.0	6.0	3.0	5.0	4.0	5.0	6.0	13.0	12.0	14.0	8.0	10.0	9.0	5.0	6.0	8.0	5.0	5.0	2.0	.0	-2.0	5.0	8.0	9.0	24	14.0
18	9.0	10.0	10.0	11.0	10.0	14.0	8.0	12.0	21.0	19.0	16.0	14.0	16.0	12.0	11.0	12.0	13.0	8.0	13.0	7.0	10.0	15.0	19.0	16.0	24	21.0
19	14.0	16.0	17.0	14.0	16.0	19.0	23.0	24.0	30.0	24.0	21.0	15.0	15.0	15.0	12.0	11.0	8.0	6.0	4.0	2.0	6.0	5.0	13.0	10.0	24	30.0
20	9.0	14.0	11.0	11.0	9.0	11.0	13.0	11.0	11.0	19.0	16.0	11.0	12.0	13.0	9.0	7.0	7.0	5.0	9.0	-2.0	2.0	6.0	5.0	8.0	24	19.0
21	9.0	9.0	10.0	7.0	8.0	7.0	6.0	11.0	17.0	14.0	13.0	18.0	13.0	13.0	17.0	13.0	12.0	11.0	8.0	3.0	7.0	7.0	7.0	7.0	24	18.0
22	7.0	9.0	12.0	9.0	5.0	10.0	7.0	7.0	15.0	16.0	15.0	16.0	13.0	13.0	16.0	11.0	10.0	.0	3.0	2.0	8.0	5.0	4.0	5.0	24	16.0
23	4.0	2.0	4.0	7.0	8.0	9.0	7.0	6.0	3.0	5.0	1.0	6.0	16.0	13.0	-1.0	15.0	1.0	7.0	4.0	3.0	2.0	4.0	6.0	4.0	24	16.0
24	6.0	4.0	4.0	5.0	7.0	8.0	6.0	5.0	8.0	7.0	9.0	12.0	14.0	8.0	18.0	17.0	16.0	16.0	11.0	-7.0	3.0	2.0	4.0	3.0	24	18.0
25	3.0	6.0	6.0	6.0	5.0	5.0	5.0	8.0	9.0	11.0	-3.0	1.0	3.0	2.0	5.0	5.0	5.0	4.0	2.0	-1.0	.0	6.0	6.0	5.0	24	11.0
26	3.0	3.0	3.0	3.0	1.0	3.0	1.0	4.0	4.0	11.0	3.0	2.0	-3.0	1.0	3.0	3.0	.0	-1.0	2.0	2.0	3.0	5.0	.0	4.0	24	11.0
27	6.0	4.0	4.0	3.0	6.0	3.0	13.0	8.0	12.0	8.0	BA	BA	5.0	5.0	7.0	6.0	3.0	2.0	5.0	3.0	3.0	3.0	5.0	3.0	22	13.0
28	8.0	4.0	6.0	5.0	7.0	7.0	1.0	4.0	7.0	6.0	8.0	6.0	6.0	6.0	8.0	7.0	-1.0	9.0	6.0	5.0	7.0	9.0	9.0	14.0	24	14.0
29	12.0	13.0	13.0	9.0	12.0	7.0	8.0	11.0	8.0	9.0	14.0	11.0	10.0	8.0	9.0	9.0	7.0	6.0	7.0	5.0	6.0	13.0	11.0	13.0	24	14.0
30	13.0	11.0	13.0	13.0	10.0	13.0	10.0	15.0	17.0	16.0	15.0	8.0	7.0	7.0	6.0	8.0	10.0	10.0	4.0	6.0	8.0	9.0	6.0	10.0	24	17.0
31	5.0	7.0	7.0	8.0	6.0	8.0	7.0	13.0	14.0	14.0	11.0	12.0	14.0	10.0	8.0	13.0	5.0	10.0	8.0	7.0	6.0	15.0	15.0	13.0	24	15.0
NO.:	31	31	31	31	31	31	31	31	31	31	29	30	31	30	31	31	31	31	31	31	31	31	31	31		
MAX:	20.0	21.0	19.0	19.0	16.0	19.0	23.0	24.0	30.0	24.0	21.0	18.0	17.0	20.0	18.0	17.0	16.0	16.0	13.0	9.0	14.0	20.0	19.0	17.0		
AVG:	7.90	8.39	7.87	8.03	7.29	7.97	7.71	10.55	11.90	11.84	10.69	10.23	9.81	9.57	9.61	9.00	7.00	6.03	4.32	2.03	4.61	7.10	7.81	7.94		

MONTHLY OBSERVATIONS: 740 MONTHLY MEAN: 8.12 MONTHLY MAX: 30.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	13.0	15.0	14.0	15.0	11.0	12.0	13.0	19.0	20.0	24.0	16.0	14.0	12.0	13.0	9.0	9.0	12.0	8.0	10.0	3.0	5.0	15.0	11.0	15.0	24	24.0
2	12.0	13.0	13.0	13.0	15.0	11.0	11.0	16.0	19.0	20.0	AX	9.0	11.0	2.0	5.0	11.0	6.0	9.0	9.0	3.0	4.0	8.0	5.0	4.0	23	20.0
3	11.0	9.0	8.0	10.0	6.0	4.0	8.0	5.0	10.0	8.0	7.0	5.0	5.0	4.0	4.0	3.0	10.0	8.0	5.0	6.0	8.0	4.0	5.0	4.0	24	11.0
4	12.0	10.0	9.0	8.0	9.0	11.0	7.0	14.0	15.0	9.0	10.0	12.0	9.0	11.0	7.0	6.0	7.0	5.0	7.0	6.0	5.0	10.0	7.0	6.0	24	15.0
5	8.0	7.0	9.0	10.0	8.0	10.0	6.0	19.0	11.0	13.0	15.0	14.0	10.0	11.0	4.0	10.0	9.0	11.0	13.0	5.0	11.0	12.0	14.0	14.0	24	19.0
6	15.0	16.0	12.0	13.0	10.0	14.0	10.0	13.0	17.0	15.0	14.0	13.0	11.0	8.0	12.0	10.0	6.0	8.0	8.0	8.0	4.0	8.0	9.0	8.0	24	17.0
7	8.0	7.0	7.0	7.0	7.0	8.0	5.0	8.0	5.0	15.0	13.0	13.0	15.0	18.0	12.0	15.0	16.0	4.0	AV	AV	AV	AV	AV	AV	18	18.0
8	AV	7.0	10.0	8.0	7.0	7.0	4.0	3.0	1.0	3.0	-1.0	3.0	5.0	6.0	8.0	10.0	13.0	8.0	4.0	AV	AV	AV	AV	AV	18	13.0
9	AV	AV	AV	AV	9.0	6.0	6.0	4.0	10.0	6.0	6.0	13.0	11.0	7.0	7.0	6.0	2.0	5.0	2.0	1.0	3.0	6.0	2.0	5.0	20	13.0
10	8.0	6.0	7.0	5.0	4.0	7.0	4.0	8.0	9.0	9.0	7.0	6.0	4.0	6.0	5.0	2.0	3.0	1.0	6.0	3.0	5.0	9.0	10.0	10.0	24	10.0
11	9.0	6.0	7.0	9.0	6.0	11.0	4.0	12.0	16.0	12.0	13.0	14.0	12.0	13.0	10.0	13.0	13.0	11.0	9.0	7.0	8.0	12.0	12.0	14.0	24	16.0
12	13.0	12.0	13.0	13.0	12.0	11.0	13.0	17.0	18.0	21.0	21.0	15.0	15.0	12.0	9.0	10.0	10.0	9.0	8.0	9.0	10.0	9.0	12.0	9.0	24	21.0
13	14.0	13.0	12.0	14.0	14.0	12.0	12.0	13.0	21.0	24.0	18.0	17.0	14.0	14.0	15.0	18.0	14.0	17.0	12.0	12.0	10.0	16.0	16.0	14.0	24	24.0
14	16.0	16.0	19.0	14.0	17.0	12.0	16.0	20.0	29.0	33.0	31.0	30.0	29.0	28.0	25.0	29.0	27.0	26.0	29.0	28.0	27.0	23.0	28.0	AV	23	33.0
15	AV	21.0	15.0	13.0	13.0	12.0	13.0	21.0	21.0	24.0	28.0	32.0	29.0	29.0	28.0	25.0	23.0	25.0	21.0	26.0	19.0	4.0	2.0	7.0	23	32.0
16	8.0	8.0	8.0	6.0	8.0	7.0	10.0	12.0	15.0	16.0	12.0	12.0	11.0	9.0	9.0	9.0	8.0	8.0	4.0	4.0	7.0	11.0	12.0	18.0	24	18.0
17	12.0	18.0	12.0	5.0	6.0	7.0	7.0	11.0	15.0	13.0	13.0	15.0	16.0	19.0	18.0	-3.0	6.0	14.0	8.0	9.0	7.0	8.0	10.0	9.0	24	19.0
18	9.0	7.0	12.0	5.0	8.0	10.0	6.0	11.0	13.0	13.0	13.0	12.0	4.0	7.0	12.0	8.0	6.0	5.0	2.0	.0	.0	5.0	3.0	6.0	24	13.0
19	3.0	4.0	4.0	8.0	5.0	1.0	6.0	8.0	9.0	6.0	11.0	11.0	6.0	8.0	6.0	7.0	7.0	2.0	3.0	.0	-4.0	4.0	7.0	6.0	24	11.0
20	6.0	9.0	10.0	8.0	8.0	7.0	7.0	9.0	11.0	14.0	17.0	17.0	15.0	15.0	14.0	10.0	11.0	11.0	8.0	8.0	11.0	15.0	13.0	15.0	24	17.0
21	13.0	17.0	14.0	11.0	12.0	10.0	10.0	18.0	22.0	20.0	20.0	14.0	15.0	12.0	15.0	13.0	12.0	11.0	12.0	9.0	10.0	13.0	12.0	14.0	24	22.0
22	14.0	19.0	14.0	16.0	18.0	14.0	15.0	22.0	28.0	26.0	22.0	18.0	15.0	18.0	15.0	17.0	17.0	12.0	15.0	14.0	8.0	16.0	18.0	16.0	24	28.0
23	17.0	17.0	18.0	17.0	17.0	17.0	19.0	20.0	23.0	14.0	19.0	BA	BA	13.0	13.0	10.0	13.0	7.0	7.0	6.0	2.0	9.0	11.0	8.0	22	23.0
24	8.0	8.0	9.0	10.0	14.0	9.0	7.0	12.0	15.0	16.0	15.0	18.0	16.0	13.0	13.0	10.0	10.0	13.0	4.0	6.0	7.0	15.0	15.0	19.0	24	19.0
25	7.0	6.0	11.0	9.0	11.0	10.0	11.0	15.0	10.0	12.0	11.0	16.0	15.0	16.0	15.0	16.0	13.0	9.0	15.0	10.0	10.0	12.0	14.0	13.0	24	16.0
26	14.0	11.0	13.0	11.0	12.0	13.0	11.0	15.0	17.0	14.0	14.0	12.0	10.0	15.0	13.0	12.0	6.0	12.0	11.0	9.0	12.0	6.0	9.0	6.0	24	17.0
27	7.0	11.0	10.0	8.0	8.0	9.0	12.0	13.0	20.0	18.0	20.0	-6.0	9.0	14.0	10.0	8.0	11.0	9.0	11.0	8.0	8.0	10.0	6.0	7.0	24	20.0
28	7.0	9.0	6.0	8.0	5.0	9.0	7.0	9.0	8.0	9.0	9.0	12.0	7.0	14.0	13.0	15.0	13.0	-5.0	4.0	3.0	5.0	9.0	5.0	10.0	24	15.0
29	9.0	7.0	12.0	10.0	16.0	11.0	13.0	11.0	13.0	16.0	20.0	12.0	14.0	14.0	17.0	7.0	9.0	17.0	7.0	4.0	6.0	9.0	8.0	2.0	24	20.0
30	7.0	1.0	4.0	4.0	5.0	3.0	4.0	3.0	9.0	8.0	11.0	9.0	11.0	6.0	12.0	5.0	10.0	7.0	5.0	6.0	6.0	4.0	9.0	8.0	24	12.0
31																									0	
NO.:	27	29	29	29	30	30	30	30	30	30	29	29	29	30	30	30	30	30	29	28	28	28	28	27		
MAX:	17.0	21.0	19.0	17.0	18.0	17.0	19.0	22.0	29.0	33.0	31.0	32.0	29.0	29.0	28.0	29.0	27.0	26.0	29.0	28.0	27.0	23.0	28.0	19.0		
AVG:	10.37	10.69	10.76	9.93	10.03	9.50	9.23	12.70	15.00	15.03	14.66	13.17	12.28	12.50	11.83	10.70	10.77	9.57	8.93	7.61	7.64	10.07	10.18	9.89		

MONTHLY OBSERVATIONS: 699 MONTHLY MEAN: 10.99 MONTHLY MAX: 33.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	4.0	10.0	7.0	6.0	8.0	7.0	11.0	11.0	15.0	19.0	16.0	AX	7.0	14.0	8.0	6.0	15.0	7.0	6.0	5.0	4.0	6.0	9.0	7.0	23	19.0
2	8.0	8.0	8.0	9.0	4.0	8.0	11.0	12.0	14.0	15.0	11.0	9.0	8.0	12.0	12.0	4.0	-6.0	3.0	6.0	3.0	3.0	13.0	11.0	6.0	24	15.0
3	6.0	11.0	7.0	6.0	9.0	7.0	8.0	11.0	14.0	10.0	13.0	8.0	5.0	7.0	7.0	12.0	5.0	-2.0	4.0	.0	3.0	3.0	13.0	20.0	24	20.0
4	19.0	11.0	9.0	4.0	8.0	10.0	7.0	10.0	13.0	11.0	8.0	9.0	2.0	8.0	14.0	13.0	6.0	7.0	7.0	-1.0	26.0	46.0	41.0	48.0	24	48.0
5	26.0	11.0	10.0	16.0	13.0	15.0	16.0	11.0	19.0	16.0	14.0	17.0	15.0	13.0	11.0	8.0	10.0	1.0	8.0	5.0	6.0	9.0	8.0	10.0	24	26.0
6	9.0	8.0	10.0	6.0	11.0	8.0	7.0	14.0	16.0	14.0	15.0	12.0	8.0	13.0	12.0	9.0	10.0	12.0	6.0	3.0	1.0	-2.0	5.0	8.0	24	16.0
7	8.0	8.0	6.0	7.0	5.0	7.0	9.0	12.0	15.0	16.0	14.0	17.0	5.0	12.0	9.0	10.0	9.0	4.0	.0	-9.0	1.0	2.0	6.0	6.0	24	17.0
8	5.0	7.0	6.0	6.0	5.0	9.0	4.0	11.0	10.0	13.0	15.0	13.0	19.0	12.0	BR	18.0	8.0	6.0	6.0	5.0	7.0	14.0	14.0	17.0	23	19.0
9	8.0	9.0	10.0	8.0	8.0	12.0	11.0	13.0	.0	.0	5.0	6.0	7.0	9.0	8.0	7.0	9.0	BR	1.0	6.0	6.0	4.0	3.0	3.0	23	13.0
10	2.0	8.0	7.0	5.0	2.0	5.0	8.0	7.0	5.0	7.0	7.0	10.0	13.0	9.0	7.0	7.0	6.0	5.0	1.0	-1.0	.0	6.0	7.0	7.0	24	13.0
11	8.0	7.0	6.0	5.0	3.0	5.0	3.0	5.0	7.0	6.0	4.0	5.0	4.0	5.0	2.0	7.0	5.0	7.0	2.0	4.0	1.0	2.0	6.0	9.0	24	9.0
12	5.0	6.0	9.0	4.0	7.0	10.0	3.0	5.0	5.0	9.0	11.0	6.0	10.0	11.0	9.0	10.0	8.0	5.0	5.0	8.0	11.0	17.0	23.0	14.0	24	23.0
13	19.0	20.0	20.0	12.0	9.0	6.0	8.0	5.0	5.0	7.0	8.0	6.0	7.0	-2.0	3.0	7.0	9.0	.0	5.0	4.0	7.0	9.0	6.0	7.0	24	20.0
14	5.0	9.0	7.0	10.0	10.0	9.0	8.0	7.0	9.0	11.0	9.0	7.0	11.0	6.0	11.0	10.0	9.0	10.0	4.0	10.0	6.0	10.0	10.0	12.0	24	12.0
15	11.0	10.0	16.0	12.0	8.0	10.0	13.0	13.0	18.0	16.0	19.0	14.0	14.0	11.0	11.0	12.0	12.0	10.0	10.0	3.0	7.0	10.0	14.0	13.0	24	19.0
16	11.0	14.0	24.0	19.0	16.0	14.0	12.0	13.0	13.0	19.0	16.0	18.0	14.0	1.0	22.0	13.0	10.0	5.0	2.0	12.0	7.0	7.0	12.0	9.0	24	24.0
17	10.0	10.0	15.0	12.0	9.0	14.0	12.0	16.0	13.0	12.0	13.0	12.0	8.0	6.0	8.0	9.0	5.0	9.0	-2.0	6.0	6.0	7.0	8.0	6.0	24	16.0
18	10.0	8.0	7.0	6.0	8.0	11.0	9.0	11.0	16.0	9.0	10.0	11.0	8.0	7.0	BR	5.0	10.0	8.0	8.0	11.0	10.0	4.0	5.0	6.0	23	16.0
19	4.0	6.0	9.0	3.0	3.0	4.0	5.0	7.0	6.0	7.0	15.0	5.0	16.0	19.0	16.0	13.0	11.0	12.0	10.0	6.0	7.0	8.0	6.0	9.0	24	19.0
20	9.0	8.0	13.0	11.0	12.0	12.0	5.0	10.0	14.0	9.0	13.0	7.0	11.0	9.0	8.0	9.0	9.0	9.0	2.0	7.0	9.0	6.0	8.0	10.0	24	14.0
21	8.0	12.0	8.0	5.0	12.0	11.0	12.0	12.0	9.0	11.0	14.0	17.0	11.0	16.0	20.0	16.0	-4.0	.0	6.0	5.0	3.0	2.0	5.0	6.0	24	20.0
22	5.0	8.0	3.0	5.0	1.0	4.0	7.0	7.0	12.0	13.0	10.0	13.0	8.0	12.0	7.0	13.0	7.0	10.0	4.0	-1.0	3.0	7.0	5.0	7.0	24	13.0
23	8.0	6.0	7.0	6.0	5.0	6.0	7.0	9.0	13.0	16.0	15.0	13.0	13.0	8.0	10.0	12.0	7.0	7.0	4.0	4.0	1.0	7.0	7.0	5.0	24	16.0
24	8.0	5.0	4.0	6.0	7.0	5.0	5.0	14.0	12.0	14.0	13.0	18.0	16.0	11.0	23.0	8.0	9.0	14.0	7.0	6.0	6.0	8.0	10.0	10.0	24	23.0
25	13.0	8.0	11.0	8.0	8.0	7.0	5.0	9.0	8.0	7.0	BA	BA	BA	11.0	19.0	19.0	21.0	18.0	12.0	12.0	9.0	8.0	8.0	13.0	21	21.0
26	10.0	11.0	7.0	10.0	9.0	8.0	10.0	12.0	14.0	15.0	15.0	12.0	9.0	11.0	9.0	10.0	6.0	10.0	6.0	6.0	6.0	7.0	8.0	10.0	24	15.0
27	9.0	7.0	9.0	3.0	10.0	9.0	7.0	15.0	12.0	12.0	12.0	8.0	12.0	8.0	5.0	7.0	9.0	6.0	5.0	4.0	7.0	6.0	8.0	9.0	24	15.0
28	8.0	11.0	5.0	8.0	11.0	11.0	8.0	10.0	14.0	13.0	14.0	8.0	5.0	8.0	9.0	8.0	5.0	6.0	6.0	6.0	8.0	8.0	9.0	7.0	24	14.0
29	5.0	6.0	5.0	6.0	8.0	7.0	11.0	9.0	12.0	11.0	15.0	17.0	10.0	11.0	12.0	7.0	9.0	2.0	3.0	4.0	6.0	8.0	.0	7.0	24	17.0
30	7.0	.0	5.0	7.0	3.0	7.0	5.0	10.0	8.0	7.0	7.0	12.0	12.0	15.0	16.0	13.0	12.0	4.0	3.0	6.0	4.0	4.0	1.0	.0	24	16.0
31	.0	3.0	3.0	3.0	3.0	4.0	5.0	8.0	13.0	10.0	13.0	10.0	6.0	5.0	7.0	9.0	8.0	9.0	1.0	2.0	2.0	5.0	2.0	2.0	24	13.0
NO.:	31	31	31	31	31	31	31	31	31	31	30	29	30	31	29	31	31	30	31	31	31	31	31	31		
MAX:	26.0	20.0	24.0	19.0	16.0	15.0	16.0	16.0	19.0	19.0	19.0	18.0	19.0	19.0	23.0	19.0	21.0	18.0	12.0	12.0	26.0	46.0	41.0	48.0		
AVG:	8.65	8.58	8.81	7.55	7.58	8.45	8.13	10.29	11.42	11.45	12.13	11.03	9.80	9.61	10.86	10.03	8.03	6.80	4.77	4.55	5.90	8.10	8.97	9.77		

MONTHLY OBSERVATIONS: 737 MONTHLY MEAN: 8.79 MONTHLY MAX: 48.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	5.0	3.0	6.0	4.0	6.0	5.0	2.0	7.0	9.0	13.0	9.0	19.0	11.0	9.0	8.0	12.0	9.0	7.0	15.0	11.0	8.0	12.0	9.0	8.0	24	19.0
2	8.0	8.0	5.0	6.0	7.0	7.0	8.0	7.0	7.0	9.0	9.0	7.0	11.0	8.0	13.0	10.0	10.0	9.0	1.0	7.0	8.0	7.0	5.0	4.0	24	13.0
3	5.0	6.0	5.0	5.0	3.0	.0	5.0	2.0	4.0	11.0	9.0	9.0	7.0	7.0	5.0	8.0	2.0	6.0	-5.0	10.0	2.0	3.0	5.0	7.0	24	11.0
4	5.0	8.0	6.0	10.0	5.0	3.0	3.0	8.0	9.0	13.0	10.0	AX	6.0	13.0	18.0	13.0	14.0	19.0	7.0	4.0	5.0	7.0	5.0	6.0	23	19.0
5	7.0	5.0	8.0	2.0	10.0	8.0	5.0	18.0	16.0	14.0	12.0	14.0	12.0	8.0	10.0	11.0	8.0	6.0	3.0	2.0	3.0	3.0	3.0	9.0	24	18.0
6	3.0	6.0	5.0	8.0	8.0	8.0	5.0	11.0	12.0	15.0	15.0	16.0	14.0	12.0	10.0	14.0	5.0	-3.0	5.0	6.0	7.0	3.0	4.0	7.0	24	16.0
7	7.0	3.0	9.0	7.0	10.0	8.0	4.0	10.0	15.0	15.0	10.0	12.0	16.0	13.0	16.0	12.0	6.0	2.0	4.0	3.0	1.0	5.0	9.0	4.0	24	16.0
8	5.0	3.0	6.0	7.0	6.0	8.0	9.0	13.0	12.0	11.0	10.0	11.0	16.0	11.0	11.0	-9.0	4.0	9.0	9.0	6.0	2.0	8.0	7.0	12.0	24	16.0
9	8.0	7.0	9.0	8.0	9.0	3.0	8.0	11.0	15.0	11.0	17.0	13.0	10.0	10.0	8.0	-3.0	-5.0	4.0	3.0	5.0	5.0	5.0	4.0	5.0	24	17.0
10	4.0	7.0	3.0	.0	5.0	7.0	5.0	9.0	6.0	12.0	7.0	9.0	6.0	6.0	1.0	2.0	2.0	7.0	2.0	-9.0	.0	3.0	5.0	5.0	24	12.0
11	5.0	6.0	3.0	8.0	8.0	1.0	1.0	11.0	6.0	7.0	10.0	12.0	-7.0	-6.0	13.0	11.0	8.0	8.0	7.0	2.0	8.0	6.0	7.0	7.0	24	13.0
12	4.0	5.0	6.0	6.0	7.0	1.0	6.0	7.0	5.0	6.0	12.0	7.0	10.0	9.0	8.0	4.0	7.0	9.0	2.0	5.0	2.0	3.0	6.0	4.0	24	12.0
13	5.0	8.0	9.0	8.0	6.0	6.0	10.0	12.0	10.0	12.0	13.0	19.0	17.0	14.0	15.0	12.0	5.0	10.0	.0	4.0	5.0	3.0	10.0	8.0	24	19.0
14	9.0	9.0	7.0	8.0	9.0	8.0	10.0	11.0	17.0	15.0	13.0	9.0	13.0	12.0	10.0	10.0	11.0	5.0	2.0	2.0	5.0	8.0	7.0	11.0	24	17.0
15	9.0	9.0	6.0	10.0	7.0	8.0	9.0	15.0	17.0	18.0	18.0	16.0	11.0	11.0	13.0	11.0	-2.0	4.0	4.0	2.0	6.0	7.0	4.0	4.0	24	18.0
16	7.0	8.0	7.0	7.0	7.0	3.0	6.0	15.0	20.0	15.0	13.0	11.0	6.0	10.0	6.0	6.0	8.0	7.0	2.0	3.0	7.0	7.0	10.0	9.0	24	20.0
17	9.0	5.0	5.0	9.0	9.0	9.0	5.0	9.0	16.0	11.0	13.0	BL	-1.0	8.0	14.0	10.0	13.0	15.0	20.0	12.0	13.0	17.0	13.0	13.0	23	20.0
18	12.0	13.0	12.0	9.0	12.0	12.0	10.0	11.0	18.0	11.0	18.0	14.0	12.0	13.0	9.0	16.0	14.0	13.0	9.0	3.0	10.0	9.0	10.0	5.0	24	18.0
19	8.0	12.0	11.0	13.0	12.0	15.0	11.0	14.0	14.0	18.0	7.0	13.0	14.0	9.0	1.0	9.0	8.0	13.0	1.0	.0	1.0	5.0	8.0	5.0	24	18.0
20	8.0	7.0	7.0	4.0	6.0	3.0	5.0	5.0	7.0	12.0	9.0	14.0	6.0	8.0	8.0	6.0	9.0	5.0	-1.0	-1.0	3.0	8.0	2.0	2.0	24	14.0
21	2.0	3.0	2.0	3.0	1.0	9.0	7.0	4.0	9.0	6.0	7.0	8.0	10.0	9.0	11.0	8.0	5.0	8.0	5.0	3.0	7.0	8.0	9.0	7.0	24	11.0
22	6.0	5.0	3.0	4.0	5.0	6.0	-1.0	4.0	6.0	3.0	9.0	8.0	8.0	3.0	7.0	-2.0	7.0	3.0	4.0	4.0	4.0	2.0	4.0	7.0	24	9.0
23	3.0	6.0	9.0	5.0	6.0	6.0	1.0	6.0	6.0	15.0	15.0	13.0	11.0	6.0	9.0	8.0	7.0	3.0	4.0	6.0	2.0	4.0	4.0	6.0	24	15.0
24	7.0	4.0	5.0	2.0	5.0	4.0	4.0	6.0	5.0	5.0	9.0	7.0	6.0	3.0	4.0	3.0	4.0	4.0	5.0	1.0	6.0	7.0	5.0	8.0	24	9.0
25	5.0	3.0	2.0	1.0	2.0	4.0	5.0	9.0	3.0	2.0	5.0	5.0	2.0	6.0	1.0	3.0	11.0	4.0	-2.0	.0	2.0	.0	2.0	2.0	24	11.0
26	1.0	4.0	3.0	4.0	6.0	7.0	5.0	4.0	5.0	6.0	11.0	6.0	2.0	2.0	5.0	5.0	.0	6.0	1.0	.0	2.0	5.0	5.0	8.0	24	11.0
27	6.0	7.0	7.0	4.0	7.0	5.0	7.0	10.0	13.0	13.0	6.0	10.0	7.0	10.0	6.0	3.0	6.0	4.0	.0	1.0	7.0	9.0	8.0	9.0	24	13.0
28	3.0	8.0	6.0	7.0	11.0	7.0	8.0	12.0	15.0	14.0	11.0	6.0	7.0	6.0	7.0	2.0	6.0	10.0	6.0	4.0	6.0	5.0	5.0	8.0	24	15.0
29	6.0	6.0	7.0	8.0	11.0	AJ	AJ	AJ	AJ	AJ	BA	18.0	11.0	12.0	11.0	11.0	8.0	9.0	8.0	.0	9.0	10.0	10.0	10.0	18	18.0
30	11.0	12.0	11.0	10.0	13.0	13.0	13.0	10.0	18.0	17.0	16.0	15.0	1.0	1.0	5.0	6.0	9.0	10.0	4.0	6.0	8.0	8.0	7.0	8.0	24	18.0
31	12.0	7.0	4.0	2.0	8.0	4.0	3.0	9.0	9.0	7.0	BA	BA	17.0	12.0	13.0	7.0	7.0	7.0	4.0	12.0	8.0	10.0	7.0	14.0	22	17.0
NO.:	31	31	31	31	31	30	30	30	30	30	29	28	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:	12.0	13.0	12.0	13.0	13.0	15.0	13.0	18.0	20.0	18.0	18.0	19.0	17.0	14.0	18.0	16.0	14.0	19.0	20.0	12.0	13.0	17.0	13.0	14.0		
AVG:	6.29	6.55	6.26	6.10	7.32	6.27	5.97	9.33	10.80	11.23	11.14	11.46	8.77	8.23	8.90	7.06	6.65	7.19	4.16	3.68	5.23	6.35	6.42	7.16		

MONTHLY OBSERVATIONS: 734 MONTHLY MEAN: 7.40 MONTHLY MAX: 20.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	10.0	6.0	6.0	10.0	8.0	6.0	5.0	7.0	14.0	11.0	13.0	11.0	14.0	10.0	6.0	8.0	6.0	3.0	6.0	1.0	6.0	8.0	10.0	11.0	24	14.0
2	6.0	4.0	8.0	10.0	11.0	11.0	8.0	10.0	10.0	13.0	8.0	7.0	7.0	7.0	8.0	6.0	4.0	3.0	-1.0	5.0	8.0	8.0	5.0	5.0	24	13.0
3	3.0	5.0	7.0	7.0	5.0	6.0	6.0	7.0	8.0	14.0	4.0	7.0	10.0	4.0	8.0	5.0	6.0	-1.0	3.0	10.0	5.0	5.0	6.0	.0	24	14.0
4	2.0	5.0	.0	2.0	1.0	4.0	2.0	5.0	9.0	7.0	7.0	6.0	5.0	-6.0	2.0	1.0	.0	1.0	.0	4.0	-2.0	2.0	3.0	3.0	24	9.0
5	6.0	6.0	3.0	3.0	3.0	3.0	7.0	4.0	4.0	7.0	7.0	6.0	6.0	7.0	12.0	2.0	15.0	-2.0	3.0	.0	6.0	3.0	5.0	6.0	24	15.0
6	4.0	5.0	8.0	4.0	4.0	3.0	7.0	7.0	6.0	9.0	11.0	18.0	11.0	13.0	10.0	11.0	9.0	7.0	.0	2.0	6.0	6.0	4.0	6.0	24	18.0
7	8.0	2.0	5.0	5.0	3.0	4.0	3.0	4.0	9.0	11.0	8.0	11.0	14.0	9.0	6.0	5.0	7.0	13.0	4.0	3.0	2.0	9.0	3.0	3.0	24	14.0
8	4.0	4.0	3.0	1.0	6.0	3.0	3.0	2.0	9.0	8.0	9.0	5.0	3.0	13.0	12.0	12.0	7.0	6.0	6.0	3.0	2.0	9.0	9.0	7.0	24	13.0
9	8.0	8.0	9.0	8.0	6.0	6.0	9.0	8.0	11.0	12.0	8.0	10.0	13.0	9.0	6.0	9.0	4.0	8.0	3.0	4.0	8.0	4.0	10.0	5.0	24	13.0
10	6.0	4.0	5.0	6.0	5.0	6.0	5.0	7.0	4.0	3.0	5.0	5.0	4.0	7.0	4.0	5.0	2.0	5.0	3.0	4.0	5.0	8.0	7.0	5.0	24	8.0
11	4.0	9.0	6.0	2.0	6.0	2.0	7.0	7.0	9.0	5.0	5.0	8.0	7.0	4.0	11.0	8.0	3.0	4.0	-3.0	2.0	5.0	4.0	9.0	3.0	24	11.0
12	8.0	8.0	6.0	5.0	5.0	3.0	5.0	7.0	14.0	3.0	6.0	11.0	8.0	6.0	7.0	5.0	7.0	3.0	.0	2.0	.0	8.0	2.0	5.0	24	14.0
13	5.0	5.0	7.0	8.0	5.0	4.0	3.0	4.0	10.0	13.0	12.0	12.0	8.0	11.0	6.0	7.0	5.0	4.0	4.0	-2.0	6.0	7.0	6.0	10.0	24	13.0
14	7.0	16.0	7.0	11.0	8.0	12.0	9.0	10.0	12.0	16.0	11.0	14.0	5.0	5.0	5.0	6.0	4.0	4.0	4.0	3.0	8.0	2.0	2.0	4.0	24	16.0
15	4.0	3.0	2.0	2.0	2.0	8.0	4.0	3.0	12.0	9.0	11.0	11.0	12.0	9.0	11.0	9.0	9.0	6.0	.0	7.0	10.0	6.0	13.0	10.0	24	13.0
16	7.0	11.0	15.0	8.0	9.0	6.0	9.0	5.0	13.0	13.0	18.0	16.0	12.0	10.0	14.0	8.0	8.0	16.0	11.0	11.0	16.0	14.0	14.0	12.0	24	18.0
17	13.0	11.0	12.0	13.0	14.0	11.0	11.0	12.0	20.0	17.0	23.0	13.0	12.0	15.0	14.0	19.0	25.0	11.0	5.0	7.0	10.0	10.0	14.0	14.0	24	25.0
18	14.0	15.0	15.0	14.0	14.0	13.0	11.0	12.0	23.0	19.0	21.0	18.0	18.0	12.0	7.0	10.0	11.0	8.0	6.0	19.0	14.0	15.0	14.0	15.0	24	23.0
19	16.0	12.0	12.0	12.0	10.0	15.0	12.0	12.0	20.0	22.0	21.0	17.0	15.0	14.0	12.0	16.0	14.0	11.0	6.0	13.0	14.0	14.0	17.0	16.0	24	22.0
20	19.0	19.0	16.0	17.0	20.0	17.0	16.0	14.0	20.0	24.0	BA	BA	31.0	21.0	13.0	12.0	12.0	12.0	5.0	8.0	12.0	12.0	16.0	16.0	22	31.0
21	17.0	16.0	12.0	13.0	13.0	10.0	12.0	13.0	16.0	20.0	23.0	21.0	15.0	15.0	17.0	14.0	8.0	8.0	8.0	7.0	13.0	16.0	13.0	15.0	24	23.0
22	14.0	13.0	15.0	15.0	15.0	13.0	15.0	17.0	22.0	27.0	26.0	21.0	19.0	17.0	12.0	4.0	7.0	9.0	5.0	5.0	6.0	2.0	6.0	5.0	24	27.0
23	3.0	5.0	5.0	1.0	4.0	1.0	-2.0	-1.0	5.0	6.0	6.0	7.0	8.0	10.0	10.0	4.0	5.0	5.0	-1.0	-1.0	3.0	8.0	6.0	5.0	24	10.0
24	7.0	8.0	9.0	7.0	8.0	8.0	9.0	9.0	13.0	12.0	11.0	11.0	10.0	10.0	8.0	8.0	7.0	10.0	3.0	4.0	8.0	5.0	7.0	9.0	24	13.0
25	18.0	18.0	20.0	13.0	14.0	12.0	15.0	9.0	13.0	13.0	16.0	15.0	18.0	12.0	10.0	5.0	12.0	5.0	3.0	9.0	11.0	10.0	9.0	11.0	24	20.0
26	12.0	10.0	9.0	6.0	9.0	10.0	8.0	9.0	10.0	11.0	8.0	5.0	2.0	4.0	2.0	4.0	8.0	1.0	-3.0	1.0	1.0	.0	1.0	1.0	24	12.0
27	3.0	3.0	4.0	3.0	.0	3.0	2.0	-1.0	9.0	10.0	15.0	6.0	2.0	2.0	7.0	1.0	1.0	3.0	-2.0	-2.0	1.0	3.0	5.0	-2.0	24	15.0
28	4.0	3.0	3.0	1.0	3.0	6.0	2.0	2.0	6.0	5.0	4.0	6.0	4.0	3.0	-1.0	.0	.0	-1.0	-4.0	-4.0	-2.0	1.0	2.0	1.0	24	6.0
29	2.0	2.0	3.0	2.0	2.0	3.0	2.0	-3.0	7.0	7.0	10.0	4.0	5.0	3.0	1.0	3.0	2.0	2.0	-3.0	.0	3.0	5.0	5.0	3.0	24	10.0
30	4.0	6.0	5.0	1.0	2.0	1.0	3.0	3.0	10.0	11.0	10.0	9.0	9.0	6.0	3.0	3.0	3.0	1.0	-7.0	3.0	-1.0	3.0	1.0	4.0	24	11.0
31																									0	
NO.:	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:	19.0	19.0	20.0	17.0	20.0	17.0	16.0	17.0	23.0	27.0	26.0	21.0	31.0	21.0	17.0	19.0	25.0	16.0	11.0	19.0	16.0	16.0	17.0	16.0		
AVG:	7.93	8.07	7.90	7.00	7.17	7.00	7.00	6.80	11.60	11.93	11.62	10.72	10.23	8.73	8.10	7.00	7.03	5.50	2.13	4.27	6.13	6.90	7.47	6.93		

MONTHLY OBSERVATIONS: 718 MONTHLY MEAN: 7.71 MONTHLY MAX: 31.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	2.0	2.0	1.0	.0	-2.0	3.0	4.0	-4.0	6.0	9.0	10.0	10.0	10.0	9.0	4.0	5.0	3.0	-2.0	-5.0	1.0	-3.0	2.0	4.0	4.0	24	10.0
2	3.0	4.0	6.0	4.0	4.0	7.0	2.0	-1.0	9.0	6.0	8.0	8.0	9.0	8.0	7.0	4.0	6.0	2.0	-5.0	-1.0	-4.0	1.0	1.0	2.0	24	9.0
3	-1.0	1.0	3.0	-1.0	.0	.0	2.0	4.0	8.0	1.0	5.0	5.0	7.0	3.0	9.0	9.0	-1.0	8.0	-6.0	-1.0	-1.0	.0	3.0	2.0	24	9.0
4	5.0	1.0	3.0	2.0	2.0	.0	5.0	2.0	13.0	10.0	15.0	11.0	12.0	10.0	10.0	8.0	5.0	2.0	-9.0	-3.0	4.0	3.0	7.0	8.0	24	15.0
5	8.0	9.0	10.0	10.0	9.0	4.0	4.0	7.0	4.0	10.0	9.0	11.0	10.0	10.0	4.0	6.0	.0	.0	-7.0	-1.0	5.0	8.0	4.0	7.0	24	11.0
6	9.0	8.0	9.0	6.0	10.0	5.0	11.0	7.0	15.0	20.0	16.0	13.0	19.0	12.0	8.0	11.0	5.0	4.0	-2.0	1.0	6.0	8.0	8.0	10.0	24	20.0
7	12.0	8.0	9.0	7.0	9.0	8.0	7.0	8.0	13.0	16.0	20.0	15.0	12.0	9.0	2.0	7.0	6.0	2.0	.0	1.0	10.0	9.0	11.0	10.0	24	20.0
8	9.0	7.0	3.0	6.0	5.0	8.0	6.0	5.0	4.0	10.0	4.0	9.0	14.0	5.0	3.0	3.0	2.0	3.0	-5.0	.0	.0	4.0	5.0	.0	24	14.0
9	3.0	2.0	4.0	2.0	4.0	2.0	6.0	1.0	6.0	6.0	10.0	4.0	7.0	3.0	3.0	5.0	5.0	3.0	-4.0	.0	11.0	9.0	8.0	9.0	24	11.0
10	5.0	11.0	8.0	4.0	9.0	7.0	5.0	4.0	12.0	13.0	14.0	10.0	4.0	6.0	9.0	6.0	5.0	3.0	-3.0	5.0	5.0	7.0	.0	13.0	24	14.0
11	12.0	10.0	10.0	5.0	9.0	8.0	4.0	5.0	15.0	19.0	16.0	15.0	13.0	15.0	14.0	10.0	8.0	9.0	10.0	11.0	14.0	14.0	20.0	19.0	24	20.0
12	13.0	19.0	16.0	17.0	14.0	18.0	18.0	13.0	18.0	20.0	11.0	11.0	11.0	8.0	3.0	3.0	3.0	5.0	-1.0	4.0	4.0	5.0	7.0	6.0	24	20.0
13	8.0	6.0	4.0	4.0	6.0	3.0	2.0	3.0	3.0	.0	14.0	9.0	15.0	10.0	7.0	5.0	4.0	-1.0	-4.0	-4.0	3.0	2.0	3.0	10.0	24	15.0
14	5.0	6.0	5.0	6.0	7.0	4.0	4.0	4.0	7.0	13.0	13.0	11.0	7.0	10.0	6.0	7.0	5.0	2.0	-6.0	4.0	5.0	9.0	12.0	12.0	24	13.0
15	11.0	10.0	11.0	14.0	13.0	10.0	11.0	9.0	15.0	18.0	17.0	20.0	18.0	19.0	14.0	7.0	8.0	3.0	2.0	7.0	8.0	11.0	13.0	15.0	24	20.0
16	20.0	14.0	17.0	17.0	17.0	15.0	16.0	13.0	17.0	24.0	25.0	23.0	14.0	18.0	9.0	8.0	4.0	6.0	5.0	7.0	12.0	15.0	17.0	12.0	24	25.0
17	15.0	16.0	14.0	18.0	16.0	15.0	10.0	10.0	17.0	15.0	13.0	13.0	8.0	7.0	8.0	5.0	3.0	2.0	3.0	.0	1.0	1.0	.0	1.0	24	18.0
18	.0	-1.0	.0	2.0	.0	1.0	1.0	1.0	7.0	5.0	2.0	5.0	4.0	4.0	1.0	3.0	1.0	-2.0	-2.0	2.0	1.0	2.0	2.0	5.0	24	7.0
19	4.0	4.0	2.0	5.0	.0	3.0	.0	2.0	9.0	9.0	6.0	5.0	7.0	5.0	2.0	4.0	6.0	4.0	.0	3.0	3.0	9.0	11.0	9.0	24	11.0
20	5.0	7.0	9.0	6.0	8.0	2.0	5.0	5.0	12.0	11.0	10.0	BA	BA	BA	14.0	9.0	8.0	7.0	9.0	15.0	9.0	8.0	7.0	13.0	21	15.0
21	10.0	14.0	10.0	12.0	7.0	10.0	9.0	11.0	21.0	23.0	18.0	16.0	15.0	13.0	9.0	11.0	12.0	8.0	5.0	9.0	14.0	18.0	16.0	15.0	24	23.0
22	18.0	16.0	21.0	17.0	21.0	22.0	18.0	20.0	21.0	19.0	24.0	23.0	17.0	13.0	13.0	16.0	14.0	14.0	9.0	20.0	23.0	16.0	17.0	16.0	24	24.0
23	17.0	24.0	22.0	21.0	21.0	20.0	20.0	23.0	20.0	26.0	24.0	23.0	20.0	19.0	19.0	17.0	11.0	10.0	9.0	26.0	17.0	17.0	18.0	16.0	24	26.0
24	17.0	20.0	20.0	20.0	15.0	18.0	21.0	21.0	23.0	23.0	23.0	24.0	18.0	13.0	15.0	11.0	7.0	2.0	4.0	5.0	14.0	17.0	20.0	19.0	24	24.0
25	16.0	14.0	14.0	13.0	17.0	15.0	16.0	17.0	19.0	17.0	20.0	10.0	13.0	14.0	12.0	10.0	4.0	6.0	8.0	-1.0	3.0	4.0	3.0	6.0	24	20.0
26	6.0	2.0	4.0	2.0	5.0	5.0	.0	-1.0	4.0	4.0	3.0	5.0	3.0	3.0	7.0	3.0	1.0	2.0	-2.0	.0	-1.0	3.0	.0	3.0	24	7.0
27	5.0	3.0	5.0	2.0	.0	2.0	-1.0	4.0	4.0	7.0	7.0	7.0	BA	14.0	10.0	9.0	8.0	5.0	-1.0	5.0	9.0	8.0	4.0	6.0	23	14.0
28	7.0	7.0	9.0	8.0	12.0	12.0	12.0	9.0	11.0	10.0	15.0	12.0	13.0	11.0	9.0	7.0	7.0	8.0	4.0	7.0	7.0	12.0	11.0	10.0	24	15.0
29	10.0	12.0	9.0	8.0	7.0	8.0	8.0	AV	10.0	7.0	6.0	10.0	8.0	9.0	10.0	9.0	5.0	2.0	5.0	4.0	4.0	6.0	7.0	8.0	23	12.0
30	8.0	6.0	5.0	7.0	4.0	-1.0	3.0	3.0	4.0	2.0	2.0	3.0	4.0	5.0	5.0	10.0	1.0	6.0	2.0	3.0	2.0	7.0	1.0	.0	24	10.0
31	3.0	6.0	2.0	.0	.0	3.0	2.0	1.0	9.0	5.0	13.0	11.0	11.0	9.0	9.0	9.0	7.0	10.0	7.0	13.0	12.0	17.0	14.0	15.0	24	17.0
NO.:	31	31	31	31	31	31	31	30	31	31	31	30	29	30	31	31	31	31	31	31	31	31	31	31		
MAX:	20.0	24.0	22.0	21.0	21.0	22.0	21.0	23.0	23.0	26.0	25.0	24.0	20.0	19.0	19.0	17.0	14.0	14.0	10.0	26.0	23.0	18.0	20.0	19.0		
AVG:	8.55	8.65	8.55	7.87	8.03	7.65	7.45	6.87	11.48	12.19	12.68	11.73	11.14	9.80	8.23	7.65	5.26	4.29	.65	4.58	6.35	8.13	8.19	9.06		

MONTHLY OBSERVATIONS: 739 MONTHLY MEAN: 8.11 MONTHLY MAX: 26.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	17.0	17.0	13.0	13.0	12.0	8.0	6.0	7.0	11.0	9.0	14.0	13.0	5.0	8.0	5.0	5.0	3.0	2.0	10.0	12.0	11.0	9.0	16.0	16.0	24	17.0
2	14.0	16.0	14.0	17.0	15.0	15.0	16.0	12.0	12.0	15.0	15.0	18.0	14.0	13.0	12.0	10.0	11.0	7.0	7.0	13.0	15.0	16.0	19.0	19.0	24	19.0
3	20.0	20.0	19.0	16.0	19.0	15.0	17.0	17.0	13.0	13.0	15.0	16.0	16.0	21.0	11.0	14.0	9.0	14.0	10.0	19.0	26.0	24.0	17.0	21.0	24	26.0
4	17.0	16.0	14.0	18.0	13.0	18.0	17.0	19.0	19.0	19.0	17.0	18.0	16.0	14.0	10.0	9.0	11.0	4.0	11.0	15.0	11.0	10.0	16.0	13.0	24	19.0
5	11.0	16.0	12.0	11.0	10.0	8.0	13.0	6.0	11.0	8.0	11.0	10.0	6.0	6.0	5.0	7.0	17.0	6.0	.0	5.0	9.0	5.0	9.0	8.0	24	17.0
6	13.0	6.0	8.0	10.0	11.0	12.0	11.0	8.0	13.0	10.0	17.0	15.0	9.0	14.0	9.0	8.0	9.0	7.0	11.0	14.0	18.0	15.0	14.0	14.0	24	18.0
7	19.0	15.0	17.0	16.0	17.0	17.0	16.0	13.0	18.0	22.0	17.0	15.0	13.0	18.0	10.0	13.0	4.0	3.0	3.0	1.0	8.0	6.0	6.0	5.0	24	22.0
8	7.0	8.0	12.0	7.0	10.0	8.0	11.0	8.0	8.0	13.0	9.0	11.0	14.0	12.0	9.0	12.0	9.0	1.0	4.0	7.0	8.0	14.0	12.0	11.0	24	14.0
9	9.0	4.0	10.0	2.0	5.0	2.0	1.0	1.0	2.0	7.0	5.0	2.0	5.0	4.0	2.0	4.0	1.0	5.0	-2.0	4.0	6.0	8.0	10.0	10.0	24	10.0
10	28.0	24.0	17.0	16.0	13.0	7.0	6.0	2.0	3.0	6.0	8.0	10.0	7.0	5.0	7.0	3.0	1.0	1.0	7.0	6.0	13.0	11.0	13.0	21.0	24	28.0
11	5.0	4.0	9.0	3.0	6.0	4.0	6.0	-2.0	2.0	.0	7.0	7.0	2.0	3.0	2.0	3.0	.0	5.0	2.0	3.0	1.0	3.0	2.0	2.0	24	9.0
12	5.0	4.0	10.0	3.0	6.0	3.0	8.0	7.0	10.0	8.0	2.0	-1.0	1.0	-1.0	4.0	1.0	3.0	4.0	3.0	-1.0	.0	1.0	.0	2.0	24	10.0
13	-1.0	3.0	3.0	-5.0	1.0	3.0	3.0	4.0	6.0	1.0	1.0	4.0	5.0	5.0	4.0	5.0	3.0	4.0	-1.0	.0	4.0	1.0	6.0	3.0	24	6.0
14	2.0	4.0	4.0	.0	4.0	5.0	5.0	4.0	3.0	4.0	5.0	4.0	.0	5.0	7.0	.0	4.0	5.0	4.0	4.0	6.0	11.0	8.0	9.0	24	11.0
15	7.0	7.0	2.0	9.0	1.0	7.0	8.0	8.0	9.0	6.0	4.0	3.0	.0	-1.0	3.0	3.0	1.0	4.0	2.0	6.0	3.0	2.0	5.0	3.0	24	9.0
16	5.0	8.0	3.0	5.0	4.0	3.0	2.0	6.0	4.0	.0	9.0	4.0	.0	4.0	5.0	8.0	2.0	1.0	2.0	5.0	1.0	3.0	4.0	4.0	24	9.0
17	2.0	5.0	9.0	7.0	4.0	7.0	4.0	3.0	5.0	9.0	8.0	7.0	8.0	8.0	6.0	BA	BA	11.0	4.0	10.0	9.0	6.0	8.0	7.0	22	11.0
18	11.0	8.0	10.0	9.0	7.0	8.0	10.0	6.0	7.0	13.0	11.0	12.0	12.0	8.0	4.0	3.0	-1.0	2.0	1.0	11.0	7.0	10.0	16.0	18.0	24	18.0
19	14.0	11.0	11.0	11.0	11.0	13.0	8.0	5.0	2.0	11.0	8.0	7.0	5.0	6.0	4.0	8.0	2.0	8.0	7.0	8.0	9.0	7.0	6.0	7.0	24	14.0
20	2.0	8.0	3.0	7.0	5.0	5.0	7.0	4.0	4.0	5.0	4.0	2.0	4.0	5.0	4.0	6.0	6.0	3.0	-1.0	6.0	7.0	12.0	15.0	12.0	24	15.0
21	11.0	8.0	9.0	7.0	7.0	7.0	7.0	6.0	4.0	12.0	11.0	13.0	9.0	5.0	7.0	5.0	5.0	4.0	6.0	8.0	9.0	15.0	15.0	12.0	24	15.0
22	18.0	20.0	16.0	18.0	16.0	13.0	15.0	12.0	10.0	14.0	12.0	14.0	19.0	10.0	11.0	9.0	11.0	7.0	5.0	15.0	30.0	21.0	18.0	24.0	24	30.0
23	22.0	20.0	20.0	20.0	14.0	13.0	12.0	15.0	9.0	18.0	19.0	16.0	19.0	14.0	12.0	12.0	39.0	51.0	32.0	44.0	52.0	49.0	29.0	22.0	24	52.0
24	22.0	17.0	25.0	28.0	25.0	24.0	18.0	21.0	22.0	21.0	12.0	16.0	14.0	7.0	10.0	6.0	9.0	5.0	8.0	6.0	8.0	13.0	20.0	12.0	24	28.0
25	10.0	8.0	12.0	5.0	9.0	11.0	9.0	5.0	7.0	7.0	4.0	9.0	8.0	7.0	9.0	9.0	10.0	3.0	5.0	2.0	7.0	5.0	9.0	8.0	24	12.0
26	10.0	11.0	8.0	8.0	4.0	7.0	8.0	6.0	7.0	9.0	13.0	8.0	14.0	12.0	12.0	3.0	4.0	4.0	9.0	6.0	4.0	6.0	7.0	7.0	24	14.0
27	6.0	6.0	6.0	6.0	4.0	4.0	-1.0	2.0	2.0	2.0	3.0	2.0	.0	3.0	1.0	5.0	2.0	1.0	2.0	2.0	1.0	3.0	7.0	1.0	24	7.0
28	1.0	2.0	3.0	1.0	7.0	4.0	3.0	2.0	-1.0	4.0	1.0	6.0	4.0	3.0	8.0	6.0	2.0	-1.0	2.0	9.0	9.0	15.0	12.0	16.0	24	16.0
29	13.0	10.0	7.0	7.0	9.0	4.0	8.0	9.0	3.0	10.0	9.0	12.0	14.0	11.0	12.0	13.0	7.0	10.0	7.0	10.0	7.0	-3.0	-1.0	-1.0	24	14.0
30	3.0	3.0	2.0	.0	-1.0	3.0	5.0	8.0	7.0	-4.0	4.0	-1.0	2.0	5.0	-4.0	6.0	-3.0	.0	-1.0	.0	1.0	.0	1.0	5.0	24	8.0
31																									0	
NO.:	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30		
MAX:	28.0	24.0	25.0	28.0	25.0	24.0	18.0	21.0	22.0	22.0	19.0	18.0	19.0	21.0	12.0	14.0	39.0	51.0	32.0	44.0	52.0	49.0	29.0	24.0		
AVG:	10.77	10.30	10.27	9.50	8.93	8.60	8.63	7.47	7.73	9.07	9.17	9.07	8.23	7.80	6.70	6.76	6.24	6.03	5.30	8.33	10.00	9.93	10.63	10.37		

MONTHLY OBSERVATIONS: 718 MONTHLY MEAN: 8.58 MONTHLY MAX: 52.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2022

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	.0	7.0	3.0	.0	1.0	2.0	.0	2.0	-2.0	4.0	2.0	5.0	5.0	-1.0	3.0	4.0	4.0	1.0	3.0	4.0	4.0	4.0	4.0	8.0	24	8.0
2	9.0	7.0	4.0	11.0	7.0	11.0	9.0	7.0	7.0	8.0	4.0	8.0	BC	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	12	11.0
3	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
4	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
5	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	7.0	2.0	6.0	4.0	1.0	1.0	.0	7	7.0
6	1.0	-2.0	.0	3.0	6.0	3.0	3.0	6.0	4.0	4.0	3.0	5.0	14.0	11.0	10.0	6.0	4.0	2.0	1.0	2.0	7.0	7.0	6.0	10.0	24	14.0
7	9.0	9.0	9.0	9.0	11.0	11.0	11.0	7.0	11.0	13.0	16.0	14.0	13.0	10.0	10.0	6.0	8.0	8.0	8.0	9.0	9.0	4.0	1.0	5.0	24	16.0
8	5.0	3.0	3.0	2.0	2.0	2.0	2.0	1.0	5.0	6.0	13.0	18.0	17.0	9.0	14.0	10.0	9.0	11.0	10.0	10.0	12.0	16.0	12.0	15.0	24	18.0
9	17.0	13.0	18.0	10.0	13.0	12.0	10.0	11.0	9.0	12.0	14.0	16.0	13.0	17.0	16.0	17.0	14.0	12.0	12.0	12.0	10.0	6.0	5.0	4.0	24	18.0
10	5.0	4.0	3.0	5.0	.0	1.0	6.0	4.0	3.0	9.0	5.0	7.0	4.0	12.0	4.0	1.0	.0	1.0	5.0	5.0	3.0	3.0	5.0	5.0	24	12.0
11	2.0	4.0	5.0	2.0	4.0	4.0	4.0	3.0	3.0	6.0	3.0	-2.0	5.0	3.0	1.0	1.0	-1.0	3.0	-1.0	2.0	2.0	3.0	-2.0	4.0	24	6.0
12	2.0	2.0	3.0	.0	3.0	1.0	3.0	2.0	3.0	3.0	2.0	3.0	4.0	1.0	4.0	9.0	2.0	6.0	6.0	3.0	5.0	11.0	1.0	.0	24	11.0
13	1.0	3.0	8.0	5.0	4.0	9.0	5.0	7.0	8.0	11.0	9.0	12.0	12.0	BA	BA	9.0	14.0	9.0	10.0	9.0	10.0	7.0	11.0	11.0	22	14.0
14	12.0	6.0	11.0	9.0	11.0	10.0	8.0	8.0	7.0	9.0	5.0	8.0	6.0	4.0	6.0	AV	2.0	6.0	4.0	5.0	4.0	1.0	5.0	4.0	23	12.0
15	1.0	1.0	2.0	-2.0	.0	3.0	2.0	.0	1.0	-2.0	1.0	1.0	6.0	1.0	1.0	1.0	-1.0	.0	-1.0	2.0	5.0	4.0	6.0	9.0	24	9.0
16	7.0	6.0	3.0	3.0	5.0	5.0	2.0	3.0	-1.0	7.0	2.0	1.0	5.0	-3.0	1.0	4.0	5.0	2.0	.0	5.0	5.0	8.0	3.0	5.0	24	8.0
17	4.0	4.0	4.0	-1.0	.0	.0	3.0	5.0	5.0	1.0	2.0	3.0	2.0	2.0	4.0	4.0	2.0	1.0	4.0	8.0	5.0	3.0	5.0	4.0	24	8.0
18	3.0	4.0	3.0	2.0	5.0	3.0	1.0	3.0	-4.0	8.0	1.0	4.0	.0	4.0	-1.0	4.0	5.0	.0	1.0	3.0	2.0	7.0	5.0	4.0	24	8.0
19	5.0	7.0	2.0	5.0	3.0	8.0	8.0	3.0	-1.0	3.0	5.0	8.0	7.0	4.0	3.0	5.0	6.0	7.0	8.0	11.0	7.0	11.0	6.0	11.0	24	11.0
20	16.0	10.0	12.0	14.0	13.0	14.0	18.0	13.0	14.0	11.0	12.0	11.0	10.0	8.0	4.0	5.0	11.0	6.0	8.0	7.0	7.0	10.0	10.0	8.0	24	18.0
21	9.0	5.0	6.0	5.0	6.0	8.0	9.0	11.0	8.0	8.0	6.0	12.0	9.0	9.0	5.0	6.0	4.0	7.0	5.0	BA	4.0	9.0	6.0	9.0	23	12.0
22	11.0	3.0	5.0	5.0	6.0	6.0	3.0	7.0	6.0	7.0	.0	.0	4.0	.0	1.0	6.0	6.0	7.0	6.0	7.0	2.0	5.0	7.0	-4.0	24	11.0
23	-6.0	2.0	4.0	4.0	2.0	-1.0	4.0	-1.0	-1.0	5.0	.0	.0	2.0	2.0	4.0	3.0	3.0	5.0	3.0	3.0	7.0	3.0	2.0	-2.0	24	7.0
24	-3.0	4.0	-2.0	.0	3.0	2.0	2.0	3.0	-2.0	2.0	2.0	.0	.0	1.0	4.0	1.0	1.0	3.0	2.0	2.0	2.0	2.0	1.0	2.0	24	4.0
25	3.0	-2.0	-3.0	2.0	1.0	1.0	.0	1.0	.0	3.0	-1.0	5.0	5.0	2.0	6.0	2.0	.0	4.0	-4.0	1.0	-2.0	4.0	7.0	9.0	24	9.0
26	12.0	8.0	8.0	9.0	8.0	7.0	9.0	10.0	11.0	5.0	9.0	7.0	10.0	3.0	9.0	8.0	7.0	4.0	8.0	7.0	4.0	1.0	3.0	6.0	24	12.0
27	7.0	4.0	4.0	8.0	8.0	8.0	6.0	5.0	1.0	8.0	12.0	12.0	10.0	8.0	8.0	10.0	7.0	9.0	10.0	13.0	12.0	10.0	15.0	13.0	24	15.0
28	12.0	16.0	18.0	14.0	13.0	13.0	14.0	15.0	14.0	13.0	18.0	18.0	14.0	13.0	12.0	15.0	8.0	9.0	10.0	9.0	7.0	13.0	15.0	15.0	24	18.0
29	18.0	6.0	14.0	14.0	9.0	13.0	10.0	13.0	13.0	17.0	17.0	18.0	16.0	12.0	10.0	5.0	7.0	2.0	.0	5.0	14.0	10.0	10.0	10.0	24	18.0
30	13.0	13.0	13.0	15.0	12.0	12.0	15.0	18.0	15.0	15.0	19.0	13.0	6.0	8.0	12.0	10.0	8.0	10.0	9.0	20.0	17.0	9.0	7.0	7.0	24	20.0
31	.0	5.0	2.0	3.0	9.0	10.0	4.0	5.0	7.0	5.0	7.0	9.0	5.0	11.0	7.0	2.0	9.0	2.0	2.0	6.0	4.0	4.0	13.0	10.0	24	13.0
NO.:	28	28	28	28	28	28	28	28	28	28	28	28	27	26	26	26	27	28	28	27	28	28	28	28		
MAX:	18.0	16.0	18.0	15.0	13.0	14.0	18.0	18.0	15.0	17.0	19.0	18.0	17.0	17.0	16.0	17.0	14.0	12.0	12.0	20.0	17.0	16.0	15.0	15.0		
AVG:	6.25	5.43	5.79	5.57	5.89	6.36	6.11	6.14	5.14	7.18	6.71	7.71	7.56	5.81	6.12	5.92	5.33	5.14	4.68	6.52	6.14	6.29	6.07	6.50		

MONTHLY OBSERVATIONS: 663 MONTHLY MEAN: 6.10 MONTHLY MAX: 20.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	15.0IF	35.0IF	38.0IF	39.0IF	29.0IF	36.0IF	20.0IF	22.0IF	18.0IF	11.0IF	11.0IF	14.0IF	14.0IF	11.0IF	8.0IF	9.0IF	8.0IF	6.0IF	3.0IF	13.0IF	15.0IF	15.0IF	14.0IF	20.0IF	24	39.0
2	26.0IF	17.0IF	12.0IF	14.0IF	13.0IF	10.0IF	13.0IF	10.0IF	12.0IF	13.0IF	12.0IF	13.0IF	15.0IF	11.0IF	13.0IF	15.0IF	24.0IF	15.0IF	20.0IF	21.0IF	20.0IF	17.0IF	15.0IF	16.0IF	24	26.0
3	8.0 6	9.0 6	8.0 6	3.0 6	9.0 6	7.0 6	9.0 6	5.0 6	8.0 6	8.0 6	2.0 6	8.0 6	8.0 6	8.0 6	3.0 6	.0 6	-5.0 6	.0 6	2.0 6	5.0 6	1.0 6	4.0 6	4.0 6	3.0 6	24	9.0
4	2.0 6	.0 6	1.0 6	3.0 6	3.0 6	3.0 6	-1.0 6	1.0 6	.0 6	3.0 6	.0 6	1.0	4.0	4.0	3.0	4.0	1.0	2.0	.0	4.0	3.0	7.0	6.0	8.0	24	8.0
5	6.0	10.0	8.0	7.0	6.0	.0	3.0	1.0	4.0	7.0	3.0	3.0	1.0	4.0	2.0	4.0	4.0	.0	-2.0	.0	2.0	1.0	2.0	3.0	24	10.0
6	3.0	1.0	1.0	2.0	3.0	4.0	5.0	4.0	-2.0	9.0	5.0	5.0	5.0	4.0	3.0	6.0	3.0	.0	2.0	3.0	9.0	7.0	12.0	14.0	24	14.0
7	17.0	12.0	9.0	7.0	7.0	6.0	4.0	17.0	11.0	16.0	11.0	9.0	13.0	8.0	13.0	14.0	13.0	3.0	10.0	6.0	7.0	7.0	9.0	12.0	24	17.0
8	10.0	11.0	10.0	16.0	14.0	15.0	13.0	13.0	10.0	10.0	10.0	15.0	12.0	6.0	8.0	6.0	.0	3.0	4.0	10.0	6.0	5.0	8.0	8.0	24	16.0
9	9.0	8.0	10.0	8.0	10.0	9.0	11.0	11.0	12.0	16.0	11.0	12.0	14.0	6.0	10.0	5.0	5.0	4.0	4.0	10.0	15.0	13.0	11.0	10.0	24	16.0
10	13.0	11.0	9.0	11.0	5.0	9.0	11.0	10.0	10.0	13.0	8.0	8.0	9.0	10.0	11.0	9.0	8.0	4.0	5.0	7.0	6.0	25.0	11.0	15.0	24	25.0
11	17.0	18.0	12.0	13.0	13.0	11.0	12.0	10.0	12.0	12.0	15.0	14.0	12.0	8.0	11.0	12.0	11.0	11.0	17.0	16.0	13.0	21.0	16.0	16.0	24	21.0
12	17.0	14.0	15.0	10.0	10.0	9.0	8.0	7.0	7.0	7.0	7.0	5.0	1.0	-3.0	1.0	2.0	9.0	4.0	.0	8.0	.0	5.0	2.0	2.0	24	17.0
13	1.0	5.0	4.0	8.0	3.0	6.0	6.0	2.0	.0	2.0	1.0	1.0	2.0	.0	5.0	2.0	-1.0	-2.0	7.0	2.0	1.0	3.0	7.0	1.0	24	8.0
14	1.0	4.0	2.0	.0	1.0	.0	1.0	1.0	2.0	3.0	4.0	5.0	6.0	.0	5.0	5.0	3.0	3.0	2.0	5.0	4.0	7.0	4.0	3.0	24	7.0
15	4.0	4.0	8.0	.0	3.0	5.0	3.0	.0	-2.0	9.0	3.0	7.0	4.0	3.0	1.0	8.0	3.0	4.0	1.0	15.0	11.0	11.0	4.0	13.0	24	15.0
16	12.0	16.0	8.0	8.0	9.0	5.0	10.0	10.0	10.0	11.0	9.0	16.0	11.0	13.0	13.0	16.0	7.0	4.0	6.0	5.0	10.0	8.0	5.0	5.0	24	16.0
17	10.0	7.0	6.0	4.0	4.0	8.0	6.0	3.0	6.0	-1.0	2.0	5.0	6.0	7.0	7.0	15.0	6.0	9.0	3.0	4.0	3.0	2.0	10.0	13.0	24	15.0
18	9.0	4.0	6.0	5.0	8.0	5.0	5.0	5.0	2.0	8.0	9.0	15.0	9.0	23.0	10.0	13.0	8.0	4.0	6.0	1.0	6.0	12.0	10.0	8.0	24	23.0
19	10.0	10.0	7.0	7.0	11.0	5.0	7.0	2.0	5.0	4.0	7.0	8.0	9.0	3.0	5.0	6.0	7.0	3.0	-1.0	2.0	.0	2.0	2.0	2.0	24	11.0
20	-2.0	4.0	3.0	1.0	.0	.0	3.0	5.0	2.0	7.0	6.0	2.0	4.0	2.0	2.0	4.0	7.0	1.0	-7.0	5.0	5.0	4.0	7.0	6.0	24	7.0
21	6.0	7.0	3.0	5.0	4.0	5.0	2.0	5.0	-1.0	4.0	6.0	6.0	2.0	1.0	11.0	4.0	3.0	1.0	7.0	6.0	6.0	6.0	7.0	10.0	24	11.0
22	9.0	10.0	8.0	9.0	3.0	2.0	3.0	7.0	3.0	2.0	2.0	3.0	2.0	6.0	2.0	1.0	2.0	6.0	3.0	3.0	1.0	3.0	1.0	4.0	24	10.0
23	3.0	1.0	5.0	6.0	7.0	6.0	2.0	6.0	.0	3.0	5.0	-1.0	.0	3.0	2.0	7.0	6.0	4.0	1.0	3.0	2.0	5.0	9.0	17.0	24	17.0
24	13.0	12.0	15.0	7.0	7.0	9.0	8.0	6.0	7.0	11.0	10.0	11.0	6.0	10.0	10.0	7.0	6.0	3.0	5.0	2.0	4.0	8.0	5.0	8.0	24	15.0
25	13.0	2.0	4.0	11.0	6.0	7.0	1.0	4.0	5.0	9.0	-3.0	1.0	1.0	4.0	-2.0	1.0	.0	-1.0	1.0	1.0	-1.0	3.0	2.0	.0	24	13.0
26	3.0	3.0	6.0	.0	5.0	5.0	6.0	5.0	1.0	5.0	4.0	11.0	BA	BA	7.0	8.0	6.0	7.0	-1.0	5.0	4.0	1.0	4.0	3.0	22	11.0
27	6.0	3.0	3.0	4.0	5.0	5.0	5.0	-2.0	-2.0	7.0	9.0	6.0	5.0	5.0	4.0	4.0	3.0	.0	-3.0	-2.0	2.0	6.0	10.0	12.0	24	12.0
28	4.0	12.0	7.0	11.0	12.0	10.0	13.0	14.0	5.0	15.0	12.0	11.0	12.0	8.0	9.0	14.0	13.0	9.0	17.0	10.0	5.0	6.0	12.0	3.0	24	17.0
29	9.0	10.0	11.0	10.0	13.0	12.0	9.0	8.0	12.0	13.0	14.0	14.0	12.0	15.0	14.0	12.0	12.0	12.0	13.0	13.0	12.0	10.0	10.0	10.0	24	15.0
30	10.0	13.0	9.0	9.0	6.0	4.0	7.0	7.0	9.0	10.0	5.0	BA	11.0	9.0	6.0	10.0	5.0	6.0	1.0	4.0	4.0	3.0	5.0	5.0	23	13.0
31	7.0	6.0	5.0	14.0	14.0	10.0	10.0	11.0	12.0	10.0	10.0	5.0	4.0	8.0	1.0	-1.0	2.0	-2.0	.0	2.0	-1.0	2.0	3.0	3.0	24	14.0
NO.:	31	31	31	31	31	31	31	31	31	31	31	30	30	30	31	31	31	31	31	31	31	31	31	31		
MAX:	26.0	35.0	38.0	39.0	29.0	36.0	20.0	22.0	18.0	16.0	15.0	16.0	15.0	23.0	14.0	16.0	24.0	15.0	20.0	21.0	20.0	25.0	16.0	20.0		
AVG:	8.74	9.00	8.16	8.13	7.84	7.35	6.94	6.77	5.74	8.29	6.77	7.77	7.13	6.57	6.39	7.16	5.77	3.97	4.06	6.10	5.65	7.39	7.32	8.16		

MONTHLY OBSERVATIONS: 741 MONTHLY MEAN: 6.96 MONTHLY MAX: 39.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	.0	-1.0	.0	.0	3.0	1.0	1.0	3.0	3.0	3.0	2.0	1.0	2.0	2.0	6.0	1.0	3.0	-2.0	-1.0	5.0	3.0	3.0	5.0	3.0	24	6.0
2	4.0	4.0	.0	1.0	3.0	4.0	3.0	3.0	1.0	1.0	2.0	1.0	.0	5.0	4.0	2.0	5.0	1.0	3.0	1.0	2.0	2.0	2.0	-1.0	24	5.0
3	-1.0	2.0	4.0	2.0	2.0	5.0	3.0	4.0	4.0	13.0	14.0	10.0	9.0	5.0	5.0	10.0	8.0	5.0	-2.0	6.0	.0	5.0	8.0	8.0	24	14.0
4	7.0 6	7.0 6	7.0 6	7.0 6	11.0 6	9.0 6	4.0 6	6.0 6	4.0 6	9.0 6	8.0 6	7.0 6	7.0 6	12.0 6	14.0 6	6.0 6	10.0 6	6.0 6	5.0 6	5.0 6	5.0 6	4.0 6	9.0 6	8.0 6	24	14.0
5	6.0 6	4.0 6	7.0 6	9.0 6	11.0 6	12.0 6	13.0 6	10.0 6	3.0 6	13.0 6	18.0 6	11.0 6	16.0 6	10.0 6	14.0 6	10.0 6	7.0 6	4.0 6	-3.0 6	-4.0 6	5.0 6	3.0 6	5.0 6	7.0 6	24	18.0
6	11.0 6	9.0 6	7.0 6	8.0 6	10.0 6	7.0 6	7.0 6	11.0 6	12.0 6	13.0 6	14.0 6	14.0 6	8.0 6	6.0 6	9.0 6	6.0 6	2.0 6	-4.0 6	BR	-2.0 6	1.0 6	1.0 6	8.0 6	7.0 6	23	14.0
7	6.0 6	10.0 6	8.0 6	10.0 6	9.0 6	13.0 6	12.0 6	7.0 6	10.0 6	18.0 6	18.0	18.0	21.0	17.0	14.0	10.0	9.0	7.0	9.0	10.0	14.0	12.0	15.0	18.0	24	21.0
8	21.0	23.0	19.0	18.0	16.0	22.0	20.0	22.0	18.0	21.0	17.0	22.0	19.0	19.0	21.0	16.0	11.0	18.0	14.0	25.0	17.0	22.0	15.0	17.0	24	25.0
9	17.0	18.0	18.0	19.0	11.0	8.0	8.0	6.0	5.0	8.0	7.0	8.0	-5.0	3.0	4.0	AN	4.0	10.0	3.0	5.0	3.0	5.0	6.0	3.0	23	19.0
10	4.0	.0	3.0	1.0	1.0	3.0	2.0	4.0	.0	2.0	5.0	4.0	4.0	-1.0	.0	2.0	1.0	-1.0	4.0	1.0	-1.0	-1.0	4.0	2.0	24	5.0
11	3.0	4.0	4.0	2.0	1.0	7.0	3.0	4.0	5.0	5.0	4.0	.0	3.0	8.0	6.0	8.0	6.0	1.0	7.0	6.0	4.0	5.0	2.0	5.0	24	8.0
12	4.0	2.0	2.0	1.0	4.0	3.0	2.0	1.0	-1.0	-1.0	6.0	4.0	1.0	4.0	6.0	6.0	3.0	8.0	-3.0	1.0	4.0	5.0	7.0	8.0	24	8.0
13	7.0	5.0	7.0	7.0	3.0	5.0	1.0	8.0	2.0	8.0	9.0	5.0	5.0	6.0	6.0	5.0	8.0	4.0	-1.0	2.0	2.0	6.0	12.0	9.0	24	12.0
14	11.0	8.0	13.0	13.0	15.0	11.0	10.0	8.0	14.0	11.0	9.0	8.0	BA	BA	2.0	13.0	10.0	7.0	7.0	4.0	11.0	10.0	9.0	12.0	22	15.0
15	13.0	7.0	8.0	4.0	.0	5.0	4.0	4.0	2.0	5.0	5.0	3.0	.0	3.0	11.0	7.0	8.0	5.0	5.0	5.0	4.0	11.0	8.0	11.0	24	13.0
16	9.0IF	12.0IF	10.0IF	13.0IF	18.0IF	11.0IF	13.0IF	12.0IF	10.0IF	11.0IF	12.0IF	10.0IF	13.0IF	15.0IF	13.0IF	8.0IF	10.0IF	3.0IF	7.0IF	11.0IF	9.0IF	13.0IF	8.0IF	5.0IF	24	18.0
17	4.0	-5.0	.0	-2.0	-1.0	-1.0	1.0	2.0	.0	4.0	3.0	1.0	3.0	4.0	-1.0	-1.0	2.0	5.0	.0	2.0	4.0	3.0	1.0	1.0	24	5.0
18	-1.0	2.0	3.0	4.0	4.0	6.0	5.0	3.0	-2.0	11.0	7.0	4.0	7.0	.0	5.0	5.0	7.0	5.0	4.0	5.0	9.0	5.0	13.0	11.0	24	13.0
19	13.0	11.0	13.0	7.0	7.0	6.0	6.0	9.0	13.0	5.0	15.0	12.0	12.0	11.0	11.0	14.0	12.0	8.0	4.0	4.0	7.0	7.0	5.0	7.0	24	15.0
20	11.0	9.0	9.0	11.0	11.0	8.0	12.0	12.0	12.0	11.0	15.0	15.0	14.0	10.0	12.0	10.0	15.0	10.0	6.0	15.0	12.0	11.0	11.0	9.0	24	15.0
21	8.0IF	7.0IF	7.0IF	12.0IF	6.0IF	11.0IF	6.0IF	7.0IF	11.0IF	9.0IF	4.0IF	7.0IF	10.0IF	9.0IF	4.0IF	14.0IF	6.0IF	9.0IF	8.0IF	4.0IF	6.0IF	7.0IF	6.0IF	7.0IF	24	14.0
22	7.0IF	10.0IF	12.0IF	10.0IF	11.0IF	11.0IF	8.0IF	7.0IF	6.0IF	6.0IF	9.0IF	12.0IF	10.0IF	10.0IF	12.0IF	16.0IF	13.0IF	8.0IF	11.0IF	7.0IF	12.0IF	9.0IF	12.0IF	9.0IF	24	16.0
23	10.0	12.0	15.0	10.0	10.0	12.0	9.0	6.0	8.0	12.0	10.0	12.0	18.0	8.0	12.0	14.0	11.0	15.0	10.0	8.0	13.0	9.0	10.0	11.0	24	18.0
24	15.0	10.0	7.0	14.0	14.0	6.0	9.0	8.0	9.0	10.0	4.0	8.0	5.0	7.0	2.0	7.0	1.0	7.0	3.0	3.0	2.0	6.0	2.0	3.0	24	15.0
25	7.0	7.0	7.0	7.0	3.0	5.0	6.0	6.0	8.0	9.0	10.0	11.0	5.0	8.0	13.0	7.0	13.0	10.0	6.0	4.0	7.0	5.0	3.0	7.0	24	13.0
26	6.0IF	8.0IF	8.0IF	9.0IF	9.0IF	7.0IF	8.0IF	10.0IF	7.0IF	8.0IF	8.0IF	7.0IF	7.0IF	9.0IF	11.0IF	7.0IF	10.0IF	8.0IF	7.0IF	9.0IF	7.0IF	10.0IF	6.0IF	11.0IF	24	11.0
27	11.0	10.0	9.0	10.0	8.0	15.0	11.0	9.0	11.0	6.0	5.0	13.0	14.0	11.0	16.0	17.0	16.0	13.0	13.0	8.0	7.0	16.0	12.0	15.0	24	17.0
28	13.0	15.0	21.0	22.0	18.0	20.0	19.0	20.0	22.0	31.0	25.0	25.0	21.0	16.0	14.0	12.0	11.0	4.0	6.0	8.0	14.0	15.0	25.0	18.0	24	31.0
29																									0	
30																									0	
31																									0	
NO.:	28	28	28	28	28	28	28	28	28	28	28	28	27	27	28	27	28	28	27	28	28	28	28	28		
MAX:	21.0	23.0	21.0	22.0	18.0	22.0	20.0	22.0	22.0	31.0	25.0	25.0	21.0	19.0	21.0	17.0	16.0	18.0	14.0	25.0	17.0	22.0	25.0	18.0		
AVG:	8.07	7.50	8.14	8.18	7.79	8.29	7.36	7.57	7.04	9.36	9.46	9.04	8.48	8.04	8.79	8.59	7.93	6.21	4.89	5.64	6.54	7.46	8.18	8.25		

MONTHLY OBSERVATIONS: 668 MONTHLY MEAN: 7.78 MONTHLY MAX: 31.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	21.0	18.0	18.0	15.0	19.0	21.0	19.0	23.0	24.0	23.0	31.0	32.0	24.0	20.0	24.0	19.0	24.0	20.0	17.0	22.0	22.0	21.0	16.0	11.0	24	32.0
2	10.0IF	8.0IF	11.0IF	-5.0IF	.0IF	4.0IF	1.0IF	2.0IF	2.0IF	3.0IF	2.0IF	2.0IF	2.0IF	1.0IF	1.0IF	-1.0IF	3.0IF	1.0IF	3.0IF	4.0IF	6.0IF	4.0IF	5.0IF	2.0IF	24	11.0
3	4.0	3.0	2.0	4.0	7.0	7.0	8.0	18.0	15.0	17.0	17.0	25.0	8.0	24.0	BR	11.0	6.0	1.0	-3.0	-1.0	1.0	2.0	.0	2.0	23	25.0
4	-1.0	.0	3.0	3.0	.0	1.0	5.0	1.0	.0	1.0	1.0	3.0	3.0	5.0	4.0	4.0	6.0	1.0	-3.0	-1.0	-2.0	1.0	9.0	3.0	24	9.0
5	2.0	4.0	8.0	6.0	9.0	7.0	11.0	7.0	8.0	10.0	7.0	11.0	14.0	5.0	11.0	9.0	8.0	7.0	1.0	2.0	10.0	15.0	11.0	13.0	24	15.0
6	28.0	24.0	14.0	12.0	16.0	14.0	13.0	14.0	16.0	18.0	21.0	29.0	29.0	23.0	22.0	18.0	17.0	16.0	6.0	8.0	16.0	19.0	17.0	26.0	24	29.0
7	22.0	22.0	22.0	20.0	21.0	15.0	18.0	16.0	22.0	22.0	24.0	22.0	17.0	17.0	16.0	13.0	10.0	9.0	4.0	2.0	5.0	3.0	7.0	6.0	24	24.0
8	17.0	21.0	10.0	11.0	9.0	8.0	4.0	5.0	9.0	8.0	8.0	10.0	10.0	8.0	8.0	5.0	4.0	3.0	6.0	14.0	11.0	12.0	17.0	14.0	24	21.0
9	10.0	9.0	9.0	5.0	9.0	13.0	17.0	21.0	18.0	20.0	20.0	25.0	34.0	32.0	27.0	15.0	13.0	17.0	18.0	19.0	21.0	21.0	18.0	18.0	24	34.0
10	18.0	19.0	21.0	20.0	20.0	19.0	22.0	24.0	25.0	22.0	10.0	6.0	1.0	6.0	3.0	10.0	4.0	3.0	.0	1.0	2.0	6.0	5.0	7.0	24	25.0
11	6.0	6.0	1.0	8.0	4.0	6.0	9.0	4.0	8.0	3.0	8.0	5.0	6.0	8.0	8.0	4.0	5.0	3.0	6.0	3.0	7.0	12.0	5.0	15.0	24	15.0
12	7.0	8.0	11.0	9.0	8.0	11.0	8.0	4.0	8.0	11.0	7.0	6.0	4.0	9.0	7.0	6.0	8.0	1.0	.0	.0	3.0	6.0	3.0	4.0	24	11.0
13	5.0	2.0	5.0	6.0	1.0	4.0	6.0	1.0	11.0	11.0	6.0	4.0	4.0	4.0	8.0	5.0	4.0	2.0	1.0	1.0	4.0	6.0	7.0	4.0	24	11.0
14	4.0IF	.0IF	4.0IF	4.0IF	5.0IF	4.0IF	5.0IF	-2.0IF	8.0IF	7.0IF	6.0IF	5.0IF	3.0IF	3.0IF	7.0IF	4.0IF	7.0IF	5.0IF	2.0IF	4.0IF	4.0IF	5.0IF	7.0IF	6.0IF	24	8.0
15	7.0IF	6.0IF	6.0IF	7.0IF	7.0IF	8.0IF	5.0IF	1.0IF	9.0IF	9.0IF	6.0IF	7.0IF	6.0IF	4.0IF	6.0IF	6.0IF	4.0IF	4.0IF	11.0IF	9.0IF	14.0IF	23.0IF	15.0IF	13.0IF	24	23.0
16	14.0	15.0	18.0	18.0	17.0	13.0	16.0	16.0	19.0	18.0	26.0	29.0	27.0	21.0	20.0	36.0	65.0	60.0	74.0	49.0	31.0	25.0	39.0	22.0	24	74.0
17	15.0	12.0	10.0	10.0	8.0	8.0	5.0	8.0	7.0	7.0	9.0	7.0	7.0	-2.0	-4.0	-5.0	2.0	.0	.0	-4.0	1.0	3.0	7.0	4.0	24	15.0
18	7.0	7.0	7.0	6.0	5.0	.0	.0	.0	4.0	6.0	3.0	3.0	4.0	1.0	4.0	7.0	1.0	3.0	4.0	3.0	6.0	3.0	1.0	-1.0	24	7.0
19	4.0	-1.0	8.0	2.0	.0	6.0	2.0	4.0	8.0	7.0	6.0	9.0	6.0	5.0	7.0	7.0	4.0	3.0	2.0	1.0	6.0	2.0	7.0	4.0	24	9.0
20	3.0	7.0	5.0	9.0	4.0	6.0	6.0	3.0	11.0	5.0	4.0	6.0	7.0	6.0	7.0	6.0	3.0	4.0	2.0	2.0	5.0	11.0	8.0	11.0	24	11.0
21	12.0	13.0	14.0	17.0	13.0	13.0	14.0	19.0	23.0	28.0	22.0	20.0	11.0	17.0	11.0	12.0	17.0	8.0	15.0	8.0	23.0	35.0	34.0	34.0	24	35.0
22	35.0IF	36.0IF	28.0IF	35.0IF	33.0IF	42.0IF	28.0IF	25.0IF	26.0IF	29.0IF	27.0IF	27.0IF	27.0IF	25.0IF	32.0IF	33.0IF	30.0IF	19.0IF	20.0IF	19.0IF	22.0IF	22.0IF	27.0IF	26.0IF	24	42.0
23	24.0	24.0	27.0	28.0	28.0	30.0	23.0	23.0	30.0	31.0	24.0	26.0	20.0	20.0	16.0	BA	BA	14.0	13.0	30.0	31.0	29.0	18.0	31.0	22	31.0
24	19.0	24.0	27.0	21.0	18.0	16.0	12.0	14.0	17.0	14.0	16.0	21.0	17.0	18.0	16.0	14.0	8.0	9.0	9.0	3.0	7.0	9.0	8.0	10.0	24	27.0
25	8.0	3.0	9.0	2.0	-2.0	.0	5.0	3.0	10.0	10.0	10.0	9.0	9.0	10.0	6.0	11.0	9.0	8.0	5.0	4.0	5.0	9.0	15.0	13.0	24	15.0
26	15.0	16.0	17.0	17.0	14.0	10.0	8.0	10.0	10.0	18.0	5.0	10.0	10.0	9.0	15.0	10.0	10.0	10.0	10.0	10.0	15.0	15.0	16.0	3.0	24	18.0
27	4.0	5.0	3.0	-1.0	4.0	4.0	5.0	8.0	9.0	6.0	17.0	13.0	16.0	9.0	10.0	7.0	7.0	9.0	3.0	4.0	5.0	5.0	5.0	7.0	24	17.0
28	8.0	8.0	11.0	11.0	12.0	11.0	8.0	11.0	14.0	11.0	13.0	10.0	8.0	14.0	12.0	5.0	7.0	3.0	1.0	2.0	4.0	5.0	3.0	8.0	24	14.0
29	5.0	3.0	3.0	7.0	2.0	5.0	3.0	4.0	10.0	3.0	7.0	5.0	3.0	8.0	6.0	7.0	5.0	3.0	7.0	3.0	6.0	8.0	12.0	17.0	24	17.0
30	23.0	26.0	20.0	14.0	15.0	16.0	13.0	13.0	17.0	18.0	14.0	13.0	11.0	10.0	AN	AN	11.0	4.0	7.0	2.0	9.0	13.0	7.0	8.0	22	26.0
31	19.0	21.0	12.0	14.0	20.0	17.0	18.0	11.0	14.0	14.0	14.0	12.0	12.0	17.0	15.0	12.0	6.0	16.0	14.0	11.0	10.0	10.0	8.0	7.0	24	21.0
NO.:	31	31	31	31	31	31	31	31	31	31	31	31	31	31	29	29	30	31	31	31	31	31	31	31		
MAX:	35.0	36.0	28.0	35.0	33.0	42.0	28.0	25.0	30.0	31.0	31.0	32.0	34.0	32.0	32.0	36.0	65.0	60.0	74.0	49.0	31.0	35.0	39.0	34.0		
AVG:	12.10	11.90	11.74	10.81	10.52	10.94	10.23	10.03	13.29	13.23	12.61	13.29	11.61	11.52	11.21	10.00	10.27	8.58	8.23	7.55	10.00	11.61	11.52	11.23		

MONTHLY OBSERVATIONS: 739 MONTHLY MEAN: 11.00 MONTHLY MAX: 74.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	7.0	10.0	10.0	11.0	8.0	5.0	1.0	6.0	9.0	12.0	15.0	12.0	11.0	11.0	9.0	12.0	5.0	5.0	1.0	-2.0	-2.0	1.0	-2.0	.0	24	15.0
2	1.0	-2.0	1.0	1.0	-2.0	5.0	5.0	-1.0	5.0	4.0	3.0	5.0	5.0	7.0	8.0	7.0	9.0	6.0	1.0	-4.0	8.0	11.0	12.0	10.0	24	12.0
3	12.0IF	14.0IF	11.0IF	13.0IF	12.0IF	16.0IF	13.0IF	11.0IF	6.0IF	12.0IF	11.0IF	10.0IF	6.0IF	7.0IF	10.0IF	7.0IF	5.0IF	8.0IF	7.0IF	8.0IF	9.0IF	8.0IF	8.0IF	7.0IF	24	16.0
4	12.0	11.0	12.0	12.0	14.0	15.0	13.0	13.0	11.0	20.0	15.0	26.0	27.0	26.0	16.0	18.0	15.0	9.0	9.0	2.0	9.0	10.0	9.0	8.0	24	27.0
5	8.0	11.0	12.0	9.0	11.0	10.0	6.0	10.0	11.0	16.0	23.0	17.0	14.0	10.0	9.0	9.0	10.0	7.0	6.0	7.0	9.0	-1.0	1.0	4.0	24	23.0
6	5.0	4.0	7.0	4.0	6.0	9.0	7.0	9.0	10.0	10.0	12.0	12.0	12.0	16.0	13.0	9.0	13.0	11.0	3.0	3.0	2.0	3.0	3.0	-1.0	24	16.0
7	2.0	5.0	6.0	1.0	2.0	5.0	5.0	3.0	2.0	3.0	8.0	6.0	5.0	5.0	6.0	2.0	5.0	4.0	3.0	5.0	3.0	2.0	6.0	6.0	24	8.0
8	4.0	1.0	2.0	2.0	2.0	2.0	.0	4.0	1.0	.0	3.0	4.0	4.0	-1.0	3.0	.0	2.0	.0	2.0	-1.0	1.0	4.0	1.0	3.0	24	4.0
9	6.0IF	1.0IF	4.0IF	-2.0IF	.0IF	-1.0IF	5.0IF	3.0IF	2.0IF	9.0IF	3.0IF	9.0IF	6.0IF	7.0IF	4.0IF	6.0IF	3.0IF	5.0IF	5.0IF	.0IF	.0IF	7.0IF	2.0IF	4.0IF	24	9.0
10	3.0IF	5.0IF	2.0IF	9.0IF	4.0IF	7.0IF	5.0IF	6.0IF	10.0IF	7.0IF	7.0IF	4.0IF	8.0IF	4.0IF	3.0IF	10.0IF	6.0IF	8.0IF	5.0IF	1.0IF	.0IF	5.0IF	8.0IF	11.0IF	24	11.0
11	5.0	9.0	11.0	9.0	8.0	10.0	8.0	10.0	13.0	12.0	8.0	14.0	BA	11.0	12.0	6.0	5.0	6.0	8.0	4.0	9.0	8.0	13.0	16.0	23	16.0
12	14.0	20.0	21.0	22.0	16.0	16.0	13.0	18.0	19.0	21.0	18.0	15.0	14.0	8.0	15.0	10.0	16.0	15.0	11.0	15.0	20.0	23.0	19.0	15.0	24	23.0
13	20.0	20.0	21.0	17.0	20.0	22.0	22.0	17.0	17.0	13.0	10.0	16.0	5.0	7.0	3.0	6.0	5.0	4.0	.0	2.0	4.0	3.0	-1.0	4.0	24	22.0
14	4.0	6.0	.0	2.0	6.0	4.0	5.0	9.0	7.0	7.0	7.0	9.0	9.0	9.0	12.0	9.0	15.0	11.0	10.0	10.0	9.0	13.0	7.0	11.0	24	15.0
15	9.0	8.0	6.0	12.0	8.0	9.0	6.0	7.0	7.0	16.0	14.0	12.0	11.0	11.0	6.0	15.0	8.0	8.0	11.0	13.0	11.0	13.0	10.0	11.0	24	16.0
16	9.0	11.0	4.0	7.0	6.0	6.0	6.0	10.0	4.0	11.0	9.0	-7.0	5.0	8.0	4.0	3.0	4.0	.0	.0	-2.0	2.0	3.0	4.0	5.0	24	11.0
17	4.0IF	1.0IF	4.0IF	3.0IF	8.0IF	7.0IF	3.0IF	6.0IF	9.0IF	5.0IF	7.0IF	5.0IF	2.0IF	5.0IF	4.0IF	4.0IF	1.0IF	3.0IF	4.0IF	1.0IF	3.0IF	8.0IF	13.0IF	12.0IF	24	13.0
18	13.0	15.0	16.0	15.0	10.0	10.0	12.0	14.0	18.0	12.0	16.0	12.0	13.0	12.0	8.0	10.0	AV	-2.0	10.0	8.0	8.0	12.0	15.0	19.0	23	19.0
19	16.0	25.0	22.0	26.0	19.0	21.0	15.0	22.0	19.0	19.0	21.0	22.0	12.0	15.0	15.0	13.0	11.0	11.0	6.0	10.0	13.0	14.0	15.0	16.0	24	26.0
20	18.0	18.0	20.0	17.0	13.0	16.0	12.0	17.0	BL	20.0	21.0	BA	BA	BA	18.0	13.0	12.0	10.0	9.0	14.0	16.0	15.0	12.0	14.0	20	21.0
21	12.0	18.0	13.0	11.0	13.0	13.0	12.0	15.0	23.0	18.0	20.0	17.0	16.0	21.0	15.0	13.0	13.0	13.0	18.0	13.0	16.0	15.0	10.0	-3.0	24	23.0
22	2.0	2.0	4.0	-1.0	-1.0	4.0	1.0	5.0	7.0	9.0	8.0	8.0	4.0	3.0	8.0	5.0	4.0	6.0	2.0	1.0	6.0	6.0	16.0	11.0	24	16.0
23	9.0	13.0	9.0	9.0	9.0	6.0	2.0	6.0	9.0	10.0	2.0	6.0	7.0	4.0	5.0	3.0	3.0	5.0	.0	2.0	2.0	7.0	6.0	5.0	24	13.0
24	6.0	8.0	5.0	6.0	3.0	3.0	2.0	6.0	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	8	8.0
25	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN	BA	BA	14.0	14.0	9.0	15.0	9.0	7.0	7.0	7.0	11.0	9.0	10.0	10.0	12	15.0
26	16.0	12.0	12.0	17.0	20.0	16.0	14.0	10.0	12.0	11.0	7.0	11.0	9.0	11.0	14.0	16.0	13.0	11.0	11.0	14.0	12.0	14.0	11.0	9.0	24	20.0
27	9.0	8.0	8.0	5.0	9.0	6.0	7.0	5.0	5.0	5.0	4.0	1.0	5.0	12.0	9.0	8.0	5.0	11.0	6.0	8.0	8.0	7.0	7.0	8.0	24	12.0
28	4.0	10.0	10.0	9.0	2.0	7.0	3.0	5.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	5.0	7.0	3.0	5.0	6.0	7.0	24	12.0
29	9.0	10.0	9.0	7.0	8.0	5.0	6.0	9.0	14.0	8.0	8.0	11.0	9.0	6.0	7.0	8.0	9.0	6.0	5.0	8.0	9.0	10.0	9.0	13.0	24	14.0
30	13.0	12.0	7.0	4.0	7.0	5.0	6.0	6.0	12.0	7.0	9.0	9.0	4.0	4.0	2.0	3.0	-1.0	2.0	8.0	1.0	4.0	1.0	3.0	4.0	24	13.0
31																									0	
NO.:	29	29	29	29	29	29	29	29	27	28	28	27	27	28	29	29	28	29	29	29	29	29	29	29		
MAX:	20.0	25.0	22.0	26.0	20.0	22.0	22.0	22.0	23.0	21.0	23.0	26.0	27.0	26.0	18.0	18.0	16.0	15.0	18.0	15.0	20.0	23.0	19.0	19.0		
AVG:	8.69	9.86	9.28	8.86	8.31	8.93	7.41	9.00	10.15	11.04	10.75	10.30	9.22	9.46	8.93	8.69	7.75	6.97	5.97	5.34	7.07	8.14	8.03	8.24		

MONTHLY OBSERVATIONS: 686 MONTHLY MEAN: 8.58 MONTHLY MAX: 27.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	6.0	6.0	5.0	8.0	5.0	7.0	3.0	5.0	8.0	7.0	8.0	4.0	7.0	4.0	3.0	3.0	1.0	6.0	2.0	.0	3.0	6.0	3.0	3.0	24	8.0
2	6.0	7.0	3.0	6.0	7.0	5.0	5.0	13.0	7.0	9.0	7.0	4.0	5.0	4.0	5.0	8.0	8.0	2.0	4.0	-1.0	.0	2.0	4.0	4.0	24	13.0
3	2.0	8.0	6.0	9.0	3.0	6.0	2.0	14.0	8.0	6.0	11.0	5.0	4.0	6.0	4.0	8.0	5.0	5.0	2.0	1.0	.0	4.0	7.0	7.0	24	14.0
4	5.0	11.0	11.0	23.0	44.0	31.0	12.0	20.0	20.0	15.0	AX	13.0	9.0	13.0	10.0	6.0	11.0	5.0	9.0	3.0	9.0	13.0	15.0	13.0	23	44.0
5	19.0	13.0	13.0	13.0	12.0	9.0	13.0	10.0	12.0	11.0	13.0	12.0	11.0	8.0	10.0	9.0	6.0	8.0	9.0	2.0	7.0	9.0	9.0	11.0	24	19.0
6	14.0	12.0	11.0	14.0	14.0	16.0	13.0	14.0	13.0	16.0	15.0	11.0	10.0	12.0	12.0	7.0	10.0	8.0	6.0	7.0	9.0	9.0	4.0	5.0	24	16.0
7	8.0	10.0	13.0	10.0	8.0	6.0	8.0	12.0	12.0	13.0	14.0	13.0	18.0	17.0	21.0	18.0	13.0	14.0	11.0	9.0	13.0	15.0	11.0	10.0	24	21.0
8	14.0	4.0	2.0	2.0	4.0	4.0	.0	3.0	7.0	4.0	10.0	12.0	10.0	12.0	8.0	16.0	16.0	19.0	13.0	13.0	11.0	16.0	18.0	27.0	24	27.0
9	26.0	20.0	11.0	17.0	16.0	15.0	16.0	18.0	18.0	17.0	22.0	21.0	19.0	22.0	18.0	14.0	14.0	9.0	8.0	9.0	8.0	10.0	12.0	12.0	24	26.0
10	10.0	7.0	11.0	14.0	10.0	10.0	10.0	12.0	16.0	9.0	14.0	13.0	16.0	12.0	8.0	13.0	11.0	6.0	-3.0	3.0	5.0	6.0	7.0	7.0	24	16.0
11	11.0	7.0	9.0	5.0	10.0	11.0	12.0	16.0	21.0	19.0	18.0	17.0	15.0	14.0	15.0	10.0	15.0	11.0	7.0	12.0	10.0	13.0	12.0	16.0	24	21.0
12	8.0	13.0	13.0	14.0	16.0	16.0	14.0	12.0	18.0	14.0	7.0	3.0	7.0	7.0	6.0	7.0	10.0	4.0	9.0	5.0	5.0	8.0	1.0	6.0	24	18.0
13	10.0	7.0	8.0	10.0	9.0	11.0	6.0	6.0	11.0	15.0	15.0	14.0	9.0	13.0	15.0	10.0	7.0	5.0	8.0	5.0	10.0	7.0	9.0	8.0	24	15.0
14	9.0	11.0	9.0	9.0	9.0	8.0	9.0	13.0	12.0	11.0	12.0	9.0	7.0	10.0	17.0	-1.0	18.0	8.0	6.0	5.0	7.0	6.0	10.0	6.0	24	18.0
15	6.0	9.0	4.0	11.0	8.0	9.0	9.0	13.0	14.0	13.0	15.0	16.0	10.0	16.0	13.0	14.0	2.0	8.0	.0	1.0	2.0	2.0	6.0	3.0	24	16.0
16	10.0	4.0	3.0	7.0	4.0	6.0	8.0	3.0	9.0	12.0	13.0	13.0	16.0	-5.0	13.0	10.0	10.0	12.0	8.0	11.0	7.0	11.0	3.0	5.0	24	16.0
17	3.0	7.0	5.0	3.0	5.0	5.0	6.0	9.0	13.0	9.0	5.0	10.0	9.0	-1.0	7.0	5.0	7.0	3.0	7.0	6.0	4.0	8.0	11.0	7.0	24	13.0
18	4.0	9.0	8.0	7.0	5.0	9.0	6.0	8.0	11.0	15.0	8.0	10.0	9.0	11.0	-4.0	-1.0	12.0	12.0	7.0	9.0	9.0	5.0	6.0	7.0	24	15.0
19	6.0	4.0	4.0	5.0	4.0	4.0	7.0	7.0	7.0	10.0	5.0	8.0	7.0	11.0	10.0	7.0	5.0	4.0	9.0	7.0	6.0	8.0	5.0	4.0	24	11.0
20	5.0	6.0	8.0	4.0	8.0	9.0	3.0	8.0	7.0	8.0	12.0	6.0	12.0	14.0	8.0	23.0	6.0	4.0	5.0	7.0	.0	1.0	3.0	1.0	24	23.0
21	.0IF	4.0IF	5.0IF	5.0IF	13.0IF	14.0IF	17.0IF	21.0IF	25.0IF	28.0IF	24.0IF	20.0IF	16.0IF	19.0IF	13.0IF	10.0IF	11.0IF	14.0IF	10.0IF	18.0IF	18.0IF	17.0IF	17.0IF	19.0IF	24	28.0
22	17.0IF	20.0IF	19.0IF	21.0IF	19.0IF	22.0IF	19.0IF	18.0IF	15.0IF	16.0IF	12.0IF	21.0IF	22.0IF	24.0IF	21.0IF	11.0IF	13.0IF	15.0IF	10.0IF	10.0IF	9.0IF	11.0IF	12.0IF	17.0IF	24	24.0
23	13.0IF	16.0IF	14.0IF	16.0IF	12.0IF	17.0IF	13.0IF	18.0IF	17.0IF	18.0IF	18.0IF	14.0IF	20.0IF	21.0IF	16.0IF	17.0IF	22.0IF	14.0IF	18.0IF	21.0IF	19.0IF	19.0IF	21.0IF	19.0IF	24	22.0
24	16.0IF	20.0IF	15.0IF	16.0IF	18.0IF	16.0IF	14.0IF	15.0IF	20.0IF	21.0IF	22.0IF	20.0IF	16.0IF	20.0IF	20.0IF	21.0IF	18.0IF	22.0IF	17.0IF	13.0IF	19.0IF	19.0IF	21.0IF	22.0IF	24	22.0
25	18.0IF	22.0IF	17.0IF	20.0IF	18.0IF	17.0IF	15.0IF	22.0IF	19.0IF	21.0IF	BA	BA	25.0IF	21.0IF	24.0IF	19.0IF	19.0IF	18.0IF	14.0IF	18.0IF	16.0IF	19.0IF	26.0IF	22.0IF	22	26.0
26	21.0IF	19.0IF	22.0IF	21.0IF	22.0IF	18.0IF	18.0IF	20.0IF	18.0IF	17.0IF	20.0IF	19.0IF	16.0IF	18.0IF	16.0IF	20.0IF	13.0IF	16.0IF	10.0IF	10.0IF	15.0IF	17.0IF	17.0IF	17.0IF	24	22.0
27	20.0IF	16.0IF	12.0IF	6.0IF	9.0IF	7.0IF	6.0IF	7.0IF	8.0IF	7.0IF	10.0IF	8.0IF	6.0IF	6.0IF	10.0IF	9.0IF	17.0IF	9.0IF	11.0IF	4.0IF	13.0IF	16.0IF	14.0IF	9.0IF	24	20.0
28	6.0IF	5.0IF	4.0IF	5.0IF	7.0IF	6.0IF	7.0IF	11.0IF	8.0IF	5.0IF	11.0IF	8.0IF	8.0IF	6.0IF	8.0IF	12.0IF	5.0IF	7.0IF	6.0IF	9.0IF	6.0IF	6.0IF	6.0IF	9.0IF	24	12.0
29	6.0IF	12.0IF	10.0IF	8.0IF	9.0IF	8.0IF	9.0IF	10.0IF	7.0IF	5.0IF	4.0IF	4.0IF	3.0IF	6.0IF	5.0IF	7.0IF	4.0IF	5.0IF	3.0IF	.0IF	-3.0IF	4.0IF	6.0IF	7.0IF	24	12.0
30	6.0IF	1.0IF	5.0IF	3.0IF	7.0IF	5.0IF	4.0IF	6.0IF	9.0IF	6.0IF	13.0IF	10.0IF	10.0IF	5.0IF	9.0IF	6.0IF	8.0IF	.0IF	2.0IF	1.0IF	6.0IF	5.0IF	7.0IF	5.0IF	24	13.0
31	8.0	6.0	10.0	6.0	9.0	7.0	7.0	6.0	15.0	18.0	13.0	13.0	14.0	14.0	15.0	18.0	9.0	9.0	17.0	16.0	14.0	16.0	13.0	18.0	24	18.0
NO.:	31	31	31	31	31	31	31	31	31	31	29	30	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:	26.0	22.0	22.0	23.0	44.0	31.0	19.0	22.0	25.0	28.0	24.0	21.0	25.0	24.0	24.0	23.0	22.0	22.0	18.0	21.0	19.0	19.0	26.0	27.0		
AVG:	10.10	10.19	9.35	10.26	11.10	10.77	9.39	11.94	13.06	12.74	12.79	11.70	11.81	11.61	11.48	10.84	10.52	9.10	7.90	7.55	8.29	9.94	10.19	10.52		

MONTHLY OBSERVATIONS: 741 MONTHLY MEAN: 10.54 MONTHLY MAX: 44.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	17.0	13.0	11.0	12.0	13.0	11.0	11.0	14.0	16.0	14.0	14.0	13.0	12.0	8.0	8.0	9.0	12.0	9.0	6.0	5.0	3.0	9.0	9.0	12.0	24	17.0
2	13.0	14.0	13.0	10.0	12.0	8.0	11.0	13.0	10.0	14.0	13.0	14.0	7.0	11.0	10.0	2.0	17.0	4.0	9.0	2.0	6.0	4.0	10.0	13.0	24	17.0
3	15.0	15.0	11.0	12.0	13.0	9.0	8.0	16.0	11.0	16.0	15.0	16.0	13.0	13.0	15.0	11.0	12.0	8.0	6.0	7.0	2.0	10.0	15.0	19.0	24	19.0
4	19.0 6	18.0 6	21.0 6	16.0 6	17.0 6	12.0 6	14.0 6	18.0 6	19.0 6	20.0 6	25.0 6	10.0 6	18.0 6	19.0 6	14.0 6	14.0 6	15.0 6	15.0 6	15.0 6	15.0 6	15.0 6	9.0 6	8.0 6	12.0 6	24	25.0
5	10.0 6	6.0 6	5.0 6	14.0 6	11.0 6	7.0 6	9.0 6	14.0 6	22.0 6	13.0 6	15.0 6	16.0 6	16.0 6	12.0 6	17.0 6	14.0 6	12.0 6	10.0 6	10.0 6	9.0 6	13.0 6	16.0 6	23.0 6	16.0 6	24	23.0
6	23.0 6	21.0 6	19.0 6	20.0 6	16.0 6	17.0 6	14.0 6	20.0 6	22.0 6	21.0 6	18.0 6	17.0 6	AX	14.0	15.0	20.0	13.0	13.0	11.0	10.0	12.0	23.0	17.0	20.0	23	23.0
7	16.0	20.0	15.0	21.0	17.0	11.0	17.0	16.0	19.0	45.0	25.0	29.0	24.0	29.0	25.0	24.0	21.0	22.0	15.0	14.0	19.0	21.0	19.0	21.0	24	45.0
8	22.0	25.0	21.0	22.0	24.0	24.0	22.0	23.0	26.0	28.0	33.0	27.0	18.0	16.0	15.0	13.0	12.0	14.0	16.0	13.0	16.0	22.0	20.0	22.0	24	33.0
9	17.0	23.0	26.0	21.0	20.0	22.0	22.0	21.0	28.0	28.0	28.0	25.0	22.0	23.0	22.0	27.0	17.0	15.0	17.0	14.0	17.0	25.0	25.0	23.0	24	28.0
10	24.0	21.0	23.0	21.0	22.0	25.0	23.0	23.0	29.0	26.0	32.0	25.0	23.0	24.0	24.0	22.0	22.0	20.0	19.0	18.0	29.0	29.0	28.0	29.0	24	32.0
11	29.0	20.0	11.0	13.0	13.0	11.0	12.0	16.0	14.0	16.0	11.0	18.0	13.0	13.0	12.0	13.0	11.0	6.0	6.0	3.0	3.0	8.0	16.0	-9.0	24	29.0
12	4.0	3.0	5.0	5.0	6.0	2.0	6.0	7.0	9.0	8.0	11.0	14.0	10.0	11.0	13.0	17.0	16.0	7.0	15.0	14.0	13.0	13.0	15.0	16.0	24	17.0
13	15.0	16.0	15.0	17.0	16.0	15.0	14.0	16.0	20.0	25.0	7.0	16.0	14.0	17.0	16.0	7.0	7.0	9.0	13.0	11.0	12.0	9.0	9.0	10.0	24	25.0
14	9.0	10.0	13.0	11.0	17.0	13.0	16.0	17.0	13.0	16.0	15.0	5.0	12.0	-2.0	4.0	13.0	9.0	5.0	-1.0	2.0	3.0	4.0	2.0	6.0	24	17.0
15	5.0	9.0	4.0	5.0	8.0	7.0	8.0	6.0	11.0	12.0	13.0	9.0	10.0	14.0	10.0	11.0	4.0	9.0	9.0	4.0	6.0	10.0	10.0	9.0	24	14.0
16	9.0	10.0	5.0	9.0	8.0	7.0	14.0	9.0	4.0	14.0	15.0	12.0	11.0	12.0	7.0	13.0	9.0	5.0	8.0	7.0	6.0	5.0	3.0	2.0	24	15.0
17	6.0	5.0	5.0	9.0	4.0	6.0	7.0	8.0	6.0	9.0	15.0	17.0	17.0	13.0	18.0	14.0	21.0	17.0	14.0	12.0	17.0	13.0	17.0	21.0	24	21.0
18	22.0	18.0	18.0	24.0	18.0	19.0	23.0	20.0	28.0	30.0	26.0	16.0	13.0	7.0	7.0	11.0	8.0	11.0	11.0	3.0	7.0	6.0	4.0	8.0	24	30.0
19	11.0	7.0	7.0	2.0	3.0	5.0	8.0	6.0	8.0	7.0	9.0	13.0	13.0	11.0	11.0	9.0	6.0	5.0	4.0	2.0	3.0	7.0	3.0	4.0	24	13.0
20	1.0	6.0	6.0	5.0	4.0	11.0	6.0	10.0	10.0	12.0	12.0	9.0	17.0	1.0	16.0	7.0	-4.0	8.0	7.0	1.0	3.0	7.0	4.0	6.0	24	17.0
21	3.0	2.0	3.0	5.0	4.0	8.0	8.0	7.0	5.0	5.0	1.0	6.0	BA	.0	12.0	-2.0	2.0	1.0	6.0	5.0	-1.0	.0	3.0	2.0	23	12.0
22	3.0	3.0	4.0	1.0	4.0	3.0	3.0	2.0	1.0	4.0	-2.0	5.0	5.0	8.0	3.0	3.0	BR	4.0	6.0	4.0	3.0	2.0	5.0	4.0	23	8.0
23	3.0	7.0	2.0	3.0	3.0	5.0	6.0	6.0	5.0	7.0	12.0	8.0	8.0	3.0	7.0	6.0	5.0	7.0	10.0	6.0	8.0	8.0	12.0	10.0	24	12.0
24	12.0	13.0	16.0	15.0	11.0	15.0	12.0	16.0	18.0	18.0	18.0	17.0	20.0	17.0	19.0	4.0	24.0	19.0	14.0	15.0	12.0	17.0	16.0	16.0	24	24.0
25	20.0	21.0	20.0	15.0	21.0	21.0	18.0	18.0	24.0	21.0	21.0	23.0	14.0	15.0	16.0	10.0	4.0	-3.0	8.0	6.0	3.0	3.0	8.0	6.0	24	24.0
26	7.0	6.0	3.0	7.0	8.0	4.0	9.0	12.0	15.0	10.0	10.0	7.0	11.0	11.0	9.0	9.0	11.0	9.0	7.0	8.0	7.0	9.0	10.0	11.0	24	15.0
27	15.0	15.0	12.0	16.0	14.0	14.0	18.0	21.0	23.0	21.0	20.0	16.0	16.0	12.0	14.0	14.0	14.0	14.0	11.0	11.0	11.0	12.0	16.0	17.0	24	23.0
28	20.0IF	20.0IF	20.0IF	-1.0IF	13.0IF	13.0IF	1.0IF	15.0IF	17.0IF	17.0IF	17.0IF	15.0IF	17.0IF	13.0IF	12.0IF	15.0IF	16.0IF	7.0IF	9.0IF	9.0IF	11.0IF	13.0IF	13.0IF	15.0IF	24	20.0
29	15.0IF	11.0IF	15.0IF	13.0IF	10.0IF	10.0IF	14.0IF	22.0IF	32.0IF	34.0IF	36.0IF	32.0IF	20.0IF	15.0IF	14.0IF	20.0IF	18.0IF	19.0IF	19.0IF	23.0IF	27.0IF	29.0IF	36.0IF	34.0IF	24	36.0
30	31.0IF	33.0IF	33.0IF	34.0IF	34.0IF	31.0IF	30.0IF	34.0IF	34.0IF	39.0IF	38.0IF	33.0IF	33.0IF	14.0IF	16.0IF	8.0IF	13.0IF	14.0IF	15.0IF	15.0IF	16.0IF	23.0IF	14.0IF	18.0IF	24	39.0
31																									0	
NO.:	30	30	30	30	30	30	30	30	30	30	30	30	28	30	30	30	29	30	30	30	30	30	30	30		
MAX:	31.0	33.0	33.0	34.0	34.0	31.0	30.0	34.0	34.0	45.0	38.0	33.0	33.0	29.0	25.0	27.0	24.0	22.0	19.0	23.0	29.0	29.0	36.0	34.0		
AVG:	13.87	13.70	12.73	12.57	12.80	12.20	12.80	14.87	16.63	18.33	17.43	16.10	15.25	12.47	13.37	11.93	11.97	10.10	10.50	8.93	10.07	12.20	13.00	13.10		

MONTHLY OBSERVATIONS: 717 MONTHLY MEAN: 13.20 MONTHLY MAX: 45.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	16.0IF	21.0IF	16.0IF	18.0IF	18.0IF	15.0IF	18.0IF	17.0IF	24.0IF	25.0IF	27.0IF	30.0IF	24.0IF	25.0IF	21.0IF	18.0IF	-5.0IF	9.0IF	5.0IF	8.0IF	9.0IF	14.0IF	10.0IF	12.0IF	24	30.0
2	7.0IF	11.0IF	9.0IF	9.0IF	7.0IF	9.0IF	5.0IF	11.0IF	14.0IF	21.0IF	19.0IF	24.0IF	22.0IF	27.0IF	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	14	27.0
3	AV	AV	AV	AV	AV	AV	AV	AV	.0	20.0	19.0	22.0	19.0	19.0	15.0	AV	AV	AV	AV	AV	AV	11.0	6.0	5.0	10	22.0
4	4.0	4.0	6.0	6.0	6.0	7.0	6.0	7.0	5.0	10.0	12.0	21.0	15.0	16.0	19.0	15.0	18.0	8.0	11.0	7.0	15.0	19.0	19.0	18.0	24	21.0
5	18.0	14.0	13.0	16.0	23.0	18.0	16.0	13.0	16.0	20.0	16.0	15.0	15.0	14.0	15.0	10.0	18.0	6.0	8.0	7.0	-6.0	4.0	5.0	4.0	24	23.0
6	3.0	6.0	8.0	9.0	4.0	6.0	5.0	7.0	11.0	15.0	19.0	-2.0	13.0	17.0	13.0	6.0	12.0	4.0	7.0	2.0	3.0	4.0	3.0	9.0	24	19.0
7	6.0	5.0	7.0	4.0	5.0	11.0	5.0	8.0	5.0	10.0	8.0	7.0	15.0	11.0	10.0	7.0	1.0	6.0	6.0	6.0	7.0	9.0	10.0	8.0	24	15.0
8	7.0	7.0	8.0	5.0	8.0	6.0	9.0	9.0	13.0	7.0	10.0	9.0	8.0	8.0	4.0	5.0	5.0	4.0	8.0	6.0	6.0	5.0	2.0	4.0	24	13.0
9	3.0	3.0	4.0	3.0	3.0	5.0	5.0	4.0	5.0	10.0	5.0	5.0	3.0	5.0	7.0	9.0	2.0	9.0	1.0	6.0	1.0	-1.0	4.0	2.0	24	10.0
10	.0	2.0	3.0	3.0	-2.0	3.0	5.0	1.0	-1.0	2.0	2.0	1.0	6.0	5.0	1.0	8.0	.0	4.0	5.0	4.0	2.0	6.0	9.0	8.0	24	9.0
11	7.0	13.0	8.0	7.0	9.0	10.0	9.0	9.0	12.0	14.0	12.0	10.0	6.0	6.0	7.0	8.0	5.0	3.0	6.0	6.0	4.0	6.0	10.0	9.0	24	14.0
12	8.0	9.0	5.0	7.0	8.0	6.0	6.0	10.0	9.0	18.0	20.0	14.0	10.0	12.0	13.0	18.0	17.0	14.0	12.0	26.0	14.0	9.0	2.0	7.0	24	26.0
13	4.0	21.0	2.0	5.0	8.0	5.0	5.0	6.0	9.0	10.0	9.0	12.0	11.0	5.0	7.0	11.0	12.0	6.0	8.0	12.0	5.0	5.0	9.0	7.0	24	21.0
14	7.0	5.0	6.0	10.0	6.0	8.0	8.0	8.0	7.0	7.0	12.0	7.0	10.0	10.0	12.0	12.0	11.0	8.0	6.0	7.0	5.0	7.0	7.0	10.0	24	12.0
15	6.0	5.0	9.0	9.0	5.0	6.0	7.0	7.0	11.0	4.0	12.0	10.0	10.0	12.0	9.0	3.0	5.0	3.0	4.0	2.0	1.0	-1.0	4.0	5.0	24	12.0
16	8.0	3.0	6.0	6.0	9.0	9.0	7.0	7.0	11.0	10.0	14.0	10.0	12.0	8.0	17.0	22.0	24.0	30.0	26.0	24.0	34.0	33.0	30.0	32.0	24	34.0
17	29.0	32.0	31.0	32.0	32.0	30.0	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	6	32.0
18	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	0	
19	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	0	
20	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	1.0	5.0	7.0	6.0	7.0	9.0	6	9.0
21	11.0	10.0	9.0	7.0	7.0	10.0	11.0	11.0	17.0	17.0	20.0	22.0	19.0	20.0	18.0	18.0	16.0	AV	AV	AV	AV	AV	AV	AV	17	22.0
22	11.0	8.0	4.0	5.0	7.0	8.0	7.0	6.0	11.0	10.0	9.0	11.0	13.0	10.0	9.0	8.0	8.0	6.0	7.0	5.0	10.0	11.0	13.0	14.0	24	14.0
23	15.0	16.0	11.0	15.0	13.0	13.0	13.0	15.0	14.0	18.0	12.0	10.0	10.0	9.0	8.0	11.0	10.0	6.0	13.0	4.0	6.0	6.0	11.0	8.0	24	18.0
24	9.0	11.0	11.0	11.0	8.0	10.0	11.0	10.0	15.0	14.0	13.0	13.0	12.0	8.0	11.0	11.0	12.0	10.0	9.0	8.0	12.0	15.0	15.0	14.0	24	15.0
25	15.0	17.0	14.0	11.0	14.0	16.0	14.0	19.0	20.0	23.0	22.0	16.0	14.0	17.0	16.0	10.0	13.0	12.0	9.0	11.0	13.0	14.0	15.0	15.0	24	23.0
26	16.0	17.0	19.0	17.0	14.0	17.0	17.0	21.0	23.0	26.0	20.0	23.0	19.0	16.0	17.0	15.0	17.0	8.0	8.0	10.0	13.0	14.0	16.0	14.0	24	26.0
27	17.0	18.0	15.0	12.0	12.0	15.0	14.0	22.0	20.0	25.0	21.0	19.0	16.0	19.0	16.0	12.0	13.0	14.0	.0	7.0	11.0	12.0	14.0	16.0	24	25.0
28	15.0	15.0	14.0	15.0	12.0	18.0	13.0	21.0	21.0	18.0	25.0	16.0	19.0	13.0	18.0	6.0	10.0	8.0	10.0	8.0	11.0	12.0	17.0	13.0	24	25.0
29	17.0	14.0	18.0	10.0	15.0	14.0	16.0	13.0	17.0	23.0	20.0	20.0	12.0	19.0	20.0	16.0	1.0	13.0	25.0	15.0	16.0	19.0	20.0	17.0	24	25.0
30	24.0	22.0	19.0	16.0	14.0	10.0	13.0	16.0	15.0	18.0	14.0	-7.0	7.0	10.0	6.0	11.0	15.0	13.0	7.0	6.0	6.0	7.0	4.0	8.0	24	24.0
31	10.0	9.0	7.0	7.0	6.0	7.0	7.0	8.0	8.0	12.0	12.0	11.0	8.0	10.0	9.0	10.0	6.0	5.0	4.0	.0	2.0	2.0	4.0	7.0	24	12.0
NO.:	27	27	27	27	27	27	26	26	27	27	27	27	27	27	26	25	25	24	25	25	25	26	26	26		
MAX:	29.0	32.0	31.0	32.0	32.0	30.0	18.0	22.0	24.0	26.0	27.0	30.0	24.0	27.0	21.0	22.0	24.0	30.0	26.0	26.0	34.0	33.0	30.0	32.0		
AVG:	10.85	11.78	10.44	10.19	10.04	10.81	9.69	11.00	12.30	15.07	14.96	12.93	12.89	13.00	12.23	11.20	9.84	8.71	8.24	8.08	8.28	9.54	10.23	10.58		

MONTHLY OBSERVATIONS: 629 MONTHLY MEAN: 11.00 MONTHLY MAX: 34.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	10.0	6.0	12.0	10.0	10.0	11.0	7.0	12.0	15.0	9.0	19.0	6.0	7.0	16.0	7.0	5.0	2.0	4.0	7.0	5.0	2.0	3.0	5.0	7.0	24	19.0
2	7.0	8.0	6.0	4.0	6.0	8.0	6.0	17.0	16.0	17.0	BA	14.0	11.0	15.0	15.0	8.0	7.0	8.0	8.0	6.0	6.0	10.0	13.0	12.0	23	17.0
3	14.0	18.0	14.0	13.0	9.0	13.0	13.0	20.0	17.0	18.0	18.0	19.0	15.0	15.0	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	14	20.0
4	AV	AV	AV	AV	AV	AV	13.0	5.0	4.0	2.0	3.0	7.0	10.0	AV	AV	9.0	6.0	3.0	9.0	.0	9.0	5.0	10.0	5.0	16	13.0
5	5.0	11.0	7.0	5.0	4.0	5.0	1.0	10.0	9.0	10.0	13.0	8.0	8.0	4.0	7.0	12.0	10.0	7.0	7.0	6.0	10.0	9.0	6.0	1.0	24	13.0
6	6.0	5.0	7.0	5.0	3.0	4.0	5.0	10.0	8.0	13.0	14.0	14.0	16.0	13.0	15.0	13.0	AV	AV	AV	AV	12.0	8.0	9.0	5.0	20	16.0
7	6.0	11.0	11.0	9.0	7.0	7.0	4.0	13.0	11.0	17.0	18.0	16.0	9.0	9.0	12.0	AV	AV	AV	AV	AV	AV	AV	AV	AV	15	18.0
8	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	13.0	6.0	6.0	5.0	7.0	10.0	8.0	7	13.0
9	8.0	6.0	9.0	7.0	6.0	6.0	8.0	7.0	7.0	12.0	BK	11.0	10.0	8.0	10.0	6.0	8.0	8.0	12.0	4.0	8.0	.0	3.0	6.0	23	12.0
10	4.0	4.0	4.0	4.0	2.0	1.0	7.0	5.0	4.0	6.0	9.0	4.0	5.0	7.0	10.0	BK	BK	BK	BK	BK	BK	BK	BK	BK	15	10.0
11	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	BK	6.0	12.0	16.0	15.0	10.0	13.0	9.0	10.0	10.0	11.0	12.0	12.0	12.0	13	16.0
12	12.0	12.0	9.0	8.0	8.0	11.0	11.0	6.0	14.0	18.0	12.0	15.0	15.0	10.0	12.0	AV	AV	AV	AV	AV	AV	14.0	8.0	6.0	18	18.0
13	6.0	5.0	7.0	6.0	10.0	10.0	9.0	6.0	13.0	11.0	12.0	13.0	12.0	14.0	-3.0	20.0	8.0	11.0	AV	AV	AV	AV	AV	13.0	19	20.0
14	5.0	5.0	3.0	6.0	5.0	8.0	1.0	4.0	10.0	10.0	12.0	17.0	20.0	17.0	15.0	9.0	15.0	16.0	13.0	13.0	11.0	14.0	16.0	17.0	24	20.0
15	15.0	13.0	15.0	10.0	5.0	5.0	6.0	6.0	4.0	5.0	7.0	5.0	1.0	6.0	7.0	4.0	2.0	.0	-2.0	1.0	3.0	2.0	6.0	5.0	24	15.0
16	4.0	6.0	3.0	4.0	6.0	1.0	1.0	7.0	8.0	11.0	9.0	4.0	5.0	2.0	3.0	1.0	1.0	9.0	5.0	1.0	5.0	5.0	5.0	7.0	24	11.0
17	8.0	6.0	8.0	5.0	3.0	6.0	5.0	10.0	AV	9.0	9.0	3.0	5.0	7.0	4.0	7.0	3.0	4.0	6.0	.0	9.0	7.0	11.0	6.0	23	11.0
18	9.0	9.0	7.0	8.0	9.0	6.0	8.0	10.0	13.0	14.0	13.0	13.0	16.0	9.0	6.0	7.0	15.0	7.0	8.0	6.0	10.0	10.0	11.0	15.0	24	16.0
19	12.0	15.0	9.0	6.0	8.0	10.0	4.0	10.0	11.0	9.0	13.0	12.0	8.0	13.0	13.0	12.0	12.0	15.0	12.0	9.0	12.0	13.0	15.0	13.0	24	15.0
20	14.0	12.0	12.0	10.0	12.0	13.0	10.0	13.0	15.0	12.0	16.0	17.0	17.0	12.0	10.0	14.0	11.0	12.0	12.0	9.0	15.0	19.0	19.0	15.0	24	19.0
21	17.0	18.0	15.0	18.0	15.0	16.0	16.0	17.0	19.0	19.0	19.0	18.0	17.0	10.0	17.0	16.0	13.0	12.0	8.0	8.0	11.0	12.0	14.0	14.0	24	19.0
22	12.0	13.0	17.0	14.0	12.0	11.0	14.0	15.0	18.0	24.0	20.0	20.0	27.0	19.0	19.0	21.0	17.0	18.0	12.0	13.0	14.0	15.0	17.0	18.0	24	27.0
23	19.0	19.0	17.0	17.0	19.0	16.0	20.0	15.0	26.0	20.0	18.0	24.0	21.0	20.0	21.0	19.0	16.0	17.0	17.0	18.0	19.0	21.0	25.0	21.0	24	26.0
24	24.0	21.0	22.0	21.0	18.0	21.0	22.0	22.0	27.0	25.0	26.0	24.0	19.0	22.0	24.0	23.0	17.0	17.0	19.0	19.0	19.0	21.0	20.0	17.0	24	27.0
25	20.0	18.0	18.0	26.0	24.0	20.0	19.0	21.0	26.0	22.0	24.0	19.0	23.0	20.0	22.0	19.0	19.0	20.0	16.0	12.0	21.0	22.0	20.0	19.0	24	26.0
26	18.0	22.0	20.0	18.0	17.0	18.0	20.0	17.0	22.0	22.0	19.0	14.0	19.0	15.0	15.0	16.0	12.0	13.0	13.0	10.0	17.0	16.0	12.0	9.0	24	22.0
27	11.0	10.0	6.0	6.0	7.0	9.0	10.0	10.0	10.0	7.0	14.0	12.0	8.0	12.0	16.0	18.0	11.0	11.0	13.0	11.0	9.0	12.0	10.0	6.0	24	18.0
28	11.0	6.0	7.0	6.0	6.0	7.0	7.0	12.0	14.0	10.0	11.0	18.0	14.0	17.0	16.0	15.0	-3.0	6.0	9.0	4.0	5.0	5.0	4.0	6.0	24	18.0
29	9.0	4.0	6.0	7.0	3.0	8.0	5.0	5.0	9.0	11.0	10.0	14.0	15.0	13.0	10.0	11.0	7.0	9.0	6.0	7.0	6.0	8.0	7.0	4.0	24	15.0
30	6.0	6.0	6.0	5.0	3.0	6.0	5.0	8.0	7.0	13.0	BA	BA	14.0	15.0	7.0	14.0	9.0	9.0	1.0	.0	6.0	10.0	8.0	9.0	22	15.0
31	15.0	8.0	11.0	9.0	13.0	13.0	6.0	9.0	14.0	15.0	12.0	14.0	13.0	15.0	12.0	12.0	9.0	10.0	5.0	5.0	11.0	14.0	16.0	12.0	24	16.0
NO.:	28	28	28	28	28	28	29	29	28	29	26	29	30	29	28	26	25	26	25	25	26	27	27	28		
MAX:	24.0	22.0	22.0	26.0	24.0	21.0	22.0	22.0	27.0	25.0	26.0	24.0	27.0	22.0	24.0	23.0	19.0	20.0	19.0	19.0	21.0	22.0	25.0	21.0		
AVG:	10.96	10.61	10.29	9.54	8.93	9.64	9.07	11.10	13.25	13.48	14.23	13.14	13.07	12.79	12.04	12.35	9.60	10.31	9.28	7.32	10.23	10.89	11.56	10.29		

MONTHLY OBSERVATIONS: 660 MONTHLY MEAN: 11.03 MONTHLY MAX: 27.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	11.0	13.0	13.0	12.0	16.0	12.0	14.0	14.0	15.0	14.0	14.0	11.0	11.0	14.0	14.0	9.0	15.0	16.0	11.0	15.0	14.0	6.0	8.0	6.0	24	16.0
2	10.0 6	4.0 6	8.0 6	4.0 6	4.0 6	11.0 6	8.0 6	7.0 6	5.0 6	8.0 6	8.0 6	12.0 6	11.0 6	6.0 6	8.0 6	6.0 6	8.0 6	11.0 6	10.0 6	12.0 6	14.0 6	14.0 6	10.0 6	12.0 6	24	14.0
3	12.0 6	13.0 6	10.0 6	11.0 6	11.0 6	9.0 6	9.0 6	15.0 6	17.0 6	13.0 6	10.0 6	7.0 6	10.0 6	9.0 6	9.0 6	9.0 6	10.0 6	8.0 6	5.0 6	4.0 6	9.0 6	11.0 6	14.0 6	11.0 6	24	17.0
4	14.0 6	11.0 6	14.0 6	12.0 6	8.0 6	8.0 6	9.0 6	13.0 6	17.0 6	19.0 6	15.0 6	9.0 6	12.0 6	13.0 6	10.0 6	9.0 6	9.0 6	10.0 6	11.0 6	8.0 6	11.0 6	12.0 6	6.0 6	10.0 6	24	19.0
5	12.0 6	9.0 6	14.0 6	14.0 6	11.0 6	6.0 6	11.0 6	10.0 6	11.0 6	20.0 6	13.0 6	16.0 6	12.0	12.0	13.0	14.0	16.0	5.0	11.0	14.0	13.0	12.0	14.0	14.0	24	20.0
6	11.0	14.0	10.0	12.0	14.0	11.0	13.0	14.0	17.0	12.0	18.0	15.0	11.0	11.0	8.0	9.0	7.0	9.0	6.0	4.0	10.0	11.0	8.0	10.0	24	18.0
7	7.0	8.0	11.0	10.0	10.0	7.0	5.0	9.0	14.0	8.0	9.0	8.0	12.0	11.0	8.0	4.0	9.0	8.0	7.0	6.0	10.0	15.0	15.0	14.0	24	15.0
8	15.0	18.0	15.0	14.0	15.0	13.0	16.0	14.0	25.0	18.0	20.0	15.0	17.0	14.0	15.0	11.0	11.0	7.0	10.0	7.0	15.0	14.0	12.0	14.0	24	25.0
9	10.0	12.0	13.0	9.0	14.0	15.0	11.0	12.0	13.0	18.0	17.0	17.0	13.0	14.0	14.0	16.0	9.0	.0	9.0	7.0	12.0	14.0	13.0	12.0	24	18.0
10	12.0	10.0	9.0	9.0	12.0	12.0	10.0	11.0	12.0	12.0	9.0	12.0	12.0	13.0	12.0	10.0	8.0	4.0	6.0	4.0	6.0	9.0	7.0	6.0	24	13.0
11	13.0	9.0	10.0	4.0	8.0	7.0	11.0	9.0	16.0	14.0	15.0	15.0	8.0	13.0	14.0	8.0	11.0	12.0	6.0	10.0	13.0	12.0	13.0	13.0	24	16.0
12	11.0	13.0	13.0	15.0	10.0	15.0	9.0	14.0	20.0	16.0	19.0	20.0	12.0	9.0	21.0	16.0	10.0	17.0	5.0	13.0	14.0	17.0	6.0	8.0	24	21.0
13	8.0	6.0	4.0	6.0	7.0	7.0	10.0	10.0	14.0	12.0	13.0	11.0	15.0	8.0	9.0	13.0	7.0	9.0	7.0	6.0	8.0	7.0	5.0	6.0	24	15.0
14	6.0	6.0	6.0	3.0	5.0	3.0	4.0	8.0	6.0	10.0	9.0	8.0	7.0	12.0	13.0	11.0	4.0	10.0	8.0	7.0	11.0	10.0	11.0	11.0	24	13.0
15	10.0	11.0	11.0	9.0	8.0	5.0	12.0	9.0	8.0	11.0	13.0	15.0	10.0	12.0	9.0	16.0	14.0	11.0	7.0	6.0	6.0	7.0	7.0	7.0	24	16.0
16	8.0	10.0	7.0	9.0	10.0	7.0	9.0	8.0	8.0	13.0	10.0	4.0	11.0	11.0	10.0	13.0	8.0	9.0	6.0	8.0	12.0	12.0	11.0	11.0	24	13.0
17	8.0	9.0	13.0	9.0	9.0	11.0	9.0	16.0	6.0	13.0	12.0	13.0	8.0	12.0	14.0	9.0	10.0	6.0	4.0	4.0	10.0	13.0	12.0	10.0	24	16.0
18	12.0	12.0	15.0	13.0	12.0	10.0	11.0	8.0	9.0	11.0	16.0	16.0	6.0	6.0	7.0	7.0	.0	6.0	1.0	-3.0	6.0	1.0	6.0	5.0	24	16.0
19	2.0	7.0	5.0	5.0	6.0	3.0	3.0	2.0	12.0	13.0	8.0	6.0	7.0	4.0	10.0	7.0	6.0	3.0	1.0	3.0	7.0	9.0	12.0	13.0	24	13.0
20	15.0	21.0	19.0	15.0	16.0	13.0	10.0	14.0	13.0	13.0	18.0	19.0	15.0	25.0	19.0	19.0	27.0	23.0	22.0	15.0	22.0	16.0	16.0	18.0	24	27.0
21	13.0	17.0	14.0	16.0	14.0	13.0	16.0	14.0	15.0	17.0	17.0	15.0	23.0	6.0	10.0	10.0	13.0	10.0	4.0	9.0	13.0	11.0	13.0	10.0	24	23.0
22	13.0	11.0	9.0	12.0	15.0	11.0	15.0	11.0	17.0	18.0	18.0	19.0	BA	BA	16.0	17.0	13.0	7.0	9.0	9.0	18.0	15.0	16.0	17.0	22	19.0
23	14.0	16.0	16.0	16.0	16.0	14.0	16.0	17.0	13.0	18.0	15.0	11.0	13.0	10.0	9.0	8.0	9.0	6.0	5.0	3.0	9.0	13.0	13.0	14.0	24	18.0
24	14.0	16.0	14.0	9.0	12.0	12.0	10.0	9.0	10.0	12.0	14.0	10.0	9.0	8.0	11.0	9.0	9.0	7.0	3.0	11.0	13.0	14.0	12.0	14.0	24	16.0
25	13.0	12.0	14.0	11.0	8.0	8.0	9.0	10.0	15.0	12.0	7.0	8.0	12.0	7.0	12.0	13.0	3.0	10.0	5.0	9.0	12.0	11.0	11.0	9.0	24	15.0
26	8.0	8.0	7.0	9.0	10.0	8.0	9.0	10.0	6.0	12.0	8.0	12.0	11.0	6.0	7.0	8.0	8.0	12.0	6.0	12.0	12.0	13.0	14.0	15.0	24	15.0
27	16.0	18.0	14.0	16.0	14.0	16.0	18.0	15.0	17.0	19.0	18.0	14.0	14.0	11.0	18.0	14.0	18.0	10.0	11.0	6.0	14.0	9.0	10.0	9.0	24	19.0
28	9.0	11.0	10.0	10.0	12.0	9.0	7.0	7.0	7.0	5.0	8.0	8.0	9.0	7.0	8.0	8.0	5.0	7.0	5.0	5.0	8.0	11.0	8.0	12.0	24	12.0
29	10.0	13.0	8.0	11.0	7.0	13.0	10.0	8.0	11.0	11.0	7.0	8.0	7.0	8.0	7.0	9.0	8.0	8.0	3.0	6.0	9.0	9.0	9.0	11.0	24	13.0
30	14.0	11.0	8.0	9.0	9.0	7.0	8.0	7.0	15.0	18.0	11.0	15.0	11.0	8.0	5.0	12.0	8.0	3.0	.0	10.0	11.0	16.0	17.0	8.0	24	18.0
31																									0	.
NO.:	30	30	30	30	30	30	30	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	30	30		
MAX:	16.0	21.0	19.0	16.0	16.0	16.0	18.0	17.0	25.0	20.0	20.0	20.0	23.0	25.0	21.0	19.0	27.0	23.0	22.0	15.0	22.0	17.0	17.0	18.0		
AVG:	11.03	11.63	11.13	10.47	10.77	9.87	10.40	10.83	12.80	13.67	12.97	12.30	11.34	10.34	11.33	10.80	9.77	8.80	6.80	7.67	11.40	11.47	10.97	11.00		

MONTHLY OBSERVATIONS: 718 MONTHLY MEAN: 10.81 MONTHLY MAX: 27.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	11.0	10.0	10.0	14.0	10.0	11.0	11.0	8.0	11.0	19.0	15.0	13.0	9.0	12.0	10.0	12.0	8.0	10.0	1.0	8.0	9.0	13.0	11.0	13.0	24	19.0
2	14.0	12.0	12.0	12.0	14.0	13.0	11.0	14.0	16.0	13.0	AX	22.0	9.0	12.0	9.0	11.0	10.0	8.0	4.0	6.0	6.0	11.0	11.0	13.0	23	22.0
3	12.0	10.0	9.0	7.0	9.0	11.0	7.0	5.0	12.0	14.0	13.0	12.0	6.0	12.0	9.0	3.0	7.0	7.0	2.0	7.0	10.0	12.0	14.0	13.0	24	14.0
4	11.0	13.0	11.0	13.0	15.0	11.0	14.0	16.0	22.0	19.0	22.0	19.0	15.0	10.0	11.0	12.0	10.0	9.0	4.0	11.0	14.0	16.0	16.0	16.0	24	22.0
5	17.0	13.0	13.0	17.0	17.0	16.0	15.0	14.0	18.0	17.0	19.0	14.0	13.0	11.0	9.0	11.0	13.0	6.0	11.0	13.0	11.0	13.0	13.0	17.0	24	19.0
6	16.0	18.0	18.0	21.0	20.0	14.0	13.0	16.0	17.0	18.0	13.0	10.0	14.0	12.0	20.0	17.0	5.0	14.0	8.0	4.0	7.0	5.0	7.0	9.0	24	21.0
7	12.0	7.0	4.0	2.0	3.0	3.0	3.0	-1.0	6.0	5.0	4.0	3.0	.0	5.0	2.0	4.0	-1.0	-1.0	.0	-1.0	2.0	5.0	.0	3.0	24	12.0
8	3.0	2.0	4.0	4.0	5.0	6.0	4.0	.0	8.0	3.0	7.0	5.0	6.0	7.0	.0	4.0	.0	3.0	-4.0	2.0	6.0	8.0	6.0	4.0	24	8.0
9	7.0	9.0	3.0	4.0	4.0	6.0	3.0	4.0	12.0	8.0	11.0	11.0	9.0	5.0	12.0	12.0	4.0	7.0	1.0	3.0	7.0	7.0	5.0	7.0	24	12.0
10	5.0	8.0	9.0	6.0	13.0	9.0	4.0	6.0	13.0	12.0	12.0	16.0	12.0	18.0	13.0	4.0	12.0	8.0	6.0	7.0	6.0	10.0	7.0	13.0	24	18.0
11	12.0	13.0	13.0	11.0	13.0	12.0	14.0	12.0	14.0	11.0	15.0	15.0	17.0	19.0	20.0	19.0	20.0	21.0	18.0	12.0	13.0	10.0	14.0	17.0	24	21.0
12	14.0	8.0	5.0	7.0	4.0	3.0	3.0	4.0	2.0	6.0	2.0	7.0	8.0	5.0	7.0	5.0	6.0	3.0	4.0	8.0	4.0	6.0	6.0	4.0	24	14.0
13	3.0	4.0	7.0	6.0	8.0	6.0	7.0	8.0	6.0	10.0	7.0	5.0	11.0	4.0	6.0	3.0	6.0	9.0	5.0	5.0	3.0	7.0	3.0	7.0	24	11.0
14	3.0	6.0	6.0	4.0	9.0	3.0	8.0	4.0	6.0	9.0	9.0	11.0	5.0	9.0	4.0	3.0	3.0	.0	-2.0	.0	5.0	1.0	1.0	.0	24	11.0
15	1.0	-1.0	3.0	3.0	-1.0	3.0	1.0	.0	5.0	2.0	.0	3.0	3.0	.0	2.0	1.0	-6.0	-2.0	1.0	-2.0	.0	1.0	.0	4.0	24	5.0
16	3.0	1.0	3.0	5.0	1.0	3.0	2.0	4.0	5.0	1.0	2.0	4.0	BA	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	12	5.0
17	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
18	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
19	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
20	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
21	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
22	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	0	
23	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT	11.0	13.0	12.0	12.0	7.0	6.0	16.0	12.0	10.0	12.0	12.0	12.0	12	16.0
24	11.0	15.0	12.0	14.0	13.0	13.0	13.0	12.0	17.0	13.0	16.0	10.0	8.0	7.0	7.0	9.0	5.0	7.0	1.0	4.0	7.0	8.0	10.0	12.0	24	17.0
25	13.0	16.0	15.0	20.0	26.0	28.0	29.0	24.0	23.0	18.0	20.0	12.0	11.0	4.0	8.0	6.0	4.0	5.0	2.0	7.0	6.0	8.0	11.0	12.0	24	29.0
26	10.0	11.0	10.0	11.0	10.0	10.0	10.0	8.0	12.0	13.0	10.0	10.0	8.0	4.0	7.0	8.0	6.0	2.0	2.0	8.0	8.0	8.0	9.0	10.0	24	13.0
27	14.0	8.0	10.0	5.0	12.0	8.0	6.0	12.0	18.0	13.0	15.0	14.0	10.0	5.0	6.0	10.0	-4.0	5.0	11.0	6.0	7.0	11.0	9.0	7.0	24	18.0
28	11.0	6.0	10.0	13.0	12.0	11.0	10.0	10.0	14.0	20.0	14.0	12.0	10.0	9.0	11.0	9.0	8.0	7.0	3.0	8.0	7.0	13.0	14.0	8.0	24	20.0
29	10.0	13.0	18.0	15.0	12.0	9.0	12.0	9.0	16.0	19.0	17.0	14.0	7.0	9.0	11.0	7.0	8.0	6.0	7.0	6.0	8.0	4.0	6.0	9.0	24	19.0
30	10.0	14.0	10.0	12.0	11.0	8.0	10.0	9.0	16.0	14.0	20.0	4.0	4.0	-1.0	-2.0	-3.0	.0	.0	3.0	2.0	-2.0	6.0	2.0	-1.0	24	20.0
31	-3.0	.0	3.0	4.0	4.0	1.0	2.0	4.0	1.0	2.0	1.0	.0	4.0	3.0	4.0	4.0	4.0	3.0	-2.0	2.0	6.0	5.0	5.0	2.0	24	6.0
NO.:	24	24	24	24	24	24	24	24	24	24	23	24	24	24	24	24	24	24	24	24	24	24	24	24		
MAX:	17.0	18.0	18.0	21.0	26.0	28.0	29.0	24.0	23.0	20.0	22.0	22.0	17.0	19.0	20.0	19.0	20.0	21.0	18.0	13.0	14.0	16.0	16.0	17.0		
AVG:	9.17	9.00	9.08	9.58	10.17	9.08	8.83	8.42	12.08	11.63	11.48	10.25	8.75	8.08	8.25	7.63	5.63	5.96	4.25	5.75	6.67	8.33	8.00	8.79		

MONTHLY OBSERVATIONS: 575 MONTHLY MEAN: 8.53 MONTHLY MAX: 29.0

Note: Qualifier codes with regional concurrence are shown in upper-case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM

REPORT

, 2024

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	7.0	6.0	6.0	4.0	5.0	1.0	4.0	3.0	11.0	8.0	5.0	2.0	3.0	5.0	4.0	3.0	6.0	4.0	2.0	5.0	6.0	5.0	7.0	6.0	24	11.0
2	8.0 6	8.0 6	5.0 6	6.0 6	6.0 6	4.0 6	5.0 6	6.0 6	14.0 6	14.0 6	12.0 6	12.0 6	9.0 6	11.0 6	8.0 6	8.0 6	8.0 6	7.0 6	1.0 6	9.0 6	10.0 6	9.0 6	10.0 6	9.0 6	24	14.0
3	11.0 6	10.0 6	7.0 6	10.0 6	15.0 6	17.0 6	16.0 6	15.0 6	21.0 6	16.0 6	11.0 6	14.0 6	11.0 6	11.0 6	9.0 6	10.0 6	6.0 6	4.0 6	.0 6	10.0 6	13.0 6	16.0 6	13.0 6	16.0 6	24	21.0
4	21.0 6	16.0 6	14.0 6	11.0 6	11.0 6	10.0 6	10.0 6	8.0 6	17.0 6	19.0 6	27.0 6	24.0 6	20.0 6	18.0 6	20.0 6	12.0 6	10.0 6	6.0 6	2.0 6	8.0 6	15.0 6	18.0 6	22.0 6	17.0 6	24	27.0
5	15.0 6	16.0 6	17.0 6	16.0 6	13.0 6	15.0 6	17.0 6	13.0 6	17.0 6	16.0 6	19.0 6	21.0 6	21.0 6	12.0 6	10.0 6	6.0 6	AV	AV	5.0 6	10.0 6	9.0 6	15.0 6	12.0 6	14.0 6	22	21.0
6	13.0 6	14.0 6	11.0 6	15.0 6	10.0 6	13.0 6	14.0 6	15.0 6	20.0 6	18.0 6	25.0 6	23.0	17.0	14.0	9.0	9.0	11.0	11.0	12.0	13.0	12.0	20.0	18.0	20.0	24	25.0
7	21.0	19.0	18.0	20.0	20.0	18.0	17.0	16.0	19.0	20.0	28.0	21.0	15.0	13.0	13.0	9.0	12.0	8.0	10.0	6.0	14.0	16.0	15.0	17.0	24	28.0
8	19.0	16.0	16.0	15.0	16.0	18.0	11.0	14.0	22.0	22.0	23.0	19.0	15.0	13.0	8.0	13.0	7.0	7.0	6.0	9.0	5.0	10.0	11.0	7.0	24	23.0
9	7.0	11.0	8.0	9.0	10.0	5.0	12.0	16.0	15.0	14.0	13.0	19.0	13.0	13.0	16.0	14.0	13.0	14.0	9.0	11.0	10.0	10.0	10.0	11.0	24	19.0
10	13.0	14.0	13.0	12.0	12.0	16.0	14.0	13.0	17.0	12.0	7.0	9.0	8.0	8.0	9.0	4.0	5.0	5.0	3.0	8.0	4.0	7.0	5.0	4.0	24	17.0
11	6.0	5.0	8.0	AV	AV	7.0	4.0	5.0	7.0	6.0	6.0	5.0	7.0	4.0	6.0	3.0	4.0	4.0	6.0	4.0	8.0	5.0	5.0	8.0	22	8.0
12	3.0	7.0	3.0	8.0	6.0	5.0	4.0	7.0	8.0	5.0	9.0	7.0	8.0	5.0	9.0	6.0	4.0	5.0	1.0	5.0	5.0	4.0	8.0	9.0	24	9.0
13	5.0	8.0	9.0	9.0	7.0	9.0	10.0	7.0	8.0	9.0	10.0	10.0	13.0	10.0	11.0	4.0	4.0	7.0	6.0	10.0	14.0	14.0	9.0	13.0	24	14.0
14	12.0	15.0	15.0	11.0	9.0	6.0	10.0	7.0	5.0	7.0	11.0	11.0	BL	14.0	4.0	13.0	10.0	9.0	14.0	10.0	17.0	10.0	11.0	13.0	23	17.0
15	9.0	6.0	3.0	9.0	9.0	14.0	11.0	8.0	10.0	12.0	10.0	12.0	10.0	11.0	7.0	7.0	6.0	7.0	4.0	10.0	7.0	5.0	8.0	8.0	24	14.0
16	9.0	7.0	9.0	7.0	8.0	9.0	7.0	4.0	5.0	11.0	9.0	10.0	10.0	5.0	9.0	8.0	4.0	1.0	7.0	6.0	4.0	5.0	8.0	8.0	24	11.0
17	8.0	6.0	10.0	10.0	12.0	12.0	13.0	10.0	13.0	12.0	13.0	15.0	8.0	11.0	7.0	5.0	6.0	6.0	8.0	6.0	9.0	10.0	7.0	3.0	24	15.0
18	5.0	6.0	2.0	3.0	2.0	.0	4.0	5.0	8.0	9.0	10.0	9.0	9.0	8.0	8.0	6.0	5.0	4.0	5.0	7.0	7.0	7.0	6.0	8.0	24	10.0
19	7.0	5.0	8.0	7.0	10.0	6.0	5.0	6.0	7.0	8.0	6.0	8.0	8.0	11.0	8.0	8.0	6.0	5.0	7.0	10.0	12.0	16.0	13.0	14.0	24	16.0
20	17.0	12.0	16.0	16.0	12.0	13.0	17.0	13.0	14.0	17.0	13.0	13.0	11.0	8.0	7.0	7.0	8.0	6.0	6.0	8.0	11.0	10.0	8.0	10.0	24	17.0
21	9.0	9.0	5.0	2.0	8.0	6.0	4.0	5.0	5.0	4.0	.0	6.0	4.0	6.0	.0	4.0	8.0	4.0	2.0	6.0	6.0	9.0	11.0	3.0	24	11.0
22	4.0	5.0	3.0	9.0	7.0	9.0	.0	.0	2.0	2.0	7.0	-1.0	BA	BA	BA	10.0	4.0	3.0	2.0	4.0	5.0	3.0	6.0	7.0	21	10.0
23	6.0	10.0	8.0	7.0	10.0	9.0	10.0	7.0	11.0	12.0	5.0	9.0	4.0	5.0	5.0	5.0	3.0	4.0	5.0	11.0	10.0	15.0	12.0	12.0	24	15.0
24	12.0	10.0	10.0	12.0	10.0	9.0	11.0	9.0	12.0	14.0	9.0	10.0	11.0	13.0	13.0	10.0	5.0	2.0	3.0	12.0	6.0	7.0	8.0	9.0	24	14.0
25	14.0	10.0	8.0	11.0	9.0	7.0	9.0	10.0	8.0	16.0	15.0	15.0	17.0	17.0	10.0	11.0	9.0	8.0	7.0	6.0	13.0	11.0	19.0	14.0	24	19.0
26	21.0	15.0	20.0	14.0	19.0	19.0	12.0	18.0	16.0	11.0	15.0	17.0	14.0	11.0	9.0	10.0	8.0	3.0	5.0	5.0	6.0	6.0	9.0	8.0	24	21.0
27	5.0	1.0	3.0	4.0	5.0	.0	4.0	8.0	6.0	5.0	9.0	12.0	5.0	9.0	8.0	6.0	5.0	1.0	7.0	6.0	10.0	6.0	5.0	7.0	24	12.0
28	7.0	8.0	10.0	5.0	4.0	5.0	8.0	6.0	6.0	7.0	8.0	5.0	4.0	4.0	2.0	6.0	2.0	1.0	-2.0	7.0	5.0	6.0	10.0	6.0	24	10.0
29	6.0	7.0	7.0	7.0	7.0	8.0	7.0	6.0	4.0	11.0	13.0	14.0	9.0	5.0	10.0	10.0	9.0	3.0	4.0	5.0	6.0	5.0	10.0	11.0	24	14.0
30	16.0	14.0	12.0	17.0	15.0	9.0	10.0	9.0	5.0	15.0	19.0	17.0	BA	14.0	10.0	7.0	.0	.0	9.0	8.0	7.0	10.0	10.0	12.0	23	19.0
31																									0	
NO.:	30	30	30	29	29	30	30	30	30	30	30	30	27	29	29	30	29	29	30	30	30	30	30	30		
MAX:	21.0	19.0	20.0	20.0	20.0	19.0	17.0	18.0	22.0	22.0	28.0	24.0	21.0	18.0	20.0	14.0	13.0	14.0	14.0	13.0	17.0	20.0	22.0	20.0		
AVG:	10.53	9.87	9.47	9.86	9.90	9.30	9.33	8.97	11.10	11.73	12.23	12.27	10.52	9.97	8.59	7.80	6.48	5.14	5.20	7.83	8.87	9.67	10.20	10.13		

MONTHLY OBSERVATIONS: 711 MONTHLY MEAN: 9.38 MONTHLY MAX: 28.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2023

DURATION: 1 HOUR
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	15.0	18.0	19.0	17.0	16.0	15.0	18.0	15.0	18.0	16.0	16.0	16.0	16.0	16.0	19.0	16.0	15.0	13.0	13.0	14.0	17.0	16.0	20.0	14.0	24	20.0
2	19.0	18.0	19.0	17.0	18.0	14.0	13.0	12.0	9.0	6.0	9.0	12.0	10.0	8.0	12.0	8.0	5.0	5.0	7.0	8.0	1.0	4.0	.0	3.0	24	19.0
3	1.0	6.0	-2.0	2.0	-1.0	3.0	2.0	2.0	.0	2.0	5.0	4.0	2.0	5.0	1.0	7.0	8.0	3.0	4.0	9.0	8.0	7.0	13.0	10.0	24	13.0
4	8.0	6.0	7.0	9.0	10.0	8.0	4.0	7.0	9.0	9.0	15.0	10.0	2.0	3.0	4.0	5.0	7.0	-2.0	2.0	2.0	4.0	3.0	5.0	5.0	24	15.0
5	7.0	6.0	8.0	7.0	8.0	7.0	5.0	7.0	7.0	7.0	12.0	8.0	3.0	5.0	BC	8.0	4.0	1.0	4.0	7.0	5.0	6.0	-1.0	1.0	23	12.0
6	5.0	1.0	1.0	1.0	7.0	6.0	4.0	7.0	1.0	11.0	-2.0	3.0	7.0	3.0	3.0	2.0	3.0	2.0	-1.0	2.0	4.0	4.0	8.0	11.0	24	11.0
7	15.0	13.0	13.0	9.0	10.0	11.0	8.0	10.0	9.0	10.0	17.0	11.0	9.0	11.0	9.0	8.0	7.0	5.0	5.0	6.0	9.0	12.0	10.0	12.0	24	17.0
8	16.0	20.0	17.0	20.0	18.0	20.0	20.0	21.0	21.0	23.0	20.0	23.0	18.0	23.0	17.0	12.0	11.0	3.0	12.0	27.0	20.0	21.0	13.0	12.0	24	27.0
9	13.0	15.0	15.0	13.0	16.0	16.0	15.0	9.0	12.0	15.0	12.0	12.0	13.0	13.0	11.0	14.0	3.0	11.0	8.0	12.0	9.0	6.0	10.0	10.0	24	16.0
10	7.0	-1.0	4.0	2.0	4.0	2.0	3.0	-4.0	-1.0	5.0	5.0	.0	5.0	3.0	1.0	1.0	5.0	-1.0	2.0	2.0	7.0	6.0	.0	1.0	24	7.0
11	1.0	4.0	1.0	2.0	5.0	4.0	1.0	.0	.0	6.0	2.0	4.0	.0	3.0	3.0	2.0	3.0	1.0	2.0	6.0	8.0	7.0	12.0	11.0	24	12.0
12	12.0	10.0	8.0	11.0	9.0	7.0	5.0	5.0	11.0	23.0	16.0	10.0	6.0	8.0	9.0	8.0	7.0	8.0	13.0	10.0	14.0	31.0	23.0	16.0	24	31.0
13	23.0	18.0	13.0	16.0	17.0	16.0	16.0	14.0	9.0	13.0	15.0	13.0	13.0	11.0	9.0	7.0	9.0	6.0	11.0	16.0	10.0	12.0	14.0	18.0	24	23.0
14	16.0	16.0	16.0	18.0	17.0	15.0	14.0	8.0	6.0	12.0	9.0	11.0	9.0	7.0	9.0	11.0	7.0	2.0	4.0	5.0	13.0	15.0	8.0	12.0	24	18.0
15	13.0	16.0	12.0	12.0	12.0	15.0	10.0	14.0	8.0	14.0	14.0	7.0	9.0	12.0	3.0	11.0	18.0	8.0	6.0	15.0	12.0	14.0	16.0	12.0	24	18.0
16	14.0	13.0	10.0	13.0	11.0	12.0	10.0	14.0	10.0	13.0	12.0	12.0	12.0	5.0	12.0	5.0	8.0	3.0	6.0	7.0	3.0	7.0	9.0	7.0	24	14.0
17	8.0	2.0	4.0	6.0	11.0	5.0	6.0	10.0	6.0	11.0	5.0	7.0	2.0	12.0	2.0	5.0	2.0	4.0	6.0	5.0	1.0	6.0	4.0	7.0	24	12.0
18	3.0	3.0	3.0	2.0	5.0	4.0	5.0	6.0	1.0	11.0	8.0	9.0	3.0	8.0	1.0	3.0	3.0	-3.0	3.0	5.0	3.0	2.0	3.0	3.0	24	11.0
19	-2.0	-3.0	1.0	4.0	-2.0	2.0	2.0	2.0	-3.0	7.0	5.0	7.0	4.0	6.0	6.0	3.0	6.0	.0	5.0	7.0	7.0	11.0	12.0	12.0	24	12.0
20	11.0	10.0	16.0	12.0	5.0	10.0	8.0	8.0	10.0	15.0	15.0	12.0	14.0	3.0	12.0	14.0	10.0	5.0	9.0	12.0	13.0	19.0	17.0	15.0	24	19.0
21	17.0	17.0	12.0	17.0	17.0	13.0	17.0	12.0	15.0	19.0	15.0	21.0	BA	13.0	19.0	8.0	11.0	8.0	10.0	17.0	16.0	21.0	25.0	27.0	23	27.0
22	23.0	22.0	19.0	23.0	24.0	23.0	16.0	18.0	19.0	18.0	27.0	17.0	14.0	27.0	21.0	16.0	17.0	16.0	16.0	17.0	28.0	28.0	26.0	30.0	24	30.0
23	28.0	29.0	28.0	22.0	24.0	21.0	20.0	23.0	19.0	32.0	24.0	27.0	27.0	15.0	15.0	16.0	12.0	6.0	1.0	9.0	19.0	25.0	18.0	21.0	24	32.0
24	20.0	18.0	16.0	16.0	14.0	18.0	15.0	21.0	13.0	17.0	13.0	15.0	17.0	11.0	10.0	12.0	3.0	.0	2.0	5.0	7.0	10.0	5.0	7.0	24	21.0
25	4.0	1.0	.0	4.0	5.0	1.0	7.0	2.0	4.0	9.0	-1.0	1.0	5.0	5.0	5.0	3.0	2.0	.0	-3.0	8.0	5.0	5.0	1.0	7.0	24	9.0
26	7.0	7.0	5.0	4.0	6.0	7.0	3.0	.0	1.0	3.0	3.0	9.0	4.0	8.0	5.0	11.0	5.0	6.0	9.0	3.0	11.0	7.0	7.0	9.0	24	11.0
27	8.0	4.0	7.0	4.0	7.0	9.0	4.0	7.0	11.0	5.0	7.0	11.0	8.0	8.0	8.0	4.0	7.0	10.0	5.0	15.0	16.0	10.0	10.0	11.0	24	16.0
28	6.0	10.0	9.0	6.0	8.0	6.0	4.0	4.0	.0	4.0	4.0	4.0	3.0	3.0	5.0	4.0	5.0	1.0	2.0	8.0	5.0	5.0	7.0	6.0	24	10.0
29	4.0	7.0	4.0	4.0	6.0	6.0	4.0	2.0	6.0	3.0	5.0	2.0	1.0	6.0	6.0	5.0	6.0	3.0	3.0	8.0	6.0	5.0	6.0	4.0	24	8.0
30	5.0	6.0	4.0	4.0	4.0	6.0	6.0	1.0	6.0	5.0	5.0	6.0	7.0	4.0	6.0	4.0	4.0	5.0	6.0	2.0	8.0	7.0	2.0	6.0	24	8.0
31	5.0	8.0	9.0	13.0	9.0	9.0	11.0	8.0	5.0	7.0	11.0	14.0	15.0	17.0	12.0	14.0	9.0	4.0	2.0	4.0	10.0	31.0IH	28.0IH	39.0IH	24	39.0
NO.:	31	31	31	31	31	31	31	31	31	31	31	31	30	31	30	31	31	31	31	31	31	31	31	31		
MAX:	28.0	29.0	28.0	23.0	24.0	23.0	20.0	23.0	21.0	32.0	27.0	27.0	27.0	27.0	21.0	16.0	18.0	16.0	16.0	27.0	28.0	31.0	28.0	39.0		
AVG:	10.71	10.32	9.61	10.00	10.32	10.03	8.90	8.55	7.81	11.32	10.42	10.26	8.60	9.10	8.50	7.97	7.16	4.29	5.61	8.81	9.65	11.71	10.68	11.58		

MONTHLY OBSERVATIONS: 742 MONTHLY MEAN: 9.25 MONTHLY MAX: 39.0

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM

REPORT

(44201) , 2024

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.018	.027	.036	.032	.032	.030	.026	.029	.030	.031	.031	.032	.032	.030	.028	.029	.030	.029	.030	.030	.030	.030	.031	23	.036
2	BF	.029	.030	.030	.030	.029	.029	.028	.028	.029	.031	.031	.030	.030	.029	.027	.026	.022	.017	.017	.019	.026	.023	.024	23	.031
3	BF	.027	.021	.019	.019	.020	.018	.019	.024	.029	.041	.044	.047	.048	.048	.050	.049	.048	.042	.043	.037	.037	.024	.025	23	.050
4	BF	.016	.016	.014	.011	.009	.011	.012	.036	.039	.047	.051	.054	.056	.056	.056	.058	.056	.053	.051	.046	.041	.037	.033	23	.058
5	BF	.018	.019	.014	.012	.012	.011	.025	.037	.040	.042	.044	.045	.047	.048	.047	.046	.043	.040	.041	.041	.038	.036	.037	23	.048
6	BF	.040	.040	.037	.035	.031	.034	.037	.038	.041	.044	.044	.046	.048	.050	.051	.050	.049	.045	.044	.043	.039	.041	.039	23	.051
7	BF	.037	.038	.033	.030	.021	.021	.029	.039	.045	.047	.048	.050	.051	.050	.051	.050	.049	.039	.035	.026	.021	.021	.018	23	.051
8	BF	.017	.015	.013	.010	.006	.005	.011	.030	.041	.048	.051	.052	.053	.058	.058	.054	.050	.040	.036	.030	.032	.024	.017	23	.058
9	BF	.013	.011	.009	.006	.005	.005	.012	.025	.042	.049	.056	.061	.062	.062	.067	.064	.057	.055	.052	.048	.032	.035	.029	23	.067
10	BF	.023	.020	.017	.017	.018	.015	.020	.030	.040	.047	.052	.053	.052	.052	.052	.052	.051	.051	.053	.052	.050	.045	.038	23	.053
11	BF	.040	.037	.033	.028	.021	.020	.020	.030	.035	BA	BA	.044	.047	.050	.055	.052	.049	.040	.037	.030	.027	.021	.020	21	.055
12	BF	.018	.012	.011	.008	.006	.007	.016	.020	.024	.032	.039	.044	.048	.050	.052	.052	.048	.043	.033	.033	.026	.020	.017	23	.052
13	BF	.014	.011	.008	.006	.005	.004	.009	.021	.035	.037	.045	.045	.047	.044	.045	.045	.042	.036	.032	.031	.029	.027	.025	23	.047
14	BF	.024	.024	.023	.020	.020	.020	.021	.024	.027	.035	.042	.047	.050	.052	.054	.054	.047	.034	.033	.033	.039	.038	.034	23	.054
15	BF	.033	.032	.030	.030	.028	.026	.023	.024	.030	.032	.034	.035	.036	.036	.036	.029	.026	.025	.025	.029	.031	.032	.033	23	.036
16	BF	.030	.028	.027	.025	.024	.025	.027	.027	.027	.025	.026	.025	.024	.023	.023	.021	.020	.018	.017	.015	.013	.012	.012	23	.030
17	BF	.010	.009	.009	.008	.007	.007	.006	.006	.008	.010	.010	.009	.009	.009	.009	.013	.012	.012	.020	.021	.024	.033	.035	23	.035
18	BF	.038	.037	.034	.031	.031	.032	.032	.033	.038	.041	.041	.037	.033	.031	.024	.020	.020	.020	.022	.025	.029	.029	.028	23	.041
19	BF	.028	.028	.028	.027	.026	.026	.024	.023	.022	.022	.026	.028	.029	.029	.029	.028	.027	.027	.026	.026	.025	.028	.029	23	.029
20	BF	.025	.025	.029	.039	.040	.040	.040	.042	.042	.044	.046	.049	.051	.052	.053	.053	.049	.036	.031	.027	.023	.019	.024	23	.053
21	BF	.025	.026	.025	.030	.030	.029	.032	.033	.037	.040	.042	.044	.045	.046	.046	.047	.046	.039	.033	.025	.026	.024	.026	23	.047
22	BF	.015	.014	.010	.011	.009	.010	.028	.034	.041	.044	.045	.048	.049	.051	.053	.053	.051	.044	.037	.034	.043	.044	.043	23	.053
23	BF	.045	.044	.043	.043	.043	.041	.039	.038	.038	.039	.037	.035	.035	.035	.034	.032	.036	.040	.041	.041	.037	.025	.018	23	.045
24	BF	.018	.018	.012	.009	.011	.009	.010	.021	.029	.037	.042	.043	.045	.045	.045	.045	.043	.033	.035	.034	.027	.023	.029	23	.045
25	BF	.024	.022	.023	.024	.030	.036	BA	BA	.018	.012	.012	.014	.014	.022	.017	.018	.019	.021	.019	.016	AV	.015	.016	20	.036
26	BF	.029	.029	.032	.032	.023	.020	.029	.031	AX	.037	.040	.042	.044	.043	.045	.042	.035	.029	.021	.020	.015	.012	.012	22	.045
27	BF	.009	.008	.007	.007	.004	.005	.010	.014	.019	.022	.024	.027	.028	.027	.027	.026	.024	.022	.018	.023	.024	.023	.023	23	.028
28	BF	.019	.021	.020	.021	.020	.019	.032	.032	.033	.037	.036	.037	.038	.039	.040	.041	.040	.043	.041	.040	.038	.038	.038	23	.043
29	BF	.036	.036	.035	.025	.017	.020	.032	.038	.042	.044	.046	.048	.050	.050	.050	.050	.046	.034	.023	.022	.021	.015	.016	23	.050
30	BF	.016	.013	.011	.011	.010	.021	.025	.029	.036	.042	.045	.046	.045	.048	.050	.047	.042	.038	.036	.034	.034	.030	.027	23	.050
31	BF	.026	.024	.022	.022	.033	.034	.031	.033	.033	.028	.029	.031	.029	.031	.035	.033	.033	.036	.040	.039	.033	.035	.034	23	.040
NO.:		31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31	30	31	31		
MAX:		.045	.044	.043	.043	.043	.041	.040	.042	.045	.049	.056	.061	.062	.062	.067	.064	.057	.055	.053	.052	.050	.045	.043		
AVG:		.0245	.0237	.0224	.0213	.0200	.0203	.0235	.0290	.0330	.0362	.0386	.0403	.0411	.0418	.0422	.0413	.0390	.0349	.0330	.0313	.0303	.0277	.0268		

MONTHLY OBSERVATIONS: 707 MONTHLY MEAN: .0314 MONTHLY MAX: .067

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.026	.033	.038	.041	.040	.040	.041	.044	.045	.046	.046	.046	.046	.047	.048	.048	.048	.046	.043	.042	.042	.040	.039	23	.048
2	BF	.036	.036	.035	.035	.035	.036	.038	.040	.041	.043	.046	.047	.048	.049	.050	.049	.049	.039	.028	.021	.021	.017	.016	23	.050
3	BF	.012	.012	.010	.008	.007	.008	.017	.033	.035	.041	.047	.049	.048	.049	.051	.052	.049	.037	.029	.027	.022	.020	.018	23	.052
4	BF	.012	.011	.009	.008	.007	.008	.017	.030	.040	.050	.054	.055	.057	.057	.057	.055	.052	.044	.033	.028	.023	.020	.017	23	.057
5	BF	.012	.011	.008	.006	.006	.007	.017	.029	.041	.048	.054	.055	.059	.060	.063	.062	.058	.049	.034	.037	.027	.030	.023	23	.063
6	BF	.015	.015	.012	.010	.006	.010	.020	.032	.040	.049	.057	.062	.064	.060	.059	.058	.056	.045	.036	.026	.028	.022	.020	23	.064
7	BF	.013	.012	.011	.009	.010	.012	.024	.026	BA	BA	.037	.047	.049	.052	.052	.048	.047	.049	.043	.037	.032	.028	.034	21	.052
8	BF	.035	.035	.034	.034	.035	.035	.035	.035	.038	.039	.037	.036	.041	.042	.043	.045	.045	.044	.040	.033	.026	.024	.020	23	.045
9	BF	.016	.012	.009	.008	.006	.008	.015	.028	.037	.040	.043	.043	.041	.039	.041	.042	.044	.034	.024	.021	.015	.012	.012	23	.044
10	BF	.018	.018	.015	.013	.016	.019	.020	.023	.021	.023	.027	.033	.041	.042	.050	.050	.048	.038	.026	.018	.021	.020	.026	23	.050
11	BF	.032	.042	.039	.034	.034	.034	.040	.041	.043	.045	.045	.046	.046	.047	.047	.047	.045	.034	.026	.025	.023	.019	.024	23	.047
12	BF	.015	.014	.013	.010	.009	.012	.023	.033	.046	.050	.050	.056	.060	.065	.060	.062	.059	.037	.025	.025	.022	.020	.017	23	.065
13	BF	.012	.008	.005	.005	.004	.008	.018	.033	.046	.048	BL	BL	.061	.061	.061	.058	.050	.039	.031	.039	.027	.024	.023	21	.061
14	BF	.015	.016	.013	.010	.008	.008	.017	.028	.043	.048	.049	.048	.041	.041	.044	.041	.042	.033	.033	.035	.032	.024	.022	23	.049
15	BF	.033	.029	.031	.026	.022	.026	.029	.033	.037	.041	.045	.048	.048	.050	.052	.052	.050	.048	.044	.043	.042	.040	.039	23	.052
16	BF	.031	.034	.028	.028	.019	.022	.028	.033	.034	.037	.039	.042	.044	.047	.046	.041	.032	.025	.021	.016	.014	.010	.009	23	.047
17	BF	.009	.007	.006	.007	.007	.008	.017	.022	.029	.038	.043	.045	.047	.047	.049	.048	.049	.048	.044	.041	.040	.039	.037	23	.049
18	AQ	.032	.031	.019	.027	.023	.030	.031	.039	.042	.044	.045	.043	.043	.044	.044	.044	.042	.041	.040	.039	.038	.037	.036	23	.045
19	BF	.034	.033	.028	.027	.018	.025	.029	.032	.038	.043	.044	.045	.046	.046	.048	.049	.048	.038	.024	.023	.018	.016	.014	23	.049
20	BF	.009	.007	.006	.004	.004	.007	.020	.034	.043	.046	.050	.053	.054	.058	.063	.060	.056	.045	.027	.024	.018	.020	.022	23	.063
21	BF	.037	.028	.027	.027	.027	.033	.033	.032	.030	.031	.037	.042	.044	.045	.045	.045	.045	.040	.034	.026	.019	.015	.013	23	.045
22	AQ	.008	.008	.007	.005	.005	.010	.020	BA	BA	BA	.044	.046	.048	.050	.052	.052	.049	.032	.025	.025	.019	.018	.014	20	.052
23	BF	.013	.010	.012	.012	.013	.020	.020	.023	.026	.035	.044	.052	.053	.054	.052	.052	.050	.046	.030	.026	.032	.029	.034	23	.054
24	AQ	.025	.025	.034	.038	.038	.032	.030	.028	.027	.027	.030	.031	.032	.041	.043	.040	.034	.028	.039	.042	.043	.041	.039	23	.043
25	BF	.039	.042	.044	.046	.044	.045	.045	.046	.045	.047	.047	.048	.048	.049	.048	.049	.048	.036	.021	.019	.014	.010	.010	23	.049
26	BF	.006	.005	.004	.004	.004	.010	.022	.027	.035	.046	.048	.050	.053	.053	.052	.052	.046	.030	.025	.023	.024	.019	.019	23	.053
27	BF	.016	.013	.009	.007	.007	.018	.028	.034	.041	.043	.046	.048	.049	.049	.049	.047	.041	.030	.025	.020	.018	.015	.015	23	.049
28	BF	.019	.016	.021	.019	.016	.017	.027	.036	.042	.053	.057	.054	.049	.047	.047	.046	.038	.026	.025	.023	.019	.021	.020	23	.057
29	BF	.016	.016	.014	.011	.008	.014	.023	.027	.030	.029	.031	.032	.033	.034	.033	.030	.028	.021	.023	.023	.028	.036	.030	23	.036
30	BF	.032	.032	.031	.029	.029	.033	.033	.035	.038	.040	.046	.051	.051	.050	.050	.054	.053	.044	.042	.043	.047	.046	.032	23	.054
31																									0	
NO.:		30	30	30	30	30	30	30	29	28	28	29	29	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.039	.042	.044	.046	.044	.045	.045	.046	.046	.053	.057	.062	.064	.065	.063	.062	.059	.049	.044	.043	.047	.046	.039		
AVG:		.0209	.0204	.0191	.0183	.0169	.0198	.0259	.0323	.0376	.0418	.0444	.0467	.0481	.0492	.0500	.0493	.0467	.0382	.0313	.0290	.0265	.0244	.0231		

MONTHLY OBSERVATIONS: 683 MONTHLY MEAN: .0330 MONTHLY MAX: .065

Note: Qualifier codes with regional concurrence are shown in upper-case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.017	.017	.018	.017	.014	.027	.042	.050	.052	.055	.057	.056	.057	.061	.064	.064	.051	.030	.024	.025	.020	.022	.015	23	.064
2	BF	.011	.011	.022	.013	.019	.022	.021	.023	.026	.031	.036	.044	.045	.043	.042	.038	.036	.034	.032	.034	.033	.032	.031	23	.045
3	BF	.029	.026	.025	.025	.024	.020	.016	.015	.017	.017	.016	.017	.021	.026	.025	.029	.028	.017	.011	.010	.013	.022	.026	23	.029
4	BF	.024	.022	.020	.017	.015	.017	.014	.013	.017	.038	.039	.036	.034	.035	.034	.030	.031	.028	.032	.033	.032	.035	.034	23	.039
5	BF	.034	.035	.033	.027	.027	.027	.029	.031	BA	BA	.030	.031	.032	.033	.033	.029	.027	.033	.031	.030	.021	.020	.027	21	.035
6	BF	.025	.022	.022	.016	.018	.023	.024	.035	.040	.041	.044	.046	.046	.047	.048	.046	.045	.040	.047	.044	.034	.035	.043	23	.048
7	BF	.028	.043	.039	.036	.033	.032	.034	.039	.045	.047	.049	.051	.052	.053	.053	.053	.052	.046	.028	.020	.018	.017	.015	23	.053
8	BF	.013	.010	.009	.008	.010	.010	.013	.022	.031	.034	.043	.046	.051	.055	.054	.054	.049	.033	.025	.024	.023	.022	.021	23	.055
9	BF	.019	.015	.014	.014	.012	.032	.037	.042	.047	.050	.052	.053	.052	.050	.049	.048	.040	.039	.047	.045	.041	.049	.045	23	.053
10	BF	.040	.041	.035	.032	.029	.035	.035	.038	.040	.040	.039	.039	.037	.038	.034	.033	.031	.026	.024	.021	.020	.017	.015	23	.041
11	BF	.011	.011	.010	.008	.008	.008	.008	.012	.019	.022	.024	.025	.027	.030	.030	.028	.026	.021	.018	.010	.016	.023	.016	23	.030
12	BF	.025	.023	.024	.032	.031	.031	.031	.033	.033	.032	.035	.037	.038	.035	.036	.037	.033	.032	.028	.025	.026	.018	.021	23	.038
13	BF	.026	.022	.021	.018	.015	.020	.025	.026	.028	.032	.035	.036	.041	.042	.041	.038	.035	.020	.015	.010	.010	.009	.005	23	.042
14	BF	.003	.003	.004	.006	.004	.019	.026	.031	.040	.049	.049	.051	.051	.052	.050	.050	.047	.030	.025	.017	.011	.010	.008	23	.052
15	BF	.006	.005	.005	.004	.004	.012	.024	.032	.040	.044	.050	.052	.053	.054	.055	.053	.046	.033	.024	.021	.020	.016	.014	23	.055
16	BF	.011	.007	.007	.005	.005	.010	.024	.035	.046	.052	.057	.056	.054	.053	.053	.052	.047	.032	.027	.024	.019	.016	.015	23	.057
17	BF	.015	.011	.009	.008	.006	.020	.033	.040	.042	.046	.048	.049	.052	.054	.054	.052	.049	.045	.046	.048	.049	.049	.048	23	.054
18	BF	.047	.046	.044	.042	.040	.037	.036	BA	.032	.034	.037	.039	.039	.038	.039	.037	.034	.035	.038	.042	.044	.045	.046	22	.047
19	BF	.043	.045	.049	.047	.044	.044	.045	.046	.048	.049	.047	.045	.044	.043	.044	.044	.044	.042	.037	.038	.038	.037	.036	23	.049
20	BF	.034	.034	.035	.035	.035	.035	.039	.042	.043	.045	.047	.048	.050	.050	.051	.051	.051	.049	.042	.042	.042	.043	.042	23	.051
21	BF	.035	.028	.025	.025	.024	.035	.040	.044	.047	.051	.056	.056	.054	.054	.054	.054	.054	.039	.036	.031	.024	.020	.014	23	.056
22	BF	.010	.015	.014	.013	.016	.024	.033	.040	.042	.046	.047	.048	.048	.051	.052	.056	.057	.037	.028	.025	.019	.014	.008	23	.057
23	BF	.005	.003	.003	.002	.003	.012	.026	.041	.049	.057	.059	.058	.057	.059	.059	.058	.049	.031	.020	.015	.012	.009	.008	23	.059
24	BF	.002	.002	.002	.001	.002	.011	.033	.043	.056	.063	.061	.060	.058	.057	.060	.059	.052	.033	.024	.020	.018	.014	.011	23	.063
25	BF	.004	.004	.001	.002	.002	.010	.026	BA	BA	.039	.043	.046	.049	.053	.052	.069	.058	.036	.032	.026	.023	.016	.016	21	.069
26	BF	.007	.005	.002	.002	.004	.017	.032	.042	.049	.051	.050	.051	.053	.055	.053	.050	.045	.034	.026	.026	.037	.038	.034	23	.055
27	BF	.023	.018	.014	.013	.013	.017	.027	.032	.034	.039	.043	.040	.041	.044	.044	.046	.044	.033	.022	.015	.011	.009	.008	23	.046
28	BF	.005	.013	.017	.019	.021	.023	.026	.035	.039	.040	.040	.040	.040	.041	.036	.025	.021	.020	.018	.014	.011	.010	.007	23	.041
29	BF	.026	.027	.025	.024	.024	.023	.022	.026	.034	.034	.034	.035	.034	.034	.036	.036	.034	.031	.028	.026	.024	.023	.023	23	.036
30	BF	.024	.026	.028	.026	.025	.027	.028	.028	.030	.032	.035	.038	.041	.042	.043	.043	.043	.029	.021	.024	.031	.031	.028	23	.043
31	BF	.022	.015	.021	.020	.020	.022	.024	.026	.031	.035	.037	.039	.041	.042	.042	.042	.040	.031	.026	.022	.018	.016	.019	23	.042
NO.:		31	31	31	31	31	31	31	29	29	30	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.047	.046	.049	.047	.044	.044	.045	.050	.056	.063	.061	.060	.058	.061	.064	.069	.058	.049	.047	.048	.049	.049	.048		
AVG:		.0201	.0195	.0193	.0180	.0176	.0226	.0282	.0332	.0378	.0415	.0432	.0441	.0449	.0459	.0458	.0453	.0419	.0329	.0285	.0260	.0245	.0238	.0225		

MONTHLY OBSERVATIONS: 708 MONTHLY MEAN: .0316 MONTHLY MAX: .069

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.021	.018	.018	.012	.017	.024	.031	.035	.037	.039	.041	.043	.043	.042	.043	.044	.041	.033	.030	.031	.036	.036	.041	23	.044
2	BF	.037	.031	.037	.037	.027	.022	.021	.022	.023	.027	.030	.031	.036	.038	.038	.035	.024	.021	.021	.019	.022	.020	.020	23	.038
3	BF	.013	.010	.010	.008	.007	.012	.024	.029	.030	.029	.028	.035	.031	.031	.030	.027	.027	.024	.024	.021	.015	.008	.006	23	.035
4	BF	.002	.006	.014	.013	.012	.012	.018	.024	.031	.042	.044	.043	.044	.043	.038	.034	.031	.025	.020	.015	.009	.005	.004	23	.044
5	BF	.001	.000	.000	.000	.001	.006	.020	.033	.036	.034	.033	.034	.030	.028	.025	.022	.023	.019	.015	.017	.014	.016	.015	23	.036
6	BF	.011	.008	.003	.005	.006	.006	.007	.009	.016	.022	.022	.022	.020	.019	.017	.016	.014	.009	.015	.018	.017	.015	.010	23	.022
7	BF	.009	.007	.005	.004	.004	.007	.009	.016	.020	.022	.024	.026	.028	.024	.027	.025	.024	.026	.023	.021	.029	.033	.036	23	.036
8	BF	.025	.018	.015	.016	.021	.025	.023	.020	.017	.018	.018	.016	.018	.020	.017	.019	.022	.019	.015	.012	.009	.012	.008	23	.025
9	BF	.006	.006	.005	.008	.008	.007	.009	.010	BA	.025	.028	.025	.026	.025	.022	.023	.027	.024	.024	.022	.016	.013	.012	22	.028
10	BF	.015	.012	.010	.012	.016	.016	.017	.022	.020	.023	.028	.029	.029	.027	.025	.032	.034	.032	.024	.020	.012	.009	.012	23	.034
11	AQ	.007	.004	.003	.004	.010	.010	BF	.019	.023	.025	.028	.026	.027	.030	.033	.032	.027	.027	.021	.014	.009	.007	.005	22	.033
12	AQ	.010	.009	.008	.008	.015	.017	.019	.025	.031	.036	.036	.038	.042	.043	.040	.040	.041	.041	.034	.037	.030	.024	.024	23	.043
13	BF	.012	.007	.006	.004	.008	.017	.031	.040	.044	.045	.046	.045	.045	.046	.047	.043	.030	.018	.011	.011	.004	.002	.002	23	.047
14	BF	.002	.002	.006	.006	.009	.013	.023	.030	.038	.046	.048	.050	.053	.053	.051	.043	.044	.037	.021	.015	.008	.006	.005	23	.053
15	BF	.002	.001	.003	.004	.006	.018	.041	.051	.061	.061	.059	.059	.057	.051	.050	.048	.050	.047	.037	.031	.023	.013	.011	23	.061
16	BF	.011	.031	.025	.022	.028	.032	.035	.042	.047	.048	.049	.049	.052	.052	.052	.051	.052	.041	.026	.016	.017	.014	.010	23	.052
17	BF	.007	.005	.003	.003	.003	.018	.030	.043	.050	.054	.057	.058	.057	.058	.059	.057	.053	.037	.022	.019	.017	.011	.006	23	.059
18	BF	.005	.004	.002	.001	.003	.018	.030	.043	.048	.052	.055	.062	.060	.064	.066	.060	.053	.037	.024	.022	.020	.011	.008	23	.066
19	BF	.006	.004	.005	.004	.003	.008	.009	.009	.009	.013	.013	.015	.016	.017	.017	.017	.020	.021	.021	.021	.022	.024	.022	23	.024
20	BF	.017	.016	.015	.022	.024	.024	.023	.023	.027	.029	.029	.026	.027	.026	.023	.023	.027	.020	.007	.004	.005	.004	.003	23	.029
21	BF	.005	.006	.006	.006	.010	.010	.014	.017	.024	.028	.030	.031	.021	.017	.015	.016	.015	.014	.011	.019	.033	.039	.034	23	.039
22	BF	.035	.036	.033	.032	.027	.026	.024	.024	.026	.031	.037	.039	.039	.040	.042	.044	.042	.030	.015	.012	.007	.005	.002	23	.044
23	BF	.002	.001	.001	.001	.002	.009	.025	.033	.038	.042	.044	.046	.047	.049	.049	.049	.042	.024	.014	.013	.010	.009	.008	23	.049
24	BF	.010	.010	.015	.018	.019	.021	.025	.030	BA	.022	.023	.025	.027	.030	.033	.035	.035	.035	.031	.024	.021	.027	.034	22	.035
25	BF	.026	.027	.025	.020	.018	.025	.029	.035	.038	.040	.041	.041	.039	.038	.041	.040	.037	.034	.028	.029	.026	.031	.024	23	.041
26	BF	.018	.015	.012	.006	.012	.027	.033	.032	.032	.032	.030	.027	.030	.029	.027	.025	.023	.022	.010	.007	.005	.005	.005	23	.033
27	BF	.002	.004	.002	.001	.004	.010	.012	.014	.016	.017	.019	.020	.020	.019	.020	.019	.017	.014	.022	.020	.012	.008	.006	23	.022
28	BF	.002	.001	.000	.001	.001	.004	.011	.016	.019	.020	.021	.022	.026	.029	.030	.032	.033	.018	.010	.020	.023	.023	.019	23	.033
29	BF	.014	.010	.009	.013	.017	.018	.017	.017	.018	.019	.021	.023	.024	.024	.026	.026	.024	.017	.011	.003	.002	.001	.000	23	.026
30	BF	.001	.000	.001	.000	.002	.007	.018	.027	.033	.031	.030	.035	.032	.031	.028	.026	.023	.016	.009	.017	.019	.018	.014	23	.035
31																									0	
NO.:		30	30	30	30	30	30	29	30	28	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.037	.036	.037	.037	.028	.032	.041	.051	.061	.061	.059	.062	.060	.064	.066	.060	.053	.047	.037	.037	.036	.039	.041		
AVG:		.0111	.0103	.0099	.0097	.0113	.0156	.0217	.0263	.0304	.0324	.0337	.0347	.0349	.0348	.0344	.0334	.0318	.0261	.0199	.0183	.0164	.0150	.0135		

MONTHLY OBSERVATIONS: 687 MONTHLY MEAN: .0228 MONTHLY MAX: .066

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt.
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.006	.005	.008	.011	.011	.010	.014	.015	.020	.025	.025	.028	.025	.025	.026	.026	.025	.018	.009	.006	.005	.005	.024	23	.028
2	BF	.008	.008	.011	.012	.011	.010	.009	.014	.018	.019	.023	.024	.026	.029	.028	.030	.028	.026	.014	.021	.026	.016	.025	23	.030
3	BF	.022	.012	.020	.021	.019	.022	.029	.032	.035	.038	.046	.045	.046	.047	.046	.044	.040	.028	.017	.013	.009	.007	.004	23	.047
4	BF	.002	.001	.001	.001	.004	.013	.021	.030	.034	.037	.038	.038	.039	.040	.040	.040	.037	.031	.017	.012	.009	.006	.003	23	.040
5	BF	.001	.000	.000	.000	.002	.011	.022	.029	.036	.041	.043	.042	.042	.041	.044	.044	.041	.028	.018	.012	.009	.009	.010	23	.044
6	BF	.009	.009	.007	.004	.009	.012	.017	.019	.020	.023	.021	.022	.022	.021	.023	.022	.019	.012	.020	.028	.023	.020	.017	23	.028
7	BF	.013	.011	.013	.012	.015	.014	.014	.014	.014	.015	.018	.018	.020	.020	.020	.021	.021	.019	.014	.011	.009	.007	.005	23	.021
8	BF	.003	.003	.002	.003	.005	.006	.007	.013	.018	BA	.021	.022	.025	.024	.022	.024	.022	.017	.008	.006	.003	.001	.001	22	.025
9	BF	.001	.002	.007	.004	.004	.008	.013	.018	.021	.022	.022	.022	.022	.024	.026	.022	.028	.028	.022	.022	.013	.010	.009	23	.028
10	BF	.002	.001	.006	.009	.008	.011	.015	.020	.023	.024	.024	.024	.025	.032	.038	.028	.017	.019	.017	.015	.012	.013	.013	23	.038
11	BF	.014	.010	.009	.010	.010	.008	.010	.014	.015	.021	.023	.023	.021	.021	.018	.020	.019	.015	.012	.009	.008	.010	.012	23	.023
12	BF	.016	.016	.016	.016	.014	.014	.015	.019	.021	.019	.022	.024	.025	.025	.023	.020	.023	.027	.025	.022	.019	.018	.016	23	.027
13	BF	.019	.018	.017	.017	.016	.016	.018	.019	.022	.023	.025	.026	.027	.027	.025	.025	.025	.021	.018	.017	.009	.007	.004	23	.027
14	BF	.003	.003	.006	.008	.005	.007	.013	.021	.027	.032	.033	.029	.035	.047	.050	.045	.041	.027	.017	.025	.042	.028	.021	23	.050
15	BF	.007	.006	.007	.005	.007	.008	.012	.023	.029	.031	.034	.037	.037	.036	.038	.040	.039	.020	.016	.008	.007	.003	.003	23	.040
16	BF	.002	.010	.008	.004	.005	.010	.013	.018	.021	.024	.024	.028	.034	.033	.032	.036	.039	.037	.031	.026	.023	.022	.017	23	.039
17	BF	.013	.010	.008	.011	.013	.013	.013	.016	.020	.025	.025	.023	.025	.027	.029	.029	.026	.027	.028	.021	.019	.013	.010	23	.029
18	BF	.013	.013	.010	.010	.009	.014	.014	.017	.021	.023	.024	.029	.029	.030	.029	.030	.020	.023	.034	.031	.023	.018	.013	23	.034
19	BF	.010	.013	.012	.008	.008	.011	.013	.013	.021	.025	.027	.022	.025	.024	.025	.026	.024	.017	.013	.019	.021	.021	.020	23	.027
20	BF	.015	.015	.013	.014	.013	.014	.018	.023	.024	.029	.025	.028	.027	.031	.025	.022	.030	.022	.016	.017	.016	.013	.011	23	.031
21	BF	.007	.005	.004	.004	.005	.007	.010	.018	AN	AN	AN	AN	AN	BA	.029	.029	.025	.024	.024	.018	.013	.010	.005	17	.029
22	BF	.002	.002	.001	.002	.005	.008	.017	.028	.037	.050	.052	.036	.029	.035	.040	.037	.028	.017	.009	.004	.005	.002	.001	23	.052
23	BF	.001	.000	.000	.000	.001	.007	.019	.031	.037	.045	.051	.050	.051	.053	.055	.054	.042	.020	.014	.007	.008	.007	.003	23	.055
24	BF	.001	.002	.004	.003	.005	.007	.012	.017	.029	.037	.045	.046	.046	.045	.043	.042	.036	.025	.013	.009	.004	.004	.004	23	.046
25	BF	.002	.001	.001	.001	.001	.005	.014	.026	.033	.034	.046	.045	.039	.040	.037	.038	.034	.037	.025	.018	.013	.010	.009	23	.046
26	BF	.005	.002	.001	.001	.003	.006	.020	.028	.033	.036	.038	.038	.031	.036	.037	.030	.028	.028	.018	.013	.008	.009	.008	23	.038
27	BF	.007	.003	.003	.002	.002	.011	.017	.031	.042	.046	.050	.051	.040	.029	.047	.040	.033	.023	.017	.016	.009	.006	.006	23	.051
28	BF	.007	.007	.006	.003	.005	.007	.013	.022	.030	.037	.046	.052	.052	.047	.049	.047	.041	.023	.011	.007	.006	.004	.002	23	.052
29	BF	.001	.000	.000	.000	.001	.007	.017	.028	.038	.041	.047	.051	.046	.042	.043	.043	.029	.016	.010	.005	.002	.003	.002	23	.051
30	BF	.001	.000	.000	.000	.001	.003	.008	.019	.026	.035	.042	.044	.042	.045	.043	.047	.043	.038	.039	.044	.036	.029	.030	23	.047
31	BF	.021	.017	.011	.008	.007	.013	.022	.032	.030	.030	.040	.045	.044	.041	.036	.035	.035	.029	.020	.016	.013	.010	.005	23	.045
NO.:		31	31	31	31	31	31	31	31	30	29	30	30	30	30	31	31	31	31	31	31	31	31	31		
MAX:		.022	.018	.020	.021	.019	.022	.029	.032	.042	.050	.052	.052	.052	.053	.055	.054	.043	.038	.039	.044	.042	.029	.030		
AVG:		.0075	.0066	.0068	.0066	.0072	.0101	.0151	.0215	.0265	.0306	.0333	.0337	.0332	.0339	.0344	.0334	.0303	.0239	.0183	.0161	.0136	.0110	.0101		

MONTHLY OBSERVATIONS: 706 MONTHLY MEAN: .0201 MONTHLY MAX: .055

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.006	.009	.006	.004	.005	.009	.011	.019	.036	.040	.035	.041	.044	.045	.045	.048	.050	.043	.035	.022	.033	.032	.027	23	.050
2	BF	.018	.017	.008	.007	.003	.016	.024	.032	.037	.042	.045	.048	.046	.043	.039	.022	.021	.015	.010	.007	.007	.006	.009	23	.048
3	BF	.010	.014	.012	.005	.003	.011	.021	.032	.040	.045	.046	.046	.046	.048	.049	.045	.041	.034	.020	.017	.022	.014	.020	23	.049
4	BF	.016	.018	.017	.012	.015	.018	.023	.032	.029	BA	BA	.079	.050	.052	.052	.049	.043	.039	.039	.023	.021	.027	.022	21	.079
5	BF	.020	.018	.019	.018	.016	.017	.020	.028	.034	.037	.041	.046	.049	.047	.048	.049	.048	.033	.024	.020	.015	.014	.020	23	.049
6	BF	.010	.014	.012	.010	.011	.013	.022	.029	.035	.038	.042	.043	.045	.044	.042	.037	.033	.026	.015	.014	.009	.008	.005	23	.045
7	BF	.003	.002	.001	.000	.002	.009	.017	.028	.031	.037	.039	.033	.037	.038	.044	.044	.036	.019	.016	.018	.008	.005	.003	23	.044
8	BF	.001	.001	.001	.002	.002	.011	.016	.025	.030	.034	.038	.036	.037	.041	.040	.040	.044	.026	.014	.009	.005	.004	.003	23	.044
9	BF	.003	.001	.003	.002	.001	.006	.014	.024	.030	.043	.052	.034	.036	.031	.035	.032	.039	.033	.020	.012	.010	.007	.004	23	.052
10	BF	.002	.002	.001	.000	.001	.005	.012	.022	.033	.039	.040	.042	.033	.025	.027	.023	.012	.018	.009	.006	.005	.005	.003	23	.042
11	BF	.001	.000	.000	.001	.001	.008	.018	.026	.032	.032	.034	.037	.037	.033	.028	.026	.024	.025	.015	.010	.008	.007	.008	23	.037
12	BF	.005	.001	.001	.001	.002	.006	.011	.018	.029	.044	.044	.044	.047	.047	.046	.046	.038	.020	.011	.009	.009	.012	.010	23	.047
13	BF	.009	.009	.005	.003	.003	.007	.018	.028	.038	.042	.043	.045	.049	.056	.057	.050	.045	.031	.043	.040	.027	.027	.018	23	.057
14	BF	.005	.005	.004	.004	.004	.014	.025	.034	.041	.040	.039	.038	.039	.040	.041	.040	.034	.036	.036	.034	.040	.036	.032	23	.041
15	BF	.022	.016	.009	.009	.008	.016	.021	.024	.027	.030	.031	.032	.027	.030	.026	.020	.017	.022	.020	.025	.025	.019	.017	23	.032
16	BF	.021	.024	.017	.017	.016	.018	.020	.017	.018	.019	.020	.022	.024	.027	.026	.025	.022	.024	.022	.019	.016	.016	.014	23	.027
17	BF	.012	.013	.014	.015	.017	.016	.016	.016	.015	BA	.018	.020	.022	.023	.022	.022	.019	.011	.003	.003	.001	.001	.000	22	.023
18	BF	.001	.000	.000	.001	.001	.004	.010	.019	.026	.027	.029	.032	.034	.034	.032	.029	.025	.021	.010	.006	.006	.021	.025	23	.034
19	BF	.019	.019	.014	.014	.011	.013	.014	.019	.028	.027	.027	.026	.024	.022	.022	.022	.019	.012	.007	.004	.007	.007	.007	23	.028
20	BF	.006	.004	.005	.007	.006	.006	.011	.019	.021	.023	.024	.024	.025	.024	.025	.023	.021	.015	.008	.007	.007	.007	.004	23	.025
21	BF	.002	.002	.001	.001	.002	.005	.008	.010	.012	.017	.022	.021	.024	.026	.023	.026	.028	.024	.014	.013	.012	.013	.010	23	.028
22	BF	.010	.007	.011	.012	.012	.012	.013	.017	.026	.030	.037	.039	.042	.041	.041	.038	.035	.018	.010	.008	.008	.004	.003	23	.042
23	BF	.005	.002	.001	.001	.009	.012	.015	.027	.034	.037	.038	.039	.041	.039	.039	.033	.027	.012	.007	.004	.003	.001	.001	23	.041
24	BF	.000	.000	.000	.000	.000	.004	.014	.032	.047	.049	.048	.052	.055	.057	.056	.053	.043	.016	.009	.007	.009	.007	.004	23	.057
25	BF	.001	.001	.000	.000	.001	.007	.018	.030	.038	.042	.042	.044	.045	.046	.048	.052	.036	.019	.051	.048	.032	.031	.024	23	.052
26	BF	.014	.011	.011	.010	.007	.014	.022	.025	.028	.029	.030	.030	.028	.029	.030	.029	.024	.011	.008	.004	.003	.002	.001	23	.030
27	BF	.000	.001	.004	.006	.007	.009	.015	.021	.022	.025	.031	.035	.033	.031	.034	.029	.020	.013	.022	.025	.019	.017	.011	23	.035
28	BF	.011	.012	.008	.007	.006	.007	.011	.019	.022	.029	.033	.027	.026	.027	.028	.027	.026	.015	.010	.029	.020	.017	.018	23	.033
29	BF	.012	.014	.012	.014	.014	.013	.013	.013	.015	.016	.017	.016	.017	.019	.019	.013	.010	.010	.005	.003	.002	.001	.000	23	.019
30	BF	.003	.002	.002	.001	.002	.003	.007	.012	.015	.017	.017	.018	.019	.019	.015	.013	.014	.016	.015	.017	.017	.017	.017	23	.019
31	BF	.019	.018	.018	.019	.018	.019	.019	.019	.017	.016	.016	.017	.016	.016	.016	.014	.015	.015	.017	.018	.018	.018	.019	23	.019
NO.:		31	31	31	31	31	31	31	31	31	29	30	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.022	.024	.019	.019	.018	.019	.025	.034	.047	.049	.052	.079	.055	.057	.057	.053	.050	.043	.051	.048	.040	.036	.032		
AVG:		.0086	.0083	.0070	.0065	.0066	.0106	.0161	.0231	.0286	.0326	.0339	.0357	.0354	.0355	.0353	.0329	.0293	.0217	.0176	.0155	.0137	.0130	.0116		

MONTHLY OBSERVATIONS: 710 MONTHLY MEAN: .0208 MONTHLY MAX: .079

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.018	.018	.018	.014	.011	.012	.018	.023	.024	BA	.031	.033	.038	.041	.037	.026	.027	.028	.029	.017	.009	.007	.005	22	.041
2	BF	.002	.002	.006	.011	.008	.014	.021	.032	.036	.038	.039	.041	.044	.046	.046	.046	.040	.037	.021	.018	.013	.009	.007	23	.046
3	BF	.004	.004	.005	.012	.016	.015	.018	.025	.035	.043	.046	.048	.049	.048	.048	.047	.034	.021	.016	.013	.016	.017	.012	23	.049
4	BF	.010	.007	.006	.005	.002	.006	.022	.031	.038	.041	.043	.045	.047	.049	.047	.043	.028	.013	.006	.006	.007	.003	.003	23	.049
5	BF	.003	.002	.001	.001	.002	.006	.012	.024	.030	.035	.035	.040	.045	.047	.045	.043	.026	.013	.008	.005	.010	.014	.018	23	.047
6	BF	.010	.010	.008	.004	.004	.012	.015	.019	.023	.028	.030	.033	.034	.033	.031	.029	.024	.011	.006	.019	.010	.005	.012	23	.034
7	BF	.013	.016	.020	.021	.018	.017	.022	.026	.030	.031	.032	.034	.035	.040	.047	.044	.030	.016	.011	.010	.009	.010	.010	23	.047
8	BF	.006	.003	.002	.003	.003	.003	.006	.016	.025	.030	.038	.043	.043	.041	.040	.037	.026	.020	.018	.013	.014	.009	.007	23	.043
9	BF	.011	.022	.028	.026	.025	.028	.029	.038	.043	.046	.048	.047	.046	.046	.044	.044	.042	.034	.030	.016	.012	.011	.011	23	.048
10	BF	.007	.006	.005	.005	.006	.011	.022	.027	.038	.044	.047	.049	.048	.047	.046	.043	.032	.017	.012	.010	.006	.003	.004	23	.049
11	BF	.001	.001	.001	.003	.007	.008	.014	.022	.033	.038	.043	.046	.047	.047	.047	.043	.030	.018	.014	.014	.012	.011	.009	23	.047
12	BF	.004	.002	.001	.001	.001	.007	.013	.018	.026	.032	.034	.036	.038	.040	.041	.039	.029	.013	.008	.007	.005	.003	.001	23	.041
13	BF	.000	.000	.000	.000	.000	.002	.007	.023	.027	.029	.030	.032	.035	.035	.033	.027	.014	.009	.005	.002	.001	.001	.001	23	.035
14	BF	.000	.000	.000	.001	.000	.004	.013	.023	.030	.036	.034	.032	.031	.033	.032	.027	.020	.016	.011	.005	.003	.004	.005	23	.036
15	BF	.003	.002	.002	.001	.001	.002	.006	.016	.014	BA	.022	.025	.026	.026	.022	.026	.024	.023	.022	.023	.020	.021	.022	22	.026
16	BF	.017	.016	.014	.013	.015	.017	.017	.017	.017	.017	.018	.021	.023	.021	.022	.018	.011	.012	.021	.020	.017	.013	.015	23	.023
17	BF	.010	.010	.007	.007	.006	.007	.008	.011	.017	.017	.018	.018	.018	.018	.017	.014	.008	.006	.004	.003	.002	.002	.002	23	.018
18	BF	.002	.002	.003	.003	.003	.003	.004	.007	.008	.012	.010	.014	.019	.018	.017	.014	.015	.015	.013	.013	.010	.010	.012	23	.019
19	BF	.007	.009	.011	.010	.008	.007	.009	.013	.013	.016	.017	.016	.017	.017	.016	.014	.014	.013	.013	.014	.009	.009	.013	23	.017
20	BF	.015	.016	.018	.020	.017	.014	.015	.017	.018	.020	.017	.020	.020	.022	.020	.024	.025	.023	.021	.019	.016	.013	.011	23	.025
21	BF	.010	.010	.011	.012	.012	.013	.013	.013	.016	.020	.023	.020	.020	.018	.020	.014	.010	.005	.005	.003	.001	.002	.003	23	.023
22	BF	.002	.002	.006	.005	.009	.013	.031	.037	.038	.043	.043	.043	.041	.039	.038	.038	.036	.034	.033	.031	.029	.026	.019	23	.043
23	BF	.010	.011	.009	.011	.015	.020	.021	.025	.028	.032	.036	.038	.039	.040	.041	.039	.024	.014	.010	.006	.007	.007	.004	23	.041
24	BF	.003	.003	.003	.003	.002	.005	.017	.025	.031	.036	.039	.041	.043	.043	.044	.042	.022	.011	.012	.007	.008	.005	.004	23	.044
25	BF	.002	.002	.002	.001	.001	.004	.009	.015	.027	.041	.044	.047	.052	.055	.055	.046	.021	.014	.012	.010	.004	.003	.002	23	.055
26	BF	.002	.002	.001	.001	.001	.003	.009	.017	.031	.040	.048	.049	.047	.050	.046	.045	.021	.014	.008	.005	.005	.003	.002	23	.050
27	BF	.001	.003	.004	.004	.003	.003	.008	.011	.020	.041	.045	.044	.046	.050	.052	.045	.029	.015	.010	.008	.006	.004	.003	23	.052
28	BF	.001	.001	.002	.003	.003	.004	.006	.010	.021	BA	.037	.040	.041	.043	.046	.036	.019	.006	.004	.003	.002	.001	.001	22	.046
29	BF	.001	.002	.001	.002	.002	.002	.006	.012	.028	.037	.042	.043	.043	.043	.043	.038	.021	.011	.006	.004	.003	.002	.002	23	.043
30	BF	.000	.001	.001	.000	.004	.007	.013	.023	.032	.037	.040	.041	.043	.043	.040	.032	.016	.006	.003	.004	.002	.001	.001	23	.043
31																									0	
NO.:		30	30	30	30	30	30	30	30	30	27	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.018	.022	.028	.026	.025	.028	.031	.038	.043	.046	.048	.049	.052	.055	.055	.047	.042	.037	.033	.031	.029	.026	.022		
AVG:		.0058	.0062	.0065	.0068	.0068	.0090	.0141	.0205	.0266	.0326	.0343	.0360	.0373	.0380	.0374	.0341	.0239	.0163	.0131	.0109	.0089	.0076	.0074		

MONTHLY OBSERVATIONS: 687 MONTHLY MEAN: .0191 MONTHLY MAX: .055

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2021

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.001	.002	.002	.001	.002	.003	.009	.016	.027	.040	.047	.052	.052	.053	.053	.041	.021	.010	.007	.006	.005	.005	.002	23	.053
2	BF	.001	.002	.004	.007	.008	.009	.011	.017	.025	.031	.038	.039	.038	.037	.036	.033	.019	.013	.013	.006	.005	.004	.002	23	.039
3	BF	.002	.004	.017	.015	.014	.011	.014	.018	.019	.024	.026	.022	.021	.020	.019	.018	.016	.017	.016	.011	.009	.010	.010	23	.026
4	BF	.007	.003	.004	.004	.005	.007	.018	.023	.024	.032	.036	.039	.039	.038	.030	.022	.014	.010	.009	.008	.013	.008	.005	23	.039
5	BF	.007	.006	.010	.012	.012	.009	.011	.023	.029	.033	.033	.034	.034	.037	.036	.029	.029	.029	.027	.024	.023	.023	.021	23	.037
6	BF	.017	.010	.011	.015	.010	.008	.009	.019	.024	.028	.025	.026	.028	.030	.028	.026	.023	.024	.023	.021	.021	.020	.016	23	.030
7	BF	.015	.008	.012	.010	.007	.010	.020	.020	.020	.023	.028	.033	.033	.033	.033	.030	.020	.015	.012	.010	.008	.004	.004	23	.033
8	BF	.003	.006	.007	.007	.007	.010	.008	.012	BA	.026	.032	.036	.040	.042	.042	.038	.019	.008	.007	.005	.002	.001	.001	22	.042
9	BF	.001	.001	.002	.001	.003	.007	.009	.012	.017	.032	.044	.046	.047	.047	.049	.039	.018	.009	.006	.004	.003	.001	.001	23	.049
10	BF	.001	.002	.004	.011	.012	.011	.015	.022	.027	.031	.036	.038	.041	.042	.044	.038	.016	.011	.005	.003	.003	.004	.003	23	.044
11	BF	.006	.005	.005	.004	.003	.006	.014	.020	.024	.028	.031	.032	.032	.032	.033	.033	.027	.021	.015	.011	.007	.010	.009	23	.033
12	BF	.007	.005	.003	.002	.001	.005	.012	.014	.016	.022	.026	.028	.027	.029	.028	.026	.020	.007	.005	.004	.004	.003	.001	23	.029
13	BF	.001	.001	.001	.001	.003	.004	.005	.008	BL	BL	BL	.043	.044	.045	.045	.038	.021	.012	.007	.004	.002	.001	.001	20	.045
14	BF	.002	.001	.002	.001	.001	.006	.009	.015	.025	.035	.042	.043	.045	.047	.046	.033	.018	.011	.008	.003	.002	.001	.001	23	.047
15	BF	.001	.001	.003	.002	.002	.004	.005	.013	.024	.032	.038	.043	.047	.050	.049	.041	.027	.018	.011	.007	.006	.005	.005	23	.050
16	BF	.015	.024	.025	.023	.017	.024	.026	.031	.032	.034	.036	.037	.038	.040	.041	.039	.037	.030	.019	.015	.014	.011	.009	23	.041
17	BF	.014	.023	.025	.023	.023	.022	.024	.028	.034	.037	.037	.039	.040	.040	.040	.039	.026	.018	.013	.010	.009	.008	.009	23	.040
18	BF	.007	.005	.004	.004	.003	.005	.018	.025	.030	.035	.039	.041	.043	.045	.046	.034	.021	.011	.007	.008	.006	.003	.003	23	.046
19	BF	.004	.006	.008	.005	.004	.005	.009	.016	.023	.035	.045	.047	.047	.048	.048	.033	.019	.013	.011	.007	.005	.004	.005	23	.048
20	BF	.001	.001	.001	.001	.002	.002	.011	.015	BA	.027	.032	.037	.043	.045	.043	.034	.018	.012	.008	.006	.006	.005	.004	22	.045
21	BF	.004	.004	.006	.005	.003	.005	.006	.013	.023	.026	.030	.033	.036	.039	.040	.038	.027	.017	.031	.034	.027	.028	.012	23	.040
22	BF	.012	.006	.005	.004	.003	.010	.020	.022	.031	.036	.041	.042	.043	.046	.046	.042	.037	.035	.025	.015	.009	.007	.004	23	.046
23	BF	.002	.002	.002	.002	.001	.002	.009	.022	.030	.035	.038	.041	.043	.042	.041	.032	.015	.010	.009	.006	.004	.003	.002	23	.043
24	BF	.001	.001	.001	.001	.001	.002	.009	.012	.016	.021	.026	.029	.038	.037	.029	.019	.010	.008	.016	.016	.014	.012	.009	23	.038
25	BF	.006	.004	.006	.005	.003	.004	.006	.015	.029	.032	.033	.031	.032	.034	.033	.032	.024	.031	.032	.029	.028	.027	.029	23	.034
26	BF	.030	.030	.030	.029	.029	.028	.027	.027	.027	.029	.032	.034	.036	.038	.039	.038	.029	.030	.030	.028	.027	.022	.020	23	.039
27	BF	.011	.009	.010	.013	.015	.010	.020	.024	.027	.030	.034	.037	.039	.041	.040	.033	.025	.030	.028	.018	.020	.020	.027	23	.041
28	BF	.034	.038	.038	.038	.037	.034	.029	.026	.025	.025	.030	.035	.033	.031	.031	.028	.025	.020	.013	.019	.021	.021	.020	23	.038
29	BF	.014	.017	.018	.019	.018	.018	.018	.018	.019	.018	.019	.019	.018	.018	.016	.014	.012	.011	.009	.009	.009	.009	.010	23	.019
30	BF	.009	.010	.011	.013	.013	.014	.014	.018	.019	.019	.017	.016	.015	.014	.012	.012	.012	.013	.013	.013	.016	.017	.018	23	.019
31	BF	.017	.018	.018	.018	.018	.017	.020	.021	.027	.032	.032	.033	.034	.035	.035	.030	.015	.013	.008	.005	.004	.003	.003	23	.035
NO.:		31	31	31	31	31	31	31	31	28	30	30	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.034	.038	.038	.038	.037	.034	.029	.031	.034	.040	.047	.052	.052	.053	.053	.042	.037	.035	.032	.034	.028	.028	.029		
AVG:		.0082	.0082	.0095	.0095	.0090	.0101	.0140	.0189	.0248	.0296	.0334	.0356	.0370	.0379	.0371	.0317	.0213	.0167	.0143	.0118	.0107	.0097	.0086		

MONTHLY OBSERVATIONS: 708 MONTHLY MEAN: .0194 MONTHLY MAX: .053

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) [illegible], 2024

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: [illegible]8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.015	.013	.010	.009	.008	.009	.011	.021	.033	.043	.048	.050	.050	.051	.052	.051	.050	.043	.030	.028	.024	.021	.016	23	.052
2	BF	.016	.012	.010	.009	.009	.007	.009	.022	.033	.041	.050	.058	.061	.060	.057	.058	.054	.039	.030	.032	.021	.015	.018	23	.061
3	BF	.017	.014	.016	.013	.011	.010	.013	.025	.042	BA	BA	.057	.061	.065	.067	.067	.062	.048	.041	.031	.029	.027	.025	21	.067
4	BF	.019	.018	.015	.013	.011	.008	.012	.035	.042	.048	.055	.063	.072	.080	.077	.074	.069	.059	.044	.042	.049	.062	.059	23	.080
5	BF	.052	.050	.044	.037	.042	.036	.038	.043	.046	.049	.057	.061	.062	.061	.062	.064	.065	.061	.054	.054	.048	.043	.040	23	.065
6	BF	.030	.033	.029	.025	.019	.017	.024	.029	.033	.034	.035	.036	.035	.036	.038	.039	.034	.029	.020	.020	.017	.026	.031	23	.039
7	BF	.030	.030	.029	.030	.027	.027	.026	.026	.026	.027	.029	.031	.042	.043	.039	.041	.041	.033	.028	.025	.023	.025	.024	23	.043
8	BF	.023	.026	.029	.029	.028	.028	.026	.026	.026	.026	.028	.029	.028	.029	.029	.029	.030	.031	.031	.030	.030	.031	.029	23	.031
9	BF	.025	.022	.021	.021	.024	.025	.026	.027	.026	.027	.029	.032	.034	.037	.039	.038	.037	.037	.034	.033	.031	.032	.031	23	.039
10	BF	.024	.022	.016	.020	.019	.022	.025	.025	.030	.034	.039	.044	.049	.051	.053	.053	.049	.040	.029	.024	.021	.014	.015	23	.053
11	BF	.021	.019	.015	.015	.016	.013	.013	.013	.012	.012	.014	.018	.026	.031	.032	.034	.031	.026	.020	.018	.018	.032	.027	23	.034
12	BF	.037	.036	.041	.042	.041	.042	.041	.042	.042	.042	.043	.045	.046	.046	.046	.046	.045	.044	.043	.043	.042	.042	.038	23	.046
13	BF	.023	.023	.024	.021	.020	.020	.032	.040	.041	.042	.044	.044	.045	.048	.050	.051	.051	.044	.035	.027	.026	.024	.021	23	.051
14	BF	.014	.013	.012	.011	.010	.006	.017	.027	.037	.046	.049	.050	.051	.051	.057	.060	.063	.050	.046	.035	.032	.026	.022	23	.063
15	BF	.024	.020	.019	.019	.026	.030	.029	.029	BA	BA	.026	.025	.025	.025	.026	.027	.030	.031	.033	.035	.034	.032	.032	21	.035
16	BF	.032	.031	.030	.028	.027	.027	.027	.032	.033	.034	.037	.036	.038	.041	.039	.033	.032	.019	.013	.011	.016	.021	.019	23	.041
17	BF	.019	.019	.021	.021	.020	.021	.022	.020	.020	.022	.026	.033	.042	.046	.050	.050	.045	.033	.027	.021	.021	.015	.009	23	.050
18	BF	.007	.008	.011	.011	.017	.024	.031	.040	.038	.034	.036	.036	.034	.034	.037	.036	.035	.032	.032	.028	.024	.024	.023	23	.040
19	BF	.036	.035	.034	.032	.031	.030	.032	.033	.034	.037	.038	.039	.040	.041	.042	.042	.042	.042	.039	.037	.027	.023	.016	23	.042
20	BF	.010	.009	.009	.007	.007	.008	.013	.022	.035	.044	.046	.049	.051	.051	.051	.051	.050	.040	.028	.025	.016	.019	.017	23	.051
21	BF	.010	.010	.008	.008	.007	.008	.019	.027	.032	.039	.050	.052	.058	.059	.056	.054	.053	.050	.039	.047	.052	.049	.047	23	.059
22	BF	.042	.046	.045	.044	.040	.034	.039	.046	.047	.048	.048	.048	.047	.047	.048	.051	.051	.053	.054	.043	.042	.039	.038	23	.054
23	BF	.031	.027	.027	.030	.028	.028	.030	.035	.036	.039	.044	.046	.046	.045	.046	.045	.043	.040	.038	.038	.036	.036	.038	23	.046
24	BF	.034	.026	.027	.017	.016	.021	.031	.035	.039	.046	.050	.051	.051	.051	.052	.052	.052	.046	.031	.025	.025	.022	.021	23	.052
25	BF	.040	.037	.036	.033	.026	.032	.037	.037	.041	.043	.044	.045	.044	.045	.045	.045	.045	.045	.040	.036	.037	.038	.027	23	.045
26	BF	.031	.039	.037	.036	.036	.036	.037	.041	.044	.045	.046	.048	.049	.049	.050	.050	.049	.049	.049	.048	.044	.041	.036	23	.050
27	BF	.040	.038	.038	.036	.031	.027	.039	.042	.043	.045	.048	.049	.049	.049	.048	.047	.046	.044	.043	.030	.030	.027	.030	23	.049
28	BF	.022	.021	.018	.015	.015	.017	.026	.034	.037	.042	.048	.050	.050	.052	.053	.053	.052	.040	.036	.040	.031	.031	.035	23	.053
29	BF	.031	.033	.032	.033	.032	.030	.031	.034	.040	.049	.051	.054	.051	.050	.052	.052	.051	.050	.046	.036	.036	.045	.042	23	.054
30	BF	.041	.042	.043	.044	.044	.039	.038	.042	BA	BA	.042	.049	.049	.051	.054	.056	.056	.056	.053	.050	.047	.043	.041	21	.056
31	BF	.044	.037	.033	.036	.038	.035	.033	.032	.030	.025	.030	.032	.033	.036	.038	.037	.035	.030	.024	.019	.013	.016	.019	23	.044
NO.:		31	31	31	31	31	31	31	31	29	28	30	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.052	.050	.045	.044	.044	.042	.041	.046	.047	.049	.057	.063	.072	.080	.077	.074	.069	.061	.054	.054	.052	.062	.059		
AVG:		.0271	.0261	.0251	.0240	.0234	.0231	.0267	.0317	.0351	.0380	.0410	.0439	.0458	.0471	.0479	.0479	.0467	.0414	.0358	.0326	.0304	.0304	.0286		

MONTHLY OBSERVATIONS: 707 MONTHLY MEAN: .0348 MONTHLY MAX: .080

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.030	.034	.033	.031	.029	.028	.028	.030	.032	.037	.040	.043	.046	.046	.047	.047	.047	.040	.031	.026	.017	.015	.018	23	.047
2	BF	.014	.018	.013	.012	.015	.025	.027	.031	.032	.033	.037	.042	.044	.045	.046	.046	.043	.035	.025	.020	.015	.020	.015	23	.046
3	BF	.010	.010	.009	.006	.010	.018	.034	.039	.041	.043	.046	.048	.048	.049	.051	.051	.050	.048	.039	.029	.023	.022	.023	23	.051
4	BF	.013	.013	.012	.010	.008	.015	.026	.030	.035	.044	.049	.051	.054	.056	.057	.059	.056	.043	.036	.027	.023	.022	.018	23	.059
5	BF	.014	.012	.016	.012	.022	.025	.026	.028	.028	.036	.035	.032	.036	.041	.043	.044	.042	.036	.026	.025	.032	.032	.033	23	.044
6	BF	.029	.029	.026	.020	.014	.012	.011	.014	.015	.015	.020	.028	.032	.028	.030	.028	.026	.032	.033	.040	.044	.044	.044	23	.044
7	BF	.042	.040	.039	.038	.033	.029	.037	.042	.037	BL	BL	.042	.043	.044	.044	.044	.045	.046	.046	.045	.043	.041	.036	21	.046
8	BF	.037	.035	.033	.033	.032	.032	.033	.037	.040	.040	.040	.039	.037	.037	.035	.038	.038	.038	.037	.035	.036	.034	.033	23	.040
9	BF	.032	.031	.030	.030	.031	.031	.032	.035	.039	.040	.042	.043	.044	.046	.046	.047	.047	.044	.030	.028	.021	.019	.018	23	.047
10	BF	.012	.011	.010	.007	.007	.013	.023	.029	.036	.047	.052	.055	.056	.056	.056	.056	.056	.057	.055	.046	.041	.047	.046	23	.057
11	BF	.047	.040	.031	.030	.030	.037	.037	.034	.032	.035	.038	.037	.037	.038	.039	.040	.039	.038	.037	.034	.027	.018	.012	23	.047
12	BF	.008	.011	.010	.012	.021	.029	.033	.028	.035	.039	.040	.039	.039	.041	.042	.041	.039	.036	.024	.031	.035	.033	.033	23	.042
13	BF	.033	.033	.035	.035	.033	.030	.030	.031	BA	.029	.033	.035	.042	.037	.036	.035	.035	.036	.035	.036	.035	.028	.030	22	.042
14	BF	.037	.028	.022	.022	.030	.033	.033	.032	.032	.036	.040	.044	.046	.050	.050	.051	.050	.047	.042	.029	.020	.018	.015	23	.051
15	BF	.014	.011	.009	.008	.006	.011	.024	.032	.037	.048	.053	.055	.055	.056	.056	.055	.050	.038	.027	.027	.028	.025	.029	23	.056
16	BF	.049	.044	.044	.041	.036	.034	.034	.035	.034	.034	.032	.032	.030	.030	.028	.025	.025	.016	.012	.017	.008	.003	.003	23	.049
17	BF	.004	.009	.007	.007	.012	.017	.021	.028	.030	.025	.027	.033	.036	.037	.037	.037	.036	.035	.033	.026	.027	.023	.021	23	.037
18	BF	.018	.017	.014	.010	.008	.018	.027	.027	.028	.028	.030	.033	.035	.039	.042	.042	.042	.040	.035	.037	.038	.042	.043	23	.043
19	BF	.035	.023	.034	.035	.035	.040	.044	.046	.047	.048	.050	.051	.052	.052	.052	.053	.051	.034	.022	.020	.015	.015	.013	23	.053
20	BF	.008	.006	.005	.005	.008	.017	.025	.032	.045	.048	.053	.055	.055	.053	.051	.052	.049	.045	.047	.048	.046	.037	.029	23	.055
21	BF	.024	.032	.039	.038	.031	.033	.036	.039	.042	.045	.047	.049	.049	.049	.048	.048	.045	.033	.023	.019	.017	.018	.022	23	.049
22	BF	.019	.009	.009	.004	.005	.013	.022	.035	.038	.041	.042	.045	.046	.046	.047	.047	.042	.031	.024	.021	.021	.022	.020	23	.047
23	BF	.019	.013	.010	.011	.007	.012	.031	.035	.038	.046	.047	.046	.046	.045	.045	.044	.043	.039	.034	.040	.026	.029	.026	23	.047
24	BF	.021	.030	.034	.021	.016	.022	.028	.034	.038	.038	.040	.042	.042	.043	.044	.042	.040	.029	.024	.021	.021	.018	.016	23	.044
25	BF	.012	.010	.008	.005	.004	.010	.020	.029	.037	.042	.043	.043	.043	.044	.043	.042	.036	.023	.013	.013	.012	.013	.009	23	.044
26	BF	.011	.013	.023	.025	.027	.025	.026	.026	.025	.026	.028	.031	.035	.040	.040	.043	.045	.046	.043	.044	.044	.045	.043	23	.046
27	BF	.040	.038	.037	.035	.033	.031	.036	.043	.047	.050	.051	.053	.055	.055	.056	.057	.055	.038	.029	.025	.020	.016	.014	23	.057
28	BF	.010	.008	.006	.005	.003	.016	.027	.031	BA	.044	.054	.055	.057	.059	.059	.058	.053	.039	.030	.028	.026	.025	.027	22	.059
29	BF	.017	.014	.013	.010	.009	.014	.028	.039	.050	.052	.053	.054	.054	.053	.054	.055	.054	.045	.038	.034	.030	.028	.025	23	.055
30	BF	.022	.021	.017	.017	.019	.029	.038	.040	.042	.044	.044	.043	.043	.044	.043	.042	.042	.037	.031	.027	.024	.023	.023	23	.044
31																									0	
NO.:		30	30	30	30	30	30	30	30	28	29	29	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.049	.044	.044	.041	.036	.040	.044	.046	.050	.052	.054	.055	.057	.059	.059	.059	.056	.057	.055	.048	.046	.047	.046		
AVG:		.0227	.0214	.0209	.0192	.0191	.0233	.0292	.0330	.0361	.0391	.0416	.0433	.0446	.0453	.0456	.0456	.0440	.0381	.0320	.0299	.0272	.0258	.0246		

MONTHLY OBSERVATIONS: 686 MONTHLY MEAN: .0327 MONTHLY MAX: .059

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 28-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.021	.022	.024	.026	.024	.022	.019	.026	.028	.031	.033	.037	.037	.039	.041	.042	.036	.027	.017	.014	.012	.015	.015	23	.042
2	BF	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	0	
3	AV	AV	AV	AV	AV	AV	AV	AV	.025	.029	.031	.032	.032	.033	.035	.036	.034	.029	.021	.012	.009	.008	.007	.008	16	.036
4	BF	.002	.003	.003	.002	.001	.010	.019	.024	.031	.037	.039	.040	.041	.043	.047	.047	.041	.037	.026	.036	.034	.023	.015	23	.047
5	BF	.006	.006	.002	.011	.015	.019	.023	.027	.030	.034	.039	.041	.039	.038	.040	.036	.035	.022	.016	.010	.009	.013	.019	23	.041
6	BF	.014	.018	.019	.016	.017	.018	.021	.026	.031	.037	.046	.049	.052	.052	.050	.047	.045	.042	.042	.040	.040	.039	.037	23	.052
7	BF	.039	.038	.037	.035	.036	.037	.037	.038	.036	.037	.035	.034	.034	.034	.035	.034	.032	.031	.029	.027	.025	.025	.025	23	.039
8	BF	.017	.018	.018	.020	.021	.023	.029	.032	.033	.033	.034	.035	.035	.038	.038	.038	.037	.029	.020	.023	.029	.025	.020	23	.038
9	BF	.017	.016	.021	.022	.022	.025	.027	.029	.032	.035	.037	.037	.038	.039	.040	.041	.039	.028	.021	.017	.018	.020	.019	23	.041
10	BF	.014	.015	.012	.009	.010	.018	.027	.040	BA	.043	.045	.048	.050	.050	.051	.052	.047	.030	.025	.023	.016	.012	.008	22	.052
11	BF	.003	.002	.001	.000	.001	.015	.028	.044	.052	.058	.058	.059	.059	.060	.059	.051	.047	.032	.022	.016	.011	.008	.005	23	.060
12	BF	.003	.010	.016	.014	.016	.022	.034	.048	.055	.057	.059	.061	.060	.059	.058	.060	.056	.036	.027	.025	.025	.045	.044	23	.061
13	BF	.040	.035	.033	.027	.023	.026	.027	.026	.033	.035	.036	.037	.039	.041	.041	.040	.036	.022	.015	.014	.013	.014	.012	23	.041
14	BF	.014	.014	.010	.006	.010	.017	.024	.030	.033	.037	.041	.045	.045	.043	.042	.043	.042	.036	.022	.018	.012	.008	.017	23	.045
15	BF	.029	.018	.020	.015	.018	.024	.030	.034	.037	.042	.049	.056	.058	.058	.056	.052	.045	.042	.041	.029	.022	.019	.024	23	.058
16	BF	.015	.015	.012	.011	.011	.020	.028	.036	.044	.047	.049	.052	.055	.058	.057	.058	.058	.051	.043	.045	.045	.031	.026	23	.058
17	BF	.019	.016	.012	.009	.007	.026	.035	.043	.053	.058	.060	.060	.060	.061	.061	.062	.057	.038	.028	.020	.020	.015	.013	23	.062
18	BF	.009	.005	.004	.003	.004	.010	.022	.035	.051	.060	.064	.062	.062	.065	.060	.064	.062	.043	.031	.024	.019	.019	.016	23	.065
19	BF	.014	.011	.008	.011	.007	.020	.033	.042	.050	.051	.058	.059	.056	.052	.051	.052	.053	.042	.028	.025	.023	.020	.018	23	.059
20	BF	.032	.030	.030	.030	.031	.032	.033	.036	.038	.041	.038	.040	.043	.041	.040	.039	.038	.036	.031	.028	.027	.024	.021	23	.043
21	BF	.019	.019	.019	.018	.016	.018	.021	.026	.032	.035	.036	.038	.036	.038	.040	.040	.038	.031	.028	.024	.022	.017	.020	23	.040
22	BF	.013	.019	.014	.016	.020	.024	.025	.028	.032	.035	.034	.035	.035	.034	.034	.035	.032	.022	.018	.029	.028	.022	.019	23	.035
23	BF	.013	.013	.013	.013	.021	.025	.026	.027	.027	.025	.024	.025	.027	.029	.030	.027	.023	.016	.017	.023	.020	.016	.008	23	.030
24	BF	.003	.003	.007	.010	.009	.010	.011	.011	.014	.019	.019	.020	.021	.022	.019	.018	.026	.035	.031	.027	.021	.017	.016	23	.035
25	BF	.015	.013	.013	.013	.015	.020	.019	.019	.032	BA	.013	.015	.014	.014	.016	.018	.017	.016	.015	.014	.013	.015	.016	22	.032
26	BF	.020	.019	.020	.021	.020	.019	.019	.020	.021	.021	.020	.021	.023	.025	.027	.031	.030	.026	.022	.015	.011	.012	.016	23	.031
27	BF	.019	.021	.021	.022	.022	.025	.027	.036	.040	.043	.045	.042	.037	.036	.034	.034	.034	.033	.033	.032	.023	.014	.010	23	.045
28	BF	.005	.007	.011	.007	.010	.021	.023	.029	.034	.038	.039	.041	.041	.042	.037	.035	.023	.017	.016	.012	.008	.006	.004	23	.042
29	BF	.001	.001	.000	.001	.006	.016	.022	.027	.033	.041	.044	.046	.046	.046	.044	.044	.042	.031	.023	.017	.011	.013	.015	23	.046
30	BF	.014	.012	.012	.009	.006	.018	.030	.034	.036	.041	.044	.047	.047	.046	.046	.041	.037	.028	.020	.014	.033	.033	.029	23	.047
31	BF	.019	.015	.013	.012	.014	.016	.023	.029	.032	.034	.036	.040	.039	.039	.034	.035	.031	.026	.017	.011	.009	.005	.003	23	.040
NO.:		29	29	29	29	29	29	29	30	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.040	.038	.037	.035	.036	.037	.037	.048	.055	.060	.064	.062	.062	.065	.061	.064	.062	.051	.043	.045	.045	.045	.044		
AVG:		.0155	.0150	.0147	.0141	.0149	.0206	.0256	.0309	.0355	.0392	.0402	.0418	.0421	.0426	.0421	.0417	.0389	.0309	.0245	.0220	.0202	.0184	.0173		

MONTHLY OBSERVATIONS: 681 MONTHLY MEAN: .0283 MONTHLY MAX: .065

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.001	.000	.001	.000	.002	.009	.021	.032	.037	.039	.042	.044	.045	.043	.041	.039	.033	.023	.016	.007	.006	.004	.002	23	.045
2	BF	.004	.002	.001	.000	.002	.013	.026	.029	.032	.031	.031	.034	.032	.031	.027	.023	.024	.019	.011	.008	.009	.005	.007	23	.034
3	BF	.010	.016	.015	.016	.016	.015	.023	.028	.033	.036	.038	.036	.033	.037	.038	.039	.041	.039	.032	.019	.026	.016	.011	23	.041
4	BF	.006	.005	.016	.023	.026	.027	.031	.037	.041	.044	.047	.049	.051	.051	.052	.051	.050	.039	.025	.013	.012	.009	.008	23	.052
5	BF	.008	.010	.018	.030	.028	.030	.034	.039	.045	.050	.052	.051	.052	.051	.052	.052	.051	.040	.028	.022	.020	.020	.018	23	.052
6	BF	.031	.024	.018	.021	.019	.025	.034	.037	.037	.041	.044	.043	.043	.043	.036	.040	.041	.031	.032	.034	.036	.035	.035	23	.044
7	BF	.032	.031	.030	.028	.025	.024	.026	.031	.033	.036	.040	.042	.043	.044	.042	.042	.040	.041	.040	.038	.032	.023	.020	23	.044
8	BF	.016	.018	.015	.012	.012	.020	.027	.029	.028	.031	.031	.030	.033	.035	.037	.035	.029	.024	.039	.038	.032	.030	.027	23	.039
9	BF	.017	.015	.017	.018	.016	.016	.020	BA	BA	.019	.022	.030	.038	.041	.044	.047	.046	.035	.024	.029	.016	.009	.009	21	.047
10	BF	.007	.004	.002	.002	.004	.017	.031	.041	.045	.047	.049	.049	.049	.050	.051	.041	.029	.024	.019	.013	.010	.005	.004	23	.051
11	BF	.003	.001	.001	.002	.003	.014	.024	.035	.050	.050	.051	.049	.049	.049	.049	.050	.047	.031	.015	.010	.009	.008	.006	23	.051
12	BF	.001	.003	.000	.000	.001	.006	.017	.027	.034	.037	.040	.041	.044	.048	.049	.052	.048	.032	.020	.012	.006	.009	.007	23	.052
13	BF	.005	.004	.004	.002	.004	.011	.017	.023	.026	.027	.028	.035	.042	.033	.034	.031	.028	.017	.009	.005	.004	.002	.001	23	.042
14	BF	.000	.000	.000	.000	.001	.012	.021	.025	.028	.027	.027	.027	.027	.027	.028	.028	.022	.014	.004	.003	.002	.009	.012	23	.028
15	BF	.008	.007	.006	.004	.006	.013	.022	.032	.039	.040	.039	.037	.037	.037	.037	.032	.018	.023	.027	.043	.038	.029	.024	23	.043
16	BF	.019	.011	.006	.005	.006	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	AV	5	.019
17	AV	AV	AV	AV	AV	AV	AV	AV	AV	.042	.045	.052	.051	.048	.045	.042	.038	.031	.021	.015	.018	.020	.022	.022	15	.052
18	BF	.006	.003	.002	.002	.008	.025	.030	.044	.048	.052	.054	.054	.053	.057	.057	.056	.058	.055	.052	.047	.045	.043	.038	23	.058
19	BF	.036	.033	.015	.014	.031	.032	.035	.039	.042	.043	.045	.047	.052	.055	.051	.048	.047	.034	.028	.022	.017	.017	.012	23	.055
20	BF	.012	.005	.009	.006	.012	.028	.032	.039	.044	.046	.045	.046	.049	.051	.053	.052	.047	.029	.019	.012	.010	.007	.006	23	.053
21	BF	.003	.001	.001	.001	.001	.015	.026	.042	.052	.055	.053	.055	.053	.053	.054	.053	.048	.028	.016	.012	.011	.009	.008	23	.055
22	BF	.002	.001	.000	.001	.002	.014	.032	.040	.045	.047	BA	.035	.039	.043	.050	.052	.050	.032	.023	.017	.011	.011	.007	22	.052
23	BF	.008	.005	.006	.006	.008	.028	.040	.049	.057	.062	.060	.056	.059	.064	.062	.059	.061	.059	.053	.053	.048	.034	.033	23	.064
24	BF	.018	.014	.013	.011	.013	.040	.046	.053	.055	.060	.068	.070	.072	.072	.072	.071	.064	.043	.033	.030	.020	.030	.042	23	.072
25	BF	.035	.033	.037	.029	.032	.034	.036	.038	.039	.041	.041	.043	.043	.045	.045	.044	.041	.035	.025	.020	.031	.021	.013	23	.045
26	BF	.007	.004	.005	.002	.002	.011	.028	.036	.038	.038	.039	.040	.043	.043	.043	.042	.041	.034	.030	.036	.038	.027	.023	23	.043
27	BF	.013	.011	.009	.005	.007	.016	.027	.030	.037	.041	.044	.045	.041	.040	.038	.034	.032	.032	.031	.025	.013	.016	.028	23	.045
28	BF	.014	.024	.027	.032	.035	.036	.037	.041	.044	.047	.049	.049	.053	.057	.057	.049	.049	.048	.047	.042	.036	.025	.014	23	.057
29	BF	.015	.018	.016	.013	.011	.013	.015	.022	.030	.037	.039	.037	.035	.035	.034	.037	.036	.029	.021	.017	.021	.033	.026	23	.039
30	BF	.015	.014	.009	.013	.015	.021	.029	.037	.037	.038	.039	.041	.038	.037	.039	.036	.031	.028	.015	.014	.013	.006	.006	23	.041
31																									0	
NO.:		29	29	29	29	29	28	28	27	28	29	28	29	29	29	29	29	29	29	29	29	29	29	29		
MAX:		.036	.033	.037	.032	.035	.040	.046	.053	.057	.062	.068	.070	.072	.072	.072	.071	.064	.059	.053	.053	.048	.043	.042		
AVG:		.0121	.0109	.0103	.0103	.0120	.0202	.0281	.0354	.0399	.0416	.0432	.0437	.0447	.0454	.0453	.0439	.0408	.0324	.0258	.0227	.0204	.0177	.0162		

MONTHLY OBSERVATIONS: 661 MONTHLY MEAN: .0288 MONTHLY MAX: .072

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
REPORT

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.001	.002	.003	.001	.002	.012	.018	.027	.033	.036	.040	.036	.036	.039	.040	.037	.035	.029	.018	.014	.010	.007	.008	23	.040
2	BF	.003	.003	.002	.003	.004	.017	.027	.032	.036	.036	.035	.039	.039	.037	.037	.036	.033	.029	.021	.015	.024	.017	.012	23	.039
3	BF	.002	.003	.005	.009	.010	.016	.020	.022	.023	.026	.028	.029	.029	.028	.027	.027	.024	.018	.009	.009	.006	.001	.001	23	.029
4	BF	.000	.000	.000	.001	.003	.009	.015	.019	.022	.025	.025	.027	.029	.031	.034	.033	.029	.012	.008	.010	.008	.004	.003	23	.034
5	BF	.001	.001	.001	.001	.002	.006	.014	.021	.030	.034	.033	.034	.038	.046	.043	.038	.035	.028	.018	.010	.006	.005	.004	23	.046
6	BF	.003	.006	.002	.002	.003	.012	.021	.029	.033	.035	.037	.037	.035	.042	.055	.043	.034	.024	.022	.033	.023	.016	.011	23	.055
7	BF	.010	.005	.004	.001	.003	.016	.026	.033	BA	BA	.017	.018	.022	.029	.032	.033	.033	.039	.039	.026	.024	.013	.011	21	.039
8	BF	.003	.006	.002	.002	.002	.008	.016	.028	.036	.041	.041	.039	.038	.042	.041	.040	.038	.033	.027	.016	.009	.016	.013	23	.042
9	BF	.010	.006	.006	.009	.009	.011	.033	.039	.033	.038	.038	.037	.035	.034	.035	.045	.038	.036	.036	.031	.031	.032	.030	23	.045
10	BF	.025	.023	.015	.011	.015	.019	.021	.027	.028	.028	.032	.036	.037	.037	.037	.037	.035	.032	.015	.010	.007	.005	.004	23	.037
11	BF	.013	.012	.013	.011	.010	.011	.014	.013	.014	.018	.023	.026	.030	.034	.036	.038	.037	.034	.027	.020	.017	.017	.014	23	.038
12	BF	.008	.006	.006	.004	.007	.011	.014	.014	.024	.031	.034	.036	.040	.042	.043	.043	.036	.021	.010	.007	.006	.008	.005	23	.043
13	BF	.002	.004	.007	.007	.009	.021	.030	.031	.044	.047	.046	.040	.041	.045	.046	.043	.038	.031	.027	.027	.017	.010	.005	23	.047
14	BF	.001	.001	.001	.001	.002	.011	.023	.039	.050	.051	.050	.049	.049	.049	.050	.046	.033	.023	.019	.011	.009	.006	.006	23	.051
15	BF	.003	.001	.002	.001	.003	.010	.017	.029	.040	.047	.051	.056	.057	.058	.058	.058	.041	.029	.020	.015	.010	.008	.005	23	.058
16	BF	.006	.007	.006	.005	.004	.009	.020	.029	.037	.045	.051	.052	.055	.057	.050	.052	.049	.042	.027	.019	.012	.012	.010	23	.057
17	BF	.007	.007	.006	.004	.002	.011	.019	.024	.028	.029	.034	.032	.035	.044	.040	.036	.033	.026	.020	.017	.013	.012	.011	23	.044
18	BF	.003	.003	.003	.004	.007	.016	.021	.028	.034	.036	.036	.036	.037	.033	.029	.026	.023	.020	.022	.019	.024	.016	.018	23	.037
19	BF	.020	.033	.031	.024	.025	.025	.023	.023	.028	.027	.028	.035	.039	.045	.045	.049	.042	.028	.014	.011	.007	.008	.007	23	.049
20	BF	.007	.009	.010	.009	.012	.015	.017	.022	.029	.032	.033	.037	.043	.045	.043	.036	.033	.031	.027	.020	.021	.017	.015	23	.045
21	BF	.014	.013	.014	.013	.011	.013	.015	.017	BL	BL	BL	BL	.016	.017	.025	.023	.022	.022	.020	.016	.017	.015	.012	19	.025
22	BF	.006	.007	.006	.007	.007	.011	BF	.021	.025	.031	BA	.030	.038	.048	.046	.046	.042	.032	.037	.032	.022	.013	.014	21	.048
23	BF	.007	.003	.004	.003	.004	.012	.020	.029	.042	.047	.046	.050	.051	.052	.055	.046	.035	.030	.024	.019	.014	.010	.009	23	.055
24	BF	.004	.002	.002	.002	.002	.007	.015	.022	.025	.026	.027	.030	.031	.030	.031	.032	.035	.024	.017	.013	.010	.006	.004	23	.035
25	BF	.005	.003	.005	.005	.005	.009	.012	.016	.022	.027	.029	.029	.024	.023	.021	.023	.030	.025	.013	.010	.007	.005	.002	23	.030
26	BF	.002	.002	.004	.003	.007	.013	.016	.019	.026	.030	.032	.032	.033	.034	.034	.036	.036	.030	.016	.009	.009	.006	.005	23	.036
27	BF	.003	.003	.002	.001	.002	.009	.019	.027	.032	.033	.037	.034	.032	.030	.031	.032	.034	.024	.018	.012	.011	.009	.005	23	.037
28	BF	.005	.003	.004	.004	.006	.011	.021	.028	.033	.032	.035	.040	.044	.047	.046	.041	.037	.033	.023	.023	.019	.008	.016	23	.047
29	BF	.012	.011	.012	.011	.011	.014	.018	.026	.032	.030	.031	.028	.031	.027	.028	.032	.031	.028	.027	.034	.034	.030	.023	23	.034
30	BF	.015	.013	.012	.012	.012	.015	.017	.020	.032	.032	.034	.035	.030	.029	.026	.030	.027	.019	.027	.028	.023	.021	.021	23	.035
31	BF	.016	.015	.013	.016	.015	.013	.014	.017	.021	.023	.028	.026	.026	.026	.025	.027	.026	.017	.026	.024	.016	.009	.005	23	.028
NO.:		31	31	31	31	31	31	30	31	29	29	29	30	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.025	.033	.031	.024	.025	.025	.033	.039	.050	.051	.051	.056	.057	.058	.058	.058	.049	.042	.039	.034	.034	.032	.030		
AVG:		.0070	.0069	.0065	.0060	.0070	.0127	.0192	.0249	.0308	.0336	.0349	.0355	.0361	.0381	.0384	.0375	.0340	.0274	.0217	.0181	.0150	.0117	.0100		

MONTHLY OBSERVATIONS: 705 MONTHLY MEAN: .0222 MONTHLY MAX: .058

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.004	.003	.002	.002	.001	.005	.010	.014	.016	.024	.024	.024	.026	.027	.029	.025	.020	.011	.004	.003	.002	.004	.005	23	.029
2	BF	.003	.005	.004	.004	.006	.006	.009	.016	.019	.022	.027	.026	.028	.029	.030	.029	.024	.014	.017	.026	.025	.020	.013	23	.030
3	BF	.006	.003	.009	.006	.005	.012	.018	.024	BA	BA	.031	.032	.033	.037	.042	.042	.034	.024	.015	.011	.005	.007	.006	21	.042
4	BF	.006	.004	.006	.008	.009	.011	.014	.022	.026	.029	.032	.032	.029	.029	.029	.028	.024	.016	.009	.006	.005	.004	.003	23	.032
5	BF	.002	.002	.002	.002	.002	.008	.017	.027	.029	.029	.029	.032	.035	.034	.034	.036	.031	.033	.038	.030	.020	.011	.012	23	.038
6	BF	.003	.009	.005	.006	.013	.016	.017	.025	.032	.033	.032	.031	.031	.031	.032	.035	.022	.026	.017	.018	.009	.011	.014	23	.035
7	BF	.013	.011	.012	.012	.009	.011	.016	.020	.023	.024	.028	.029	.032	.032	.032	.032	.031	.029	.021	.017	.018	.020	.013	23	.032
8	BF	.007	.004	.003	.002	.005	.011	.019	.026	.026	.032	.035	.036	.035	.035	.032	.030	.024	.029	.018	.013	.009	.017	.017	23	.036
9	BF	.014	.009	.013	.012	.011	.011	BF	.020	.025	.034	.036	.036	.036	.036	.037	.030	.021	.020	.012	.010	.014	.010	.008	22	.037
10	BF	.004	.004	.006	.010	.008	.012	.014	.019	.028	.030	.034	.035	.035	.033	.029	.028	.024	.031	.021	.019	.015	.016	.016	23	.035
11	BF	.008	.007	.006	.004	.004	.012	.017	.023	.026	.031	.030	.027	.029	.028	.030	.034	.028	.014	.006	.021	.027	.024	.017	23	.034
12	BF	.007	.004	.003	.002	.004	.017	.022	.025	.030	.034	.041	.042	.042	.042	.045	.047	.040	.033	.016	.024	.033	.018	.012	23	.047
13	BF	.021	.012	.009	.005	.010	.020	.023	.025	.029	.033	.036	.043	.045	.046	.046	.042	.037	.025	.018	.015	.015	.014	.008	23	.046
14	BF	.004	.002	.003	.005	.002	.010	.022	.031	.035	.038	.040	.041	.041	.043	.044	.045	.039	.028	.020	.017	.007	.009	.007	23	.045
15	BF	.005	.005	.004	.003	.003	.010	.025	.033	.040	.042	.042	.046	.043	.043	.043	.036	.029	.021	.015	.010	.005	.003	.002	23	.046
16	BF	.002	.002	.001	.001	.001	.009	.023	.033	.040	.046	.044	.042	.044	.045	.042	.042	.038	.034	.020	.013	.019	.021	.025	23	.046
17	BF	.024	.026	.023	.018	.020	.022	.027	.033	BA	BA	.034	.036	.038	.039	.039	.038	.039	.033	.027	.024	.025	.025	.030	21	.039
18	BF	.027	.026	.021	.022	.020	.018	.023	.031	.036	.041	.045	.044	.043	.044	.045	.045	.042	.027	.022	.020	.019	.015	.010	23	.045
19	BF	.014	.012	.007	.007	.008	.009	.013	.026	.028	.036	.041	.041	.038	.035	.039	.038	.034	.029	.026	.022	.016	.011	.008	23	.041
20	BF	.014	.008	.004	.009	.007	.007	.010	.015	.020	.027	.033	.034	.037	.036	.035	.027	.025	.017	.009	.013	.025	.022	.017	23	.037
21	BF	.018	.018	.020	.016	.015	.015	.015	.017	.019	.021	.022	.025	.030	.029	.028	.024	.017	.008	.005	.002	.007	.010	.012	23	.030
22	BF	.014	.013	.011	.010	.015	.017	.016	.017	.023	.024	.024	.024	.026	.029	.031	.031	.029	.022	.028	.024	.016	.010	.006	23	.031
23	BF	.012	.010	.010	.010	.010	.012	.016	.024	.027	.032	.035	.035	.035	.033	.032	.027	.032	.027	.023	.017	.010	.011	.012	23	.035
24	BF	.014	.008	.004	.004	.002	.005	.007	.016	.022	.026	.030	.031	.033	.033	.031	.027	.022	.016	.009	.006	.007	.012	.016	23	.033
25	BF	.005	.004	.005	.005	.005	.007	.011	.015	.019	.023	.024	.028	.030	.026	.024	.025	.024	.020	.011	.006	.004	.003	.002	23	.030
26	BF	.004	.006	.010	.009	.006	.007	.015	.023	.028	.030	.031	.032	.034	.038	.039	.029	.018	.018	.012	.008	.008	.004	.004	23	.039
27	BF	.002	.001	.001	.001	.001	.004	.009	.015	.024	.033	.037	.038	.039	.041	.044	.042	.036	.022	.015	.022	.022	.014	.009	23	.044
28	BF	.005	.003	.002	.002	.001	.005	.011	.018	.023	.026	.026	.030	.028	.030	.032	.022	.015	.007	.003	.002	.001	.001	.001	23	.032
29	BF	.002	.003	.001	.002	.004	.008	.014	.023	.028	.030	.032	.033	.036	.039	.041	.042	.031	.018	.011	.010	.007	.004	.003	23	.042
30	BF	.002	.002	.001	.002	.003	.004	.012	.024	BA	.028	.031	.028	.021	.022	.023	.026	.019	.010	.004	.002	.001	.001	.001	22	.031
31	BF	.001	.003	.001	.001	.001	.008	.022	.035	.041	.043	.050	.051	.052	.052	.050	.049	.039	.021	.015	.011	.006	.005	.004	23	.052
NO.:		31	31	31	31	31	31	30	31	28	29	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.027	.026	.023	.022	.020	.022	.027	.035	.041	.046	.050	.051	.052	.052	.050	.049	.042	.034	.038	.030	.033	.025	.030		
AVG:		.0086	.0074	.0067	.0065	.0068	.0106	.0162	.0231	.0272	.0311	.0334	.0343	.0350	.0354	.0358	.0340	.0286	.0220	.0157	.0143	.0130	.0115	.0101		

MONTHLY OBSERVATIONS: 707 MONTHLY MEAN: .0203 MONTHLY MAX: .052

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM

R REPORT

(44201) O3

2024

SITE ID: 01-055-0011 POC: 1

COUNTY: (055) Etowah

CITY: (71832) Southside

SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907

SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD

MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama

AQCR: (003) EAST ALABAMA

URBANIZED AREA: (2880) GADSDEN, AL

LAND USE: AGRICULTURAL

LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6

LATITUDE: 33.9040390009

LONGITUDE: -86.053867

UTM ZONE:

UTM NORTHING:

UTM EASTING:

ELEVATION-MSL: 152.4

PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt

MONITOR TYPE: SLAMS

COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI

PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2022

DURATION: 1 HOUR

UNITS: Parts per million

MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.002	.001	.002	.001	.001	.005	.018	.031	.041	.044	.047	.052	.051	.052	.053	.050	.037	.020	.015	.010	.010	.010	.010	23	.053
2	BF	.005	.004	.006	.007	.007	.012	.018	.028	.032	.035	.036	.039	.038	.038	.041	.041	.033	.023	.022	.019	.021	.020	.026	23	.041
3	BF	.022	.019	.012	.010	.009	.009	.017	.023	.025	.028	.029	.027	.025	.029	.029	.027	.017	.013	.030	.025	.019	.013	.010	23	.030
4	BF	.007	.008	.010	.010	.006	.006	.008	.015	.019	.020	.018	.028	.028	.028	.024	.018	.015	.013	.010	.016	.014	.011	.011	23	.028
5	BF	.010	.008	.009	.008	.012	.011	.013	.015	.017	.019	.018	.022	.027	.027	.028	.029	.029	.019	.011	.008	.006	.003	.003	23	.029
6	BF	.001	.001	.001	.003	.005	.005	.008	.012	.020	.027	.028	.030	.030	.031	.029	.029	.036	.037	.025	.021	.021	.014	.010	23	.037
7	BF	.008	.016	.013	.010	.009	.018	.019	.024	.027	.032	.034	.035	.037	.037	.036	.034	.032	.028	.024	.022	.020	.025	.025	23	.037
8	BF	.020	.021	.022	.020	.016	.018	.022	.025	.029	.033	.034	.037	.040	.043	.044	.043	.039	.031	.036	.023	.022	.015	.014	23	.044
9	BF	.013	.012	.010	.010	.009	.011	.014	.022	.026	.028	.031	.031	.036	.038	.037	.035	.033	.031	.022	.019	.022	.018	.029	23	.038
10	BF	.022	.024	.025	.025	.022	.020	.018	.017	.016	.019	.022	.023	.024	.023	.022	.022	.021	.020	.018	.016	.014	.012	.011	23	.025
11	BF	.006	.004	.003	.003	.002	.005	.014	.020	.023	.027	.031	.034	.034	.033	.033	.032	.034	.029	.016	.010	.010	.008	.007	23	.034
12	BF	.009	.015	.017	.014	.016	.018	.019	.019	.023	.031	.034	.035	.037	.038	.041	.038	.033	.025	.025	.019	.014	.007	.007	23	.041
13	BF	.003	.003	.002	.003	.002	.005	.016	.024	.033	BA	.041	.043	.045	.047	.048	.049	.036	.019	.016	.009	.010	.007	.007	22	.049
14	BF	.005	.004	.003	.003	.002	.003	.011	.027	.037	.042	.046	.047	.047	.045	.045	.042	.031	.019	.014	.012	.011	.009	.009	23	.047
15	BF	.004	.003	.009	.014	.014	.014	.016	.023	.032	.038	.043	.045	.047	.046	.048	.040	.037	.019	.015	.011	.008	.006	.006	23	.048
16	BF	.004	.003	.002	.001	.003	.011	.020	.029	.037	.044	.048	.050	.051	.052	.052	.054	.039	.022	.022	.017	.013	.009	.005	23	.054
17	BF	.004	.004	.002	.002	.004	.013	.018	.024	.033	.040	.042	.045	.047	.047	.046	.036	.024	.020	.014	.008	.007	.009	.008	23	.047
18	BF	.007	.005	.004	.004	.015	.016	.020	.029	.036	.039	.041	.045	.046	.048	.048	.046	.031	.019	.019	.013	.010	.008	.006	23	.048
19	BF	.004	.002	.002	.002	.001	.002	.008	.020	.031	.049	.054	.052	.050	.050	.050	.048	.025	.016	.010	.008	.006	.005	.003	23	.054
20	BF	.003	.003	.002	.001	.001	.004	.014	.028	.038	.046	.056	.054	.045	.043	.046	.046	.035	.022	.010	.010	.008	.006	.003	23	.056
21	BF	.001	.001	.001	.001	.001	.002	.012	.029	.044	.052	.054	.056	.057	.053	.051	.049	.032	.018	.015	.009	.007	.005	.003	23	.057
22	BF	.001	.001	.001	.002	.001	.003	.014	.032	.045	.054	.057	.059	.058	.055	.054	.052	.050	.048	.046	.045	.043	.043	.040	23	.059
23	BF	.034	.035	.035	.032	.034	.033	.032	.034	.037	.039	.042	.046	.047	.049	.050	.049	.046	.038	.023	.016	.018	.016	.012	23	.050
24	BF	.008	.005	.005	.005	.004	.008	.020	.030	.039	.045	.050	.055	.057	.056	.054	.054	.041	.024	.026	.026	.018	.018	.017	23	.057
25	BF	.014	.027	.026	.023	.019	.019	.019	.024	.031	.036	.041	.042	.039	.040	.039	.037	.024	.013	.007	.005	.004	.002	.003	23	.042
26	BF	.021	.008	.009	.004	.003	.014	.028	.032	.043	.046	.048	.048	.049	.050	.050	.053	.051	.048	.045	.038	.023	.025	.025	23	.053
27	BF	.012	.020	.014	.013	.009	.011	.029	.032	.039	.041	.042	.042	.042	.043	.043	.044	.045	.038	.018	.025	.023	.026	.026	23	.045
28	BF	.013	.017	.017	.017	.011	.012	.026	.033	.040	BL	BL	BL	.048	.046	.046	.045	.043	.041	.038	.033	.029	.026	.024	20	.048
29	BF	.022	.021	.021	.021	.020	.019	.020	.024	.028	BA	BA	.036	.038	.040	.041	.041	.039	.034	.032	.025	.029	.028	.017	21	.041
30	BF	.013	.015	.015	.017	.017	.017	.018	.024	.028	.035	.040	.041	.042	.042	.043	.044	.039	.036	.037	.036	.036	.036	.035	23	.044
31																									0	
NO.:		30	30	30	30	30	30	30	30	30	27	28	29	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.034	.035	.035	.032	.034	.033	.032	.034	.045	.054	.057	.059	.058	.056	.054	.054	.051	.048	.046	.045	.043	.043	.040		
AVG:		.0099	.0103	.0100	.0095	.0092	.0115	.0176	.0250	.0316	.0366	.0395	.0413	.0421	.0423	.0424	.0409	.0342	.0261	.0220	.0185	.0165	.0147	.0137		

MONTHLY OBSERVATIONS: 684 MONTHLY MEAN: .0245 MONTHLY MAX: .059

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2022

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.030	.032	.028	.032	.031	.031	.031	.032	.036	.039	.041	.042	.043	.044	.045	.047	.047	.047	.047	.045	.044	.042	.029	23	.047
2	BF	.018	.014	.011	.012	.014	.020	.030	.033	.035	.037	.038	.039	.039	.039	.040	.040	.038	.032	.030	.030	.031	.030	.029	23	.040
3	BF	.025	.024	.019	.016	.017	.016	.018	.020	.024	.027	.031	.034	.035	.037	.037	.036	.037	.036	.037	.034	.029	.018	.013	23	.037
4	BF	.006	.004	.004	.003	.002	.006	.014	.020	.028	.034	.039	.040	.041	.044	.045	.044	.040	.030	.019	.016	.012	.014	.012	23	.045
5	BF	.007	.006	.004	.004	.003	.003	.018	.032	.041	.050	.054	.054	.053	.054	.055	.053	.040	.026	.019	.022	.019	.016	.013	23	.055
6	BF	.010	.009	.008	.006	.005	.006	.017	.033	.043	.051	.057	.060	.061	.060	.059	.050	.035	.031	.022	.019	.016	.015	.014	23	.061
7	BF	.012	.008	.007	.006	.006	.006	.016	.032	.047	.057	.059	.059	.060	.059	.057	.056	.051	.046	.034	.044	.040	.044	.041	23	.060
8	BF	.037	.035	.033	.031	.030	.029	.027	.030	.034	.038	.042	.044	.045	.046	.046	.045	.044	.042	.039	.035	.033	.029	.021	23	.046
9	BF	.020	.015	.021	.020	.025	.026	.026	.032	.038	.040	.044	.048	.049	.048	.048	.047	.041	.028	.025	.021	.018	.016	.015	23	.049
10	BF	.013	.012	.010	.009	.007	.007	.018	.031	.038	.045	.049	.052	.053	.053	.053	.051	.042	.033	.025	.023	.020	.016	.015	23	.053
11	BF	.013	.012	.018	.023	.020	.020	.024	.028	.032	.040	.043	.047	.047	.047	.047	.046	.040	.030	.026	.024	.019	.015	.017	23	.047
12	BF	.024	.022	.018	.018	.014	.012	.019	.026	.023	.020	.021	.025	.024	.024	.026	.024	.013	.005	.004	.005	.010	.005	.004	23	.026
13	BF	.025	.017	.017	.017	.018	.018	.019	.024	BA	.064	.039	.040	.041	.044	.044	.043	.041	.039	.037	.036	.033	.017	.014	22	.064
14	BF	.010	.008	.008	.006	.004	.004	.014	.023	.031	.040	.047	.048	.052	.053	.053	.048	.031	.024	.021	.019	.015	.019	.017	23	.053
15	BF	.015	.012	.012	.011	.008	.007	.016	.028	.036	.043	.048	.053	.057	.058	.057	.050	.037	.028	.024	.018	.018	.016	.011	23	.058
16	BF	.005	.004	.003	.002	.002	.002	.009	.021	.033	.042	.047	.054	.057	.053	.051	.048	.031	.024	.017	.015	.011	.009	.009	23	.057
17	BF	.006	.007	.006	.006	.005	.005	.018	.034	.036	.038	.042	.042	.044	.043	.044	.045	.043	.041	.039	.037	.038	.040	.039	23	.045
18	BF	.035	.035	.033	.031	.030	.030	.029	.028	.028	.028	.028	.029	.029	.029	.029	.029	.028	.026	.023	.019	.023	.025	.025	23	.035
19	BF	.024	.023	.022	.022	.021	.021	.021	.021	.025	.030	.032	.033	.034	.035	.036	.036	.028	.020	.012	.010	.012	.009	.010	23	.036
20	BF	.008	.006	.006	.005	.005	.007	.008	.014	.021	.033	.040	.044	.046	.049	.049	.045	.028	.025	.020	.019	.017	.015	.013	23	.049
21	BF	.008	.008	.007	.006	.004	.004	.010	.018	.030	.040	.048	.054	.058	.059	.058	.050	.037	.032	.028	.029	.022	.019	.019	23	.059
22	BF	.012	.012	.008	.007	.006	.007	.021	.027	.037	.052	.058	.060	.062	.062	.060	.048	.037	.033	.029	.030	.025	.024	.018	23	.062
23	BF	.014	.012	.008	.007	.006	.008	.018	.028	.040	.046	.052	.054	.054	.055	.057	.048	.030	.028	.025	.025	.023	.017	.016	23	.057
24	BF	.015	.013	.012	.011	.012	.012	.022	.027	.036	.045	.051	.051	.051	.048	.048	.041	.032	.027	.018	.025	.023	.027	.026	23	.051
25	BF	.020	.018	.010	.012	.009	.010	.013	.030	BA	.038	.040	.041	.041	.040	.039	.035	.032	.026	.028	.026	.023	.028	.021	22	.041
26	BF	.015	.018	.022	.023	.024	.022	.023	.024	.025	.025	.026	.028	.032	.034	.030	.029	.027	.024	.024	.023	.022	.021	.020	23	.034
27	BF	.018	.018	.017	.016	.006	.004	.015	.019	.022	.026	.031	.035	.037	.040	.042	.043	.041	.031	.035	.035	.033	.029	.027	23	.043
28	BF	.020	.018	.020	.020	.020	.019	.020	.021	.026	.030	.037	.044	.046	.048	.047	.043	.029	.040	.036	.029	.031	.034	.032	23	.048
29	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	0	
30	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	0	
31	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	0	
NO.:		28	28	28	28	28	28	28	28	26	28	28	28	28	28	28	28	28	28	28	28	28	28	28		
MAX:		.037	.035	.033	.032	.031	.031	.031	.034	.047	.064	.059	.060	.062	.062	.060	.056	.051	.047	.047	.045	.044	.044	.041		
AVG:		.0166	.0151	.0140	.0136	.0126	.0129	.0191	.0263	.0325	.0392	.0423	.0448	.0461	.0466	.0465	.0436	.0357	.0305	.0265	.0255	.0236	.0218	.0193		

MONTHLY OBSERVATIONS: 642 MONTHLY MEAN: .0285 MONTHLY MAX: .064

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	AS	BC	BC	.025	.027	.029	.029	.028	.028	.025	.024	.025	.028	.027	11	.029
2	BF	.025	.034	.035	.030	.026	.023	.024	.028	.026	.028	.032	.035	.039	.042	.038	.035	.032	.031	.028	.025	.026	.023	.028	23	.042
3	BF	.032	.031	.031	.030	.029	.031	.031	.031	.031	.031	.029	.030	.041	.045	.046	.045	.043	.041	.043	.044	.040	.026	.020	23	.046
4	BF	.012	.013	.010	.012	.027	.028	.030	.031	.033	.036	.040	.043	.044	.044	.045	.046	.046	.041	.040	.039	.036	.029	.023	23	.046
5	BF	.016	.011	.011	.008	.009	.022	.025	.030	.034	.038	.041	.043	.045	.046	.048	.051	.046	.033	.029	.023	.019	.018	.013	23	.051
6	BF	.011	.012	.011	.011	.008	.008	.015	.023	.032	.042	.049	.054	.055	.055	.058	.059	.048	.041	.033	.029	.025	.022	.013	23	.059
7	BF	.008	.010	.006	.005	.004	.004	.008	.030	.042	.049	.052	.056	.057	.057	.057	.056	.055	.052	.049	.047	.046	.045	.045	23	.057
8	BF	.042	.039	.037	.035	.034	.033	.033	.033	.039	.043	.048	.051	.052	.054	.051	.051	.047	.045	.044	.050	.048	.044	.039	23	.054
9	BF	.035	.032	.031	.031	.029	.028	.026	.026	.032	.042	.029	.038	.042	.043	.043	.042	.037	.033	.034	.034	.032	.028	.027	23	.043
10	BF	.030	.027	.025	.025	.025	.024	.021	.021	.021	.026	.030	.034	.037	.038	.038	.040	.039	.037	.036	.035	.033	.033	.036	23	.040
11	BF	.030	.024	.030	.029	.029	.027	.028	.033	.037	.040	.042	.045	.045	.045	.045	.043	.039	.032	.029	.030	.030	.028	.034	23	.045
12	BF	.027	.026	.025	.024	.024	.024	.023	.023	.024	.024	.023	.024	.024	.023	.022	.023	.025	.026	.028	.029	.030	.031	.033	23	.033
13	BF	.037	.038	.036	.035	.033	.031	.030	.034	.036	.037	.038	.041	.042	.042	.041	.040	.039	.038	.036	.035	.035	.034	.034	23	.042
14	BF	.035	.035	.034	.032	.030	.030	.032	.036	.037	.039	.040	.042	.043	.043	.043	.042	.041	.039	.036	.035	.036	.035	.037	23	.043
15	BF	.038	.038	.037	.034	.027	.022	.033	.040	.043	BA	.046	.048	.051	.052	.053	.053	.049	.035	.030	.028	.019	.016	.016	22	.053
16	BF	.013	.010	.010	.009	.008	.008	.014	.029	.038	.053	.056	.058	.061	.070	.077	.073	.069	.065	.059	.057	.053	.049	.047	23	.077
17	BF	.047	.045	.042	.040	.038	.038	.038	.039	.038	.038	.037	.030	.027	.024	.025	.027	.025	.028	.029	.035	.034	.033	.030	23	.047
18	BF	.030	.033	.036	.037	.037	.036	.036	.041	.044	.044	.046	.047	.047	.047	.048	.047	.046	.045	.042	.043	.043	.043	.043	23	.048
19	BF	.042	.040	.038	.037	.036	.036	.037	.039	.040	.041	.042	.043	.044	.044	.044	.044	.042	.041	.040	.039	.038	.038	.037	23	.044
20	BF	.035	.034	.035	.034	.033	.031	.033	.037	.038	.040	.043	.046	.048	.049	.050	.050	.045	.035	.030	.024	.021	.019	.016	23	.050
21	BF	.011	.010	.007	.006	.007	.012	.020	.031	.045	.051	.053	.053	.053	.054	.055	.055	.054	.053	.057	.048	.038	.042	.039	23	.057
22	BF	.035	.028	.032	.030	.031	.031	.033	.034	.034	.035	.038	.038	.040	.041	.041	.036	.033	.029	.024	.015	.009	.008	.005	23	.041
23	BF	.005	.004	.003	.002	.002	.002	.013	.034	.042	.045	.047	.047	.047	.045	.044	.043	.046	.044	.035	.035	.033	.030	.028	23	.047
24	BF	.033	.029	.026	.023	.021	.020	.020	.020	.023	.031	.034	.036	.037	.037	.038	.038	.038	.038	.037	.037	.036	.034	.031	23	.038
25	BF	.027	.032	.033	.029	.028	.022	.030	.034	.037	.043	.048	.049	.048	.048	.048	.048	.047	.038	.029	.022	.018	.016	.015	23	.049
26	BF	.011	.008	.009	.024	.027	.027	.030	.034	.038	.041	.040	.038	.035	.037	.036	.036	.030	.024	.017	.014	.019	.028	.031	23	.041
27	BF	.033	.031	.026	.022	.016	.013	.021	.031	.038	.043	.045	.050	.055	.056	.056	.055	.054	.053	.051	.042	.028	.026	.021	23	.056
28	BF	.016	.013	.012	.010	.012	.012	.031	.037	.041	.042	.046	.049	.050	.053	.055	.052	.051	.050	.051	.050	.050	.049	.048	23	.055
29	BF	.047	.047	.046	.045	.042	.038	.041	.044	.047	BA	.049	.052	.054	.056	.055	.054	.047	.038	.028	.023	.021	.020	.018	22	.056
30	BF	.011	.009	.008	.006	.004	.005	.019	.036	.042	.050	.055	.057	.059	.062	.066	.063	.053	.043	.041	.039	.044	.039	.046	23	.066
31	BF	.026	.033	.039	.045	.049	.047	.045	.045	.047	.048	.048	.049	.047	.046	.046	.048	.046	.044	.043	.041	.040	.040	.038	23	.049
NO.:		30	30	30	30	30	30	30	30	30	28	30	30	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.047	.047	.046	.045	.049	.047	.045	.045	.047	.053	.056	.058	.061	.070	.077	.073	.069	.065	.059	.057	.053	.049	.048		
AVG:		.0267	.0259	.0254	.0247	.0242	.0238	.0273	.0328	.0366	.0400	.0422	.0442	.0450	.0460	.0465	.0459	.0432	.0394	.0365	.0345	.0324	.0308	.0296		

MONTHLY OBSERVATIONS: 699 MONTHLY MEAN: .0350 MONTHLY MAX: .077

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.034	.032	.029	.037	.044	.044	.042	.041	.044	.047	.047	.047	.048	.049	.052	.054	.054	.054	.053	.052	.050	.048	.047	23	.054
2	BF	.043	.042	.041	.039	.036	.038	.039	.043	.044	.046	.048	.049	.050	.050	.050	.051	.046	.033	.031	.023	.023	.018	.016	23	.051
3	BF	.015	.022	.016	.016	.018	.022	.025	.036	.039	.038	.036	.035	.034	.033	.032	.030	.029	.026	.025	.023	.022	.020	.018	23	.039
4	BF	.014	.012	.012	.011	.010	.009	.009	.009	.010	.017	.024	.027	.027	.027	.027	.027	.028	.025	.022	.023	.022	.022	.022	23	.028
5	BF	.020	.018	.020	.017	.013	.011	.017	.022	.027	.030	.029	.030	.034	.034	.034	.033	.030	.026	.028	.038	.037	.033	.030	23	.038
6	BF	.016	.014	.011	.007	.005	.006	.013	.020	.028	.029	.030	.031	.032	.035	.037	.035	.026	.022	.015	.023	.018	.014	.013	23	.037
7	BF	.016	.016	.017	.020	.020	.021	.022	.025	.027	.031	.033	.035	.034	.034	.033	.023	.024	.026	.027	.024	.022	.020	.025	23	.035
8	BF	.032	.032	.031	.031	.032	.033	.033	.035	.035	.034	.033	.034	.036	.038	.039	.040	.038	.037	.037	.035	.035	.032	.029	23	.040
9	BF	.033	.034	.034	.032	.028	.029	.032	.034	.038	.043	.045	.046	.047	.049	.050	.048	.044	.036	.023	.021	.019	.020	.025	23	.050
10	BF	.023	.024	.028	.030	.029	.031	.034	.040	.047	BA	.052	.055	.056	.057	.057	.057	.057	.053	.036	.030	.031	.025	.023	22	.057
11	BF	.017	.015	.023	.014	.013	.018	.034	.038	.044	.052	.055	.056	.058	.059	.061	.061	.057	.041	.022	.025	.024	.019	.017	23	.061
12	BF	.011	.008	.005	.005	.004	.005	.018	.027	.039	.060	.063	.062	.063	.064	.065	.064	.056	.036	.030	.021	.023	.023	.019	23	.065
13	BF	.032	.030	.028	.029	.026	.024	.023	.021	.023	.029	.033	.033	.033	.031	.031	.031	.031	.028	.027	.033	.038	.032	.022	23	.038
14	BF	.013	.014	.021	.024	.017	.022	.025	.028	.029	.032	.035	.042	.042	.038	.036	.033	.031	.029	.021	.015	.010	.007	.005	23	.042
15	BF	.002	.001	.001	.001	.001	.002	.008	.017	.030	.043	.048	.052	.051	.049	.045	.042	.031	.023	.021	.025	.034	.033	.033	23	.052
16	BF	.030	.026	.030	.027	.023	.021	.018	.022	.029	.023	.031	.043	.046	.046	.047	.049	.049	.047	.045	.047	.045	.044	.042	23	.049
17	BF	.042	.040	.038	.039	.027	.035	.042	.044	.046	.048	.050	.053	.055	.056	.056	.055	.052	.040	.024	.023	.019	.019	.016	23	.056
18	BF	.012	.011	.010	.007	.007	.011	.022	.032	.042	.050	.053	.056	.057	.059	.062	.060	.055	.042	.031	.026	.026	.023	.020	23	.062
19	BF	.013	.010	.010	.005	.006	.009	.021	.036	.046	.054	.057	.060	.060	.060	.061	.061	.053	.044	.034	.031	.030	.025	.022	23	.061
20	BF	.016	.012	.008	.006	.004	.007	.020	.039	.051	.058	.061	.062	.062	.061	.062	.062	.054	.042	.040	.038	.034	.033	.030	23	.062
21	BF	.026	.023	.024	.025	.024	.022	.037	.044	.046	.049	.051	.051	.049	.047	.042	.037	.035	.041	.045	.040	.036	.040	.039	23	.051
22	BF	.040	.040	.039	.038	.038	.036	.037	.039	.043	.046	.048	.049	.051	.050	.052	.053	.051	.046	.025	.019	.016	.012	.013	23	.053
23	BF	.025	.016	.023	.033	.031	.033	.034	.038	.041	.043	.045	.047	.046	.046	.045	.048	.046	.043	.039	.037	.034	.033	.032	23	.048
24	BF	.029	.027	.027	.028	.028	.030	.034	.038	.042	.044	.047	.050	.053	.054	.053	.054	.051	.045	.030	.023	.033	.023	.018	23	.054
25	BF	.031	.033	.032	.034	.037	.036	.039	.043	.045	.046	.050	.054	.057	.058	.060	.058	.054	.046	.041	.031	.036	.041	.039	23	.060
26	BF	.038	.035	.034	.035	.036	.031	.034	.033	BL	BL	BA	.036	.036	.036	.036	.036	.035	.037	.034	.033	.032	.030	.030	20	.038
27	BF	.025	.026	.027	.027	.027	.024	.025	.025	.024	.021	.020	.022	.022	.023	.021	.026	.024	.021	.012	.011	.019	.014	.012	23	.027
28	BF	.015	.025	.026	.024	.020	.022	.029	.034	.036	.040	.044	.045	.043	.043	.043	.042	.041	.036	.034	.035	.030	.019	.014	23	.045
29	BF	.007	.006	.004	.004	.003	.009	.023	.032	.037	.042	.041	.042	.042	.038	.036	.031	.023	.019	.013	.015	.011	.008	.008	23	.042
30	BF	.020	.027	.029	.027	.034	.036	.035	.037	.039	.041	.044	.047	.048	.048	.047	.046	.046	.046	.047	.046	.032	.023	.025	23	.048
31																									0	
NO.:		30	30	30	30	30	30	30	30	29	28	29	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.043	.042	.041	.039	.044	.044	.042	.044	.051	.060	.063	.062	.063	.064	.065	.064	.057	.054	.053	.052	.050	.048	.047		
AVG:		.0230	.0224	.0226	.0224	.0214	.0226	.0275	.0324	.0369	.0406	.0432	.0450	.0457	.0457	.0457	.0449	.0417	.0363	.0304	.0289	.0280	.0251	.0235		

MONTHLY OBSERVATIONS: 686 MONTHLY MEAN: .0328 MONTHLY MAX: .065

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.030	.027	.029	.024	.016	.031	.037	.039	.045	.047	.048	.049	.049	.049	.049	.049	.049	.046	.047	.048	.048	.037	.030	23	.049
2	BF	.032	.042	.045	.044	.029	.030	.037	.040	.048	.050	.049	.050	.052	.054	.056	.059	.056	.054	.054	.054	.051	.048	.038	23	.059
3	BF	.024	.032	.048	.046	.043	.043	.042	.045	.049	.052	.054	.054	.054	.054	.054	.054	.053	.048	.031	.027	.024	.019	.017	23	.054
4	BF	.012	.009	.007	.005	.003	.011	.023	.034	.041	.047	.051	.052	.054	.058	.057	.058	.049	.031	.025	.023	.024	.017	.020	23	.058
5	BF	.014	.011	.013	.016	.022	.022	.023	.018	.021	.025	.035	.034	.032	.030	.033	.033	.033	.027	.024	.023	.021	.018	.012	23	.035
6	BF	.015	.015	.016	.016	.019	.020	.023	.033	.039	.042	.046	.046	.045	.044	.043	.042	.042	.040	.037	.036	.033	.024	.020	23	.046
7	BF	.020	.014	.008	.006	.006	.021	.029	.033	.035	.036	.037	.038	.041	.045	.048	.049	.047	.033	.025	.018	.020	.018	.017	23	.049
8	BF	.037	.042	.041	.038	.024	.026	.036	.038	.043	.042	.044	.047	.043	.038	.038	.039	.041	.036	.030	.024	.018	.013	.012	23	.047
9	BF	.008	.005	.004	.002	.003	.012	.013	.016	.023	BA	.028	.030	.036	.041	.040	.040	.037	.040	.026	.022	.014	.015	.011	22	.041
10	BF	.007	.006	.005	.010	.008	.021	.028	.033	.038	.042	.045	.049	.048	.047	.048	.046	.049	.043	.037	.036	.034	.033	.034	23	.049
11	BF	.021 3	.017 3	.023 3	.024 3	.021 3	.024 3	.024 3	.027 3	.034 3	.036 3	.039 3	.038 3	.037 3	.037 3	.037 3	.042 3	.041 3	.037 3	.024 3	.027 3	.022 3	.028 3	.034 3	23	.042
12	BF	.027	.033	.033	.027	.021	.020	.021	.027	.030	.036	.042	.040	.040	.035	.038	.039	.035	.029	.025	.018	.010	.004	.009	23	.042
13	BF	.006	.003	.005	.006	.007	.007	.009	.011	.018	.023	.028	.038	.040	.043	.043	.038	.029	.020	.007	.004	.007	.002	.001	23	.043
14	BF	.000	.000	.000	.000	.001	.009	.023	.029	.033	.033	.036	.037	.031	.028	.028	.029	.031	.025	.013	.008	.005	.006	.003	23	.037
15	BF	.003	.007	.014	.015	.015	.018	.022	.030	.033	.035	.034	.038	.039	.039	.040	.039	.039	.040	.036	.031	.033	.031	.020	23	.040
16	BF	.008	.007	.005	.003	.004	.016	.024	.030	.037	.040	.041	.046	.037	.032	.038	.035	.032	.027	.021	.026	.031	.025	.024	23	.046
17	BF	.015	.013	.010	.009	.009	.014	.020	.020	.025	.033	.038	.038	.033	.030	.027	.024	.017	.015	.007	.005	.005	.002	.001	23	.038
18	BF	.002	.001	.006	.017	.018	.017	.018	.022	.027	.031	.029	.032	.032	.043	.038	.030	.030	.031	.030	.030	.034	.037	.037	23	.043
19	BF	.038	.041	.040	.041	.039	.038	.037	.037	.039	.038	.039	.038	.037	.035	.034	.032	.030	.028	.026	.023	.018	.009	.007	23	.041
20	BF	.004 3	.002 3	.003 3	.008 3	.011 3	.015 3	.016 3	.020 3	.022 3	.024 3	.026 3	.026 3	.029 3	.031 3	.033 3	.034 3	.030 3	.029 3	.029 3	.027 3	.028 3	.029 3	.028 3	23	.034
21	BF	.028 3	.027 3	.027 3	.028 3	.020 3	.026 3	.036 3	.038 3	.041 3	.043 3	.045 3	.045 3	.047 3	.046 3	.045 3	.041 3	.036 3	.034 3	.025 3	.019 3	.022 3	.021 3	.020 3	23	.047
22	BF	.035	.034	.032	.030	.027	.023	.021	.023	.033	BA	.046	.050	.051	.049	.047	.046	.044	.044	.044	.044	.041	.029	.025	22	.051
23	BF	.032	.034	.028	.022	.026	.041	.038	.030	.032	.029	.030	.038	.037	.038	.040	.041	.038	.032	.029	.029	.023	.022	.022	23	.041
24	BF	.028	.025	.026	.030	.024	.032	.037	.042	.045	.048	.050	.052	.054	.055	.055	.054	.047	.027	.020	.018	.012	.009	.007	23	.055
25	BF	.001	.001	.007	.018	.017	.021	.030	.039	.047	.050	.053	.056	.058	.057	.057	.057	.055	.036	.026	.019	.017	.012	.011	23	.058
26	BF	.006	.009	.018	.028	.028	.035	.040	.045	.049	.051	.053	.056	.059	.061	.062	.063	.061	.046	.033	.023	.025	.045	.050	23	.063
27	BF	.034	.031	.024	.020	.023	.027	.039	.045	.046	.048	.051	.055	.057	.056	.055	.054	.049	.030	.023	.021	.026	.043	.044	23	.057
28	BF	.034	.028	.018	.017	.018	.030	.038	.042	.042	.044	.049	.052	.055	.057	.059	.058	.054	.048	.042	.036	.029	.027	.021	23	.059
29	BF	.022	.028	.028	.025	.025	.026	.029	.030	.032	.033	.033	.033	.033	.033	.034	.036	.034	.029	.019	.014	.009	.005	.005	23	.036
30	BF	.003	.001	.001	.001	.002	.013	.021	.030	.034	.039	.040	.039	.044	.051	.049	.048	.050	.036	.025	.021	.016	.015	.016	23	.051
31	BF	.026	.024	.022	.023	.023	.025	.030	.035	.037	.040	.046	.046	.045	.048	.039	.028	.027	.018	.013	.012	.013	.026	.025	23	.048
NO.:		31	31	31	31	31	31	31	31	31	29	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:		.038	.042	.048	.046	.043	.043	.042	.045	.049	.052	.054	.056	.059	.061	.062	.063	.061	.054	.054	.054	.051	.048	.050		
AVG:		.0185	.0184	.0189	.0193	.0178	.0230	.0279	.0316	.0361	.0392	.0415	.0433	.0435	.0440	.0440	.0431	.0408	.0342	.0275	.0247	.0230	.0216	.0200		

MONTHLY OBSERVATIONS: 711 MONTHLY MEAN: .0305 MONTHLY MAX: .063

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.013	.018	.019	.018	.017	.019	.024	.030	.036	.040	.041	.043	.044	.048	.051	.053	.050	.035	.020	.018	.014	.009	.006	23	.053
2	BF	.005	.002	.000	.000	.002	.014	.022	.035	.046	.050	.052	.054	.056	.053	.052	.052	.049	.040	.036	.021	.013	.008	.008	23	.056
3	BF	.008	.004	.003	.001	.005	.017	.028	.038	.049	.061	.063	.064	.062	.061	.063	.062	.055	.036	.026	.021	.018	.011	.007	23	.064
4	BF	.003	.003	.006	.007	.014	.030	.040	.045	.045	.047	.050	.050	.050	.048	.048	.047	.044	.034	.035	.028	.027	.037	.043	23	.050
5	BF	.033	.034	.032	.026	.021	.023	.029	.032	.034	.038	.043	.049	.052	.052	.051	.047	.034	.024	.020	.018	.018	.012	.011	23	.052
6	BF	.012	.012	.009	.007	.008	.018	.031	.041	.044	.047	.049	.051	.052	.056	.056	.057	.057	.037	.028	.025	.018	.019	.019	23	.057
7	BF	.012	.010	.009	.009	.008	.017	.029	.037	.048	BA	.065	.071	.073	.070	.069	.073	.073	.059	.039	.042	.047	.031	.029	22	.073
8	BF	.021	.017	.014	.009	.010	.031	.050	.060	.064	.062	.061	.061	.061	.062	.065	.068	.068	.063	.056	.046	.037	.029	.030	23	.068
9	BF	.020	.017	.018	.020	.016	.027	.034	.047	.055	.058	.065	.069	.070	.071	.071	.071	.067	.050	.037	.031	.028	.024	.019	23	.071
10	BF	.013	.011	.011	.007	.010	.031	.041	.050	.056	.060	.064	.067	.068	.069	.069	.067	.060	.045	.039	.034	.032	.033	.045	23	.069
11	BF	.044	.039	.036	.030	.027	.043	.042	.043	.048	.052	.056	.059	.063	.061	.060	.057	.058	.049	.036	.037	.045	.051	.043	23	.063
12	BF	.028	.026	.024	.027	.022	.020	.023	.025	.036	.043	.048	.053	.055	.059	.058	.058	.059	.044	.028	.019	.010	.009	.013	23	.059
13	BF	.008	.005	.008	.020	.016	.023	.036	.040	.032	.040	.048	.048	.049	.046	.047	.052	.053	.040	.019	.016	.022	.027	.023	23	.053
14	BF	.024	.016	.014	.021	.020	.016	.015	.026	.034	.028	.028	.035	.036	.038	.041	.040	.033	.026	.016	.008	.005	.009	.016	23	.041
15	BF	.008	.004	.010	.009	.010	.013	.019	.031	.037	.040	.042	.044	.045	.048	.043	.042	.041	.040	.038	.030	.025	.017	.013	23	.048
16	BF	.014	.008	.011	.009	.008	.013	.023	.032	.038	.049	.050	.056	.057	.058	.057	.050	.046	.034	.039	.047	.034	.030	.025	23	.058
17	BF	.019	.012	.008	.005	.006	.019	.041	.044	.048	.052	.058	.061	.060	.060	.066	.069	.055	.038	.022	.018	.008	.008	.004	23	.069
18	BF	.003	.001	.001	.001	.004	.016	.032	.036	.030	.032	.034	.036	.038	.044	.047	.046	.042	.036	.036	.030	.027	.030	.031	23	.047
19	BF	.027	.030	.024	.019	.019	.018	.018	.021	.024	.026	.031	.037	.040	.043	.045	.046	.045	.039	.028	.025	.026	.021	.015	23	.046
20	BF	.007	.005	.004	.002	.005	.023	.038	.044	.048	.051	.049	.044	.049	.048	.046	.035	.037	.040	.038	.028	.030	.028	.023	23	.051
21	BF	.023	.019	.016	.014	.015	.019	.025	.025	.027	.028	.033	.037	.037	.038	.034	.034	.032	.031	.027	.025	.027	.031	.031	23	.038
22	BF	.026	.025	.025	.025	.023	.023	.022	.021	.023	.025	.030	.031	.031	.032	.031	.027	.025	.019	.012	.007	.007	.004	.003	23	.032
23	BF	.019	.016	.018	.016	.016	.017	.019	.024	.030	BA	BA	.035	.036	.041	.046	.052	.053	.034	.017	.012	.006	.004	.003	21	.053
24	BF	.001	.001	.001	.001	.002	.013	.030	.045	.055	.062	.062	.058	.056	.059	.058	.058	.052	.033	.022	.011	.006	.005	.002	23	.062
25	BF	.002	.002	.001	.001	.002	.015	.032	.042	.047	.047	.046	.044	.043	.034	.029	.040	.038	.028	.018	.013	.013	.020	.023	23	.047
26	BF	.013	.009	.005	.003	.004	.013	.020	.032	.039	.040	.043	.045	.045	.040	.039	.043	.042	.039	.035	.043	.045	.046	.039	23	.046
27	BF	.015	.013	.009	.002	.005	.027	.043	.049	.055	.055	.053	.054	.054	.055	.059	.060	.059	.041	.023	.020	.019	.013	.009	23	.060
28	BF	.001	.001	.000	.000	.001	.014	.030	.041	.051	.055	.057	.058	.061	.062	.063	.061	.057	.050	.028	.020	.015	.007	.003	23	.063
29	BF	.003	.002	.000	.000	.000	.011	.027	.039	.046	.051	.052	.057	.058	.055	.056	.054	.047	.033	.036	.039	.041	.030	.016	23	.058
30	BF	.005	.007	.003	.002	.004	.021	.030	.036	.039	.044	.045	.043	.038	.039	.039	.040	.038	.030	.023	.020	.014	.012	.016	23	.045
31																									0	
NO.:		30	30	30	30	30	30	30	30	30	28	29	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:		.044	.039	.036	.030	.027	.043	.050	.060	.064	.062	.065	.071	.073	.071	.071	.073	.073	.063	.056	.047	.047	.051	.045		
AVG:		.0143	.0123	.0113	.0104	.0107	.0201	.0298	.0370	.0421	.0458	.0489	.0505	.0513	.0517	.0520	.0520	.0490	.0382	.0292	.0251	.0226	.0205	.0189		

MONTHLY OBSERVATIONS: 687 MONTHLY MEAN: .0323 MONTHLY MAX: .073

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM

REPORT

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

), 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.004	.001	.000	.001	.003	.010	.022	.029	.034	.037	.036	.036	.035	.040	.037	.035	.023	.017	.014	.012	.010	.005	.002	23	.040
2	BF	.001	.000	.000	.000	.001	.007	.017	.025	.025	.029	.032	.035	.035	.029	.032	.031	.027	.013	.013	.022	.020	.017	.013	23	.035
3	BF	.016	.007	.011	.007	.008	.021	.026	.028	.031	.036	.036	.036	.037	.043	.038	.028	.028	.027	.027	.019	.016	.014	.016	23	.043
4	BF	.011	.006	.004	.006	.009	.009	.014	.021	.030	.037	.037	.038	.041	.040	.037	.026	.029	.026	.021	.021	.021	.016	.010	23	.041
5	BF	.007	.002	.002	.002	.004	.007	.009	.026	BA	.031	.033	.035	.036	.037	.038	.034	.026	.039	.029	.019	.018	.011	.009	22	.039
6	BF	.011	.010	.005	.003	.006	.007	.012	.017	.022	.037	.030	.035	.037	.040	.038	.029	.027	.036	.029	.026	.022	.020	.015	23	.040
7	BF	.014	.012	.013	.012	.013	.020	.021	.030	.038	.040	.042	.044	.041	.043	.047	.042	.034	.030	.031	.023	.014	.017	.010	23	.047
8	BF	.003	.003	.002	.002	.006	.015	.025	.032	.035	.036	.035	.036	.035	.034	.033	.030	.028	.024	.026	.026	.023	.020	.020	23	.036
9	BF	.016	.013	.014	.014	.015	.019	.024	.029	.032	.032	.033	.035	.034	.033	.031	.030	.024	.015	.035	.035	.031	.024	.028	23	.035
10	BF	.049	.045	.040	.034	.029	.027	.034	.035	.037	.040	.041	.040	.041	.040	.040	.043	.044	.039	.031	.018	.014	.010	.008	23	.049
11	BF	.005	.005	.002	.002	.003	.018	.029	.034	.037	.043	.041	.039	.041	.041	.042	.042	.036	.022	.010	.008	.008	.004	.003	23	.043
12	BF	.002	.001	.001	.000	.004	.013	.021	.027	.034	.038	.036	.035	.037	.043	.048	.050	.047	.038	.025	.036	.031	.025	.023	23	.050
13	BF	.016	.009	.008	.006	.007	.012	.019	.023	.026	.030	.032	.029	.029	.031	.031	.028	.032	.031	.023	.015	.007	.004	.002	23	.032
14	BF	.001	.003	.001	.000	.001	.006	.014	.021	.025	.026	.030	.030	.032	.033	.027	.020	.028	.032	.024	.019	.018	.014	.014	23	.033
15	BF	.006	.003	.001	.004	.004	.010	.013	.015	.023	.028	.033	.037	.036	.035	.039	.037	.037	.030	.022	.025	.022	.019	.014	23	.039
16	BF	.008	.005	.003	.004	.003	.017	.029	.035	.040	.043	.046	.048	.052	.055	.055	.056	.052	.038	.023	.014	.015	.009	.009	23	.056
17	BF	.007	.004	.002	.003	.002	.005	.018	.033	.038	.047	.058	.063	.066	.067	.062	.062	.049	.028	.019	.012	.009	.008	.005	23	.067
18	.004	.002	.001	.001	.001	.001	.007	.016	.029	.036	.041	.044	.043	.041	.044	.053	.060	.049	.037	.024	.029	.027	.029	.023	24	.060
19	.021	.017	.012	.006	.004	.005	.014	.017	.020	.026	.034	.036	.038	.035	.036	.035	.034	.033	.020	.008	.008	.003	.003	.004	24	.038
20	.001	.007	.005	.001	.001	.001	.007	.017	.030	.034	.034	.034	.034	.034	.034	.034	.034	.035	.039	.038	.032	.021	.010	.007	24	.039
21	BF	.003	.004	.003	.003	.004	.003	.009	.018	.022	BA	.031	.032	.035	.035	.033	.044	.038	.033	.019	.012	.015	.018	.017	22	.044
22	BF	.012	.008	.006	.008	.011	.017	.023	.028	.033	.036	.039	.044	.043	.042	.042	.042	.041	.036	.030	.018	.012	.013	.009	23	.044
23	BF	.004	.006	.005	.008	.006	.019	.028	.036	.044	.046	.045	.047	.048	.047	.048	.048	.049	.043	.030	.029	.014	.013	.011	23	.049
24	BF	.004	.006	.004	.004	.003	.022	.028	.039	.048	.049	.052	.055	.055	.056	.055	.055	.053	.042	.025	.021	.016	.014	.010	23	.056
25	BF	.007	.003	.004	.003	.003	.012	.026	.034	.039	.046	.047	.046	.044	.043	.047	.045	.044	.044	.025	.017	.014	.013	.009	23	.047
26	BF	.005	.004	.003	.002	.002	.008	.023	.033	.041	.040	.041	.044	.045	.045	.046	.043	.039	.027	.015	.015	.010	.009	.006	23	.046
27	BF	.004	.003	.003	.002	.003	.012	.026	.039	.041	.044	.048	.050	.050	.052	.051	.050	.050	.037	.025	.014	.012	.009	.005	23	.052
28	BF	.003	.003	.004	.003	.002	.010	.023	.033	.046	.054	.058	.058	.056	.052	.050	.042	.034	.031	.023	.014	.010	.007	.004	23	.058
29	BF	.004	.003	.002	.002	.002	.005	.017	.032	.036	.040	.045	.045	.045	.043	.043	.043	.041	.039	.024	.017	.014	.010	.007	23	.045
30	BF	.006	.008	.006	.016	.010	.021	.027	.028	.042	.041	.035	.032	.031	.036	.039	.038	.030	.023	.009	.005	.005	.003	.002	23	.042
31	BF	.003	.007	.011	.010	.010	.019	.025	.037	.044	.050	.051	.052	.052	.053	.054	.052	.047	.036	.029	.027	.021	.015	.015	23	.054
NO.:	3	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:	.021	.049	.045	.040	.034	.029	.027	.034	.039	.048	.054	.058	.063	.066	.067	.062	.062	.053	.044	.038	.036	.031	.029	.028		
AVG:	.0087	.0083	.0065	.0054	.0054	.0058	.0129	.0210	.0289	.0346	.0388	.0399	.0410	.0413	.0420	.0421	.0404	.0372	.0314	.0234	.0196	.0159	.0130	.0106		

MONTHLY OBSERVATIONS: 714 MONTHLY MEAN: .0245 MONTHLY MAX: .067

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

AIR QUALITY SYSTEM
RAW DATA REPORT

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.006	.007	.005	.004	.015	.028	.037	.042	.045	.047	.049	.051	.050	.051	.048	.044	.039	.038	.018	.022	.023	.015	.008	23	.051
2	BF	.010	.007	.007	.004	.002	.016	.029	.037	.040	.043	.045	.047	.050	.052	.052	.049	.044	.028	.019	.017	.011	.013	.011	23	.052
3	BF	.006	.006	.005	.005	.005	.010	.018	.027	BA	.043	.050	.045	.046	.036	.029	.027	.022	.017	.010	.007	.009	.005	.005	22	.050
4	BF	.003	.004	.010	.016	.035	.046	.048	.048	.044	.042	.045	.049	.048	.046	.051	.052	.043	.027	.023	.014	.009	.008	.007	23	.052
5	BF	.003	.004	.003	.005	.006	.015	.027	.031	.035	.041	.044	.043	.044	.043	.045	.047	.040	.024	.011	.007	.031	.029	.022	23	.047
6	BF	.015	.011	.006	.003	.005	.013	.023	.027	.030	.032	.036	.038	.038	.034	.040	.033	.031	.026	.021	.019	.017	.016	.015	23	.040
7	BF	.016	.016	.023	.020	.016	.016	.018	.023	.030	.038	.037	.034	.032	.038	.033	.027	.030	.025	.014	.006	.004	.004	.003	23	.038
8	BF	.002	.001	.001	.001	.001	.009	.027	.029	.032	.034	.033	.032	.028	.032	.033	.037	.033	.023	.011	.006	.007	.003	.002	23	.037
9	BF	.003	.002	.002	.003	.005	.010	.017	.025	.034	.038	.042	.046	.046	.043	.049	.042	.033	.028	.023	.024	.026	.028	.020	23	.049
10	BF	.012	.010	.038	.048	.048	.049	.039	.038	.043	.043	.045	.042	.047	.041	.036	.037	.034	.022	.011	.010	.007	.003	.003	23	.049
11	.004	.003	.006	.016	.033	.026	.022	.027	.033	.030	.028	.031	.035	.037	.038	.038	.029	.019	.011	.006	.006	.006	.008	.009	24	.038
12	BF	.005	.004	.003	.002	.002	.009	.020	.027	.029	.029	.032	.032	.032	.037	.037	.033	.027	.020	.012	.009	.008	.004	.002	23	.037
13	BF	.002	.002	.002	.002	.003	.011	.019	.028	.035	.036	.036	.033	.032	.035	.034	.031	.034	.032	.018	.019	.018	.010	.007	23	.036
14	BF	.005	.003	.002	.001	.001	.003	.011	.020	.027	.034	.043	.043	.036	.042	.040	.041	.038	.026	.016	.019	.012	.016	.018	23	.043
15	BF	.008	.022	.027	.021	.031	.032	.031	.033	.034	.032	.034	.036	.035	.038	.039	.039	.039	.032	.030	.030	.027	.016	.016	23	.039
16	BF	.017	.008	.004	.006	.008	.019	.024	.035	.041	.045	.046	.046	.045	.045	.045	.045	.042	.027	.021	.016	.011	.007	.007	23	.046
17	BF	.004	.004	.003	.003	.002	.008	.017	.025	.037	BA	.040	.040	.041	.041	.039	.039	.037	.024	.016	.010	.009	.006	.006	22	.041
18	BF	.003	.003	.002	.001	.002	.006	.016	.026	.038	.045	.047	.044	.043	.043	.046	.048	.050	.033	.019	.016	.013	.012	.009	23	.050
19	BF	.006	.003	.003	.005	.014	.020	.024	.028	.033	.036	.042	.047	.048	.049	.052	.053	.053	.041	.022	.018	.013	.010	.009	23	.053
20	BF	.004	.003	.011	.010	.013	.021	.026	.032	.038	.041	.048	.050	.050	.049	.050	.050	.043	.026	.017	.018	.015	.012	.012	23	.050
21	BF	.011	.012	.018	.012	.010	.018	.023	.032	.036	.035	.033	.034	.037	.041	.046	.047	.039	.025	.015	.012	.010	.009	.006	23	.047
22	BF	.003	.003	.002	.002	.002	.005	.027	.043	.052	.054	.053	.051	.054	.054	.054	.058	.053	.037	.022	.014	.013	.008	.006	23	.058
23	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	0	
24	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	0	
25	BF	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	BC	BC	.049	.047	.047	.036	.018	.011	.010	.006	.004	.004	10	.049
26	BF	.001	.000	.000	.000	.000	.004	.018	.036	.041	.044	.047	.045	.043	.044	.046	.046	.041	.025	.032	.023	.035	.033	.023	23	.047
27	BF	.020	.017	.006	.005	.005	.010	.022	.033	.038	.040	.045	.044	.042	.041	.044	.041	.027	.020	.037	.038	.034	.031	.027	23	.045
28	BF	.023	.021	.018	.018	.018	.018	.020	.022	.026	.034	.040	.043	.041	.043	.041	.035	.033	.031	.030	.020	.011	.016	.014	23	.043
29	BF	.008	.010	.011	.009	.007	.010	.017	.026	.029	.033	.037	.039	.046	.050	.044	.041	.040	.031	.027	.030	.024	.021	.021	23	.050
30	BF	.024	.021	.022	.023	.017	.012	.018	.024	.028	.036	.043	.046	.048	.049	.047	.049	.048	.045	.043	.041	.039	.042	.041	23	.049
31	BF	.034	.032	.031	.028	.025	.024	.027	.032	.036	.040	.046	.049	.049	.050	.051	.053	.041	.026	.021	.016	.015	.008	.006	23	.053
NO.:	1	28	28	28	28	28	28	28	28	27	27	28	28	28	29	29	29	29	29	29	29	29	29	29		
MAX:	.004	.034	.032	.038	.048	.048	.049	.048	.048	.052	.054	.053	.051	.054	.054	.054	.058	.053	.045	.043	.041	.039	.042	.041		
AVG:	.0040	.0092	.0086	.0100	.0104	.0116	.0166	.0239	.0308	.0356	.0386	.0418	.0423	.0424	.0432	.0433	.0421	.0376	.0272	.0199	.0171	.0160	.0137	.0117		

MONTHLY OBSERVATIONS: 653 MONTHLY MEAN: .0258 MONTHLY MAX: .058

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.004	.016	.019	.017	.016	.016	.018	.022	.026	.032	.036	.040	.043	.043	.046	.047	.044	.032	.035	.031	.026	.030	.029	23	.047
2	AQ	.033	.036	.033	.026	.022	.024	.024	.025	.029	.033	.035	.039	.039	.040	.041	.043	.044	.035	.023	.016	.015	.014	.012	23	.044
3	AQ	.008	.008	.003	.008	.013	.018	.024	.030	.033	.036	.038	.041	.042	.044	.043	.040	.034	.023	.019	.014	.009	.011	.010	23	.044
4	AQ	.006	.004	.002	.000	.000	.003	.017	.028	.031	.031	.036	.038	.038	.038	.037	.038	.033	.021	.019	.016	.013	.009	.009	23	.038
5	AQ	.004	.002	.002	.001	.001	.001	.007	.021	.029	.033	.033	.036	.037	.040	.040	.034	.027	.017	.010	.009	.006	.003	.005	23	.040
6	BF	.002	.002	.001	.001	.001	.002	.005	.012	.026	.035	.037	.038	.039	.037	.036	.033	.031	.016	.015	.011	.014	.012	.008	23	.039
7	BF	.004	.002	.001	.001	.001	.008	.031	.037	.037	BA	.039	.042	.043	.046	.048	.047	.046	.041	.037	.024	.025	.026	.016	22	.048
8	BF	.020	.024	.028	.024	.010	.014	.031	.032	.042	.046	.047	.047	.048	.049	.048	.046	.040	.022	.019	.021	.030	.020	.011	23	.049
9	BF	.009	.005	.003	.002	.001	.005	.020	.031	.038	.046	.050	.051	.051	.053	.054	.048	.040	.038	.036	.036	.032	.022	.024	23	.054
10	BF	.011	.007	.007	.017	.017	.016	.020	.026	.033	.037	.045	.048	.049	.052	.052	.047	.042	.031	.021	.016	.011	.008	.007	23	.052
11	BF	.018	.021	.008	.004	.008	.016	.021	.028	.035	.039	.044	.046	.050	.048	.048	.048	.032	.021	.023	.026	.025	.012	.006	23	.050
12	BF	.004	.002	.002	.002	.004	.003	.015	.021	.037	.042	.046	.046	.049	.056	.057	.052	.047	AV	AV	AV	AV	AV	AV	17	.057
13	AV	AV	AV	AV	AV	AV	AV	AV	.028	.038	.043	.044	.046	.048	.046	.047	.045	.040	.031	.032	.034	.027	.030	.022	16	.048
14	BF	.018	.023	.016	.011	.008	.018	.029	.032	.035	.036	.036	.039	.043	.045	.042	.043	.039	.029	.016	.015	.011	.009	.016	23	.045
15	BF	.018	.018	.018	.019	.018	.020	.020	.023	.025	.030	.033	.036	.038	.039	.042	.041	.037	.035	.032	.025	.022	.023	.029	23	.042
16	BF	.026	.025	.028	.028	.023	.020	.021	.022	.020	.022	.023	.025	.027	.027	.028	.024	.022	.022	.018	.016	.016	.014	.013	23	.028
17	BF	.011	.012	.014	.016	.010	.010	.021	.034	.046	.055	.054	.056	.057	.056	.056	.054	.056	.055	.052	.041	.021	.025	.012	23	.057
18	BF	.011	.006	.003	.003	.003	.005	.021	.035	.043	.047	.048	.047	.049	.051	.051	.053	.049	.036	.030	.016	.014	.013	.008	23	.053
19	BF	.006	.005	.002	.002	.001	.003	.014	.026	.038	BA	.050	.051	.054	.055	.055	.054	.042	.028	.021	.024	.020	.022	.018	22	.055
20	BF	.009	.006	.004	.007	.012	.009	.019	.022	.032	.042	.046	.051	.050	.052	.054	.054	.044	.036	.029	.022	.022	.021	.026	23	.054
21	BF	.022	.029	.027	.024	.024	.024	.025	.029	.034	.042	.047	.050	.053	.055	.056	.056	.045	.033	.030	.031	.029	.024	.016	23	.056
22	BF	.010	.016	.009	.013	.025	.025	.033	.043	.048	.053	.056	.058	.057	.057	.058	.059	.045	.033	.029	.022	.016	.015	.012	23	.059
23	BF	.007	.007	.003	.002	.001	.004	.016	.035	.045	.052	.054	.056	.056	.057	.058	.059	.057	.051	.031	.025	.023	.019	.015	23	.059
24	BF	.009	.007	.006	.003	.003	.004	.021	.036	.042	.051	.054	.055	.055	.054	.054	.052	.032	.026	.020	.019	.017	.012	.010	23	.055
25	BF	.011	.008	.006	.003	.003	.009	.027	.034	.037	.044	.055	.058	.061	.060	.055	.051	.036	.027	.022	.021	.016	.017	.014	23	.061
26	BF	.013	.015	.022	.025	.023	.021	.020	.027	.034	.042	.047	.052	.053	.055	.056	.056	.045	.034	.025	.027	.036	.032	.024	23	.056
27	BF	.019	.034	.023	.015	.014	.017	.032	.038	.041	.041	.044	.047	.048	.049	.048	.047	.044	.039	.033	.028	.027	.021	.017	23	.049
28	BF	.018	.013	.014	.011	.010	.013	.019	.026	.028	.031	.035	.038	.041	.047	.051	.050	.041	.027	.025	.022	.016	.014	.011	23	.051
29	BF	.004	.002	.002	.001	.002	.007	.016	.025	.032	.035	.043	.045	.047	.049	.051	.050	.040	.027	.018	.016	.013	.010	.007	23	.051
30	BF	.004	.002	.001	.000	.000	.001	.021	.034	.042	.048	.056	.056	.055	.055	.056	.056	.042	.031	.025	.022	.020	.014	.013	23	.056
31																									0	
NO.:		29	29	29	29	29	29	29	30	30	28	30	30	30	30	30	30	30	29	29	29	29	29	29		
MAX:		.033	.036	.033	.028	.025	.025	.033	.043	.048	.055	.056	.058	.061	.060	.058	.059	.057	.055	.052	.041	.036	.032	.029		
AVG:		.0117	.0123	.0106	.0099	.0094	.0116	.0210	.0287	.0352	.0401	.0437	.0459	.0473	.0485	.0489	.0476	.0405	.0309	.0257	.0223	.0197	.0173	.0145		

MONTHLY OBSERVATIONS: 675 MONTHLY MEAN: .0282 MONTHLY MAX: .061

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 1 HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
1	BF	.012	.007	.006	.008	.021	.021	.022	.026	.041	.047	.051	.049	.050	.051	.052	.051	.041	.030	.028	.024	.018	.014	.010	23	.052
2	BF	.004	.003	.003	.002	.002	.003	.018	.028	.038	.041	.043	.044	.045	.048	.050	.056	.042	.033	.027	.028	.020	.018	.013	23	.056
3	AQ	.006	.005	.003	.002	.001	.012	.025	.033	.038	BL	BL	.048	.050	.054	.056	.057	.050	.047	.036	.035	.037	.030	.027	21	.057
4	BF	.018	.015	.013	.009	.006	.011	.024	.033	.043	.045	.049	.050	.051	.052	.055	.056	.044	.040	.031	.029	.024	.028	.029	23	.056
5	BF	.021	.019	.015	.013	.016	.016	.026	.039	.043	BA	.050	.049	.049	.048	.048	.046	.032	.032	.025	.023	.024	.025	.031	22	.050
6	BF	.028	.023	.020	.025	.023	.021	.023	.027	.030	.032	.037	.040	.043	.041	.038	.034	.034	.035	.030	.018	.008	.009	.015	23	.043
7	BF	.028	.029	.029	.028	.027	.026	.027	.029	.029	.030	.033	.034	.034	.033	.037	.039	.039	.038	.036	.033	.026	.025	.018	23	.039
8	BF	.018	.012	.010	.010	.008	.009	.022	.030	.034	.036	.037	.038	.038	.038	.040	.041	.038	.026	.023	.020	.018	.016	.014	23	.041
9	BF	.010	.008	.006	.006	.006	.005	.014	.025	.033	.039	.045	.052	.053	.052	.052	.051	.043	.033	.028	.027	.023	.025	.021	23	.053
10	BF	.019	.015	.012	.014	.015	.013	.030	.035	.043	.052	.059	.065	.068	.066	.066	.062	.055	.051	.048	.039	.032	.025	.025	23	.068
11	BF	.021	.019	.016	.014	.014	AV	AV	.023	.027	.028	.027	.027	.028	.027	.019	.024	.029	.029	.026	.019	.029	.033	.035	21	.035
12	BF	.039	.037	.036	.035	.035	.034	.034	.036	.039	.040	.040	.043	.044	.045	.044	.043	.040	.036	.038	.035	.025	.031	.037	23	.045
13	BF	.033 3	.031 3	.028 3	.025 3	.024 3	.024 3	.023 3	.023 3	.025 3	.027 3	.032 3	.035 3	.035 3	.034 3	.033 3	.031 3	.026 3	.026 3	.026 3	.024 3	.020 3	.018 3	.017 3	23	.035
14	BF	.011	.008	.005	.005	.008	.011	.015	.023	.025	.027	.028	.031	.034	.035	.038	.040	.037	.033	.030	.030	.029	.027	.024	23	.040
15	BF	.020	.020	.020	.019	.020	.018	.016	.017	.014	.014	.017	.020	.021	.027	.028	.027	.025	.023	.024	.023	.022	.021	.021	23	.028
16	BF	.018	.017	.016	.016	.015	.015	.017	.021	.023	BA	.028	.029	.031	.032	.031	.029	.028	.025	.025	.024	.024	.023	.022	22	.032
17	BF	.020	.018	.017	.015	.007	.004	.015	.021	.026	.029	.030	.032	.034	.034	.033	.031	.028	.023	.023	.014	.011	.009	.007	23	.034
18	BF	.003	.003	.002	.001	.000	.001	.005	.013	.019	.029	.040	.042	.043	.043	.046	.046	.028	.021	.021	.021	.014	.014	.010	23	.046
19	BF	.004	.005	.003	.003	.002	.001	.009	.024	.037	.044	.048	.046	.046	.050	.052	.047	.037	.025	.025	.023	.017	.019	.016	23	.052
20	BF	.035 3	.032 3	.028 3	.014 3	.009 3	.006 3	.020 3	.029 3	.035 3	.040 3	.041 3	.042 3	.044 3	.044 3	.045 3	.047 3	.047 3	.045 3	.044 3	.043 3	.040 3	.034 3	AE	22	.047
21	AE	AE	AE	AE	AE	AE	AE	AE	AE	AE	AE	AE	.044 3	.046 3	.048 3	.051 3	.046 3	.036 3	.031 3	.031 3	.035 3	.033 3	.024 3	.015 3	12	.051
22	BF	.016 3	.019 3	.018 3	.021 3	.023 3	.019 3	.025 3	.036 3	.038 3	.041 3	.043 3	.045 3	.045 3	.045 3	.046 3	.045 3	.036 3	.030 3	.021 3	.019 3	.015 3	.015 3	.015 3	23	.046
23	BF	.026 3	.025 3	.024 3	.024 3	.023 3	.022 3	.023 3	.025 3	.029 3	.034 3	.042 3	.047 3	.049 3	.050 3	.049 3	.052 3	.053 3	.039 3	.035 3	.032 3	.030 3	.031 3	.028 3	23	.053
24	BF	.021 3	.023 3	.021 3	.024 3	.015 3	.011 3	.020 3	.028 3	.040 3	.043 3	.045 3	.047 3	.048 3	.050 3	.049 3	.049 3	.049 3	.048 3	.047 3	.044 3	.040 3	.035 3	.033 3	23	.050
25	BF	.034 3	.022 3	.017 3	.021 3	.025 3	.025 3	.027 3	.031 3	.036 3	.042 3	.042 3	.043 3	.042 3	.041 3	.040 3	.038 3	.033 3	.031 3	.035 3	.034 3	.031 3	.025 3	.021 3	23	.043
26	BF	.019 3	.017 3	.024 3	.021 3	.014 3	.013 3	.022 3	.029 3	.033 3	.036 3	.038 3	.039 3	.041 3	.042 3	.041 3	.042 3	.029 3	.025 3	.024 3	.021 3	.022 3	.020 3	.021 3	23	.042
27	BF	.021 3	.009 3	.006 3	.003 3	.003 3	.003 3	.013 3	.028 3	.035 3	.037 3	.040 3	.043 3	.042 3	.043 3	.041 3	.037 3	.028 3	.026 3	.021 3	.017 3	.017 3	.020 3	.014 3	23	.043
28	BF	.010	.010	.006	.005	.003	.002	.010	.027	.035	.037	.041	.045	.044	.042	.042	.040	.034	.026	.024	.021	.018	.019	.015	23	.045
29	BF	.009	.006	.005	.002	.004	.002	.008	.023	.031	.035	.039	.042	.044	.047	.046	.042	.031	.027	.029	.023	.018	.016	.012	23	.047
30	BF	.007	.005	.005	.003	.002	.003	.012	.024	.030	.011	.013	.008	.007	.005	.004	.005	.006	.007	.009	.009	.010	.011	.011	23	.030
31	BF	.011	.012	.013	.014	.015	.016	.018	.019	.023	.027	.032	.034	.037	.040	.041	.041	.041	.040	.039	.037	.035	.036	.035	23	.041
NO.:		30	30	30	30	30	29	29	30	30	27	29	31	31	31	31	31	31	31	31	31	31	31	30		
MAX:		.039	.037	.036	.035	.035	.034	.034	.039	.043	.052	.059	.065	.068	.066	.066	.062	.055	.051	.048	.044	.040	.036	.037		
AVG:		.0181	.0158	.0142	.0134	.0129	.0127	.0194	.0268	.0324	.0349	.0383	.0404	.0415	.0422	.0424	.0418	.0361	.0316	.0293	.0266	.0235	.0225	.0204		

MONTHLY OBSERVATIONS: 695 MONTHLY MEAN: .0278 MONTHLY MAX: .068

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional review are shown in lower case. An asterisk ("*") indicates that the region has reviewed the value and does not concur with the qualifier.

Qualifier Code	Qualifier Description	Qualifier Type
3	Field Issue.	QA
6	QAPP Issue.	QA
AE	Shelter Temperature Outside Limits.	NULL
AF	Scheduled but not Collected.	NULL
AG	Sample Time out of Limits.	NULL
AH	Sample Flow Rate or CV out of Limits.	NULL
AJ	Filter Damage.	NULL
AN	Machine Malfunction.	NULL
AQ	Collection Error.	NULL
AS	Poor Quality Assurance Results.	NULL
AT	Calibration.	NULL
AU	Monitoring Waived.	NULL
AV	Power Failure.	NULL
AX	Precision Check.	NULL
BA	Maintenance/Routine Repairs.	NULL
BC	Multi-point Calibration.	NULL
BE	Building/Site Repair.	NULL
BF	Precision/Zero/Span.	NULL
BJ	Operator Error.	NULL
BK	Site computer/data logger down.	NULL
BL	QA Audit.	NULL
BR	Sample Value Below Acceptable Range.	NULL
EC	Exceeds Critical Criteria.	NULL
IF	Fire - Canadian.	INFORM
IH	Fireworks.	INFORM
TS	Holding Time Or Transport Temperature Is Out Of Specs.	NULL
V	Validated Value.	QA

Note: Qualifier codes with regional concurrence are shown in upper case, and those without regional concurrence are shown in lower case.

Appendix A-2 – 2021-2023 $PM_{2.5}$ and Ozone NAAQS Averages

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: GCURVIN

RAW DATA NAAQS AVERAGES

Report Request ID: 2228045 Report Code: AMP350NW Sep. 30, 2024

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	01	055	0011								
	01	055	0010								
	01	027	0001								

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

AGENCY SELECTIONS

Al Dept Of Env Mgt

SELECTED OPTIONS

Option Type	Option Value
DAILY STATISTICS	MAXIMUM
SINGLE EVENT PROCESSING	INCLUDE EVENTS
MERGE PDF FILES	YES
AGENCY ROLE	PQAO

SORT ORDER

Order	Column
1	STATE_CODE
2	COUNTY_CODE
3	SITE_ID
4	PARAMETER_CODE
5	POC

DATE CRITERIA

Start Date	End Date
2021 01 01	2023 12 31

APPLICABLE STANDARDS

Standard Description
CO 8-hour 1971
Ozone 8-hour 2015
PM10 24-hour 2006
PM25 Annual 2024
SO2 3-hour 1971

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	10.8																								1	10.8
02	10.9																								1	10.9
03	9.5																								1	9.5
04	7.9																								1	7.9
05	6.5																								1	6.5
06	8.1																								1	8.1
07	9.3																								1	9.3
08	11.2																								1	11.2
09	15.5																								1	15.5
10	9.6																								1	9.6
11	12.3																								1	12.3
12	9.9																								1	9.9
13	8.7																								1	8.7
14	8.9																								1	8.9
15	8.0																								1	8.0
16	8.8																								1	8.8
17	11.1																								1	11.1
18	10.6																								1	10.6
19	9.6																								1	9.6
20	7.6																								1	7.6
21	11.3																								1	11.3
22	7.4																								1	7.4
23	9.3																								1	9.3
24	8.2																								1	8.2
25	7.9																								1	7.9
26	8.4																								1	8.4
27	6.0																								1	6.0
28	7.2																								1	7.2
29	12.0																								1	12.0
30	5.4																								1	5.4
31	6.9																								1	6.9

NO.: 31
MAX: 15.5
AVG: 9.19

MONTHLY OBSERVATIONS: 31 MONTHLY MEAN: 9.19 MONTHLY MAX: 15.5

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	5.5																								1	5.5
02	6.1																								1	6.1
03	8.4																								1	8.4
04	10.6																								1	10.6
05	9.8																								1	9.8
06	8.7																								1	8.7
07	10.9																								1	10.9
08	17.1																								1	17.1
09	13.4																								1	13.4
10	7.4																								1	7.4
11	7.2																								1	7.2
12	7.1																								1	7.1
13	8.3																								1	8.3
14	10.8																								1	10.8
15	10.3																								1	10.3
16	14.4																								1	14.4
17	7.4																								1	7.4
18	7.9																								1	7.9
19	11.2																								1	11.2
20	14.3																								1	14.3
21	13.9																								1	13.9
22	12.9																								1	12.9
23	14.5																								1	14.5
24	12.3																								1	12.3
25	11.8																								1	11.8
26	13.2																								1	13.2
27	12.3																								1	12.3
28	22.7																								1	22.7

NO.: 28
MAX: 22.7
AVG: 11.09

MONTHLY OBSERVATIONS: 28 MONTHLY MEAN: 11.09 MONTHLY MAX: 22.7

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	19.6																								1	19.6
02	7.5																								1	7.5
03	13.7																								1	13.7
04	7.2																								1	7.2
05	9.0																								1	9.0
06	17.0																								1	17.0
07	21.1																								1	21.1
08	17.8																								1	17.8
09	22.4																								1	22.4
10	14.6																								1	14.6
11	6.8																								1	6.8
12	9.6																								1	9.6
13	6.1																								1	6.1
14	7.0																								1	7.0
15	6.5																								1	6.5
16	20.3																								1	20.3
17	7.9																								1	7.9
18	6.3																								1	6.3
19	16.5																								1	16.5
20	10.8																								1	10.8
21	18.3																								1	18.3
22	27.4																								1	27.4
23	17.5																								1	17.5
24	13.6																								1	13.6
25	10.3																								1	10.3
26	12.7																								1	12.7
27	8.2																								1	8.2
28	10.0																								1	10.0
29	7.4																								1	7.4
30	9.5																								1	9.5
31	13.2																								1	13.2

NO.: 31
MAX: 27.4
AVG: 12.77

MONTHLY OBSERVATIONS: 31 MONTHLY MEAN: 12.77 MONTHLY MAX: 27.4

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01																									0	
02																									0	
03																									0	
04																									0	
05																									0	
06																									0	
07																									0	
08																									0	
09																									0	
10																									0	
11																									0	
12																									0	
13																									0	
14																									0	
15																									0	
16																									0	
17																									0	
18																									0	
19																									0	
20																									0	
21	14.3																								1	14.3
22	5.6																								1	5.6
23	6.8																								1	6.8
24	7.7																								1	7.7
25	12.3																								1	12.3
26	17.5																								1	17.5
27																									0	
28																									0	
29	5.5																								1	5.5
30	5.0																								1	5.0

NO.: 8
MAX: 17.5
AVG: 9.34

MONTHLY OBSERVATIONS: 8 MONTHLY MEAN: 9.34 MONTHLY MAX: 17.5

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01																									0	
02																									0	
03																									0	
04																									0	
05	5.5																								1	5.5
06	8.9																								1	8.9
07	8.5																								1	8.5
08	11.4																								1	11.4
09	12.4																								1	12.4
10	8.3																								1	8.3
11	10.9																								1	10.9
12	5.9																								1	5.9
13	7.6																								1	7.6
14	7.2																								1	7.2
15	8.7																								1	8.7
16	7.7																								1	7.7
17	6.9																								1	6.9
18	6.7																								1	6.7
19	3.2																								1	3.2
20	6.9																								1	6.9
21	6.7																								1	6.7
22	10.1																								1	10.1
23	14.9																								1	14.9
24	15.9																								1	15.9
25	12.3																								1	12.3
26	13.1																								1	13.1
27	6.9																								1	6.9
28	6.4																								1	6.4
29	5.7																								1	5.7
30	4.7																								1	4.7
31	9.1																								1	9.1

NO.: 27
MAX: 15.9
AVG: 8.61

MONTHLY OBSERVATIONS: 27 MONTHLY MEAN: 8.61 MONTHLY MAX: 15.9

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	9.0																								1	9.0
02	10.3																								1	10.3
03	10.2																								1	10.2
04	12.2																								1	12.2
05	11.2																								1	11.2
06	11.5																								1	11.5
07	13.9																								1	13.9
08	17.1																								1	17.1
09	17.8																								1	17.8
10	18.1																								1	18.1
11	11.5																								1	11.5
12	7.4																								1	7.4
13	11.0																								1	11.0
14	6.3																								1	6.3
15	6.1																								1	6.1
16	8.8																								1	8.8
17	8.9																								1	8.9
18	11.0																								1	11.0
19	5.0																								1	5.0
20	7.4																								1	7.4
21	4.8																								1	4.8
22	2.1																								1	2.1
23	5.7																								1	5.7
24	11.8																								1	11.8
25	12.8																								1	12.8
26	9.8																								1	9.8
27	15.6																								1	15.6
28	12.9																								1	12.9
29	16.3																								1	16.3
30	20.1																								1	20.1

NO.: 30
MAX: 20.1
AVG: 10.89

MONTHLY OBSERVATIONS: 30 MONTHLY MEAN: 10.89 MONTHLY MAX: 20.1

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	13.0																								1	13.0
02	10.4																								1	10.4
03	9.3																								1	9.3
04	8.3																								1	8.3
05	7.8																								1	7.8
06	6.3																								1	6.3
07	5.0																								1	5.0
08	6.2																								1	6.2
09	4.9																								1	4.9
10	2.6																								1	2.6
11	5.4																								1	5.4
12	7.7																								1	7.7
13	5.5																								1	5.5
14	7.0																								1	7.0
15	6.3																								1	6.3
16	8.6																								1	8.6
17																									0	
18																									0	
19																									0	
20																									0	
21	12.1																								1	12.1
22	5.6																								1	5.6
23	7.3																								1	7.3
24	8.5																								1	8.5
25	12.3																								1	12.3
26	13.5																								1	13.5
27	14.9																								1	14.9
28	14.8																								1	14.8
29	13.9																								1	13.9
30	11.9																								1	11.9
31	7.0																								1	7.0

NO.: 27
MAX: 14.9
AVG: 8.74

MONTHLY OBSERVATIONS: 27 MONTHLY MEAN: 8.74 MONTHLY MAX: 14.9

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	7.2																								1	7.2
02	9.3																								1	9.3
03	9.4																								1	9.4
04	4.8																								1	4.8
05	5.4																								1	5.4
06	6.8																								1	6.8
07	5.7																								1	5.7
08	5.8																								1	5.8
09	4.8																								1	4.8
10																									0	
11																									0	
12	5.8																								1	5.8
13	4.0																								1	4.0
14	7.7																								1	7.7
15	7.2																								1	7.2
16	3.3																								1	3.3
17	5.2																								1	5.2
18	6.5																								1	6.5
19	8.2																								1	8.2
20	9.5																								1	9.5
21	8.0																								1	8.0
22	11.0																								1	11.0
23	14.8																								1	14.8
24	15.4																								1	15.4
25	14.4																								1	14.4
26	11.6																								1	11.6
27	8.6																								1	8.6
28	7.3																								1	7.3
29	3.7																								1	3.7
30	3.1																								1	3.1
31	6.0																								1	6.0

NO.: 29
MAX: 15.4
AVG: 7.60

MONTHLY OBSERVATIONS: 29 MONTHLY MEAN: 7.60 MONTHLY MAX: 15.4

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	7.5																								1	7.5
02	4.2																								1	4.2
03	5.0																								1	5.0
04	4.1																								1	4.1
05	5.3																								1	5.3
06	5.0																								1	5.0
07	4.6																								1	4.6
08	8.9																								1	8.9
09	9.0																								1	9.0
10	7.9																								1	7.9
11	7.3																								1	7.3
12	8.9																								1	8.9
13	6.8																								1	6.8
14	5.8																								1	5.8
15	7.7																								1	7.7
16	5.6																								1	5.6
17	5.0																								1	5.0
18																									0	
19	4.3																								1	4.3
20	8.5																								1	8.5
21	8.0																								1	8.0
22	7.7																								1	7.7
23	5.9																								1	5.9
24	5.2																								1	5.2
25	7.7																								1	7.7
26	8.1																								1	8.1
27	7.8																								1	7.8
28	4.2																								1	4.2
29	4.8																								1	4.8
30	5.7																								1	5.7

NO.: 29
MAX: 9.0
AVG: 6.43

MONTHLY OBSERVATIONS: 29 MONTHLY MEAN: 6.43 MONTHLY MAX: 9.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	4.4																								1	4.4
02	3.8																								1	3.8
03	5.8																								1	5.8
04	9.4																								1	9.4
05	7.3																								1	7.3
06	8.7																								1	8.7
07	1.9																								1	1.9
08	2.2																								1	2.2
09	2.6																								1	2.6
10	6.1																								1	6.1
11	8.3																								1	8.3
12	1.0																								1	1.0
13	1.1																								1	1.1
14	2.1																								1	2.1
15	.5																								1	.5
16	1.3																								1	1.3
17	.3																								1	.3
18	9.0																								1	9.0
19	5.7																								1	5.7
20	4.4																								1	4.4
21	3.3																								1	3.3
22	3.5																								1	3.5
23	6.2																								1	6.2
24	8.0																								1	8.0
25	3.9																								1	3.9
26	5.8																								1	5.8
27	2.4																								1	2.4
28	3.5																								1	3.5
29	2.8																								1	2.8
30	2.8																								1	2.8
31	.5																								1	.5

NO.: 31
MAX: 9.4
AVG: 4.15

MONTHLY OBSERVATIONS: 31 MONTHLY MEAN: 4.15 MONTHLY MAX: 9.4

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) 5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	1.8																								1	1.8
02	2.0																								1	2.0
03	2.5																								1	2.5
04	3.5																								1	3.5
05	6.2																								1	6.2
06	7.4																								1	7.4
07	8.1																								1	8.1
08	5.5																								1	5.5
09	6.1																								1	6.1
10	5.6																								1	5.6
11	1.1																								1	1.1
12	3.1																								1	3.1
13	6.9																								1	6.9
14	6.4																								1	6.4
15	4.7																								1	4.7
16	4.9																								1	4.9
17	4.5																								1	4.5
18	3.2																								1	3.2
19	4.8																								1	4.8
20	6.0																								1	6.0
21	1.7																								1	1.7
22	1.3																								1	1.3
23	3.8																								1	3.8
24	4.5																								1	4.5
25	6.4																								1	6.4
26	7.7																								1	7.7
27	3.0																								1	3.0
28	2.1																								1	2.1
29	1.2																								1	1.2
30																									0	

NO.: 29
MAX: 8.1
AVG: 4.34

MONTHLY OBSERVATIONS: 29 MONTHLY MEAN: 4.34 MONTHLY MAX: 8.1

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-027-0001 POC: 3
COUNTY: (027) Clay
CITY: (02860) Ashland
SITE ADDRESS: ASHLAND AIRPORT
SITE COMMENTS: SERON SITE
MONITOR COMMENTS: BAM 1022 CONTINUOUS MONITOR SAMPLING BEGAN ON 1/1/2023

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (0450) ANNISTON, AL
LAND USE: RESIDENTIAL
LOCATION SETTING: RURAL

CAS NUMBER:
LATITUDE: 33.2849280009
LONGITUDE: -85.803608
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 344.42
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	9.9																								1	9.9
02	1.5																								1	1.5
03	1.1																								1	1.1
04	2.2																								1	2.2
05	2.0																								1	2.0
06	1.8																								1	1.8
07	2.6																								1	2.6
08	7.6																								1	7.6
09	4.6																								1	4.6
10	.2																								1	.2
11	.9																								1	.9
12	3.5																								1	3.5
13	6.5																								1	6.5
14	4.7																								1	4.7
15	2.8																								1	2.8
16	3.9																								1	3.9
17	3.6																								1	3.6
18	2.4																								1	2.4
19	1.2																								1	1.2
20	2.7																								1	2.7
21	2.5																								1	2.5
22																									0	
23																									0	
24																									0	
25																									0	
26																									0	
27	3.0																								1	3.0
28	3.9																								1	3.9
29	4.7																								1	4.7
30	4.3																								1	4.3
31	11.8																								1	11.8

NO.: 26
MAX: 11.8
AVG: 3.69

MONTHLY OBSERVATIONS: 26 MONTHLY MEAN: 3.69 MONTHLY MAX: 11.8

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2021

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01																									0	
02																									0	
03																									0	
04																									0	
05																									0	
06																									0	
07																									0	
08	8.0																								2	8.0
09	9.5																								2	9.5
10	11.3																								2	11.3
11	4.7																								2	4.7
12	3.2																								2	3.2
13	8.4																								2	8.4
14	12.3																								2	12.3
15	14.2																								2	14.2
16	13.5																								2	13.5
17	12.6																								2	12.6
18	5.7																								2	5.7
19	1.5																								2	1.5
20	4.2																								2	4.2
21	7.0																								2	7.0
22	6.3																								2	6.3
23	9.4																								2	9.4
24	10.9																								2	10.9
25	4.2																								2	4.2
26	8.9																								2	8.9
27	7.8																								2	7.8
28	8.0																								2	8.0
29	6.8																								2	6.8
30	3.5																								2	3.5
31	8.3																								2	8.3

NO.: 24
MAX: 14.2
AVG: 7.93

MONTHLY OBSERVATIONS: 48 MONTHLY MEAN: 7.93 MONTHLY MAX: 14.2

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	6.0																								2	6.0
02																									0	
03																									0	
04	4.9																								2	4.9
05	10.6																								2	10.6
06	7.5																								2	7.5
07	4.5																								2	4.5
08	7.2																								2	7.2
09	7.4																								2	7.4
10	1.9																								2	1.9
11	3.7																								2	3.7
12	9.9																								2	9.9
13	9.1																								2	9.1
14	7.6																								2	7.6
15	15.0																								2	15.0
16	4.4																								2	4.4
17	6.3																								2	6.3
18	6.7																								2	6.7
19	7.5																								2	7.5
20	4.3																								2	4.3
21	6.3																								2	6.3
22	7.0																								2	7.0
23	8.5																								2	8.5
24	9.3																								2	9.3
25	10.9																								2	10.9
26	8.8																								2	8.8
27	12.7																								2	12.7
28	14.2																								2	14.2
29	4.5																								2	4.5
30	10.0																								2	10.0
31	9.9																								2	9.9

NO.: 29
MAX: 15.0
AVG: 7.81

MONTHLY OBSERVATIONS: 58 MONTHLY MEAN: 7.81 MONTHLY MAX: 15.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101 / 88502 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	17.0																								2	17.0
02	12.9																								2	12.9
03	7.8																								2	7.8
04	2.5																								2	2.5
05	4.6																								2	4.6
06	7.2																								2	7.2
07	10.4																								2	10.4
08	6.0																								2	6.0
09	8.2																								2	8.2
10	8.6																								2	8.6
11	15.2																								2	15.2
12	11.2																								2	11.2
13	6.2																								2	6.2
14	8.7																								2	8.7
15	22.4																								2	22.4
16	14.5																								2	14.5
17	9.8																								2	9.8
18	1.8																								2	1.8
19	7.7																								2	7.7
20	7.6																								2	7.6
21	14.6																								2	14.6
22	8.4																								2	8.4
23	4.6																								2	4.6
24	7.9																								2	7.9
25	2.9																								2	2.9
26	6.3																								2	6.3
27	2.2																								2	2.2
28	4.1																								2	4.1

NO.: 28
MAX: 22.4
AVG: 8.62

MONTHLY OBSERVATIONS: 56 MONTHLY MEAN: 8.62 MONTHLY MAX: 22.4

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	6.7																								2	6.7
02	9.0																								2	9.0
03	12.3																								2	12.3
04	22.1																								2	22.1
05																									0	
06																									0	
07																									0	
08	4.0																								2	4.0
09	1.6																								2	1.6
10	3.8																								2	3.8
11	9.3																								2	9.3
12	1.7																								2	1.7
13	4.9																								2	4.9
14	15.7																								2	15.7
15	11.2																								2	11.2
16	4.3																								2	4.3
17	6.1																								2	6.1
18	6.6																								2	6.6
19	1.5																								2	1.5
20	7.0																								2	7.0
21	12.8																								2	12.8
22	14.4																								2	14.4
23	5.7																								2	5.7
24	3.7																								2	3.7
25	5.6																								2	5.6
26	3.7																								2	3.7
27	3.4																								2	3.4
28	8.0																								2	8.0
29	13.6																								2	13.6
30	10.9																								2	10.9
31	5.8																								2	5.8

NO.: 28
MAX: 22.1
AVG: 7.69

MONTHLY OBSERVATIONS: 56 MONTHLY MEAN: 7.69 MONTHLY MAX: 22.1

Note:--A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	4.8																								2	4.8
02	7.5																								2	7.5
03	7.0																								2	7.0
04	9.6																								2	9.6
05	12.7																								2	12.7
06	9.7																								2	9.7
07	2.9																								2	2.9
08	2.6																								2	2.6
09	2.9																								2	2.9
10	9.5																								2	9.5
11	16.5																								2	16.5
12	19.2																								2	19.2
13	12.3																								2	12.3
14	2.0																								2	2.0
15	7.2																								2	7.2
16	10.7																								2	10.7
17	9.2																								2	9.2
18	5.1																								2	5.1
19	3.5																								2	3.5
20	7.3																								2	7.3
21	9.5																								2	9.5
22	12.1																								2	12.1
23	11.5																								2	11.5
24	9.0																								2	9.0
25	11.2																								2	11.2
26	4.0																								2	4.0
27	5.8																								2	5.8
28	12.2																								2	12.2
29	14.1																								2	14.1
30	11.4																								2	11.4

NO.: 30
MAX: 19.2
AVG: 8.77

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 8.77 MONTHLY MAX: 19.2

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	8.0																								2	8.0
02	9.2																								2	9.2
03	10.2																								2	10.2
04	9.6																								2	9.6
05	11.1																								2	11.1
06	6.1																								2	6.1
07	2.7																								2	2.7
08	3.0																								2	3.0
09	4.7																								2	4.7
10	7.8																								2	7.8
11	14.2																								2	14.2
12	12.8																								2	12.8
13	5.6																								2	5.6
14	6.1																								2	6.1
15	8.6																								2	8.6
16	7.6																								2	7.6
17	6.2																								2	6.2
18	12.7																								2	12.7
19	14.1																								2	14.1
20	9.4																								2	9.4
21	10.2																								2	10.2
22	9.0																								2	9.0
23	5.6																								2	5.6
24	7.7																								2	7.7
25	4.3																								2	4.3
26	2.5																								2	2.5
27	5.3																								2	5.3
28	6.4																								2	6.4
29	9.6																								2	9.6
30	10.2																								2	10.2
31	9.8																								2	9.8

NO.: 31
MAX: 14.2
AVG: 8.07

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 8.07 MONTHLY MAX: 14.2

Note:- A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	12.8																								2	12.8
02	9.9																								2	9.9
03	6.5																								2	6.5
04	8.8																								2	8.8
05	10.5																								2	10.5
06	10.9																								2	10.9
07	10.1																								2	10.1
08	5.8																								2	5.8
09	5.8																								2	5.8
10	6.0																								2	6.0
11	10.5																								2	10.5
12	12.5																								2	12.5
13	14.8																								2	14.8
14	24.0																								2	24.0
15	19.6																								2	19.6
16	9.6																								2	9.6
17	10.6																								2	10.6
18	7.3																								2	7.3
19	5.3																								2	5.3
20	11.2																								2	11.2
21	13.7																								2	13.7
22	16.9																								2	16.9
23	13.5																								2	13.5
24	11.7																								2	11.7
25	11.9																								2	11.9
26	11.5																								2	11.5
27	10.0																								2	10.0
28	7.9																								2	7.9
29	11.0																								2	11.0
30	6.5																								2	6.5

NO.: 30
MAX: 24.0
AVG: 10.90

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 10.90 MONTHLY MAX: 24.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	9.0																								2	9.0
02	8.0																								2	8.0
03	7.7																								2	7.7
04	14.0																								2	14.0
05	12.0																								2	12.0
06	8.9																								2	8.9
07	7.4																								2	7.4
08	10.0																								2	10.0
09	6.6																								2	6.6
10	5.8																								2	5.8
11	4.9																								2	4.9
12	8.7																								2	8.7
13	7.7																								2	7.7
14	8.7																								2	8.7
15	11.9																								2	11.9
16	12.6																								2	12.6
17	9.3																								2	9.3
18	8.6																								2	8.6
19	8.6																								2	8.6
20	9.1																								2	9.1
21	9.0																								2	9.0
22	7.0																								2	7.0
23	8.1																								2	8.1
24	9.9																								2	9.9
25	11.1																								2	11.1
26	9.6																								2	9.6
27	8.2																								2	8.2
28	8.5																								2	8.5
29	7.9																								2	7.9
30	7.0																								2	7.0
31	5.5																								2	5.5

NO.: 31
MAX: 14.0
AVG: 8.75

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 8.75 MONTHLY MAX: 14.0

Note:—A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	8.6																								2	8.6
02	7.5																								2	7.5
03	5.0																								2	5.0
04	8.5																								2	8.5
05	8.2																								2	8.2
06	8.1																								2	8.1
07	8.3																								2	8.3
08	7.7																								2	7.7
09	7.0																								2	7.0
10	4.3																								2	4.3
11	5.9																								2	5.9
12	5.8																								2	5.8
13	9.2																								2	9.2
14	9.2																								2	9.2
15	9.0																								2	9.0
16	8.3																								2	8.3
17	10.7																								2	10.7
18	11.4																								2	11.4
19	9.2																								2	9.2
20	5.9																								2	5.9
21	6.2																								2	6.2
22	4.5																								2	4.5
23	6.7																								2	6.7
24	4.9																								2	4.9
25	3.2																								2	3.2
26	4.2																								2	4.2
27	6.8																								2	6.8
28	7.5																								2	7.5
29	9.1																								2	9.1
30	9.6																								2	9.6
31	8.3																								2	8.3

NO.: 31
MAX: 11.4
AVG: 7.38

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 7.38 MONTHLY MAX: 11.4

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	8.1																								2	8.1
02	7.1																								2	7.1
03	5.9																								2	5.9
04	2.6																								2	2.6
05	5.0																								2	5.0
06	7.1																								2	7.1
07	6.2																								2	6.2
08	6.0																								2	6.0
09	7.7																								2	7.7
10	5.0																								2	5.0
11	5.2																								2	5.2
12	5.5																								2	5.5
13	6.6																								2	6.6
14	7.7																								2	7.7
15	7.2																								2	7.2
16	11.5																								2	11.5
17	13.5																								2	13.5
18	14.0																								2	14.0
19	14.2																								2	14.2
20	16.0																								2	16.0
21	13.9																								2	13.9
22	12.9																								2	12.9
23	4.2																								2	4.2
24	8.3																								2	8.3
25	12.1																								2	12.1
26	5.3																								2	5.3
27	3.1																								2	3.1
28	1.8																								2	1.8
29	2.9																								2	2.9
30	3.8																								2	3.8

NO.: 30
MAX: 16.0
AVG: 7.68

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 7.68 MONTHLY MAX: 16.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	3.0																								2	3.0
02	3.7																								2	3.7
03	2.4																								2	2.4
04	5.2																								2	5.2
05	5.8																								2	5.8
06	9.1																								2	9.1
07	8.7																								2	8.7
08	4.5																								2	4.5
09	4.5																								2	4.5
10	6.7																								2	6.7
11	11.8																								2	11.8
12	10.2																								2	10.2
13	4.6																								2	4.6
14	6.5																								2	6.5
15	11.8																								2	11.8
16	14.3																								2	14.3
17	8.7																								2	8.7
18	1.8																								2	1.8
19	4.6																								2	4.6
20	8.5																								2	8.5
21	12.7																								2	12.7
22	17.8																								2	17.8
23	19.1																								2	19.1
24	16.2																								2	16.2
25	11.2																								2	11.2
26	2.5																								2	2.5
27	5.3																								2	5.3
28	9.5																								2	9.5
29	7.4																								2	7.4
30	3.8																								2	3.8
31	7.8																								2	7.8

NO.: 31
MAX: 19.1
AVG: 8.05

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 8.05 MONTHLY MAX: 19.1

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	10.0																								2	10.0
02	13.9																								2	13.9
03	16.7																								2	16.7
04	14.3																								2	14.3
05	8.8																								2	8.8
06	11.5																								2	11.5
07	12.1																								2	12.1
08	9.3																								2	9.3
09	4.4																								2	4.4
10	9.7																								2	9.7
11	3.2																								2	3.2
12	3.4																								2	3.4
13	3.0																								2	3.0
14	4.4																								2	4.4
15	4.2																								2	4.2
16	3.8																								2	3.8
17	6.6																								2	6.6
18	8.4																								2	8.4
19	7.8																								2	7.8
20	5.6																								2	5.6
21	8.4																								2	8.4
22	14.9																								2	14.9
23	23.8																								2	23.8
24	15.3																								2	15.3
25	7.4																								2	7.4
26	7.7																								2	7.7
27	2.9																								2	2.9
28	4.9																								2	4.9
29	7.7																								2	7.7
30	1.7																								2	1.7

NO.: 30
MAX: 23.8
AVG: 8.53

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 8.53 MONTHLY MAX: 23.8

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2022

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	2.7																								2	2.7
02																									0	
03																									0	
04																									0	
05																									0	
06	4.8																								2	4.8
07	9.2																								2	9.2
08	8.6																								2	8.6
09	12.2																								2	12.2
10	4.1																								2	4.1
11	2.4																								2	2.4
12	3.2																								2	3.2
13	8.3																								2	8.3
14	6.5																								2	6.5
15	1.7																								2	1.7
16	3.4																								2	3.4
17	3.0																								2	3.0
18	2.7																								2	2.7
19	5.9																								2	5.9
20	10.5																								2	10.5
21	7.2																								2	7.2
22	4.4																								2	4.4
23	1.9																								2	1.9
24	1.3																								2	1.3
25	1.8																								2	1.8
26	7.2																								2	7.2
27	8.6																								2	8.6
28	13.2																								2	13.2
29	10.9																								2	10.9
30	12.3																								2	12.3
31	5.8																								2	5.8

NO.: 27
MAX: 13.2
AVG: 6.07

MONTHLY OBSERVATIONS: 54 MONTHLY MEAN: 6.07 MONTHLY MAX: 13.2

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JANUARY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	17.6																								2	17.6
02	15.2																								2	15.2
03	4.8																								2	4.8
04	2.5																								2	2.5
05	3.2																								2	3.2
06	4.5																								2	4.5
07	10.0																								2	10.0
08	9.2																								2	9.2
09	9.7																								2	9.7
10	9.9																								2	9.9
11	13.4																								2	13.4
12	6.1																								2	6.1
13	2.7																								2	2.7
14	2.9																								2	2.9
15	5.0																								2	5.0
16	9.4																								2	9.4
17	6.0																								2	6.0
18	7.9																								2	7.9
19	5.1																								2	5.1
20	2.9																								2	2.9
21	4.8																								2	4.8
22	3.9																								2	3.9
23	4.2																								2	4.2
24	7.9																								2	7.9
25	2.8																								2	2.8
26	4.4																								2	4.4
27	3.9																								2	3.9
28	10.1																								2	10.1
29	11.6																								2	11.6
30	6.8																								2	6.8
31	5.6																								2	5.6

NO.: 31
MAX: 17.6
AVG: 6.90

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 6.90 MONTHLY MAX: 17.6

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	1.9																								2	1.9
02	2.2																								2	2.2
03	5.3																								2	5.3
04	7.3																								2	7.3
05	7.9																								2	7.9
06	7.1																								2	7.1
07	12.2																								2	12.2
08	18.8																								2	18.8
09	7.5																								2	7.5
10	1.7																								2	1.7
11	4.2																								2	4.2
12	3.2																								2	3.2
13	5.4																								2	5.4
14	9.8																								2	9.8
15	5.7																								2	5.7
16	10.6																								2	10.6
17	1.2																								2	1.2
18	5.0																								2	5.0
19	9.1																								2	9.1
20	11.2																								2	11.2
21	7.7																								2	7.7
22	9.9																								2	9.9
23	11.0																								2	11.0
24	6.7																								2	6.7
25	7.2																								2	7.2
26	8.2																								2	8.2
27	11.5																								2	11.5
28	17.2																								2	17.2

NO.: 28
MAX: 18.8
AVG: 7.74

MONTHLY OBSERVATIONS: 56 MONTHLY MEAN: 7.74 MONTHLY MAX: 18.8

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	21.0																								2	21.0
02	2.9																								2	2.9
03	7.7																								2	7.7
04	1.9																								2	1.9
05	8.1																								2	8.1
06	18.1																								2	18.1
07	14.7																								2	14.7
08	9.6																								2	9.6
09	17.8																								2	17.8
10	11.4																								2	11.4
11	6.2																								2	6.2
12	6.2																								2	6.2
13	4.6																								2	4.6
14	4.4																								2	4.4
15	8.0																								2	8.0
16	28.6																								2	28.6
17	4.7																								2	4.7
18	3.5																								2	3.5
19	4.5																								2	4.5
20	5.8																								2	5.8
21	18.0																								2	18.0
22	28.0																								2	28.0
23	24.5																								2	24.5
24	14.4																								2	14.4
25	7.1																								2	7.1
26	11.7																								2	11.7
27	6.8																								2	6.8
28	8.3																								2	8.3
29	5.9																								2	5.9
30	12.9																								2	12.9
31	13.5																								2	13.5

NO.: 31
MAX: 28.6
AVG: 10.99

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 10.99 MONTHLY MAX: 28.6

Note:- A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) [illegible] - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	6.4																								2	6.4
02	4.3																								2	4.3
03	9.6																								2	9.6
04	13.8																								2	13.8
05	9.5																								2	9.5
06	7.5																								2	7.5
07	4.1																								2	4.1
08	1.7																								2	1.7
09	3.6																								2	3.6
10	5.7																								2	5.7
11	9.3																								2	9.3
12	16.4																								2	16.4
13	10.7																								2	10.7
14	7.9																								2	7.9
15	10.0																								2	10.0
16	4.6																								2	4.6
17	5.0																								2	5.0
18	12.0																								2	12.0
19	16.5																								2	16.5
20	15.2																								2	15.2
21	14.3																								2	14.3
22	5.0																								2	5.0
23	5.7																								2	5.7
24																									0	
25																									0	
26	12.6																								2	12.6
27	6.9																								2	6.9
28	8.4																								2	8.4
29	8.4																								2	8.4
30	5.5																								2	5.5

NO.: 28
MAX: 16.5
AVG: 8.59

MONTHLY OBSERVATIONS: 56 MONTHLY MEAN: 8.59 MONTHLY MAX: 16.5

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	4.7																								2	4.7
02	5.1																								2	5.1
03	5.5																								2	5.5
04	13.9																								2	13.9
05	10.3																								2	10.3
06	10.9																								2	10.9
07	12.3																								2	12.3
08	10.2																								2	10.2
09	15.5																								2	15.5
10	9.4																								2	9.4
11	12.7																								2	12.7
12	9.2																								2	9.2
13	9.5																								2	9.5
14	9.1																								2	9.1
15	8.5																								2	8.5
16	8.0																								2	8.0
17	6.3																								2	6.3
18	7.5																								2	7.5
19	6.4																								2	6.4
20	7.0																								2	7.0
21	14.9																								2	14.9
22	16.4																								2	16.4
23	17.2																								2	17.2
24	18.3																								2	18.3
25	19.5																								2	19.5
26	17.5																								2	17.5
27	10.0																								2	10.0
28	7.1																								2	7.1
29	5.7																								2	5.7
30	5.7																								2	5.7
31	12.1																								2	12.1

NO.: 31
MAX: 19.5
AVG: 10.53

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 10.53 MONTHLY MAX: 19.5

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	10.8																								2	10.8
02	10.0																								2	10.0
03	12.0																								2	12.0
04	15.7																								2	15.7
05	12.9																								2	12.9
06	17.2																								2	17.2
07	21.0																								2	21.0
08	20.5																								2	20.5
09	22.0																								2	22.0
10	24.2																								2	24.2
11	11.6																								2	11.6
12	10.0																								2	10.0
13	13.5																								2	13.5
14	8.8																								2	8.8
15	8.4																								2	8.4
16	8.5																								2	8.5
17	12.1																								2	12.1
18	14.9																								2	14.9
19	6.8																								2	6.8
20	6.8																								2	6.8
21	3.6																								2	3.6
22	3.3																								2	3.3
23	6.5																								2	6.5
24	15.5																								2	15.5
25	13.8																								2	13.8
26	8.7																								2	8.7
27	15.2																								2	15.2
28	13.2																								2	13.2
29	21.5																								2	21.5
30	25.1																								2	25.1

NO.: 30
MAX: 25.1
AVG: 13.14

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 13.14 MONTHLY MAX: 25.1

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	16.4																								2	16.4
02																									0	
03																									0	
04	11.4																								2	11.4
05	12.4																								2	12.4
06	7.6																								2	7.6
07	7.3																								2	7.3
08	6.7																								2	6.7
09	4.2																								2	4.2
10	3.2																								2	3.2
11	8.1																								2	8.1
12	11.4																								2	11.4
13	8.0																								2	8.0
14	8.1																								2	8.1
15	6.1																								2	6.1
16	16.3																								2	16.3
17																									0	
18																									0	
19																									0	
20																									0	
21																									0	
22	8.7																								2	8.7
23	11.1																								2	11.1
24	11.3																								2	11.3
25	15.0																								2	15.0
26	16.5																								2	16.5
27	15.0																								2	15.0
28	14.5																								2	14.5
29	16.2																								2	16.2
30	11.4																								2	11.4
31	7.1																								2	7.1

NO.: 24
MAX: 16.5
AVG: 10.58

MONTHLY OBSERVATIONS: 48 MONTHLY MEAN: 10.58 MONTHLY MAX: 16.5

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) [illegible] - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	8.2																								2	8.2
02	9.9																								2	9.9
03																									0	
04																									0	
05	7.2																								2	7.2
06	9.2																								2	9.2
07																									0	
08																									0	
09	7.3																								2	7.3
10																									0	
11																									0	
12	11.1																								2	11.1
13	9.6																								2	9.6
14	10.9																								2	10.9
15	5.4																								2	5.4
16	4.7																								2	4.7
17	6.1																								2	6.1
18	9.9																								2	9.9
19	11.0																								2	11.0
20	13.3																								2	13.3
21	14.9																								2	14.9
22	16.6																								2	16.6
23	19.3																								2	19.3
24	21.2																								2	21.2
25	20.4																								2	20.4
26	16.4																								2	16.4
27	10.3																								2	10.3
28	8.8																								2	8.8
29	8.0																								2	8.0
30	7.5																								2	7.5
31	11.3																								2	11.3

NO.: 25
MAX: 21.2
AVG: 11.14

MONTHLY OBSERVATIONS: 50 MONTHLY MEAN: 11.14 MONTHLY MAX: 21.2

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	12.4																								2	12.4
02	8.7																								2	8.7
03	10.2																								2	10.2
04	11.2																								2	11.2
05	12.3																								2	12.3
06	11.0																								2	11.0
07	9.3																								2	9.3
08	14.3																								2	14.3
09	12.2																								2	12.2
10	9.4																								2	9.4
11	11.0																								2	11.0
12	13.4																								2	13.4
13	8.6																								2	8.6
14	7.8																								2	7.8
15	9.7																								2	9.7
16	9.3																								2	9.3
17	10.0																								2	10.0
18	8.0																								2	8.0
19	6.4																								2	6.4
20	17.6																								2	17.6
21	13.0																								2	13.0
22	13.9																								2	13.9
23	12.2																								2	12.2
24	10.9																								2	10.9
25	10.0																								2	10.0
26	9.6																								2	9.6
27	14.1																								2	14.1
28	8.1																								2	8.1
29	8.7																								2	8.7
30	10.0																								2	10.0

NO.: 30
MAX: 17.6
AVG: 10.78

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 10.78 MONTHLY MAX: 17.6

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	10.7																								2	10.7
02	11.4																								2	11.4
03	9.2																								2	9.2
04	13.7																								2	13.7
05	13.7																								2	13.7
06	13.1																								2	13.1
07	2.8																								2	2.8
08	3.8																								2	3.8
09	6.7																								2	6.7
10	9.5																								2	9.5
11	14.7																								2	14.7
12	5.4																								2	5.4
13	6.0																								2	6.0
14	4.4																								2	4.4
15	.8																								2	.8
16																									0	
17																									0	
18																									0	
19																									0	
20																									0	
21																									0	
22																									0	
23																									0	
24	10.1																								2	10.1
25	13.6																								2	13.6
26	8.5																								2	8.5
27	9.0																								2	9.0
28	10.4																								2	10.4
29	10.5																								2	10.5
30	6.0																								2	6.0
31	2.4																								2	2.4

NO.: 23
MAX: 14.7
AVG: 8.54

MONTHLY OBSERVATIONS: 46 MONTHLY MEAN: 8.54 MONTHLY MAX: 14.7

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) PM2.5 - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: NOVEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	4.9																								2	4.9
02	8.2																								2	8.2
03	11.7																								2	11.7
04	14.8																								2	14.8
05	14.0																								2	14.0
06	14.8																								2	14.8
07	16.0																								2	16.0
08	13.4																								2	13.4
09	11.7																								2	11.7
10	9.2																								2	9.2
11	5.5																								2	5.5
12	5.8																								2	5.8
13	9.0																								2	9.0
14	10.6																								2	10.6
15	8.4																								2	8.4
16	7.0																								2	7.0
17	9.1																								2	9.1
18	5.9																								2	5.9
19	8.3																								2	8.3
20	11.3																								2	11.3
21	5.2																								2	5.2
22	4.3																								2	4.3
23	8.1																								2	8.1
24	9.4																								2	9.4
25	11.4																								2	11.4
26	12.1																								2	12.1
27	5.7																								2	5.7
28	5.4																								2	5.4
29	7.6																								2	7.6
30	10.6																								2	10.6

NO.: 30
MAX: 16.0
AVG: 9.31

MONTHLY OBSERVATIONS: 60 MONTHLY MEAN: 9.31 MONTHLY MAX: 16.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(88101) - Local Conditions

SITE ID: 01-055-0010 POC: 3
COUNTY: (055) Etowah
CITY: (28696) Gadsden
SITE ADDRESS: 314 COLLEGE DRIVE, GADSDEN, AL 35902
SITE COMMENTS:
MONITOR COMMENTS: PM2.5 BAM SAMPLER 1022 AT GADSDEN STATE COMM.COLLEGE,GADSDEN

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: COMMERCIAL
LOCATION SETTING: URBAN AND CENTER CITY

CAS NUMBER:
LATITUDE: 33.98821
LONGITUDE: -85.992556
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 50
PROBE HEIGHT:

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (209) Met One BAM-1022 Mass Monitor w/ V
POAO: (0013) Al Dept Of Env Mgt

REPORT FOR: DECEMBER 2023

DURATION: 24-HR BLK AVG
UNITS: Micrograms/cubic meter (LC)
MIN DETECTABLE: 5

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01	16.1																								2	16.1
02	9.8																								2	9.8
03	4.2																								2	4.2
04	5.9																								2	5.9
05	5.7																								2	5.7
06	3.8																								2	3.8
07	9.9																								2	9.9
08	17.8																								2	17.8
09	11.7																								2	11.7
10	2.4																								2	2.4
11	3.6																								2	3.6
12	11.6																								2	11.6
13	13.2																								2	13.2
14	10.8																								2	10.8
15	11.7																								2	11.7
16	9.5																								2	9.5
17	5.7																								2	5.7
18	3.9																								2	3.9
19	4.1																								2	4.1
20	11.4																								2	11.4
21	15.9																								2	15.9
22	21.0																								2	21.0
23	20.0																								2	20.0
24	11.8																								2	11.8
25	3.3																								2	3.3
26	5.8																								2	5.8
27	8.1																								2	8.1
28	4.9																								2	4.9
29	4.6																								2	4.6
30	4.9																								2	4.9
31	12.2																								2	12.2

NO.: 31
MAX: 21.0
AVG: 9.20

MONTHLY OBSERVATIONS: 62 MONTHLY MEAN: 9.20 MONTHLY MAX: 21.0

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01																									0	
02																									0	
03																									0	
04																									0	
05																									0	
06																									0	
07																									0	
08																									0	
09																									0	
10																									0	
11																									0	
12																									0	
13																									0	
14																									0	
15																									0	
16																									0	
17																									0	
18																									0	
19																									0	
20																									0	
21																									0	
22																									0	
23																									0	
24																									0	
25																									0	
26																									0	
27																									0	
28																								.029	2	.029
NO.:																								1		
MAX:																								.029		
AVG:																								.0290		

MONTHLY OBSERVATIONS: 2 MONTHLY MEAN: .0290 MONTHLY MAX: .029

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: [illegible]8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.030	.030	.030	.030	.030	.030	.029	.029	.029	.029	.030	.029	.030	.030	.030	.029	.029	34	.030
02								.029	.029	.029	.028	.026	.024	.023	.022	.022	.021	.021	.021	.022	.022	.022	.021	.021	34	.029
03								.037	.041	.044	.046	.047	.046	.045	.044	.041	.038	.036	.032	.028	.024	.020	.016	.014	34	.047
04								.043	.049	.052	.054	.055	.055	.054	.052	.049	.046	.045	.039	.035	.029	.024	.020	.017	34	.055
05								.041	.043	.044	.045	.045	.044	.044	.043	.041	.040	.039	.039	.039	.038	.037	.036	.036	34	.045
06								.043	.045	.046	.047	.047	.047	.047	.046	.045	.043	.042	.041	.040	.038	.036	.034	.031	34	.047
07								.044	.047	.049	.049	.048	.046	.043	.040	.036	.032	.029	.025	.021	.018	.016	.014	.012	34	.049
08								.043	.048	.051	.053	.052	.050	.047	.044	.040	.035	.032	.027	.023	.019	.016	.012	.009	34	.053
09								.046	.053	.057	.059	.060	.060	.058	.054	.051	.046	.044	.039	.034	.029	.024	.022	.019	34	.060
10								.043	.047	.050	.051	.051	.052	.051	.051	.050	.049	.048	.047	.045	.042	.038	.034	.031	34	.052
11								.037	.043	.047	.049	.048	.046	.045	.042	.038	.034	.032	.027	.023	.019	.016	.013	.011	34	.049
12								.034	.038	.042	.045	.047	.046	.044	.042	.038	.034	.031	.026	.022	.018	.014	.011	.009	34	.047
13								.035	.039	.042	.043	.043	.042	.040	.038	.035	.033	.031	.029	.027	.026	.024	.023	.022	34	.043
14								.037	.041	.045	.047	.047	.046	.044	.043	.041	.039	.036	.034	.034	.034	.033	.032	.030	34	.047
15								.031	.032	.033	.033	.032	.031	.030	.029	.029	.028	.028	.029	.029	.030	.029	.028	.027	34	.033
16								.025	.025	.024	.023	.022	.021	.020	.018	.017	.016	.015	.013	.012	.011	.010	.009	.008	34	.025
17								.008	.008	.009	.010	.010	.011	.013	.015	.018	.021	.022	.026	.029	.031	.033	.034	.034	34	.034
18								.035	.034	.033	.030	.028	.025	.024	.023	.023	.024	.024	.025	.027	.027	.028	.027	.027	34	.035
19								.025	.026	.026	.027	.027	.027	.027	.027	.027	.027	.026	.026	.026	.026	.028	.030	.032	34	.032
20								.045	.047	.048	.049	.048	.046	.044	.040	.036	.032	.029	.026	.025	.024	.024	.025	.027	34	.049
21								.039	.041	.043	.044	.044	.043	.040	.038	.035	.033	.031	.026	.023	.020	.018	.015	.013	34	.044
22								.042	.045	.048	.049	.049	.048	.046	.045	.044	.043	.042	.041	.041	.042	.043	.043	.043	34	.049
23								.037	.036	.035	.035	.035	.036	.036	.037	.035	.033	.034	.031	.028	.024	.019	.015	.013	34	.037
24								.034	.038	.041	.043	.042	.041	.040	.038	.035	.033	.032	.029	.027	.026	.024	.025	.026	34	.043
25								.015	.015	.015	.016	.017	.018	.018	.018	.017	.017	.017	.019	.020	.022	.025	.025	.025	34	.025
26								.038	.040	.041	.041	.040	.037	.034	.031	.027	.023	.020	.016	.013	.011	.010	.008	.007	34	.041
27								.021	.023	.025	.025	.025	.024	.024	.023	.023	.022	.022	.021	.021	.021	.021	.021	.020	34	.025
28								.035	.036	.037	.038	.039	.039	.040	.040	.040	.039	.039	.039	.038	.037	.035	.032	.029	34	.040
29								.043	.046	.047	.048	.046	.043	.040	.037	.032	.028	.025	.021	.018	.016	.014	.013	.014	34	.048
30								.039	.042	.044	.045	.045	.044	.042	.041	.038	.036	.034	.032	.030	.028	.026	.026	.026	34	.045
31								.030	.031	.031	.031	.032	.033	.034	.035	.035	.035	.035	.034	.034	.034	.034	.035	.036	34	.036
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.046	.053	.057	.059	.060	.060	.058	.054	.051	.049	.048	.047	.045	.042	.043	.043	.043		
AVG:								.0350	.0374	.0390	.0398	.0396	.0387	.0376	.0363	.0344	.0325	.0313	.0293	.0279	.0263	.0249	.0235	.0225		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0327 MONTHLY MAX: .060

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.045	.046	.046	.046	.046	.046	.046	.045	.044	.043	.042	.041	.039	.038	.037	.036	.036	34	.046
02								.044	.045	.046	.047	.047	.044	.041	.038	.034	.030	.027	.022	.018	.015	.013	.011	.010	34	.047
03								.039	.044	.046	.048	.047	.045	.042	.039	.035	.031	.028	.023	.019	.017	.014	.012	.010	34	.048
04								.045	.050	.053	.054	.053	.051	.047	.043	.039	.034	.031	.025	.020	.017	.013	.011	.009	34	.054
05								.045	.051	.055	.057	.057	.055	.052	.048	.045	.040	.036	.030	.025	.022	.018	.015	.013	34	.057
06								.048	.052	.056	.058	.057	.055	.050	.046	.041	.036	.033	.027	.022	.018	.016	.013	.012	34	.058
07								.039	.043	.047	.047	.047	.048	.047	.045	.042	.039	.038	.036	.034	.033	.033	.033	.034	34	.048
08								.037	.038	.040	.041	.041	.042	.041	.039	.037	.034	.033	.029	.024	.020	.016	.013	.011	34	.042
09								.035	.039	.040	.041	.040	.038	.035	.032	.029	.025	.023	.019	.017	.015	.014	.014	.015	34	.041
10								.028	.032	.035	.039	.041	.041	.039	.036	.033	.030	.028	.025	.026	.028	.030	.032	.034	34	.041
11								.044	.045	.045	.046	.044	.042	.039	.036	.033	.030	.028	.023	.020	.019	.016	.014	.013	34	.046
12								.047	.052	.056	.057	.056	.053	.049	.044	.038	.033	.029	.022	.018	.015	.012	.010	.008	34	.057
13								.044	.051	.055	.056	.055	.051	.050	.045	.041	.036	.033	.028	.025	.022	.018	.015	.013	34	.056
14								.039	.042	.044	.044	.042	.040	.038	.037	.035	.032	.031	.030	.029	.029	.028	.026	.027	34	.044
15								.041	.044	.046	.048	.049	.049	.048	.047	.046	.044	.043	.041	.039	.036	.034	.031	.028	34	.049
16								.038	.040	.041	.041	.039	.037	.034	.030	.025	.021	.018	.014	.012	.010	.008	.007	.007	34	.041
17								.036	.040	.043	.045	.047	.047	.046	.045	.044	.043	.042	.040	.037	.034	.032	.029	.028	34	.047
18								.041	.043	.043	.043	.043	.042	.042	.041	.040	.039	.039	.037	.036	.035	.033	.030	.028	34	.043
19								.040	.042	.044	.046	.045	.043	.040	.036	.033	.028	.025	.020	.015	.013	.010	.008	.007	34	.046
20								.044	.050	.053	.055	.054	.052	.048	.043	.039	.034	.030	.027	.025	.025	.025	.026	.028	34	.055
21								.036	.038	.039	.041	.042	.042	.040	.037	.033	.029	.027	.022	.017	.013	.010	.008	.008	34	.042
22										.048	.048	.046	.044	.041	.038	.034	.029	.026	.020	.017	.015	.014	.013	.013	30	.048
23								.038	.042	.046	.049	.050	.048	.045	.042	.039	.037	.035	.031	.028	.029	.031	.031	.032	34	.050
24								.030	.032	.033	.034	.034	.036	.037	.038	.038	.038	.038	.038	.038	.040	.041	.042	.042	34	.042
25								.046	.047	.047	.048	.046	.043	.039	.035	.030	.025	.022	.016	.012	.009	.007	.006	.006	34	.048
26								.041	.045	.048	.050	.048	.045	.041	.038	.033	.029	.026	.022	.019	.017	.015	.012	.012	34	.050
27								.042	.044	.046	.046	.044	.042	.038	.034	.030	.026	.023	.020	.018	.017	.017	.017	.017	34	.046
28								.045	.048	.049	.048	.045	.041	.037	.033	.030	.027	.024	.021	.020	.018	.016	.015	.014	34	.049
29								.029	.031	.031	.031	.030	.029	.028	.027	.027	.027	.027	.027	.029	.030	.031	.031	.030	34	.031
30								.043	.045	.047	.049	.049	.049	.048	.047	.047	.045	.043	.038	.034	.031	.027	.023	.020	34	.049
NO.:								29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.048	.052	.056	.058	.057	.055	.052	.048	.047	.045	.043	.041	.040	.041	.042	.042	.042		
AVG:								.0403	.0435	.0456	.0468	.0461	.0447	.0423	.0395	.0365	.0331	.0309	.0271	.0245	.0227	.0210	.0195	.0188		

MONTHLY OBSERVATIONS: 1016 MONTHLY MEAN: .0343 MONTHLY MAX: .058

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.053	.056	.058	.058	.055	.050	.047	.042	.037	.031	.026	.021	.018	.018	.016	.016	.016	34	.058
02								.033	.036	.038	.039	.039	.039	.038	.036	.035	.033	.033	.032	.031	.030	.028	.027	.025	34	.039
03								.018	.019	.021	.022	.022	.021	.020	.019	.019	.019	.018	.017	.018	.019	.020	.020	.020	34	.022
04								.028	.030	.032	.034	.033	.032	.032	.031	.031	.031	.032	.032	.033	.033	.032	.032	.031	34	.034
05								.031	.031	.031	.030	.031	.031	.031	.029	.028	.027	.027	.026	.025	.023	.021	.021	.021	34	.031
06								.040	.043	.044	.045	.045	.045	.045	.043	.042	.041	.041	.038	.039	.038	.036	.036	.036	34	.045
07								.046	.048	.050	.051	.051	.048	.044	.040	.035	.031	.028	.022	.017	.014	.012	.011	.010	34	.051
08								.036	.042	.046	.048	.048	.045	.043	.039	.035	.031	.028	.023	.021	.019	.018	.016	.018	34	.048
09								.047	.049	.050	.049	.047	.047	.046	.044	.044	.044	.043	.043	.044	.042	.040	.038	.036	34	.050
10								.038	.038	.037	.036	.034	.032	.030	.028	.025	.023	.022	.019	.017	.015	.013	.011	.010	34	.038
11								.020	.023	.025	.026	.026	.025	.023	.022	.021	.019	.018	.018	.018	.019	.022	.024	.026	34	.026
12								.034	.034	.035	.035	.035	.034	.033	.031	.029	.027	.026	.025	.023	.022	.021	.020	.020	34	.035
13								.033	.035	.036	.037	.036	.033	.030	.026	.022	.017	.014	.010	.007	.006	.005	.004	.006	34	.037
14								.043	.046	.049	.049	.047	.044	.040	.035	.030	.024	.021	.015	.011	.008	.007	.006	.006	34	.049
15								.043	.047	.050	.050	.049	.046	.042	.038	.033	.028	.024	.019	.016	.013	.011	.009	.008	34	.050
16								.047	.050	.052	.053	.050	.046	.042	.038	.033	.029	.025	.021	.018	.015	.013	.011	.012	34	.053
17								.045	.048	.049	.050	.050	.050	.050	.049	.049	.048	.047	.047	.047	.047	.046	.045	.043	34	.050
18								.036	.036	.036	.037	.037	.037	.037	.038	.039	.040	.040	.041	.043	.044	.045	.045	.045	34	.045
19								.045	.045	.045	.045	.044	.042	.042	.041	.040	.039	.038	.037	.036	.036	.035	.035	.034	34	.045
20								.045	.047	.048	.049	.049	.049	.048	.047	.046	.045	.044	.042	.039	.036	.034	.031	.030	34	.049
21								.050	.052	.053	.054	.052	.050	.047	.043	.039	.034	.031	.024	.021	.018	.015	.014	.015	34	.054
22								.044	.046	.048	.050	.049	.047	.044	.040	.036	.030	.026	.019	.014	.011	.007	.005	.005	34	.050
23								.050	.054	.057	.057	.053	.048	.043	.037	.031	.025	.020	.013	.009	.007	.005	.003	.004	34	.057
24								.053	.057	.059	.058	.055	.050	.045	.040	.035	.028	.024	.017	.013	.010	.007	.005	.004	34	.059
25								.042	.047	.050	.051	.050	.049	.046	.043	.039	.034	.029	.022	.017	.013	.010	.007	.007	34	.051
26								.047	.050	.051	.051	.048	.045	.042	.040	.038	.036	.034	.031	.028	.027	.025	.021	.018	34	.051
27								.037	.039	.041	.042	.041	.039	.036	.032	.028	.023	.020	.014	.011	.011	.011	.013	.015	34	.042
28								.037	.038	.037	.035	.032	.030	.026	.023	.019	.015	.014	.015	.016	.017	.018	.020	.022	34	.038
29								.031	.033	.034	.034	.034	.033	.032	.031	.029	.028	.027	.025	.024	.024	.024	.025	.025	34	.034
30								.034	.036	.038	.039	.039	.037	.035	.034	.033	.031	.029	.026	.024	.024	.024	.022	.021	34	.039
31								.034	.036	.038	.039	.039	.037	.035	.032	.029	.026	.024	.021	.020	.018	.017	.017	.018	34	.039
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.053	.057	.059	.058	.055	.050	.050	.049	.049	.048	.047	.047	.047	.047	.046	.045	.045		
AVG:								.0394	.0416	.0432	.0436	.0426	.0407	.0385	.0358	.0332	.0302	.0282	.0250	.0232	.0218	.0206	.0197	.0196		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0322 MONTHLY MAX: .059

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.038	.040	.041	.042	.041	.039	.038	.037	.036	.036	.035	.034	.034	.035	.036	.035	.033	34	.042
02								.028	.030	.032	.032	.031	.030	.029	.027	.025	.022	.021	.019	.017	.016	.014	.012	.011	34	.032
03								.029	.030	.030	.029	.029	.028	.026	.024	.022	.019	.017	.014	.011	.010	.009	.008	.009	34	.030
04								.036	.038	.039	.039	.037	.034	.031	.026	.022	.017	.015	.011	.007	.004	.002	.001	.001	34	.039
05								.031	.031	.030	.028	.026	.024	.022	.020	.018	.017	.017	.015	.013	.012	.010	.009	.007	34	.031
06								.017	.018	.019	.019	.017	.016	.016	.015	.015	.014	.014	.013	.013	.011	.009	.007	.006	34	.019
07								.021	.023	.024	.025	.025	.025	.024	.024	.026	.027	.027	.027	.026	.025	.024	.023	.022	34	.027
08								.018	.018	.017	.018	.018	.018	.017	.016	.015	.014	.013	.011	.009	.008	.007	.007	.006	34	.018
09								.021	.023	.024	.025	.025	.024	.024	.022	.021	.020	.019	.018	.016	.014	.012	.012	.013	34	.025
10								.024	.025	.026	.028	.029	.029	.027	.025	.023	.021	.020	.016	.012	.009	.007	.007	.007	34	.029
11								.025	.026	.028	.028	.028	.027	.026	.024	.021	.017	.015	.013	.010	.008	.008	.008	.010	34	.028
12								.033	.036	.038	.039	.040	.039	.039	.038	.035	.033	.033	.028	.024	.020	.015	.012	.011	34	.040
13								.042	.044	.045	.043	.040	.035	.031	.026	.020	.015	.011	.007	.004	.004	.003	.004	.005	34	.045
14								.042	.046	.047	.048	.047	.044	.039	.034	.028	.022	.019	.013	.008	.005	.004	.003	.005	34	.048
15								.055	.056	.055	.054	.052	.049	.046	.042	.037	.032	.030	.024	.022	.020	.019	.020	.022	34	.056
16								.046	.048	.050	.050	.049	.046	.042	.038	.033	.028	.025	.018	.013	.010	.008	.006	.007	34	.050
17								.050	.054	.056	.056	.054	.050	.045	.040	.034	.027	.023	.016	.012	.009	.006	.004	.005	34	.056
18								.051	.056	.058	.059	.057	.053	.048	.043	.036	.029	.025	.018	.013	.010	.008	.005	.005	34	.059
19								.012	.013	.014	.016	.017	.018	.018	.019	.020	.021	.021	.021	.020	.019	.019	.020	.020	34	.021
20								.026	.026	.026	.026	.025	.022	.019	.016	.014	.011	.010	.006	.004	.004	.005	.005	.006	34	.026
21								.022	.022	.022	.021	.019	.017	.016	.017	.020	.022	.023	.026	.029	.032	.034	.033	.031	34	.034
22								.032	.034	.037	.039	.039	.036	.033	.029	.024	.019	.016	.010	.006	.004	.002	.002	.002	34	.039
23								.040	.043	.045	.046	.043	.040	.035	.031	.026	.021	.017	.012	.010	.010	.011	.012	.014	34	.046
24								.026	.027	.027	.028	.030	.031	.031	.030	.030	.030	.029	.028	.027	.026	.025	.025	.025	34	.031
25								.037	.039	.039	.039	.038	.037	.035	.034	.033	.031	.029	.027	.024	.022	.018	.016	.016	34	.039
26								.030	.029	.029	.027	.026	.024	.021	.018	.015	.012	.011	.008	.005	.004	.003	.003	.004	34	.030
27								.017	.018	.018	.018	.018	.018	.018	.017	.016	.014	.014	.012	.010	.007	.004	.002	.002	34	.018
28								.020	.022	.024	.026	.026	.025	.024	.024	.023	.022	.020	.018	.017	.016	.015	.015	.014	34	.026
29								.020	.021	.022	.023	.023	.021	.019	.016	.013	.010	.008	.005	.002	.001	.000	.000	.001	34	.023
30								.029	.030	.030	.029	.027	.025	.022	.021	.019	.017	.016	.014	.012	.012	.011	.010	.009	34	.030
NO.:								30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.055	.056	.058	.059	.057	.053	.048	.043	.037	.036	.035	.034	.034	.035	.036	.035	.033		
AVG:								.0306	.0322	.0331	.0333	.0325	.0308	.0287	.0264	.0240	.0213	.0198	.0167	.0143	.0129	.0116	.0109	.0110		

MONTHLY OBSERVATIONS: 1020 MONTHLY MEAN: .0230 MONTHLY MAX: .059

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
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MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.022	.023	.025	.025	.024	.022	.020	.017	.015	.014	.013	.010	.009	.009	.010	.011	.012	34	.025
02								.020	.022	.024	.025	.026	.025	.025	.025	.023	.023	.022	.021	.019	.020	.020	.019	.020	34	.026
03								.039	.041	.043	.044	.042	.039	.035	.030	.025	.020	.016	.011	.007	.005	.003	.002	.003	34	.044
04								.034	.037	.038	.038	.037	.035	.032	.028	.024	.019	.016	.011	.006	.004	.002	.001	.002	34	.038
05								.037	.039	.041	.042	.040	.037	.033	.029	.025	.021	.018	.013	.010	.009	.008	.008	.008	34	.042
06								.020	.021	.021	.021	.020	.020	.020	.021	.020	.020	.019	.019	.018	.017	.015	.014	.013	34	.021
07								.016	.017	.018	.019	.019	.019	.018	.016	.015	.013	.012	.009	.007	.005	.004	.004	.003	34	.019
08								.018	.020	.022	.022	.022	.020	.018	.015	.012	.010	.008	.005	.003	.003	.002	.002	.003	34	.022
09								.020	.022	.022	.023	.024	.024	.024	.023	.021	.019	.018	.015	.011	.009	.007	.006	.006	34	.024
10								.023	.026	.027	.026	.025	.025	.023	.022	.019	.016	.015	.014	.013	.012	.011	.011	.010	34	.027
11								.018	.019	.020	.020	.020	.018	.016	.015	.013	.013	.012	.011	.011	.012	.013	.014	.014	34	.020
12								.021	.022	.022	.022	.023	.024	.023	.023	.022	.021	.021	.020	.019	.018	.017	.017	.017	34	.024
13								.023	.024	.025	.025	.025	.024	.023	.020	.018	.015	.014	.011	.008	.007	.005	.005	.005	34	.025
14								.029	.034	.037	.039	.038	.036	.035	.036	.034	.030	.028	.023	.020	.019	.016	.011	.008	34	.039
15								.029	.033	.035	.036	.035	.032	.029	.025	.021	.017	.013	.008	.007	.005	.005	.005	.006	34	.036
16								.024	.026	.029	.031	.032	.033	.033	.032	.030	.028	.027	.024	.020	.017	.014	.013	.012	34	.033
17								.021	.023	.025	.026	.026	.026	.026	.025	.024	.021	.020	.018	.016	.014	.012	.011	.011	34	.026
18								.023	.025	.026	.026	.026	.028	.028	.027	.026	.024	.023	.021	.020	.017	.013	.011	.010	34	.028
19								.021	.022	.024	.024	.023	.022	.021	.021	.020	.020	.019	.018	.017	.017	.017	.015	.014	34	.024
20								.025	.026	.026	.027	.026	.025	.023	.022	.020	.018	.017	.014	.012	.010	.008	.007	.006	34	.027
21														.024	.023	.021	.018	.017	.013	.010	.007	.005	.003	.003	22	.024
22								.035	.038	.039	.038	.034	.028	.024	.021	.017	.012	.009	.005	.003	.001	.001	.000	.001	34	.039
23								.042	.046	.049	.050	.047	.042	.037	.031	.025	.019	.014	.008	.006	.004	.004	.003	.003	34	.050
24								.034	.038	.041	.042	.041	.037	.032	.027	.022	.017	.013	.008	.005	.003	.002	.002	.002	34	.042
25								.034	.037	.039	.039	.039	.036	.033	.030	.026	.023	.020	.016	.011	.008	.005	.004	.003	34	.039
26								.032	.034	.034	.034	.033	.030	.027	.024	.021	.017	.016	.013	.009	.007	.005	.004	.005	34	.034
27								.038	.042	.043	.042	.039	.035	.030	.026	.023	.018	.015	.012	.009	.008	.006	.005	.005	34	.043
28								.037	.041	.045	.046	.044	.040	.034	.028	.023	.017	.013	.007	.004	.002	.001	.001	.001	34	.046
29								.038	.042	.043	.042	.039	.035	.029	.023	.018	.013	.009	.005	.003	.001	.001	.001	.001	34	.043
30								.032	.037	.040	.042	.043	.042	.042	.041	.039	.038	.037	.033	.030	.026	.021	.017	.015	34	.043
31								.035	.037	.037	.038	.038	.035	.032	.028	.024	.020	.018	.014	.011	.009	.007	.006	.006	34	.038
NO.:								30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.042	.046	.049	.050	.047	.042	.042	.041	.039	.038	.037	.033	.030	.026	.021	.019	.020		
AVG:								.0280	.0305	.0320	.0325	.0317	.0298	.0274	.0250	.0221	.0192	.0172	.0139	.0114	.0098	.0084	.0075	.0074		

MONTHLY OBSERVATIONS: 1042 MONTHLY MEAN: .0207 MONTHLY MAX: .050

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

AIR QUALITY SYSTEM
RAW DATA NAAQS AVERAGES

Sep. 30, 2024

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.033	.038	.041	.043	.043	.043	.041	.040	.038	.036	.034	.030	.026	.022	.020	.016	.013	34	.043
02								.039	.041	.040	.038	.034	.030	.025	.020	.015	.012	.010	.009	.009	.009	.009	.008	.009	34	.041
03								.040	.044	.045	.045	.044	.041	.037	.034	.030	.026	.024	.020	.018	.017	.017	.016	.016	34	.045
04								.044	.049	.051	.054	.052	.050	.043	.039	.036	.032	.030	.027	.024	.021	.020	.020	.018	34	.054
05								.037	.041	.043	.045	.045	.043	.039	.035	.031	.027	.024	.019	.016	.015	.013	.013	.012	34	.045
06								.037	.039	.040	.040	.039	.035	.032	.027	.023	.018	.015	.011	.008	.006	.004	.003	.003	34	.040
07								.032	.035	.037	.038	.036	.033	.031	.027	.023	.018	.015	.010	.007	.005	.003	.002	.003	34	.038
08								.032	.035	.037	.038	.037	.034	.031	.027	.022	.018	.015	.009	.005	.004	.003	.002	.002	34	.038
09								.033	.035	.036	.037	.036	.032	.029	.026	.023	.019	.017	.012	.008	.005	.003	.002	.002	34	.037
10								.030	.032	.032	.030	.027	.023	.019	.015	.013	.010	.008	.006	.004	.002	.002	.001	.002	34	.032
11								.031	.032	.032	.031	.030	.028	.024	.021	.017	.015	.013	.011	.007	.005	.004	.003	.003	34	.032
12								.035	.039	.043	.044	.041	.037	.033	.028	.023	.019	.015	.011	.009	.009	.008	.007	.006	34	.044
13								.039	.044	.047	.048	.047	.047	.046	.043	.040	.035	.033	.027	.023	.018	.012	.009	.007	34	.048
14								.037	.039	.039	.038	.038	.038	.037	.037	.037	.036	.035	.033	.030	.027	.023	.018	.016	34	.039
15								.027	.028	.027	.026	.025	.024	.023	.023	.021	.020	.020	.021	.021	.021	.020	.018	.018	34	.028
16								.020	.021	.022	.023	.023	.024	.023	.022	.021	.019	.019	.017	.016	.014	.014	.014	.014	34	.024
17								.018	.019	.020	.020	.019	.017	.015	.013	.010	.007	.005	.002	.001	.000	.000	.000	.001	34	.020
18								.026	.029	.030	.030	.029	.027	.023	.020	.018	.017	.016	.015	.015	.015	.016	.017	.016	34	.030
19								.023	.024	.024	.023	.021	.019	.016	.014	.012	.010	.009	.007	.006	.005	.006	.006	.005	34	.024
20								.021	.023	.023	.023	.022	.020	.018	.016	.014	.011	.009	.007	.005	.004	.003	.002	.002	34	.023
21								.017	.019	.021	.023	.024	.023	.022	.020	.019	.017	.016	.013	.011	.010	.010	.010	.010	34	.024
22								.030	.034	.036	.037	.036	.033	.029	.024	.020	.015	.012	.008	.005	.004	.003	.003	.004	34	.037
23								.033	.036	.037	.036	.033	.029	.025	.020	.015	.011	.007	.004	.002	.001	.000	.000	.000	34	.037
24								.044	.049	.052	.051	.047	.042	.037	.031	.025	.018	.013	.007	.005	.004	.003	.002	.002	34	.052
25								.038	.041	.044	.044	.041	.042	.043	.041	.039	.036	.034	.031	.030	.024	.019	.015	.013	34	.044
26								.027	.028	.029	.028	.026	.023	.020	.017	.013	.010	.007	.004	.002	.002	.002	.003	.004	34	.029
27								.026	.029	.030	.029	.028	.027	.025	.024	.022	.019	.018	.016	.016	.014	.012	.010	.008	34	.030
28								.024	.026	.027	.027	.026	.023	.023	.022	.021	.020	.019	.017	.017	.017	.015	.014	.013	34	.027
29								.015	.016	.016	.015	.015	.013	.012	.010	.007	.005	.004	.003	.002	.001	.001	.001	.001	34	.016
30								.015	.016	.016	.016	.016	.016	.016	.015	.015	.015	.016	.016	.017	.017	.017	.018	.018	34	.018
31								.017	.016	.016	.015	.015	.015	.015	.016	.016	.016	.017	.017	.018	.018	.017	.016	.015	34	.018
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.044	.049	.052	.054	.052	.050	.046	.043	.040	.036	.035	.033	.030	.027	.023	.020	.018		
AVG:								.0297	.0322	.0333	.0334	.0321	.0300	.0275	.0247	.0219	.0189	.0171	.0142	.0124	.0108	.0096	.0087	.0083		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0215 MONTHLY MAX: .054

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(4420)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

[illegible], 2024
CAS NUMBER: [illegible]8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.029	.032	.032	.033	.032	.032	.030	.026	.022	.018	.017	.013	.010	.006	.006	.005	.006	34	.033
02								.037	.040	.042	.042	.042	.040	.037	.033	.028	.023	.020	.015	.010	.008	.007	.008	.009	34	.042
03								.039	.042	.045	.045	.042	.038	.034	.030	.026	.022	.018	.015	.013	.011	.010	.008	.006	34	.045
04								.039	.042	.044	.042	.039	.034	.029	.024	.019	.013	.009	.005	.004	.003	.002	.002	.002	34	.044
05								.033	.037	.040	.039	.036	.033	.029	.024	.020	.017	.013	.011	.010	.010	.010	.009	.009	34	.040
06								.026	.028	.030	.030	.028	.025	.023	.020	.016	.014	.012	.010	.011	.013	.013	.015	.016	34	.030
07								.031	.034	.036	.036	.034	.032	.029	.025	.022	.017	.013	.010	.008	.007	.006	.005	.004	34	.036
08								.030	.034	.037	.037	.036	.033	.029	.026	.022	.018	.015	.013	.013	.014	.016	.018	.021	34	.037
09								.042	.044	.045	.045	.043	.041	.037	.033	.029	.025	.022	.017	.013	.009	.008	.007	.007	34	.045
10								.040	.043	.045	.044	.041	.036	.031	.026	.021	.015	.012	.007	.005	.003	.002	.002	.003	34	.045
11								.036	.040	.043	.042	.040	.036	.032	.028	.023	.018	.015	.011	.009	.007	.005	.004	.003	34	.043
12								.029	.033	.035	.036	.033	.030	.026	.022	.018	.013	.009	.005	.003	.002	.001	.000	.000	34	.036
13								.027	.030	.031	.029	.026	.023	.020	.015	.011	.007	.004	.002	.001	.000	.000	.000	.000	34	.031
14								.029	.031	.031	.030	.028	.025	.021	.018	.014	.011	.009	.006	.004	.003	.002	.002	.002	34	.031
15								.019	.021	.023	.024	.024	.024	.024	.023	.022	.022	.022	.021	.020	.019	.017	.016	.016	34	.024
16								.018	.019	.019	.018	.018	.018	.018	.017	.016	.015	.015	.015	.015	.013	.011	.009	.008	34	.019
17								.015	.016	.017	.016	.014	.012	.011	.009	.007	.005	.003	.003	.002	.002	.002	.002	.002	34	.017
18								.011	.013	.014	.014	.015	.015	.015	.014	.013	.012	.012	.011	.010	.010	.009	.009	.009	34	.015
19								.014	.015	.015	.015	.015	.015	.014	.013	.012	.012	.012	.012	.012	.013	.014	.015	.016	34	.016
20								.018	.019	.020	.021	.021	.021	.021	.021	.020	.019	.018	.016	.014	.012	.011	.011	.011	34	.021
21								.017	.018	.018	.018	.016	.014	.011	.009	.007	.005	.004	.003	.002	.002	.003	.004	.005	34	.018
22								.039	.040	.040	.040	.039	.037	.036	.034	.033	.030	.029	.026	.022	.019	.016	.014	.013	34	.040
23								.032	.034	.036	.036	.033	.030	.026	.022	.018	.013	.010	.007	.005	.004	.004	.003	.003	34	.036
24								.034	.037	.039	.038	.035	.032	.028	.023	.018	.013	.009	.007	.005	.004	.003	.002	.002	34	.039
25								.036	.042	.045	.045	.041	.037	.033	.027	.020	.014	.009	.006	.005	.003	.002	.001	.001	34	.045
26								.036	.041	.044	.043	.040	.035	.029	.024	.018	.012	.008	.005	.003	.003	.003	.002	.002	34	.044
27								.033	.038	.042	.044	.040	.036	.031	.026	.021	.015	.010	.006	.004	.003	.002	.002	.002	34	.044
28								.028	.034	.037	.037	.033	.029	.024	.019	.014	.009	.005	.002	.002	.001	.001	.001	.001	34	.037
29								.031	.036	.039	.038	.035	.031	.026	.021	.016	.010	.007	.004	.002	.001	.001	.001	.002	34	.039
30								.034	.037	.038	.036	.032	.028	.023	.018	.013	.008	.004	.002	.002	.001	.001	.001	.001	34	.038
NO.:								30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.042	.044	.045	.045	.043	.041	.037	.034	.033	.030	.029	.026	.022	.019	.017	.018	.021		
AVG:								.0294	.0323	.0341	.0338	.0317	.0291	.0259	.0223	.0186	.0148	.0122	.0095	.0080	.0069	.0063	.0059	.0061		

MONTHLY OBSERVATIONS: 1020 MONTHLY MEAN: .0192 MONTHLY MAX: .045

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2021

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.037	.042	.045	.044	.041	.036	.030	.024	.018	.012	.008	.005	.004	.003	.003	.004	.004	34	.045
02								.029	.032	.034	.033	.031	.028	.024	.020	.016	.011	.008	.006	.005	.005	.007	.008	.009	34	.034
03								.020	.021	.021	.020	.019	.018	.017	.015	.014	.013	.012	.011	.009	.007	.006	.006	.005	34	.021
04								.031	.032	.032	.031	.028	.025	.021	.018	.014	.011	.009	.008	.008	.008	.008	.008	.008	34	.032
05								.029	.032	.033	.033	.032	.031	.030	.029	.027	.025	.025	.023	.020	.018	.017	.015	.013	34	.033
06								.023	.026	.026	.026	.026	.026	.025	.024	.023	.021	.021	.020	.017	.016	.014	.012	.011	34	.026
07								.026	.027	.029	.029	.028	.026	.023	.020	.016	.012	.010	.008	.006	.006	.005	.005	.006	34	.029
08								.028	.032	.036	.034	.032	.029	.025	.020	.015	.010	.006	.003	.002	.001	.001	.001	.002	34	.036
09								.031	.036	.040	.040	.037	.032	.027	.021	.016	.010	.006	.003	.002	.002	.003	.004	.006	34	.040
10								.031	.035	.037	.035	.033	.029	.025	.020	.015	.010	.006	.005	.004	.004	.004	.004	.004	34	.037
11								.026	.029	.030	.031	.030	.028	.025	.022	.019	.016	.014	.011	.009	.007	.006	.005	.004	34	.031
12								.021	.023	.025	.025	.023	.021	.018	.015	.012	.008	.006	.003	.002	.002	.001	.001	.001	34	.025
13											.039	.035	.031	.027	.021	.016	.010	.006	.004	.002	.001	.001	.001	.002	28	.039
14								.032	.037	.039	.038	.035	.031	.026	.021	.015	.009	.006	.003	.002	.001	.001	.001	.002	34	.039
15								.031	.037	.040	.040	.039	.035	.031	.026	.020	.015	.011	.009	.010	.012	.014	.016	.019	34	.040
16								.034	.036	.037	.037	.037	.035	.032	.029	.025	.021	.019	.016	.015	.015	.017	.018	.019	34	.037
17								.034	.036	.038	.037	.034	.031	.028	.024	.020	.016	.013	.010	.008	.007	.006	.005	.005	34	.038
18								.034	.038	.039	.038	.035	.031	.026	.022	.017	.011	.008	.006	.005	.005	.005	.004	.005	34	.039
19								.033	.038	.040	.040	.037	.033	.028	.023	.017	.012	.009	.006	.004	.003	.002	.002	.001	34	.040
20								.030	.034	.037	.034	.033	.030	.026	.021	.016	.011	.008	.006	.005	.005	.004	.004	.004	34	.037
21								.025	.030	.033	.033	.032	.032	.032	.031	.030	.026	.025	.023	.021	.017	.013	.010	.007	34	.033
22								.035	.038	.040	.041	.041	.039	.036	.031	.027	.021	.018	.013	.009	.005	.004	.002	.002	34	.041
23								.032	.036	.037	.035	.032	.029	.024	.019	.015	.010	.007	.005	.003	.002	.001	.001	.001	34	.037
24								.023	.026	.026	.026	.024	.023	.021	.018	.015	.013	.012	.011	.011	.009	.008	.006	.005	34	.026
25								.026	.029	.032	.031	.031	.031	.030	.030	.029	.029	.028	.029	.029	.029	.029	.029	.029	34	.032
26								.031	.032	.034	.034	.034	.034	.033	.032	.030	.028	.026	.024	.021	.018	.016	.014	.012	34	.034
27								.031	.034	.035	.034	.034	.034	.031	.029	.026	.025	.024	.025	.026	.027	.030	.033	.035	34	.035
28								.029	.029	.029	.029	.029	.027	.025	.023	.022	.020	.019	.018	.017	.018	.018	.018	.017	34	.029
29								.018	.018	.017	.016	.015	.014	.013	.012	.011	.010	.009	.009	.009	.009	.010	.010	.011	34	.018
30								.016	.016	.015	.014	.013	.013	.013	.013	.013	.014	.014	.014	.015	.016	.016	.017	.017	34	.017
31								.029	.031	.032	.030	.028	.025	.021	.018	.014	.010	.007	.006						24	.032
NO.:								30	30	30	31	31	31	31	31	31	31	31	31	30	30	30	30	30		
MAX:								.037	.042	.045	.044	.041	.039	.036	.032	.030	.029	.028	.029	.029	.029	.030	.033	.035		
AVG:								.0285	.0314	.0329	.0325	.0309	.0286	.0256	.0223	.0188	.0152	.0129	.0111	.0100	.0093	.0090	.0088	.0089		

MONTHLY OBSERVATIONS: 1038 MONTHLY MEAN: .0198 MONTHLY MAX: .045

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 28-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: FEBRUARY 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01																									0	
02																									0	
03																									0	
04																									0	
05																									0	
06																									0	
07																									0	
08																									0	
09																									0	
10																									0	
11																									0	
12																									0	
13																									0	
14																									0	
15																									0	
16																									0	
17																									0	
18																									0	
19																									0	
20																									0	
21																									0	
22																									0	
23																									0	
24																									0	
25																									0	
26																									0	
27																									0	
28																								.010	2	.010
NO.:																								1		
MAX:																								.010		
AVG:																								.0100		

MONTHLY OBSERVATIONS: 2 MONTHLY MEAN: .0100 MONTHLY MAX: .010

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.038	.043	.047	.049	.049	.047	.044	.041	.037	.032	.030	.025	.021	.018	.015	.013	.011	34	.049
02								.041	.047	.052	.054	.054	.052	.048	.043	.038	.033	.029	.024	.021	.019	.016	.014	.014	34	.054
03								.043	.052	.059	.063	.061	.058	.055	.051	.046	.041	.037	.031	.027	.023	.020	.018	.015	34	.063
04								.050	.059	.063	.067	.068	.067	.064	.061	.059	.057	.054	.052	.051	.051	.050	.049	.045	34	.068
05								.052	.055	.057	.060	.061	.061	.060	.058	.056	.053	.052	.047	.043	.039	.035	.031	.027	34	.061
06								.032	.034	.035	.035	.035	.033	.031	.029	.027	.027	.025	.024	.024	.026	.027	.029	.029	34	.035
07								.031	.032	.034	.036	.037	.037	.036	.034	.031	.030	.028	.025	.024	.025	.025	.026	.026	34	.037
08								.027	.027	.028	.028	.029	.029	.029	.029	.030	.030	.030	.029	.028	.026	.025	.024	.023	34	.030
09								.029	.031	.032	.034	.035	.036	.036	.035	.035	.034	.033	.031	.029	.027	.025	.023	.022	34	.036
10								.037	.040	.044	.046	.047	.046	.043	.040	.035	.030	.027	.023	.020	.018	.017	.016	.016	34	.047
11								.017	.019	.022	.024	.026	.027	.027	.026	.026	.025	.024	.025	.026	.029	.033	.036	.038	34	.038
12								.043	.044	.044	.044	.045	.045	.044	.044	.043	.042	.042	.039	.036	.033	.030	.027	.024	34	.045
13								.042	.044	.045	.046	.047	.046	.043	.041	.038	.034	.032	.027	.022	.019	.017	.015	.012	34	.047
14								.041	.046	.050	.053	.053	.053	.051	.049	.046	.041	.039	.033	.029	.025	.023	.022	.022	34	.053
15								.026	.026	.025	.026	.026	.027	.029	.030	.031	.031	.032	.032	.032	.032	.031	.030	.029	34	.032
16								.034	.036	.036	.036	.034	.031	.028	.025	.023	.020	.018	.016	.016	.018	.019	.020	.020	34	.036
17								.028	.032	.036	.039	.040	.040	.039	.036	.032	.027	.024	.019	.015	.013	.011	.011	.012	34	.040
18								.035	.036	.035	.035	.035	.034	.033	.032	.031	.029	.028	.028	.028	.029	.029	.030	.031	34	.036
19								.036	.038	.039	.040	.040	.040	.040	.039	.036	.033	.032	.027	.023	.018	.014	.011	.009	34	.040
20								.038	.043	.047	.049	.048	.046	.043	.039	.035	.030	.027	.022	.017	.015	.012	.011	.009	34	.049
21								.042	.046	.050	.052	.054	.052	.052	.051	.050	.048	.048	.046	.046	.046	.046	.044	.042	34	.054
22								.046	.047	.048	.048	.049	.049	.049	.048	.047	.046	.045	.042	.039	.035	.033	.031	.029	34	.049
23								.040	.042	.043	.044	.044	.043	.042	.041	.040	.039	.038	.037	.035	.033	.030	.027	.025	34	.044
24								.044	.046	.049	.050	.050	.048	.045	.041	.038	.034	.031	.030	.028	.029	.030	.030	.032	34	.050
25								.042	.043	.044	.044	.044	.044	.043	.042	.041	.039	.038	.036	.035	.035	.035	.034	.034	34	.044
26								.044	.046	.047	.048	.048	.049	.049	.048	.047	.045	.045	.043	.042	.040	.039	.037	.035	34	.049
27								.045	.046	.047	.047	.047	.046	.044	.042	.039	.037	.035	.032	.029	.025	.023	.021	.019	34	.047
28								.042	.045	.048	.050	.049	.048	.047	.044	.042	.039	.037	.034	.033	.033	.032	.032	.032	34	.050
29								.045	.047	.049	.051	.051	.050	.048	.046	.046	.044	.043	.042	.041	.040	.041	.043	.042	34	.051
30								.045	.047	.050	.051	.051	.053	.053	.052	.051	.050	.049	.047	.045	.042	.040	.038	.037	34	.053
31								.031	.032	.032	.033	.033	.033	.031	.029	.026	.024	.022	.021	.022	.023	.025	.027	.029	34	.033
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.052	.059	.063	.067	.068	.067	.064	.061	.059	.057	.054	.052	.051	.051	.050	.049	.045		
AVG:								.0383	.0410	.0431	.0446	.0448	.0442	.0428	.0408	.0388	.0363	.0346	.0319	.0299	.0285	.0274	.0265	.0255		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0364 MONTHLY MAX: .068

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

), 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.037	.040	.042	.044	.044	.043	.041	.037	.033	.030	.027	.023	.019	.017	.015	.015	.016	34	.044
02								.036	.038	.040	.042	.042	.040	.038	.034	.031	.027	.024	.020	.016	.014	.012	.011	.011	34	.042
03								.043	.045	.047	.048	.048	.048	.045	.042	.039	.035	.033	.028	.023	.019	.016	.014	.013	34	.048
04								.043	.047	.050	.053	.053	.051	.048	.044	.040	.035	.032	.026	.021	.018	.016	.016	.017	34	.053
05								.032	.034	.036	.038	.038	.037	.036	.036	.035	.033	.032	.030	.029	.029	.028	.026	.023	34	.038
06								.020	.022	.024	.025	.028	.029	.031	.032	.034	.036	.037	.039	.041	.041	.041	.040	.037	34	.041
07								.040	.042	.042	.043	.044	.044	.044	.044	.044	.043	.043	.042	.040	.038	.036	.035	.034	34	.044
08								.037	.038	.038	.038	.037	.037	.036	.036	.036	.036	.035	.035	.034	.033	.032	.031	.031	34	.038
09								.040	.041	.043	.044	.044	.043	.041	.038	.035	.031	.029	.024	.019	.017	.014	.012	.011	34	.044
10								.044	.048	.051	.054	.055	.055	.054	.052	.051	.050	.049	.048	.046	.042	.040	.038	.037	34	.055
11								.036	.036	.037	.037	.038	.038	.037	.036	.034	.030	.029	.024	.021	.017	.014	.013	.014	34	.038
12								.036	.037	.039	.040	.039	.037	.036	.036	.035	.034	.033	.032	.031	.033	.033	.033	.033	34	.040
13								.033	.034	.035	.035	.036	.036	.036	.035	.034	.033	.033	.033	.032	.030	.028	.028	.028	34	.036
14								.039	.041	.043	.045	.047	.047	.045	.042	.038	.034	.031	.026	.021	.016	.013	.011	.010	34	.047
15								.045	.049	.051	.053	.052	.049	.045	.042	.038	.034	.032	.031	.032	.035	.037	.038	.039	34	.053
16								.032	.031	.030	.029	.027	.024	.022	.020	.016	.013	.012	.009	.008	.007	.005	.006	.008	34	.032
17								.029	.031	.032	.033	.034	.035	.034	.033	.031	.029	.028	.026	.023	.020	.018	.015	.015	34	.035
18								.030	.032	.034	.036	.037	.038	.039	.039	.039	.039	.039	.038	.036	.036	.035	.035	.035	34	.039
19								.048	.049	.050	.051	.049	.045	.042	.037	.032	.027	.024	.018	.014	.011	.009	.008	.008	34	.051
20								.045	.049	.051	.052	.051	.050	.050	.048	.046	.044	.043	.039	.037	.036	.035	.032	.032	34	.052
21								.044	.046	.047	.047	.046	.043	.039	.035	.031	.028	.025	.021	.018	.016	.014	.012	.011	34	.047
22								.039	.042	.044	.044	.043	.041	.038	.034	.031	.028	.025	.022	.020	.018	.016	.014	.013	34	.044
23								.041	.043	.044	.045	.044	.042	.042	.039	.037	.035	.033	.030	.029	.029	.026	.025	.024	34	.045
24								.038	.040	.041	.041	.040	.038	.035	.033	.029	.026	.024	.020	.017	.015	.012	.010	.009	34	.041
25								.037	.040	.042	.042	.039	.035	.032	.028	.024	.020	.017	.013	.012	.013	.015	.017	.019	34	.042
26								.029	.031	.033	.036	.038	.040	.042	.043	.043	.044	.044	.043	.042	.041	.040	.038	.036	34	.044
27								.048	.051	.053	.054	.052	.049	.046	.041	.037	.031	.028	.021	.017	.014	.011	.008	.008	34	.054
28								.046	.051	.055	.054	.054	.051	.047	.044	.039	.035	.032	.027	.023	.021	.018	.016	.014	34	.055
29								.047	.051	.053	.053	.052	.050	.048	.045	.042	.038	.036	.031	.028	.025	.022	.021	.021	34	.053
30								.042	.042	.043	.043	.042	.040	.038	.036	.033	.031	.029	.026	.024	.023	.023	.023	.023	34	.043
NO.:								30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.048	.051	.055	.054	.055	.055	.054	.052	.051	.050	.049	.048	.046	.042	.041	.040	.039		
AVG:								.0385	.0407	.0423	.0433	.0431	.0418	.0402	.0380	.0356	.0330	.0313	.0282	.0258	.0241	.0225	.0214	.0210		

MONTHLY OBSERVATIONS: 1020 MONTHLY MEAN: .0336 MONTHLY MAX: .055

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.031	.034	.036	.037	.036	.034	.031	.028	.025	.022	.019	.016						24	.037
02																									0	
03								.031	.031	.032	.032	.031	.029	.026	.023	.019	.016	.013	.009	.007	.005	.004	.003	.004	34	.032
04								.034	.037	.040	.041	.041	.040	.039	.038	.036	.032	.030	.025	.020	.017	.013	.011	.010	34	.041
05								.033	.036	.037	.037	.036	.033	.029	.025	.022	.020	.017	.014	.014	.014	.015	.016	.017	34	.037
06								.039	.042	.045	.047	.047	.047	.046	.044	.043	.041	.040	.039	.039	.038	.037	.037	.037	34	.047
07								.035	.035	.034	.034	.033	.032	.032	.030	.029	.028	.027	.025	.023	.022	.021	.020	.020	34	.035
08								.033	.034	.035	.036	.035	.033	.032	.031	.029	.027	.026	.023	.021	.021	.021	.020	.020	34	.036
09								.034	.035	.037	.038	.037	.035	.032	.030	.028	.025	.023	.019	.017	.016	.015	.014	.013	34	.038
10								.043	.046	.048	.048	.046	.044	.041	.036	.032	.026	.023	.016	.012	.009	.006	.003	.004	34	.048
11								.052	.056	.057	.056	.053	.048	.043	.037	.030	.024	.020	.013	.010	.009	.009	.010	.012	34	.057
12								.054	.057	.058	.058	.056	.052	.047	.043	.041	.039	.036	.034	.034	.035	.035	.035	.032	34	.058
13								.034	.036	.037	.038	.036	.033	.031	.027	.024	.020	.018	.014	.013	.013	.011	.011	.011	34	.038
14								.037	.039	.041	.042	.042	.039	.036	.032	.027	.024	.022	.020	.017	.017	.017	.017	.020	34	.042
15								.045	.048	.051	.052	.052	.051	.047	.043	.038	.034	.031	.027	.023	.019	.016	.015	.015	34	.052
16								.046	.049	.052	.054	.054	.054	.053	.051	.048	.044	.042	.037	.032	.027	.022	.017	.016	34	.054
17								.053	.057	.059	.059	.057	.053	.048	.043	.037	.031	.027	.020	.015	.012	.009	.007	.006	34	.059
18								.052	.057	.061	.062	.060	.056	.051	.046	.040	.034	.030	.023	.019	.015	.014	.012	.012	34	.062
19								.050	.052	.053	.054	.052	.049	.044	.040	.036	.032	.029	.026	.025	.025	.026	.027	.029	34	.054
20								.038	.039	.040	.040	.039	.038	.037	.035	.032	.030	.029	.026	.024	.022	.021	.019	.018	34	.040
21								.032	.035	.036	.037	.037	.036	.034	.032	.030	.027	.025	.022	.020	.018	.017	.017	.018	34	.037
22								.032	.033	.034	.034	.032	.030	.029	.029	.027	.025	.024	.021	.020	.019	.017	.016	.016	34	.034
23								.026	.026	.026	.026	.025	.024	.024	.023	.021	.018	.017	.014	.012	.011	.009	.008	.007	34	.026
24								.017	.018	.019	.020	.022	.024	.024	.024	.024	.023	.024	.023	.020	.017	.015	.014	.015	34	.024
25								.018	.017	.017	.015	.015	.015	.015	.015	.015	.015	.015	.015	.016	.016	.017	.018	.019	34	.019
26								.021	.022	.023	.024	.025	.025	.024	.023	.021	.020	.018	.017	.016	.016	.017	.019	.020	34	.025
27								.038	.039	.038	.038	.036	.035	.034	.032	.029	.026	.025	.021	.017	.014	.011	.009	.010	34	.039
28								.035	.037	.038	.037	.034	.031	.027	.023	.019	.015	.012	.009	.006	.004	.003	.002	.004	34	.038
29								.038	.040	.043	.044	.042	.040	.036	.032	.028	.024	.021	.017	.015	.013	.012	.011	.012	34	.044
30								.040	.042	.043	.043	.042	.039	.034	.033	.031	.029	.027	.025	.023	.022	.022	.019	.016	34	.043
31								.034	.035	.036	.036	.035	.032	.029	.025	.021	.017	.014	.010	.006	.004	.002	.001	.002	34	.036
NO.:								30	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	29		
MAX:								.054	.057	.061	.062	.060	.056	.053	.051	.048	.044	.042	.039	.039	.038	.037	.037	.037		
AVG:								.0368	.0388	.0402	.0406	.0396	.0377	.0352	.0324	.0294	.0263	.0241	.0207	.0185	.0169	.0157	.0148	.0150		

MONTHLY OBSERVATIONS: 1010 MONTHLY MEAN: .0285 MONTHLY MAX: .062

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.037	.040	.041	.040	.038	.035	.030	.026	.021	.016	.013	.008	.005	.003	.002	.002	.003	34	.041
02								.030	.030	.030	.029	.027	.025	.021	.019	.015	.013	.011	.009	.009	.010	.011	.012	.013	34	.030
03								.033	.034	.036	.037	.037	.036	.034	.033	.031	.027	.026	.021	.016	.014	.014	.014	.016	34	.037
04								.043	.046	.048	.049	.048	.046	.041	.036	.031	.025	.022	.016	.012	.011	.013	.015	.018	34	.049
05								.046	.049	.050	.051	.050	.047	.043	.039	.035	.031	.028	.025	.023	.021	.021	.021	.022	34	.051
06								.040	.040	.040	.041	.040	.038	.037	.036	.035	.035	.034	.033	.033	.033	.032	.030	.029	34	.041
07								.036	.038	.040	.041	.041	.041	.041	.039	.037	.034	.033	.030	.026	.023	.019	.016	.016	34	.041
08								.030	.031	.032	.032	.031	.032	.033	.033	.033	.031	.031	.029	.028	.025	.022	.020	.018	34	.033
09								.028	.032	.034	.035	.037	.038	.038	.035	.031	.026	.024	.018	.014	.010	.007	.005	.006	34	.038
10								.045	.047	.047	.045	.042	.039	.034	.029	.024	.018	.014	.011	.007	.005	.003	.002	.004	34	.047
11								.044	.047	.049	.049	.046	.042	.037	.032	.027	.022	.018	.011	.007	.005	.003	.002	.002	34	.049
12								.036	.040	.043	.044	.044	.041	.038	.033	.028	.023	.019	.013	.009	.006	.005	.005	.005	34	.044
13								.028	.031	.032	.032	.031	.028	.024	.020	.016	.012	.009	.005	.003	.001	.001	.000	.002	34	.032
14								.026	.027	.027	.026	.025	.022	.019	.016	.013	.011	.009	.007	.006	.006	.006	.007	.008	34	.027
15								.035	.037	.037	.034	.032	.031	.031	.031	.030	.029	.028	.029	.027	.024	.018	.014	.011	34	.037
16																									0	
17								.047	.046	.045	.044	.041	.036	.032	.028	.025	.023	.021	.017	.015	.013	.011	.009	.009	34	.047
18								.049	.052	.053	.055	.055	.055	.054	.053	.051	.049	.048	.045	.042	.036	.032	.030	.028	34	.055
19								.044	.046	.047	.048	.047	.045	.042	.037	.033	.028	.025	.020	.016	.013	.011	.010	.012	34	.048
20								.044	.046	.048	.048	.046	.043	.039	.034	.028	.022	.018	.012	.008	.005	.004	.002	.004	34	.048
21								.048	.052	.053	.053	.049	.045	.039	.034	.028	.023	.018	.012	.008	.006	.004	.003	.004	34	.053
22								.040	.042	.044	.045	.043	.040	.038	.034	.030	.025	.021	.015	.011	.009	.007	.007	.009	34	.045
23								.055	.058	.059	.060	.060	.059	.058	.057	.053	.050	.048	.042	.036	.030	.024	.019	.020	34	.060
24								.062	.065	.067	.068	.066	.062	.057	.050	.045	.041	.037	.033	.031	.032	.032	.034	.034	34	.068
25								.040	.041	.042	.042	.042	.040	.037	.035	.032	.028	.026	.021	.017	.014	.011	.007	.006	34	.042
26								.038	.040	.040	.041	.040	.039	.039	.038	.036	.033	.032	.028	.025	.022	.018	.013	.012	34	.041
27								.038	.039	.040	.039	.038	.036	.034	.030	.027	.026	.025	.022	.021	.021	.022	.025	.028	34	.040
28								.047	.049	.050	.051	.051	.051	.050	.048	.044	.038	.037	.032	.028	.023	.019	.016	.014	34	.051
29								.031	.033	.035	.036	.035	.033	.030	.028	.028	.027	.026	.023	.021	.019	.018	.017	.016	34	.036
30								.037	.038	.038	.037	.036	.033	.029	.026	.022	.018	.016	.011	.008	.006	.004	.003	.003	34	.038
NO.:								29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29		
MAX:								.062	.065	.067	.068	.066	.062	.058	.057	.053	.050	.048	.045	.042	.036	.032	.034	.034		
AVG:								.0399	.0419	.0430	.0432	.0420	.0399	.0372	.0341	.0307	.0270	.0247	.0206	.0177	.0154	.0136	.0124	.0128		

MONTHLY OBSERVATIONS: 986 MONTHLY MEAN: .0292 MONTHLY MAX: .068

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.033	.035	.037	.037	.036	.033	.031	.027	.023	.019	.017	.012	.009	.006	.005	.004	.005	34	.037
02								.035	.036	.036	.036	.035	.033	.030	.029	.026	.023	.021	.017	.013	.011	.010	.008	.008	34	.036
03								.025	.026	.027	.027	.026	.023	.021	.018	.015	.011	.009	.006	.003	.002	.001	.000	.002	34	.027
04								.024	.026	.028	.029	.027	.025	.023	.020	.017	.013	.010	.006	.005	.004	.002	.001	.002	34	.029
05								.031	.034	.037	.037	.036	.035	.032	.028	.022	.018	.015	.010	.007	.005	.004	.003	.004	34	.037
06								.033	.037	.039	.039	.038	.036	.036	.034	.031	.025	.023	.019	.017	.014	.010	.007	.007	34	.039
07								.024	.025	.025	.026	.027	.030	.031	.031	.029	.027	.026	.022	.017	.012	.008	.005	.004	34	.031
08								.035	.038	.039	.040	.039	.037	.034	.030	.027	.024	.021	.017	.013	.010	.009	.009	.009	34	.040
09								.035	.036	.036	.037	.037	.037	.036	.035	.035	.034	.033	.031	.029	.026	.023	.021	.019	34	.037
10								.030	.032	.034	.034	.035	.033	.030	.026	.022	.018	.015	.012	.009	.009	.009	.009	.010	34	.035
11								.021	.024	.027	.030	.032	.032	.032	.030	.028	.025	.023	.019	.015	.012	.010	.008	.007	34	.032
12								.029	.033	.036	.038	.036	.033	.030	.026	.021	.017	.013	.008	.006	.005	.005	.006	.007	34	.038
13								.040	.042	.044	.043	.041	.038	.037	.034	.029	.024	.022	.016	.012	.008	.005	.003	.003	34	.044
14								.045	.048	.049	.047	.043	.039	.035	.030	.024	.019	.015	.011	.007	.005	.004	.003	.003	34	.049
15								.044	.049	.053	.053	.051	.047	.042	.036	.029	.023	.018	.013	.010	.008	.006	.005	.006	34	.053
16								.043	.047	.049	.051	.051	.048	.043	.038	.032	.027	.024	.018	.013	.010	.008	.006	.006	34	.051
17								.030	.033	.034	.035	.035	.033	.031	.028	.024	.021	.018	.014	.011	.008	.007	.006	.006	34	.035
18								.032	.033	.033	.032	.030	.028	.026	.024	.022	.021	.020	.019	.021	.023	.023	.023	.025	34	.033
19								.031	.033	.037	.038	.038	.037	.034	.030	.025	.020	.016	.011	.009	.008	.008	.008	.009	34	.038
20								.032	.035	.037	.037	.037	.036	.034	.032	.028	.025	.023	.020	.018	.016	.015	.013	.013	34	.037
21												.020	.020	.020	.020	.020	.018	.017	.015	.013	.011	.010	.008	.008	26	.020
22								.032	.034	.037	.040	.040	.039	.040	.038	.033	.029	.027	.022	.018	.013	.009	.006	.006	34	.040
23								.042	.046	.048	.047	.045	.042	.039	.034	.029	.023	.020	.015	.011	.008	.006	.004	.004	34	.048
24								.025	.027	.029	.030	.030	.028	.026	.024	.021	.017	.015	.011	.008	.006	.005	.004	.005	34	.030
25								.022	.023	.024	.025	.025	.023	.021	.019	.016	.014	.013	.009	.005	.004	.003	.003	.004	34	.025
26								.027	.030	.032	.033	.033	.031	.028	.025	.022	.018	.015	.011	.007	.005	.004	.003	.003	34	.033
27								.030	.032	.032	.032	.031	.029	.026	.024	.021	.018	.016	.012	.009	.007	.005	.005	.005	34	.032
28								.035	.038	.039	.040	.040	.038	.036	.033	.028	.025	.022	.019	.016	.014	.012	.011	.012	34	.040
29								.027	.029	.029	.029	.029	.029	.029	.030	.030	.029	.029	.027	.025	.023	.019	.016	.014	34	.030
30								.028	.029	.031	.030	.028	.027	.027	.026	.025	.024	.023	.022	.021	.019	.017	.016	.015	34	.031
31								.022	.024	.025	.025	.025	.024	.024	.023	.021	.018	.017	.014	.012	.009	.005	.003	.003	34	.025
NO.:								30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.045	.049	.053	.053	.051	.048	.043	.038	.035	.034	.033	.031	.029	.026	.023	.023	.025		
AVG:								.0314	.0338	.0354	.0359	.0347	.0330	.0311	.0285	.0250	.0215	.0192	.0154	.0125	.0104	.0086	.0073	.0075		

MONTHLY OBSERVATIONS: 1046 MONTHLY MEAN: .0229 MONTHLY MAX: .053

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 28-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.020	.023	.024	.024	.023	.020	.018	.015	.012	.009	.007	.004	.003	.003	.003	.004	.004	34	.024
02								.022	.024	.026	.026	.025	.024	.024	.024	.023	.021	.019	.017	.015	.014	.011	.008	.007	34	.026
03								.029	.033	.036	.035	.034	.032	.029	.026	.022	.018	.014	.010	.007	.006	.006	.006	.007	34	.036
04								.026	.028	.029	.029	.027	.024	.021	.018	.015	.011	.009	.006	.004	.003	.002	.002	.003	34	.029
05								.029	.031	.032	.032	.033	.034	.033	.032	.029	.026	.025	.021	.017	.012	.009	.008	.009	34	.034
06								.029	.030	.032	.030	.030	.028	.026	.023	.021	.019	.016	.015	.013	.012	.011	.011	.011	34	.032
07								.025	.027	.029	.030	.030	.029	.028	.026	.025	.022	.021	.017	.014	.011	.009	.007	.006	34	.030
08								.030	.032	.032	.032	.032	.029	.027	.023	.021	.019	.018	.016	.013	.013	.013	.013	.012	34	.032
09								.031	.032	.033	.033	.031	.028	.025	.022	.019	.015	.013	.011	.008	.008	.008	.007	.007	34	.033
10								.028	.030	.031	.031	.031	.029	.027	.025	.022	.021	.020	.018	.014	.012	.010	.008	.008	34	.031
11								.026	.028	.029	.029	.027	.024	.023	.023	.023	.021	.019	.016	.015	.014	.012	.008	.007	34	.029
12								.034	.037	.040	.041	.041	.038	.036	.035	.032	.027	.025	.022	.019	.018	.015	.012	.012	34	.041
13								.035	.037	.040	.041	.040	.037	.034	.030	.026	.021	.018	.014	.010	.008	.007	.005	.004	34	.041
14								.036	.039	.040	.041	.040	.037	.034	.030	.026	.021	.018	.013	.010	.007	.005	.005	.005	34	.041
15								.039	.041	.041	.040	.037	.034	.030	.025	.020	.015	.012	.008	.005	.003	.002	.001	.002	34	.041
16								.039	.042	.043	.042	.041	.038	.034	.031	.028	.026	.024	.022	.021	.021	.022	.022	.022	34	.043
17								.034	.036	.037	.037	.037	.036	.034	.033	.031	.030	.029	.027	.026	.025	.025	.024	.023	34	.037
18								.038	.041	.042	.043	.041	.039	.036	.033	.029	.025	.022	.018	.016	.013	.012	.010	.009	34	.043
19								.032	.035	.037	.037	.036	.035	.032	.029	.026	.023	.020	.018	.015	.011	.010	.008	.008	34	.037
20								.026	.029	.031	.031	.030	.027	.024	.023	.021	.019	.018	.017	.017	.019	.019	.018	.017	34	.031
21								.022	.023	.024	.024	.022	.020	.017	.015	.012	.010	.008	.008	.009	.009	.011	.012	.013	34	.024
22								.022	.024	.026	.027	.027	.027	.027	.026	.023	.020	.019	.016	.015	.012	.010	.009	.010	34	.027
23								.029	.031	.032	.032	.032	.030	.028	.025	.022	.019	.018	.016	.013	.010	.009	.007	.007	34	.032
24								.024	.027	.029	.029	.027	.025	.022	.018	.016	.014	.012	.010	.008	.007	.007	.007	.006	34	.029
25								.022	.023	.024	.025	.025	.023	.020	.017	.014	.011	.010	.007	.005	.005	.005	.005	.006	34	.025
26								.028	.031	.032	.031	.029	.027	.024	.021	.017	.012	.010	.008	.005	.004	.003	.002	.002	34	.032
27								.029	.033	.037	.038	.037	.034	.032	.030	.027	.022	.020	.015	.012	.011	.008	.005	.003	34	.038
28								.024	.026	.027	.026	.023	.020	.017	.014	.010	.006	.004	.002	.001	.001	.001	.002	.003	34	.027
29								.029	.032	.035	.035	.034	.031	.028	.024	.020	.015	.012	.007	.005	.004	.003	.002	.002	34	.035
30								.023	.025	.025	.024	.022	.019	.015	.013	.010	.008	.005	.002	.001	.001	.001	.001	.002	34	.025
31								.043	.046	.048	.048	.045	.041	.036	.030	.024	.018	.014	.009	.006	.004	.003	.002	.002	34	.048
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.043	.046	.048	.048	.045	.041	.036	.035	.032	.030	.029	.027	.026	.025	.025	.024	.023		
AVG:								.0291	.0315	.0330	.0330	.0319	.0296	.0271	.0245	.0215	.0182	.0161	.0132	.0110	.0097	.0088	.0078	.0077		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0208 MONTHLY MAX: .048

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.042	.046	.048	.048	.045	.041	.036	.030	.025	.020	.016	.011	.009	.007	.007	.007	.007	34	.048
02								.033	.035	.037	.037	.036	.034	.031	.029	.027	.025	.023	.021	.021	.019	.018	.016	.015	34	.037
03								.025	.026	.027	.026	.024	.024	.024	.023	.021	.019	.018	.016	.016	.013	.011	.009	.008	34	.027
04								.020	.022	.022	.022	.021	.020	.019	.017	.015	.013	.012	.012	.011	.011	.010	.009	.009	34	.022
05								.019	.021	.023	.024	.024	.024	.022	.019	.016	.013	.011	.007	.004	.003	.002	.002	.002	34	.024
06								.023	.025	.028	.030	.031	.030	.029	.028	.026	.024	.023	.019	.016	.014	.013	.011	.012	34	.031
07								.030	.032	.034	.034	.034	.032	.031	.029	.027	.026	.025	.023	.022	.022	.021	.021	.020	34	.034
08								.032	.035	.037	.039	.038	.039	.037	.035	.031	.027	.025	.022	.019	.015	.013	.011	.011	34	.039
09								.028	.031	.032	.033	.034	.032	.031	.029	.027	.026	.024	.023	.022	.022	.023	.023	.023	34	.034
10								.020	.020	.021	.022	.022	.021	.020	.019	.018	.016	.016	.013	.011	.009	.007	.005	.004	34	.022
11								.027	.029	.030	.032	.032	.030	.027	.024	.021	.018	.016	.012	.010	.010	.011	.012	.013	34	.032
12								.029	.032	.034	.035	.035	.034	.032	.029	.025	.021	.018	.014	.011	.007	.005	.003	.003	34	.035
13								.035	.040	.043	.044	.041	.037	.033	.029	.024	.019	.014	.010	.008	.006	.005	.004	.003	34	.044
14								.037	.042	.043	.043	.040	.036	.031	.027	.022	.018	.015	.011	.008	.008	.008	.008	.009	34	.043
15								.036	.040	.042	.043	.040	.037	.032	.028	.023	.017	.014	.009	.007	.005	.004	.003	.004	34	.043
16								.041	.045	.048	.048	.046	.042	.038	.033	.028	.022	.018	.013	.010	.007	.005	.004	.004	34	.048
17								.037	.040	.042	.040	.038	.034	.030	.025	.020	.015	.012	.010	.008	.006	.006	.007	.008	34	.042
18								.038	.041	.043	.043	.040	.037	.033	.029	.024	.019	.015	.011	.008	.006	.004	.003	.002	34	.043
19								.039	.044	.048	.047	.043	.037	.032	.026	.021	.015	.010	.007	.005	.004	.003	.002	.002	34	.048
20								.040	.044	.046	.046	.043	.037	.032	.027	.022	.017	.013	.008	.005	.004	.003	.002	.001	34	.046
21								.044	.049	.052	.050	.046	.041	.035	.029	.023	.017	.012	.008	.005	.003	.002	.002	.001	34	.052
22								.046	.051	.054	.054	.054	.052	.051	.049	.047	.045	.045	.042	.040	.039	.037	.036	.034	34	.054
23								.040	.043	.044	.046	.045	.043	.039	.036	.032	.027	.024	.018	.014	.011	.009	.007	.006	34	.046
24								.044	.048	.051	.051	.048	.045	.042	.037	.032	.028	.024	.020	.020	.020	.020	.020	.020	34	.051
25								.034	.036	.038	.037	.034	.030	.025	.021	.016	.011	.008	.007	.007	.007	.007	.007	.008	34	.038
26								.043	.045	.048	.049	.049	.049	.048	.044	.041	.038	.036	.030	.026	.022	.018	.016	.014	34	.049
27								.038	.040	.042	.042	.042	.039	.037	.034	.032	.030	.028	.024	.021	.021	.019	.018	.016	34	.042
28												.044	.043	.042	.040	.037	.034	.033	.030	.027	.025	.023	.022	.021	26	.044
29								.031	.034	.037	.039	.038	.037	.036	.035	.033	.030	.029	.025	.022	.020	.019	.017	.015	34	.039
30								.033	.036	.039	.040	.040	.040	.039	.039	.038	.037	.036	.035	.034	.033	.032	.032	.031	34	.040
NO.:								29	29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.046	.051	.054	.054	.054	.052	.051	.049	.047	.045	.045	.042	.040	.039	.037	.036	.034		
AVG:								.0339	.0370	.0391	.0394	.0382	.0359	.0331	.0300	.0265	.0229	.0204	.0170	.0149	.0133	.0122	.0113	.0109		

MONTHLY OBSERVATIONS: 1012 MONTHLY MEAN: .0256 MONTHLY MAX: .054

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) O3

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2022

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.038	.040	.042	.043	.044	.045	.045	.045	.045	.043	.043	.038	.034	.029	.024	.020	.016	34	.045
02								.036	.037	.038	.038	.038	.037	.036	.035	.033	.032	.031	.029	.028	.026	.024	.022	.020	34	.038
03								.028	.030	.032	.034	.035	.036	.036	.035	.033	.030	.029	.024	.020	.015	.011	.007	.005	34	.036
04								.032	.036	.039	.040	.040	.037	.034	.031	.027	.023	.020	.015	.012	.010	.008	.007	.005	34	.040
05								.044	.049	.051	.051	.048	.044	.040	.036	.031	.026	.022	.017	.015	.013	.011	.009	.008	34	.051
06								.047	.053	.055	.054	.051	.047	.042	.036	.030	.025	.021	.018	.015	.013	.011	.009	.008	34	.055
07								.048	.053	.056	.057	.055	.052	.050	.048	.046	.044	.042	.040	.039	.039	.037	.035	.033	34	.057
08								.038	.040	.042	.043	.044	.043	.042	.041	.039	.036	.034	.031	.027	.024	.022	.021	.021	34	.044
09								.040	.043	.045	.045	.044	.041	.038	.034	.030	.026	.023	.019	.017	.015	.013	.011	.010	34	.045
10								.042	.046	.049	.049	.048	.045	.041	.037	.032	.028	.024	.020	.017	.016	.016	.016	.017	34	.049
11								.038	.041	.043	.044	.043	.041	.038	.034	.030	.027	.024	.022	.021	.019	.019	.018	.017	34	.044
12								.022	.023	.023	.022	.020	.018	.015	.013	.011	.008	.006	.008	.010	.011	.013	.014	.016	34	.023
13								.038	.042	.045	.044	.041	.041	.040	.039	.036	.032	.031	.026	.022	.018	.013	.009	.007	34	.045
14								.038	.043	.046	.046	.044	.041	.037	.033	.028	.024	.020	.018	.016	.015	.014	.013	.011	34	.046
15								.042	.047	.050	.050	.048	.045	.041	.036	.031	.025	.021	.017	.013	.010	.008	.006	.004	34	.050
16								.039	.044	.048	.047	.045	.041	.037	.031	.025	.020	.016	.013	.010	.009	.007	.006	.006	34	.048
17								.037	.040	.041	.042	.043	.042	.042	.041	.040	.040	.039	.038	.037	.036	.035	.034	.033	34	.043
18								.028	.028	.028	.028	.028	.027	.026	.025	.025	.024	.024	.023	.023	.023	.023	.023	.022	34	.028
19								.028	.030	.032	.033	.031	.029	.026	.023	.020	.017	.014	.011	.009	.008	.008	.007	.006	34	.033
20								.031	.037	.040	.041	.040	.038	.035	.031	.027	.022	.019	.016	.014	.012	.010	.008	.007	34	.041
21								.039	.045	.049	.050	.049	.047	.043	.039	.034	.029	.026	.023	.020	.017	.014	.011	.010	34	.050
22								.047	.052	.054	.054	.052	.048	.045	.040	.035	.030	.028	.024	.021	.018	.015	.012	.010	34	.054
23								.043	.048	.050	.049	.047	.043	.040	.036	.031	.026	.023	.021	.019	.017	.015	.013	.013	34	.050
24								.041	.044	.046	.045	.043	.039	.036	.032	.030	.027	.025	.023	.022	.021	.019	.017	.015	34	.046
25								.034	.038	.039	.038	.036	.035	.033	.031	.029	.027	.026	.023	.022	.021	.021	.021	.020	34	.039
26								.027	.028	.028	.028	.028	.028	.027	.026	.025	.023	.023	.021	.020	.019	.018	.016	.014	34	.028
27								.028	.031	.034	.036	.037	.038	.038	.037	.036	.034	.033	.030	.028	.026	.023	.022	.020	34	.038
28								.034	.037	.040	.040	.041	.041	.039	.037	.036	.034	.033	.033						24	.041
29																									0	
30																									0	
31																									0	
NO.:								28	28	28	28	28	28	28	28	28	28	28	28	27	27	27	27	27		
MAX:								.048	.053	.056	.057	.055	.052	.050	.048	.046	.044	.043	.040	.039	.039	.037	.035	.033		
AVG:								.0367	.0402	.0423	.0425	.0415	.0396	.0372	.0344	.0313	.0279	.0257	.0229	.0204	.0185	.0167	.0151	.0139		

MONTHLY OBSERVATIONS: 942 MONTHLY MEAN: .0299 MONTHLY MAX: .057

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MARCH 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY \ HOUR	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01												.027	.027	.026	.026	.027	.026	.026	.026	.026	.028	.029	.029	.028	26	.029
02								.031	.033	.034	.035	.035	.035	.033	.032	.029	.028	.027	.027	.027	.028	.028	.029	.030	34	.035
03								.033	.035	.037	.038	.040	.041	.043	.043	.041	.037	.036	.032	.028	.023	.019	.017	.017	34	.043
04								.037	.039	.041	.043	.043	.043	.043	.042	.040	.037	.036	.032	.027	.023	.019	.015	.014	34	.043
05								.037	.040	.043	.044	.044	.042	.040	.036	.033	.029	.025	.020	.017	.015	.013	.012	.010	34	.044
06								.040	.046	.050	.052	.052	.050	.047	.043	.039	.033	.030	.024	.020	.016	.012	.009	.007	34	.052
07								.043	.050	.053	.054	.055	.054	.053	.052	.050	.049	.048	.046	.044	.043	.041	.039	.037	34	.055
08								.044	.046	.048	.049	.049	.049	.049	.048	.047	.046	.045	.043	.041	.039	.037	.034	.032	34	.049
09								.034	.036	.038	.039	.038	.039	.038	.037	.035	.033	.032	.031	.030	.029	.027	.026	.026	34	.039
10								.028	.030	.033	.035	.036	.037	.037	.037	.036	.036	.035	.034	.032	.031	.030	.030	.029	34	.037
11								.039	.041	.042	.043	.042	.040	.038	.036	.034	.033	.031	.030	.029	.028	.027	.026	.026	34	.043
12								.023	.023	.023	.023	.023	.024	.025	.025	.026	.028	.028	.030	.032	.033	.034	.034	.034	34	.034
13								.037	.038	.039	.040	.040	.039	.039	.038	.037	.036	.035	.035	.034	.034	.034	.033	.032	34	.040
14								.039	.040	.041	.041	.041	.041	.040	.039	.038	.037	.037	.036	.036	.036	.036	.035	.033	34	.041
15								.044	.047	.049	.050	.048	.046	.043	.039	.035	.030	.027	.022	.018	.016	.013	.011	.010	34	.050
16								.047	.055	.060	.064	.066	.066	.066	.065	.062	.059	.057	.053	.051	.048	.046	.044	.042	34	.066
17								.033	.032	.030	.029	.027	.026	.027	.028	.029	.030	.030	.031	.032	.033	.033	.033	.034	34	.034
18								.044	.045	.046	.046	.046	.046	.045	.045	.044	.044	.043	.043	.042	.041	.040	.039	.038	34	.046
19								.041	.042	.042	.043	.043	.042	.042	.041	.040	.039	.039	.038	.037	.036	.035	.035	.034	34	.043
20								.041	.043	.045	.046	.045	.044	.041	.038	.034	.030	.027	.022	.018	.015	.012	.010	.009	34	.046
21								.045	.049	.052	.053	.053	.054	.053	.051	.050	.048	.047	.044	.041	.037	.034	.033	.032	34	.054
22								.036	.037	.037	.037	.037	.035	.032	.028	.024	.019	.017	.013	.010	.007	.005	.004	.003	34	.037
23								.040	.043	.045	.045	.045	.043	.042	.040	.038	.036	.035	.034	.031	.030	.028	.027	.025	34	.045
24								.029	.032	.034	.036	.037	.037	.037	.037	.037	.036	.035	.034	.033	.032	.031	.030	.028	34	.037
25								.042	.044	.046	.047	.046	.044	.041	.037	.033	.029	.026	.021	.017	.014	.014	.015	.017	34	.047
26								.036	.037	.037	.036	.034	.031	.028	.026	.025	.024	.023	.023	.024	.026	.027	.026	.024	34	.037
27								.042	.046	.049	.051	.053	.053	.052	.049	.045	.041	.039	.033	.028	.022	.018	.015	.013	34	.053
28								.043	.046	.048	.049	.050	.051	.051	.051	.051	.050	.049	.049	.048	.048	.047	.046	.044	34	.051
29								.049	.051	.052	.052	.050	.048	.044	.040	.035	.031	.027	.022	.018	.015	.013	.010	.008	34	.052
30								.047	.053	.056	.058	.057	.055	.053	.051	.048	.046	.043	.039	.038	.038	.038	.039	.040	34	.058
31								.046	.047	.047	.047	.046	.046	.045	.044	.043	.042	.041	.040	.038	.036	.035	.036	.036	34	.047
NO.:								30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.049	.055	.060	.064	.066	.066	.066	.065	.062	.059	.057	.053	.051	.048	.047	.046	.044		
AVG:								.0390	.0415	.0432	.0442	.0435	.0428	.0417	.0401	.0382	.0362	.0347	.0325	.0305	.0290	.0276	.0265	.0255		

MONTHLY OBSERVATIONS: 1046 MONTHLY MEAN: .0362 MONTHLY MAX: .066

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: APRIL 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.045	.046	.048	.049	.050	.051	.052	.052	.052	.051	.051	.049	.047	.046	.044	.042	.040	34	.052
02								.046	.047	.048	.048	.047	.045	.041	.038	.034	.030	.027	.022	.021	.019	.018	.017	.017	34	.048
03								.034	.035	.034	.033	.031	.030	.029	.027	.025	.024	.023	.021	.019	.017	.015	.013	.012	34	.035
04								.018	.021	.023	.025	.026	.026	.025	.025	.024	.023	.023	.022	.021	.021	.020	.018	.017	34	.026
05								.027	.030	.031	.031	.031	.031	.032	.032	.032	.031	.031	.029	.028	.025	.021	.016	.012	34	.032
06								.027	.030	.032	.031	.031	.029	.028	.026	.023	.020	.018	.017	.016	.016	.016	.016	.017	34	.032
07								.030	.031	.031	.030	.030	.029	.028	.026	.024	.023	.024	.025	.026	.026	.027	.029	.030	34	.031
08								.034	.035	.036	.036	.036	.037	.037	.037	.036	.035	.034	.034	.033	.033	.032	.031	.031	34	.037
09								.041	.044	.045	.046	.045	.042	.039	.036	.032	.029	.026	.023	.022	.022	.024	.025	.027	34	.046
10								.048	.052	.054	.055	.055	.053	.050	.047	.043	.039	.036	.030	.025	.023	.021	.018	.017	34	.055
11								.049	.052	.055	.057	.056	.051	.048	.043	.038	.033	.029	.022	.018	.015	.012	.009	.007	34	.057
12								.049	.055	.060	.062	.059	.055	.049	.044	.039	.034	.029	.026	.025	.025	.026	.026	.026	34	.062
13								.028	.029	.030	.031	.031	.030	.030	.031	.031	.030	.030	.027	.025	.024	.023	.020	.019	34	.031
14								.033	.035	.035	.036	.035	.034	.030	.026	.022	.018	.016	.012	.008	.005	.003	.002	.001	34	.036
15								.037	.041	.045	.045	.042	.039	.035	.033	.031	.030	.028	.028	.028	.030	.030	.028	.027	34	.045
16								.032	.035	.039	.041	.044	.046	.047	.046	.046	.046	.045	.044	.043	.042	.041	.038	.037	34	.047
17								.049	.051	.052	.053	.052	.048	.045	.040	.036	.031	.027	.021	.017	.015	.013	.011	.010	34	.053
18								.046	.051	.054	.056	.055	.052	.049	.045	.040	.035	.031	.025	.021	.018	.015	.012	.010	34	.056
19								.049	.054	.057	.058	.057	.054	.050	.046	.042	.037	.034	.028	.024	.020	.017	.013	.010	34	.058
20								.051	.057	.059	.060	.058	.055	.052	.049	.045	.041	.038	.034	.032	.029	.027	.026	.024	34	.060
21								.046	.047	.046	.045	.044	.043	.042	.040	.039	.039	.039	.040	.040	.039	.038	.039	.038	34	.047
22								.045	.047	.049	.050	.050	.047	.043	.039	.034	.029	.026	.022	.018	.017	.019	.021	.024	34	.050
23								.042	.043	.045	.045	.045	.045	.043	.042	.040	.039	.037	.035	.033	.031	.030	.029	.028	34	.045
24								.045	.047	.049	.050	.050	.048	.045	.042	.039	.034	.031	.029	.027	.027	.029	.029	.031	34	.050
25								.049	.051	.053	.054	.054	.053	.050	.048	.045	.043	.041	.038	.037	.036	.036	.036	.035	34	.054
26											.035	.036	.035	.035	.034	.034	.033	.033	.031	.030	.029	.028	.027	.026	28	.036
27								.022	.022	.022	.022	.022	.021	.020	.019	.018	.017	.016	.014	.015	.017	.019	.019	.020	34	.022
28								.039	.041	.042	.042	.042	.040	.039	.038	.035	.031	.029	.025	.020	.016	.012	.008	.006	34	.042
29								.037	.038	.038	.036	.034	.030	.027	.023	.019	.016	.013	.013	.014	.016	.018	.021	.025	34	.038
30								.042	.043	.045	.045	.046	.046	.046	.044	.041	.038	.037	.035	.032	.030	.027	.024	.026	34	.046
NO.:								29	29	29	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.051	.057	.060	.062	.059	.055	.052	.052	.052	.051	.051	.049	.047	.046	.044	.042	.040		
AVG:								.0393	.0417	.0433	.0436	.0431	.0415	.0395	.0373	.0346	.0320	.0301	.0274	.0255	.0243	.0234	.0221	.0217		

MONTHLY OBSERVATIONS: 1014 MONTHLY MEAN: .0335 MONTHLY MAX: .062

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: MAY 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.045	.046	.048	.048	.048	.048	.048	.048	.046	.044	.043	.041	.040	.040	.039	.037	.036	34	.048
02								.047	.049	.052	.053	.053	.054	.054	.054	.054	.051	.050	.046	.043	.042	.041	.039	.039	34	.054
03								.050	.052	.053	.053	.053	.050	.046	.043	.038	.034	.031	.025	.019	.016	.013	.010	.009	34	.053
04								.045	.049	.052	.053	.051	.048	.044	.040	.035	.030	.027	.022	.019	.017	.016	.016	.016	34	.053
05								.027	.028	.030	.031	.032	.030	.029	.028	.026	.023	.022	.020	.018	.017	.016	.015	.016	34	.032
06								.039	.042	.043	.043	.043	.042	.041	.039	.037	.034	.033	.030	.026	.022	.017	.014	.013	34	.043
07								.036	.039	.041	.042	.042	.040	.038	.035	.032	.028	.025	.024	.025	.027	.030	.031	.032	34	.042
08								.041	.041	.041	.041	.040	.039	.036	.033	.029	.026	.024	.020	.015	.012	.008	.006	.006	34	.041
09								.026	.030	.034	.036	.036	.036	.035	.032	.029	.025	.023	.019	.014	.011	.009	.008	.009	34	.036
10								.041	.043	.045	.046	.046	.045	.044	.042	.040	.039	.038	.034	.030	.028	.026	.024	.023	34	.046
11								.034	.035	.037	.038	.038	.036	.035	.033	.032	.031	.030	.028	.027	.029	.029	.029	.027	34	.038
12								.033	.036	.037	.038	.037	.035	.032	.028	.024	.021	.018	.014	.010	.007	.006	.005	.006	34	.038
13								.026	.030	.033	.035	.034	.032	.028	.023	.018	.013	.010	.005	.003	.002	.001	.000	.001	34	.035
14								.031	.031	.031	.031	.030	.027	.024	.020	.018	.015	.013	.009	.006	.006	.007	.009	.010	34	.031
15								.033	.036	.037	.037	.038	.038	.037	.037	.036	.033	.032	.028	.023	.019	.015	.011	.009	34	.038
16								.035	.037	.038	.037	.036	.033	.031	.030	.029	.027	.026	.024	.022	.020	.018	.015	.013	34	.038
17								.029	.030	.031	.030	.027	.023	.019	.016	.012	.009	.007	.005	.003	.003	.004	.006	.008	34	.031
18								.029	.031	.032	.033	.033	.033	.033	.033	.032	.032	.032	.033	.035	.036	.038	.039	.039	34	.039
19								.037	.037	.036	.035	.034	.032	.030	.028	.025	.021	.020	.016	.012	.009	.007	.006	.007	34	.037
20								.024	.026	.028	.029	.029	.030	.030	.030	.029	.029	.028	.028	.028	.027	.027	.026	.026	34	.030
21								.042	.043	.044	.043	.042	.039	.036	.033	.030	.027	.025	.025	.025	.026	.027	.028	.028	34	.044
22								.039	.042	.046	.047	.047	.046	.046	.044	.042	.039	.038	.037	.035	.033	.030	.028	.029	34	.047
23								.034	.034	.035	.036	.036	.036	.035	.033	.031	.029	.027	.026	.025	.025	.025	.025	.026	34	.036
24								.047	.050	.051	.051	.049	.045	.041	.036	.030	.024	.020	.013	.009	.007	.007	.008	.010	34	.051
25								.048	.052	.054	.055	.053	.050	.045	.040	.034	.029	.025	.018	.014	.013	.014	.016	.019	34	.055
26								.051	.054	.056	.058	.057	.055	.051	.046	.044	.043	.040	.036	.034	.033	.032	.032	.029	34	.058
27								.049	.051	.052	.053	.050	.047	.043	.039	.037	.036	.033	.031	.031	.030	.030	.028	.027	34	.053
28								.047	.050	.052	.053	.054	.053	.051	.047	.044	.039	.036	.032	.029	.027	.025	.025	.025	34	.054
29								.032	.032	.033	.033	.033	.031	.029	.026	.022	.018	.016	.012	.008	.005	.003	.002	.003	34	.033
30								.037	.040	.043	.045	.044	.042	.040	.037	.032	.028	.025	.022	.020	.020	.020	.021	.022	34	.045
31								.040	.042	.041	.039	.037	.033	.028	.024	.022	.020	.019	.017	.017	.018	.018	.019	.018	34	.042
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.051	.054	.056	.058	.057	.055	.054	.054	.054	.051	.050	.046	.043	.042	.041	.039	.039		
AVG:								.0379	.0399	.0415	.0420	.0414	.0396	.0374	.0347	.0319	.0289	.0270	.0239	.0215	.0202	.0193	.0186	.0187		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0308 MONTHLY MAX: .058

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

, 2024
CAS NUMBER: 8-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JUNE 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.038	.041	.044	.046	.045	.043	.039	.036	.031	.025	.021	.015	.010	.007	.005	.003	.004	34	.046
02								.046	.049	.051	.052	.051	.049	.044	.039	.033	.028	.025	.019	.014	.009	.006	.005	.006	34	.052
03								.053	.057	.060	.061	.058	.053	.048	.042	.036	.029	.024	.017	.012	.009	.007	.007	.010	34	.061
04								.046	.047	.048	.048	.046	.044	.041	.038	.037	.036	.035	.033	.033	.033	.033	.032	.030	34	.048
05								.041	.043	.045	.045	.044	.041	.037	.033	.028	.023	.019	.016	.014	.013	.011	.010	.011	34	.045
06								.046	.049	.051	.053	.051	.049	.046	.041	.037	.032	.029	.022	.018	.016	.013	.012	.012	34	.053
07								.056	.061	.067	.070	.069	.065	.062	.059	.054	.049	.045	.038	.032	.028	.024	.018	.018	34	.070
08								.060	.062	.063	.063	.063	.063	.061	.058	.054	.049	.047	.040	.033	.028	.024	.021	.021	34	.063
09								.058	.063	.066	.067	.066	.063	.058	.053	.047	.040	.036	.028	.023	.019	.016	.013	.014	34	.067
10								.059	.062	.065	.065	.063	.060	.056	.051	.047	.044	.041	.038	.038	.037	.037	.036	.037	34	.065
11								.053	.055	.057	.058	.057	.055	.052	.050	.049	.047	.045	.041	.038	.036	.034	.031	.027	34	.058
12								.042	.047	.051	.054	.054	.051	.047	.041	.035	.030	.026	.018	.013	.010	.010	.011	.013	34	.054
13								.042	.043	.045	.047	.047	.044	.040	.036	.034	.031	.028	.024	.021	.020	.021	.020	.019	34	.047
14								.030	.033	.035	.034	.034	.033	.029	.025	.022	.019	.016	.012	.009	.008	.008	.009	.010	34	.035
15								.038	.041	.042	.043	.043	.042	.040	.038	.034	.030	.029	.025	.020	.016	.013	.011	.010	34	.043
16								.045	.049	.051	.052	.051	.049	.048	.045	.042	.038	.036	.032	.029	.025	.019	.015	.013	34	.052
17								.053	.056	.059	.060	.058	.053	.048	.042	.035	.027	.021	.014	.009	.006	.003	.003	.004	34	.060
18								.035	.037	.038	.039	.040	.040	.039	.038	.036	.034	.033	.031	.030	.028	.026	.025	.024	34	.040
19								.030	.033	.036	.039	.040	.040	.038	.037	.034	.030	.028	.023	.018	.014	.011	.008	.008	34	.040
20								.046	.047	.046	.044	.043	.042	.040	.037	.035	.032	.032	.030	.027	.023	.021	.019	.018	34	.047
21								.031	.032	.033	.034	.034	.033	.032	.031	.030	.029	.029	.028	.027	.027	.027	.026	.025	34	.034
22								.026	.028	.028	.029	.028	.026	.023	.020	.016	.013	.011	.010	.009	.010	.011	.013	.015	34	.029
23								.030	.035	.040	.043	.042	.039	.036	.032	.028	.022	.018	.011	.006	.004	.002	.001	.003	34	.043
24								.053	.056	.058	.058	.054	.049	.043	.037	.030	.023	.018	.011	.007	.004	.002	.002	.003	34	.058
25								.041	.041	.041	.040	.037	.034	.030	.026	.024	.024	.021	.018	.015	.013	.012	.011	.010	34	.041
26								.038	.040	.041	.042	.042	.041	.040	.040	.041	.041	.041	.037	.033	.030	.024	.018	.015	34	.042
27								.052	.054	.055	.056	.054	.050	.046	.042	.036	.030	.026	.018	.012	.009	.006	.003	.003	34	.056
28								.051	.056	.058	.059	.058	.055	.050	.044	.037	.030	.025	.018	.011	.007	.004	.002	.002	34	.059
29								.048	.051	.053	.053	.051	.049	.047	.045	.042	.037	.034	.028	.024	.020	.014	.009	.008	34	.053
30								.039	.040	.040	.040	.039	.036	.033	.030	.027	.024	.021	.017	.012	.009	.006	.005	.005	34	.040
NO.:								30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30		
MAX:								.060	.063	.067	.070	.069	.065	.062	.059	.054	.049	.047	.041	.038	.037	.037	.036	.037		
AVG:								.0442	.0469	.0489	.0498	.0487	.0464	.0431	.0395	.0357	.0315	.0287	.0237	.0199	.0173	.0150	.0133	.0133		

MONTHLY OBSERVATIONS: 1020 MONTHLY MEAN: .0333 MONTHLY MAX: .070

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

STATE: (01) Alabama
AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: JULY 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.033	.035	.036	.034	.032	.029	.026	.023	.019	.014	.011	.008	.006	.004	.002	.001	.001	34	.036
02								.028	.030	.031	.031	.029	.026	.025	.023	.021	.019	.017	.016	.015	.015	.013	.011	.011	34	.031
03								.034	.035	.035	.035	.034	.033	.030	.028	.024	.021	.021	.018	.015	.012	.010	.009	.008	34	.035
04								.032	.035	.035	.035	.034	.032	.030	.027	.024	.021	.020	.017	.014	.011	.008	.006	.004	34	.035
05								.029	.033	.034	.033	.034	.034	.032	.030	.026	.023	.021	.019	.015	.011	.009	.007	.007	34	.034
06								.028	.032	.033	.034	.034	.033	.032	.030	.028	.025	.025	.023	.019	.017	.015	.014	.014	34	.034
07								.037	.040	.042	.041	.040	.039	.036	.033	.029	.025	.022	.018	.014	.010	.007	.006	.005	34	.042
08								.033	.034	.034	.033	.031	.030	.029	.028	.026	.024	.023	.022	.020	.018	.017	.016	.015	34	.034
09								.031	.032	.032	.031	.029	.029	.029	.029	.028	.027	.027	.031	.035	.036	.035	.035	.036	34	.036
10								.038	.039	.040	.041	.041	.039	.037	.033	.029	.025	.023	.017	.013	.008	.006	.005	.006	34	.041
11								.038	.039	.040	.040	.038	.034	.030	.026	.021	.016	.013	.008	.005	.003	.002	.002	.003	34	.040
12								.033	.037	.040	.041	.041	.040	.040	.039	.037	.034	.032	.027	.023	.021	.016	.013	.011	34	.041
13								.027	.028	.029	.030	.030	.029	.027	.024	.021	.017	.016	.011	.007	.004	.002	.001	.002	34	.030
14								.026	.028	.027	.028	.029	.028	.026	.025	.022	.021	.021	.018	.014	.010	.008	.006	.006	34	.029
15								.027	.030	.033	.035	.035	.034	.032	.030	.028	.025	.024	.020	.016	.013	.010	.008	.007	34	.035
16								.043	.046	.049	.050	.050	.047	.043	.038	.032	.027	.022	.016	.011	.008	.007	.005	.004	34	.050
17								.048	.054	.057	.059	.056	.052	.045	.038	.031	.024	.016	.010	.007	.005	.003	.002	.002	34	.059
18								.036	.041	.045	.046	.046	.043	.042	.040	.038	.034	.029	.025	.022	.020	.017	.014	.012	34	.046
19								.030	.032	.034	.035	.033	.029	.026	.022	.018	.014	.010	.006	.004	.004	.003	.002	.003	34	.035
20								.031	.033	.034	.034	.034	.035	.035	.033	.030	.027	.026	.021	.016	.011	.007	.004	.003	34	.035
21								.026	.029	.033	.035	.035	.033	.031	.028	.026	.024	.021	.018	.014	.012	.012	.011	.011	34	.035
22								.036	.038	.040	.041	.041	.040	.036	.032	.029	.025	.022	.017	.013	.009	.008	.007	.008	34	.041
23								.042	.045	.046	.047	.046	.045	.042	.038	.034	.029	.027	.020	.015	.011	.008	.006	.007	34	.047
24								.047	.051	.053	.053	.052	.049	.045	.040	.035	.029	.025	.019	.013	.010	.008	.006	.006	34	.053
25								.040	.043	.044	.045	.045	.042	.038	.034	.031	.026	.023	.018	.012	.009	.007	.005	.004	34	.045
26								.039	.041	.043	.042	.041	.038	.034	.030	.025	.020	.017	.012	.008	.007	.005	.004	.004	34	.043
27								.043	.046	.048	.049	.048	.045	.041	.036	.031	.025	.021	.015	.010	.007	.005	.004	.004	34	.049
28								.047	.050	.052	.050	.047	.043	.037	.032	.026	.020	.017	.013	.009	.006	.004	.003	.003	34	.052
29								.037	.041	.042	.043	.043	.040	.036	.033	.028	.024	.021	.016	.012	.009	.009	.009	.010	34	.043
30								.034	.035	.036	.035	.033	.029	.026	.023	.019	.014	.011	.007	.004	.005	.005	.006	.008	34	.036
31								.045	.049	.051	.051	.049	.046	.043	.039	.035	.030	.027	.021	.017	.013	.010	.009	.011	34	.051
NO.:								31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31		
MAX:								.048	.054	.057	.059	.056	.052	.045	.040	.038	.034	.032	.031	.035	.036	.035	.035	.036		
AVG:								.0354	.0381	.0396	.0399	.0390	.0369	.0342	.0311	.0275	.0235	.0210	.0170	.0135	.0109	.0090	.0076	.0076		

MONTHLY OBSERVATIONS: 1054 MONTHLY MEAN: .0254 MONTHLY MAX: .059

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) , 2024

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MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

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AQCR: (003) EAST ALABAMA
URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 8-15-6
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LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: AUGUST 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.046	.047	.048	.047	.046	.042	.038	.035	.030	.025	.023	.019	.014	.013	.010	.007	.007	34	.048
02								.042	.045	.047	.047	.045	.042	.038	.034	.029	.024	.020	.015	.011	.009	.008	.007	.006	34	.047
03								.037	.039	.039	.037	.034	.029	.024	.019	.015	.012	.010	.008	.006	.006	.007	.011	.017	34	.039
04								.046	.046	.047	.047	.045	.042	.038	.033	.028	.022	.018	.013	.009	.006	.005	.005	.006	34	.047
05								.038	.040	.042	.043	.041	.037	.032	.031	.029	.026	.023	.019	.018	.017	.016	.013	.010	34	.043
06								.032	.034	.035	.035	.034	.032	.030	.027	.025	.022	.020	.018	.017	.017	.017	.017	.017	34	.035
07								.031	.033	.033	.033	.032	.029	.025	.022	.017	.014	.012	.008	.004	.003	.002	.001	.002	34	.033
08								.030	.031	.032	.032	.031	.028	.025	.022	.019	.015	.012	.007	.004	.003	.003	.002	.003	34	.032
09								.036	.040	.042	.042	.041	.038	.036	.033	.031	.028	.026	.023	.020	.022	.026	.029	.032	34	.042
10								.042	.041	.041	.040	.038	.033	.029	.024	.020	.015	.011	.007	.005	.006	.009	.011	.014	34	.042
11								.032	.033	.033	.031	.029	.026	.023	.019	.015	.011	.009	.007	.006	.005	.005	.004	.004	34	.033
12								.029	.031	.032	.032	.031	.028	.025	.022	.018	.014	.011	.008	.005	.004	.003	.002	.003	34	.032
13								.031	.033	.034	.033	.033	.031	.029	.027	.024	.021	.019	.015	.011	.009	.006	.004	.003	34	.034
14								.032	.035	.038	.039	.038	.035	.032	.029	.026	.023	.020	.016	.015	.017	.017	.020	.022	34	.039
15								.034	.035	.035	.036	.036	.036	.035	.034	.031	.028	.027	.024	.020	.016	.013	.010	.011	34	.036
16								.040	.043	.044	.044	.042	.039	.035	.031	.026	.022	.018	.013	.010	.007	.005	.004	.004	34	.044
17								.034	.037	.039	.039	.037	.034	.030	.026	.022	.018	.015	.010	.007	.005	.004	.003	.003	34	.039
18								.037	.041	.044	.045	.044	.040	.037	.033	.029	.025	.021	.015	.011	.008	.007	.007	.008	34	.045
19								.038	.041	.045	.047	.048	.045	.042	.037	.032	.027	.023	.016	.011	.009	.008	.008	.010	34	.048
20								.041	.044	.047	.047	.045	.041	.037	.033	.028	.024	.020	.015	.013	.014	.013	.012	.013	34	.047
21								.033	.036	.038	.039	.037	.035	.032	.029	.025	.020	.016	.011	.008	.006	.005	.003	.003	34	.039
22								.048	.051	.053	.053	.051	.047	.043	.038	.032	.026	.021	.016						24	.053
23																									0	
24																									0	
25													.034	.031	.028	.022	.017	.012	.007	.005	.003	.002	.001	.001	24	.034
26								.039	.043	.044	.044	.042	.040	.037	.036	.035	.032	.030	.027	.026	.022	.019	.015	.012	34	.044
27								.038	.040	.041	.040	.038	.037	.036	.035	.034	.031	.030	.030	.030	.027	.024	.022	.020	34	.041
28								.033	.036	.037	.038	.038	.037	.034	.030	.027	.023	.022	.018	.015	.012	.011	.010	.009	34	.038
29								.034	.038	.039	.041	.041	.039	.038	.035	.032	.029	.027	.025	.024	.023	.022	.021	.020	34	.041
30								.036	.040	.043	.045	.046	.046	.046	.045	.044	.043	.042	.040	.038	.037	.035	.033	.030	34	.046
31								.041	.044	.046	.047	.045	.042	.038	.034	.028	.023	.019	.013	.012	.012	.012	.012	.013	34	.047
NO.:								28	28	28	28	28	29	29	29	29	29	29	29	28	28	28	28	28		
MAX:								.048	.051	.053	.053	.051	.047	.046	.045	.044	.043	.042	.040	.038	.037	.035	.033	.032		
AVG:								.0368	.0392	.0406	.0408	.0396	.0367	.0336	.0304	.0267	.0228	.0199	.0160	.0134	.0121	.0112	.0105	.0108		

MONTHLY OBSERVATIONS: 966 MONTHLY MEAN: .0259 MONTHLY MAX: .053

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201) Ozone

SITE ID: 01-055-0011 POC: 1
COUNTY: (055) Etowah
CITY: (71832) Southside
SITE ADDRESS: 1450 PARKER ANDERSON LANE, SOUTHSIDE, AL 35907
SITE COMMENTS: THIS SITE IS LOCATED NEXT TO THE SOFTBALL FIELD
MONITOR COMMENTS: THIS IS AN OZONE MONITORING SITE

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URBANIZED AREA: (2880) GADSDEN, AL
LAND USE: AGRICULTURAL
LOCATION SETTING: SUBURBAN

CAS NUMBER: 10028-15-6
LATITUDE: 33.9040390009
LONGITUDE: -86.053867
UTM ZONE:
UTM NORTHING:
UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: SEPTEMBER 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY	HOUR 0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.032	.036	.039	.041	.041	.041	.040	.038	.036	.034	.032	.030	.031	.031	.030	.029	.029	34	.041
02								.033	.035	.037	.039	.039	.038	.035	.032	.028	.025	.022	.017	.013	.010	.009	.009	.010	34	.039
03								.036	.038	.039	.039	.038	.035	.032	.028	.024	.020	.017	.013	.010	.008	.006	.004	.003	34	.039
04								.032	.034	.035	.036	.034	.032	.030	.026	.023	.019	.017	.013	.010	.007	.005	.004	.002	34	.036
05								.029	.033	.035	.035	.033	.030	.026	.022	.018	.013	.011	.007	.005	.004	.002	.002	.002	34	.035
06								.028	.032	.035	.035	.033	.030	.027	.024	.021	.017	.015	.011	.009	.007	.006	.004	.003	34	.035
07								.039	.041	.043	.044	.044	.043	.041	.039	.036	.032	.030	.027	.024	.023	.023	.021	.019	34	.044
08								.042	.044	.046	.046	.043	.039	.036	.034	.030	.026	.023	.018	.016	.014	.011	.007	.005	34	.046
09								.042	.046	.048	.049	.048	.046	.044	.042	.038	.034	.032	.028	.024	.019	.017	.015	.014	34	.049
10								.038	.042	.045	.046	.045	.042	.038	.034	.028	.022	.019	.016	.014	.012	.011	.010	.011	34	.046
11								.038	.042	.044	.044	.042	.039	.037	.033	.029	.024	.020	.016	.014	.011	.007	.004	.003	34	.044
12								.039	.044	.048	.049	.050	.051												12	.051
13								.041	.042	.044	.044	.043	.041	.040	.037	.035	.032	.030	.027	.026	.024	.021	.018	.016	34	.044
14								.036	.038	.039	.040	.039	.037	.034	.030	.025	.022	.019	.016	.014	.015	.015	.016	.018	34	.040
15								.030	.033	.035	.037	.037	.037	.036	.034	.032	.030	.029	.027	.026	.025	.025	.026	.025	34	.037
16								.023	.024	.024	.024	.024	.024	.023	.021	.020	.018	.017	.015	.014	.013	.013	.012	.012	34	.024
17								.047	.051	.054	.055	.055	.055	.053	.048	.045	.039	.037	.031	.024	.017	.011	.009	.006	34	.055
18								.042	.046	.048	.049	.048	.045	.041	.037	.032	.027	.023	.017	.013	.009	.007	.005	.003	34	.049
19								.041	.047	.051	.051	.048	.045	.041	.037	.033	.028	.025	.020	.017	.014	.012	.011	.009	34	.051
20								.039	.043	.047	.049	.048	.046	.042	.039	.035	.031	.028	.025	.024	.024	.024	.024	.025	34	.049
21								.041	.045	.049	.050	.049	.047	.044	.041	.038	.033	.029	.024	.022	.019	.016	.016	.016	34	.050
22								.050	.053	.055	.055	.052	.049	.045	.039	.034	.028	.024	.019	.015	.011	.008	.006	.005	34	.055
23								.046	.051	.054	.056	.056	.053	.049	.045	.040	.035	.031	.024	.018	.014	.011	.008	.006	34	.056
24								.046	.050	.052	.050	.047	.043	.039	.034	.029	.023	.019	.016	.013	.011	.009	.007	.007	34	.052
25								.047	.050	.052	.052	.050	.046	.041	.036	.030	.025	.021	.018	.016	.016	.017	.018	.019	34	.052
26								.041	.045	.049	.050	.049	.047	.043	.041	.038	.034	.031	.028	.028	.027	.026	.023	.020	34	.050
27								.042	.044	.045	.046	.045	.044	.042	.039	.035	.032	.029	.026	.022	.019	.017	.014	.013	34	.046
28								.033	.037	.040	.041	.041	.040	.038	.034	.030	.025	.022	.017	.013	.010	.007	.005	.004	34	.041
29								.036	.040	.044	.045	.044	.040	.037	.033	.028	.022	.018	.013	.010	.007	.005	.003	.002	34	.045
30								.045	.050	.053	.053	.050	.047	.042	.038	.033	.027	.023	.019	.016	.013	.011	.011	.012	34	.053
NO.:								30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	29	29		
MAX:								.050	.053	.055	.056	.056	.055	.053	.048	.045	.039	.037	.031	.031	.031	.030	.029	.029		
AVG:								.0385	.0419	.0443	.0450	.0438	.0417	.0385	.0350	.0311	.0268	.0239	.0199	.0173	.0150	.0132	.0118	.0110		

MONTHLY OBSERVATIONS: 998 MONTHLY MEAN: .0295 MONTHLY MAX: .056

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

(44201)

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), 2024
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UTM EASTING:
ELEVATION-MSL: 152.4
PROBE HEIGHT: 4

SUPPORT AGENCY: (0013) Al Dept Of Env Mgt
MONITOR TYPE: SLAMS
COLLECTION AND ANALYSIS METHOD: (087) INSTRUMENTAL ULTRA VIOLET ABSORPTI
PQAO: (0013) Al Dept Of Env Mgt

REPORT FOR: OCTOBER 2023

DURATION: 8-HR RUN AVG BEGIN HOUR
UNITS: Parts per million
MIN DETECTABLE: .005

DAY / HOUR	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	OBS	MAXIMUM
01								.042	.045	.049	.049	.046	.044	.040	.036	.032	.027	.023	.018	.014	.010	.007	.005	.003	34	.049
02								.038	.042	.045	.046	.045	.043	.041	.038	.034	.029	.025	.020	.016	.013	.009	.006	.006	34	.046
03								.041	.046	.050	.052	.051	.049	.048	.046	.043	.039	.037	.032	.028	.025	.021	.016	.014	34	.052
04								.043	.047	.050	.050	.049	.047	.044	.041	.038	.035	.032	.028	.025	.023	.021	.020	.018	34	.050
05								.043	.046	.047	.046	.044	.041	.037	.034	.031	.029	.027	.026	.025	.024	.025	.025	.024	34	.047
06								.034	.036	.036	.037	.037	.036	.034	.029	.025	.022	.021	.020	.019	.019	.020	.023	.026	34	.037
07								.031	.032	.033	.034	.035	.036	.036	.035	.034	.031	.030	.027	.024	.020	.017	.014	.012	34	.036
08								.034	.036	.037	.038	.037	.035	.033	.030	.027	.024	.022	.018	.015	.013	.011	.009	.007	34	.038
09								.039	.043	.047	.048	.047	.045	.042	.038	.035	.031	.028	.025	.022	.020	.018	.017	.015	34	.048
10								.052	.056	.060	.061	.061	.060	.056	.052	.047	.042	.039	.034	.029	.025	.021	.019	.018	34	.061
11								.026	.025	.025	.026	.026	.026	.025	.025	.026	.028	.028	.030	.031	.032	.034	.035	.035	34	.035
12								.040	.041	.042	.042	.041	.041	.040	.038	.036	.035	.034	.033	.032	.031	.030	.029	.028	34	.042
13								.029	.030	.031	.031	.031	.030	.029	.027	.025	.023	.022	.020	.017	.014	.012	.010	.009	34	.031
14								.027	.030	.032	.033	.034	.034	.034	.034	.033	.031	.030	.027	.025	.024	.022	.021	.020	34	.034
15								.018	.019	.021	.022	.023	.024	.024	.024	.024	.023	.022	.021	.020	.019	.018	.017	.016	34	.024
16								.025	.027	.029	.029	.029	.028	.028	.027	.026	.025	.024	.023	.022	.021	.019	.017	.014	34	.029
17								.027	.029	.031	.031	.030	.029	.027	.024	.021	.018	.016	.012	.010	.007	.005	.003	.002	34	.031
18								.029	.034	.038	.039	.038	.036	.033	.030	.026	.021	.018	.015	.012	.010	.007	.005	.004	34	.039
19								.038	.043	.046	.046	.043	.041	.038	.034	.030	.026	.023	.022	.023	.024	.023	.021	.020	34	.046
20								.036	.040	.042	.043	.044	.044	.044	.044	.043	.042	.042							22	.044
21											.045	.043	.041	.040	.038	.035	.031	.029	.026	.024	.022	.020	.019	.018	28	.045
22								.039	.042	.043	.043	.041	.039	.035	.032	.028	.024	.021	.020	.019	.019	.020	.021	.022	34	.043
23								.037	.040	.044	.047	.047	.046	.044	.042	.040	.037	.035	.030	.028	.026	.025	.023	.020	34	.047
24								.040	.043	.046	.047	.048	.048	.048	.047	.045	.043	.042	.040	.036	.032	.028	.026	.025	34	.048
25								.038	.039	.040	.040	.038	.037	.036	.035	.033	.031	.030	.028	.026	.024	.022	.020	.018	34	.040
26								.035	.037	.039	.038	.037	.035	.033	.030	.028	.025	.023	.022	.019	.017	.014	.011	.009	34	.039
27								.035	.038	.039	.038	.037	.035	.031	.028	.025	.022	.020	.017	.015	.013	.011	.009	.007	34	.039
28								.035	.039	.040	.040	.039	.037	.034	.030	.028	.024	.022	.018	.016	.013	.010	.008	.006	34	.040
29								.033	.038	.040	.040	.039	.038	.036	.032	.029	.024	.022	.018	.015	.012	.009	.007	.005	34	.040
30								.013	.012	.010	.007	.006	.006	.006	.006	.007	.008	.009	.009	.010	.011	.011	.012	.013	34	.013
31								.028	.031	.034	.036	.038	.039	.039	.039	.038	.038	.037	.037						24	.039
NO.:								30	30	30	31	31	31	31	31	31	31	31	30	29	29	29	29	29		
MAX:								.052	.056	.060	.061	.061	.060	.056	.052	.047	.043	.042	.040	.036	.032	.034	.035	.035		
AVG:								.0342	.0369	.0389	.0395	.0388	.0377	.0360	.0337	.0314	.0286	.0269	.0239	.0213	.0194	.0176	.0161	.0150		

MONTHLY OBSERVATIONS: 1026 MONTHLY MEAN: .0293 MONTHLY MAX: .061

Note: A plus sign ("+") following a value indicates that the computed average includes one or more raw data values effected by a special event.

APPENDIX B OFFSITE SOURCE TABLES

TABLE B-1: NO_X OFFSITE SOURCES

TABLE B-2: PM_{10} OFFSITE SOURCES

TABLE B-3: $PM_{2.5}$ OFFSITE SOURCES

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TABLE B-1: NO_X OFFSITE SOURCES

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	NO_2 Emissions (lb/hr)
0006_1	309-0006 - 003 - No. 3 Recovery Furnace	Vertical	559927.98	3688014.89	128.63	60.96	457	3.00	27.78	203.20
0006_2	309-0006 - 032 - No. 3 Lime Kiln	Vertical	559828.98	3687966.06	127.71	27.43	341	1.47	10.67	21.10
0006_3	309-0006 - Z038 - No. 1 Package Boiler	Vertical	560012.02	3687767.09	132.28	15.24	427	1.47	15.01	42.00
0006_4	309-0006 - Z039 - No. 2 Package Boiler	Vertical	560025.02	3687767.09	132.28	15.24	427	1.47	15.01	42.00
0033_5	301-0033 - C001 - 1000 HP Gmv-10 Recip	Vertical	613200.01	3720628.17	201.17	10.42	672	0.55	44.10	46.97
0033_6	301-0033 - C002 - 1000 HP Gmv-10 Recip	Vertical	613123.60	3720627.69	201.17	10.42	672	0.55	44.10	45.65
0033_7	301-0033 - C003 - 1350 HP Gmv-10 Recip	Vertical	613106.02	3720638.43	201.17	10.42	672	0.55	44.10	104.46
0033_8	301-0033 - C004 - 1350 HP Gmv-10 Recip	Vertical	613200.01	3720636.23	201.17	10.42	672	0.55	44.10	104.46
0033_9	301-0033 - C005 - 1350 HP Gmv-10 Recip	Vertical	613092.10	3720636.96	201.17	10.42	672	0.55	44.10	104.46
0033_10	301-0033 - C006 - 1200 HP Solar Saturn Turbine	Vertical	613161.87	3720642.82	201.17	6.41	754	0.59	51.21	5.15
0033_11	301-0033 - C007 - 2000 HP Gmvs-10 Recip	Vertical	613083.25	3720637.21	201.17	10.80	672	0.71	32.98	72.75
0033_12	301-0033 - C008 - 2000 HP Gmvs-10 Recip	Vertical	613077.27	3720635.50	201.17	10.80	672	0.71	32.98	72.75
0002_13	305-0002 - 001 - 1100 HP Gmva-8 Recip	Vertical	643801.09	3723367.19	310.90	9.14	559	0.41	53.22	71.02
0002_14	305-0002 - 002 - 1100 HP Gmva-8 Recip	Vertical	643799.56	3723359.38	310.90	9.14	559	0.41	53.22	71.02
0002_15	305-0002 - 003 - 1200 HP Gmva-8a Recip	Vertical	643798.03	3723349.61	310.90	10.61	597	0.46	47.24	39.95
0002_16	305-0002 - 004 - 1728 HP Solar Saturn Turbine	Vertical	643816.65	3723401.12	310.90	12.19	777	1.01	22.06	7.92
0014_17	410-0014 - 001 - 4390 HP Solar Centaur Turbine	Vertical	569193.30	3718262.94	176.78	9.97	706	1.01	43.74	22.16
0007_18	301-0007 - X024 - 40 MMBTU/hr Process Steam Boiler with By-Product Fuel Firing Capabilities	Vertical	606286.01	3723954.10	231.65	9.75	494	0.91	9.75	4.61
0007_19	301-0007 - PO2 - Polyphenyl Manufacturing w/H2-Benz Flare and Assoc. Equip. (By-Prod. Dist.	Vertical	605900.00	3724300.00	231.65	6.19	789	0.97	1.50	3.35
0050_20	309-0050 - 001 - Motor Vehicle Assembly Plant	Vertical	579539.98	3720050.05	153.92	28.65	311	0.92	14.28	27.80
0050_21	309-0050 - 003 - 3-30.0 MMBtu/Hr NG Boilers	Vertical	579429.99	3720000.00	153.92	26.52	447	0.71	6.60	10.00
0050_22	309-0050 - 005 - High Pressure Aluminum Operations	Vertical	579239.99	3720232.91	153.92	13.72	366	0.61	24.26	3.93
0050_23	309-0050 - 010 - Motor vehicle assembly plant No.2	Vertical	579669.98	3720070.07	153.92	28.50	361	0.91	21.56	27.70
0050_24	309-0050 - 014 - No 2 aluminum operations	Vertical	579250.00	3720270.02	153.92	18.29	366	0.61	24.26	6.69
0050_25	309-0050 - 016 - GSN & Ferrous	Vertical	579140.01	3720260.01	153.92	26.52	405	0.91	12.22	4.00
0050_26	309-0050 - 099 - Engine Test Dynos 1,2	Vertical	579570.01	3720149.90	153.92	12.50	977	0.91	3.74	7.16
0014_27	301-0014 - 001 - 90" Water Cooled Cupola (EP-001)	Horizontal	606401.00	3725958.01	213.36	30.48	442	1.83	10.66	13.83
0041_28	301-0041 - 005 - Merged Units	Vertical	603800.00	3730800.00	213.36	9.14	408	1.29	21.77	18.22
0041_29	301-0041 - 011 - Molding Hunter & Mk I BH"s A, B, D	Vertical	603800.00	3730800.00	213.36	9.14	294	1.07	0.27	6.50
0027_30	307-0027 - X015 - 21 MMBtu/hr Cleaver Brooks NGF Boiler with No. 2 Fuel Oil Backup (NSPS) (SM	Vertical	577260.01	3767550.05	182.88	7.22	486	0.61	10.76	3.00
0042_31	307-0042 - X003 - 33.488 MMBtu/hr GBT/Seller NGF & Methane-fired Boiler	Vertical	594968.00	3759399.00	158.50	6.71	477	0.91	6.11	3.98

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	NO_2 Emissions (lb/hr)
0073_32	301-0073 - 001A - Unit 1	Vertical	595295.59	3716979.98	207.26	30.48	875	5.49	47.70	342.50
0073_33	301-0073 - 001B - Unit 2	Vertical	595336.67	3716981.93	207.26	30.48	875	5.49	47.70	342.50
0073_34	301-0073 - 001C - Unit 3	Vertical	595378.42	3716982.91	207.26	30.48	875	5.49	47.70	342.50
0073_35	301-0073 - 001D - Unit 4	Vertical	595420.10	3716983.89	207.26	30.48	875	5.49	47.70	342.50
0035_36	410-0035 - DIFF-1 - Brick Dryers (Uncontrolled) and Tunnel Kiln w/ Dry Lime Injection Fabric Fi	Vertical	549919.07	3715405.03	214.88	24.99	533	1.80	12.13	9.09
S008_37	304-S008 - 023-0 - 29.5 MMBTU/HR BOILER (3) W/ CYCLONE & ESP; WOOD WASTE	Vertical	610054.02	3679693.12	341.38	12.19	294	1.22	4.85	14.75
S008_38	304-S008 - 021-0 - Merged Units	Vertical	610049.99	3679689.94	341.38	12.19	294	1.22	4.85	29.50
S001_39	301-S001 - X002 - 14.02 MMBtu/hr Wood-fired boiler	Vertical	629540.00	3755114.00	208.48	9.75	572	0.61	11.45	6.78
0008_40	301-0008 - B01 - Two 72.1 MMBtu/hr boilers (2016 Nonapp)	Vertical	599583.98	3717674.07	181.66	12.19	616	0.81	28.36	19.34
0002_41	410-0002 - 54DC01 - Cement Kiln 1 with Flash Furnace [51DC01]	Vertical	578245.97	3733070.07	156.36	64.92	374	3.89	9.95	691.89
0002_42	410-0002 - 58DC01 - Kiln 2 Main Stack (212A)	Vertical	578328.00	3733155.03	154.23	134.00	473	3.79	19.19	492.40
0023_43	301-0023 - NP410-10 - Engine Test Stand Bldg 410 Cell 10	Vertical	600229.00	3722728.03	192.63	7.62	1200	1.15	0.42	8.52
0023_44	301-0023 - NP410-16 - Engine Test Stand Bldg 410 Cell 16	Vertical	600203.98	3722696.04	192.63	7.62	1200	1.15	0.42	8.52
0023_45	301-0023 - NP410-19 - Engine Test Stand Bldg 410 Cell 19	Vertical	600205.02	3722698.00	192.63	15.54	380	1.15	9.15	3.69
0023_46	301-0023 - NP410-2 - Engine Test Stand Bldg 410 Cell 2	Vertical	600187.99	3722743.90	192.63	15.54	380	1.15	9.15	13.80
0023_47	301-0023 - NP410-20 - Engine Test Stand Bldg 410 Cell 20	Vertical	600169.01	3722719.97	188.98	7.62	1200	1.15	0.42	12.50
0023_48	301-0023 - NP410-3 - Engine Test Stand Bldg 410 Cell 3	Vertical	600187.01	3722726.07	192.63	15.54	380	1.15	9.14	12.80
0023_49	301-0023 - NP410-6 - Engine Test Stand Bldg 410 Cell 6	Vertical	600197.02	3722719.97	192.63	15.54	380	1.15	9.15	14.00
0023_50	301-0023 - X043-1 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	599911.99	3722919.92	193.55	15.54	380	1.15	9.15	10.00
0023_51	301-0023 - X043-2 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	599890.01	3722899.90	193.55	15.54	380	1.15	9.15	10.00
0023_52	301-0023 - X043-3 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	600534.00	3722910.89	193.55	15.54	380	1.15	9.15	6.77
0023_53	301-0023 - X043-4 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	600544.98	3722919.92	193.55	15.54	380	1.15	9.15	6.77
0023_54	301-0023 - X043-5 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	600560.00	3722889.89	193.55	15.54	380	1.15	9.20	6.77
0023_55	301-0023 - X043-6 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	600567.99	3722892.09	193.55	15.54	380	1.15	9.15	6.77
0023_56	301-0023 - X043-7 - Seven Engine Test Cells located at the Power Train Facility (Building 474)	Vertical	600601.99	3722899.90	193.55	15.54	380	1.15	9.15	3.97
0023_57	301-0023 - X047-1 - Turbine Engine Test Cell Stand #1 Building 128	Vertical	599909.97	3722550.05	188.98	7.62	1200	1.15	0.99	12.50

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	NO_2 Emissions (lb/hr)
0023_58	301-0023 - X047-2 - Turbine Engine Test Cell Stand #2 Building 128	Vertical	599890.26	3722567.14	188.98	7.62	1200	1.15	0.99	12.50
0023_59	301-0023 - X047-3 - Turbine Engine Test Cell Stand #3 Building 128	Vertical	599877.99	3722562.01	188.98	7.62	1200	1.15	0.99	12.40
0023_60	301-0023 - X047-4 - Turbine Engine Test Cell Stand #4 Building 128	Vertical	599883.00	3722586.91	188.98	7.62	1200	1.15	0.99	12.41
0023_61	301-0023 - X047-5 - Turbine Engine Test Cell Stand #5 Building 128	Vertical	599892.03	3722584.96	188.98	7.62	1200	1.15	0.99	12.41
0023_62	301-0023 - X052 - Building 128 - Turbine Engine Test Cell (GHOP1-Powerpack)	Vertical	599921.02	3722583.98	188.98	7.62	1200	1.15	0.99	12.50

TABLE B-2: PM_{10} OFFSITE SOURCES

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	PM_{10} Emissions (lb/hr)	PM_{10} Increment Category[1]
0073_1	301-0073 - 001A - Unit 1	Vertical	595295.59	3716979.98	207.26	30.48	875	5.49	47.70	42.11	C
0073_2	301-0073 - 001B - Unit 2	Vertical	595336.67	3716981.93	207.26	30.48	875	5.49	47.70	13.93	C
0073_3	301-0073 - 001C - Unit 3	Vertical	595378.42	3716982.91	207.26	30.48	875	5.49	47.70	42.11	C
0073_4	301-0073 - 001D - Unit 4	Vertical	595420.10	3716983.89	207.26	30.48	875	5.49	47.70	42.11	C
0023_5	301-0023 - X025_1 - Spinner Hanger ShotBlast	Vertical	600238.77	3722516.60	188.98	12.19	294	0.76	0.52	20.22	C
0023_6	301-0023 - X025_2 - Spinner Hanger ShotBlast	Vertical	600226.01	3722528.08	188.98	12.19	294	0.76	0.52	11.52	C
0004_7	410-0004 - 002 - 40 TPH Crushing, Drying, Screening, conveying and bagging w/bh	Vertical	569600.00	3716500.00	170.69	3.96	377	0.88	17.16	6.52	C

1. B = Baseline source; C = Increment-consuming source; E = Increment-expanding source.

TABLE B-3: $PM_{2.5}$ OFFSITE SOURCES

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	$PM_{2.5}$ Emissions (lb/hr)	$PM_{2.5}$ Increment Category
0006_1	309-0006 - 003 - No. 3 Recovery Furnace	Vertical	559927.98	3688014.89	128.63	60.96	457	3.00	27.78	39.19	B
0006_2	309-0006 - 006 - No. 3 Smelt Tank	Vertical	559885.01	3688025.88	128.63	57.30	346	1.68	5.56	16.99	B
0006_3	309-0006 - 025 - No. 1 AOW Power Boiler	Vertical	560356.99	3687775.88	132.28	45.72	505	2.44	14.13	-9.27	E
0006_4	309-0006 - 026 - No. 2 AOW Power Boiler	Vertical	560370.00	3687775.88	132.28	45.72	505	2.44	14.13	-9.80	E
0006_5	309-0006 - 027 - No. 3 AOW Power Boiler	Vertical	560383.00	3687775.88	132.28	45.72	505	2.44	14.13	-10.18	E
0006_6	309-0006 - 028 - No. 4 AOW Power Boiler	Vertical	560395.02	3687777.10	132.28	45.72	505	2.44	14.13	-17.38	E
0006_7	309-0006 - 032 - No. 3 Lime Kiln	Vertical	559828.98	3687966.06	127.71	27.43	341	1.47	10.67	15.49	B
0036_8	307-0036 - X001a - 2 Rotary Furnaces with Baghouse	Vertical	595571.23	3761590.33	173.74	14.33	394	1.83	10.92	11.14	B
0036_9	307-0036 - X001b - 2 Rotary Furnaces with Baghouse	Vertical	595700.01	3761199.95	173.74	14.33	394	1.83	10.91	11.14	B
0050_10	309-0050 - 001 - Motor Vehicle Assembly Plant	Vertical	579539.98	3720050.05	153.92	28.65	311	0.92	14.28	6.57	B
0050_11	309-0050 - 010 - Motor vehicle assembly plant No.2	Vertical	579669.98	3720070.07	153.92	28.50	361	0.91	21.56	5.95	B
0050_12	309-0050 - 014 - No 2 aluminum operations	Vertical	579250.00	3720270.02	153.92	18.29	366	0.61	24.26	3.25	B
0089_13	301-0089 - 003 - Reinforced PlasticComposite Parts Production	Vertical	611658.00	3720597.00	199.64	11.58	294	0.91	11.64	4.57	C
0006_14	301-0006 - 001 - Disamatic Moldmaking, Sand Handling, Shakeout, Pouring and Cooling w/ BH-1	Vertical	607581.97	3726726.07	231.65	15.24	296	2.34	18.15	3.11	B
0006_15	301-0006 - 006 - Casting and Cleaning w/ BH-5	Vertical	607661.99	3726726.07	231.65	16.76	296	1.83	17.07	5.73	B
0014_16	301-0014 - 005 - Merged Units	Vertical	606502.99	3725784.91	213.36	15.24	311	2.44	19.20	3.82	B
0014_17	301-0014 - 001 - 90" Water Cooled Cupola (EP-001)	Horizontal	606401.00	3725958.01	213.36	30.48	442	1.83	10.66	3.38	B
0014_18	301-0014 - 006 - DISA Mold Making, Pouring/Cooling, Shakeout, & Sand Handling (EP-006)	Vertical	606508.00	3726097.90	213.36	15.24	310	1.52	49.27	7.74	B
0014_19	301-0014 - 004 - No-Bake Mold Making, Pouring/Cooling, Shakeout, & Sand Handling (EP-004)	Vertical	605900.00	3724700.00	213.36	19.81	315	2.41	13.54	3.14	B
0014_20	301-0014 - 019 - Thermal Reclamation System (EP-019)	Vertical	606421.02	3725936.04	213.36	15.24	295	1.07	15.85	19.80	C
0045_21	309-0045 - PMC1 - Pelleting Systems **	Horizontal	588422.94	3701729.24	175.87	9.75	339	0.91	19.60	6.00	C
0045_22	309-0045 - PMC2 - Pelleting Systems **	Horizontal	588422.94	3701729.24	175.87	9.75	339	0.91	19.60	6.00	C
0073_23	301-0073 - 001A - Unit 1	Vertical	595295.59	3716979.98	207.26	30.48	875	5.49	47.70	42.11	B
0073_24	301-0073 - 001B - Unit 2	Vertical	595336.67	3716981.93	207.26	30.48	875	5.49	47.70	13.93	B
0073_25	301-0073 - 001C - Unit 3	Vertical	595378.42	3716982.91	207.26	30.48	875	5.49	47.70	42.11	B
0073_26	301-0073 - 001D - Unit 4	Vertical	595420.10	3716983.89	207.26	30.48	875	5.49	47.70	42.11	B

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Stack Height (m)	Stack Temp (K)	Exit Diameter (m)	Exit Velocity (m/s)	$PM_{2.5}$ Emissions (lb/hr)	$PM_{2.5}$ Increment Category
0002_27	307-0002 - 001 - Merged Units	Vertical	595099.98	3764039.55	161.70	91.44	450	4.57	14.94	-13.03	E
0035_28	410-0035 - D-1 - Brick Dryers (Uncontrolled) and Tunnel Kiln w/ Dry Lime Injection Fabric Fi	Capped	550017.52	3715326.66	214.88	8.08	533	1.12	49.73	14.57	B
0035_29	410-0035 - D-2 - Brick Dryers (Uncontrolled) and Tunnel Kiln w/ Dry Lime Injection Fabric Fi	Capped	550013.55	3715321.29	214.88	8.08	533	1.12	49.73	14.57	B
0035_30	410-0035 - DIFF-1 - Brick Dryers (Uncontrolled) and Tunnel Kiln w/ Dry Lime Injection Fabric Fi	Vertical	549919.07	3715405.03	214.88	24.99	533	1.80	12.13	15.84	B
S002_31	309-S002 - E001 - 185 MMBtu/hr Wood Boiler w/ESP	Vertical	587349.98	3701060.55	183.18	24.48	489	1.83	18.15	-8.80	E
S002_32	309-S002 - E002 - Green End Operations	Capped	587349.98	3701060.55	183.18	14.02	293	0.97	22.53	-4.83	E
S002_33	309-S002 - E014 - Dry Waste Truck Bin w/Cyclone	Capped	587349.98	3701060.55	183.18	18.29	293	0.55	25.13	-4.00	E
S002_34	309-S002 - E012 - Merged Units	Capped	587349.98	3701060.55	183.18	4.57	293	1.07	25.87	-6.44	E
S002_35	309-S002 - E013 - Merged Units	Capped	587349.98	3701060.55	183.18	7.62	293	1.22	6.06	-4.88	E
S008_36	304-S008 - 023-0 - 29.5 MMBTU/HR BOILER (3) W/ CYCLONE & ESP; WOOD WASTE	Vertical	610054.02	3679693.12	341.38	12.19	294	1.22	4.85	3.40	B
S008_37	304-S008 - 023-0 - 29.5 MMBTU/HR BOILER (3) W/ CYCLONE & ESP; WOOD WASTE	Vertical	610054.02	3679693.12	341.38	12.19	294	1.22	4.85	3.30	B
S008_38	304-S008 - 037-0 - PANEL SAW WOOD WORKING OPERATIONS	Vertical	610200.00	3680000.00	335.28	6.10	294	1.52	1.16	3.12	B
S008_39	304-S008 - 040-0 - RE-SAW OPERATIONS	Vertical	610200.00	3680000.00	335.28	6.10	294	1.52	1.16	3.78	B
0002_40	410-0002 - 52DC10 - Clinker Cooler 1	Vertical	578291.02	3733079.10	156.36	25.91	416	2.82	14.89	6.08	B
0002_41	410-0002 - 54DC01 - Cement Kiln 1 with Flash Furnace [51DC01]	Vertical	578245.97	3733070.07	156.36	64.92	374	3.89	9.95	6.16	B
0002_42	410-0002 - 58DC01 - Kiln 2 Main Stack (212A)	Vertical	578328.00	3733155.03	154.23	134.00	473	3.79	19.19	4.19	C
0002_43	410-0002 - 56DC01 - Clinker Cooler 2 [56 DC01] - Source 220	Vertical	578429.02	3732971.68	156.06	44.23	473	3.30	18.40	6.32	C
0002_44	410-0002 - 71DC02 - O'SEPA Separator [71DC02]	Vertical	578330.02	3732955.08	158.50	13.72	350	1.26	22.86	5.14	B
0002_45	410-0002 - 72DC02 - O'SEPA Separator (72SP01) [72DC02]	Vertical	578301.03	3732960.94	158.50	13.72	350	1.17	17.46	3.43	B

1. B = Baseline source; C = Increment-consuming source; E = Increment-expanding source.

APPENDIX C MODELED CONCENTRATION PLOTS

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Note: SIL modeling results figures for pollutants exceeding the SIL include a red circle identifying the extent of the significant impact area (SIA) and the distance to the furthest receptor with a concentration at or above the SIL.

FIGURE C-1A: 1-HOUR NO_2 SIL

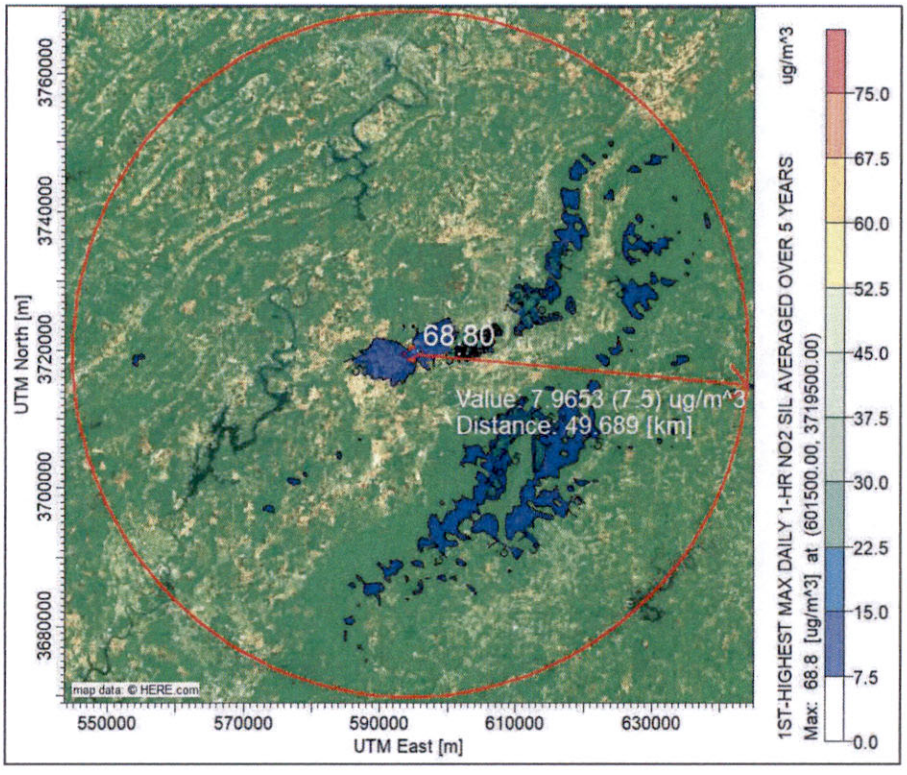


FIGURE C-1B: 1-HOUR NO_2 SIL – MAX VALUE REFINED IN 100-M GRID SPACING

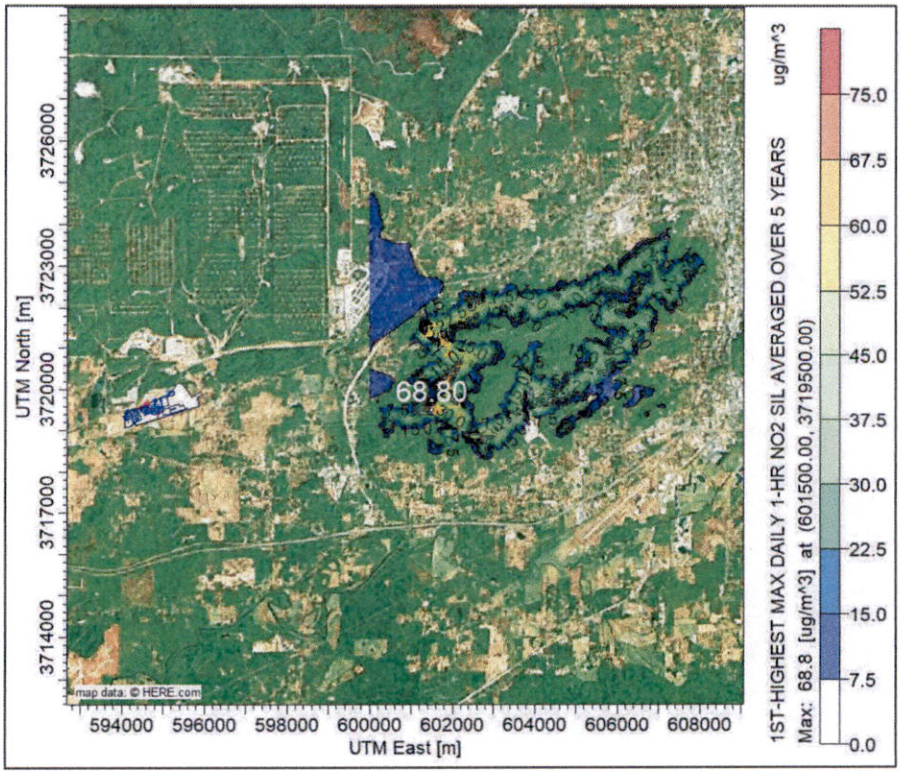


FIGURE C-2: ANNUAL NO_2 SIL

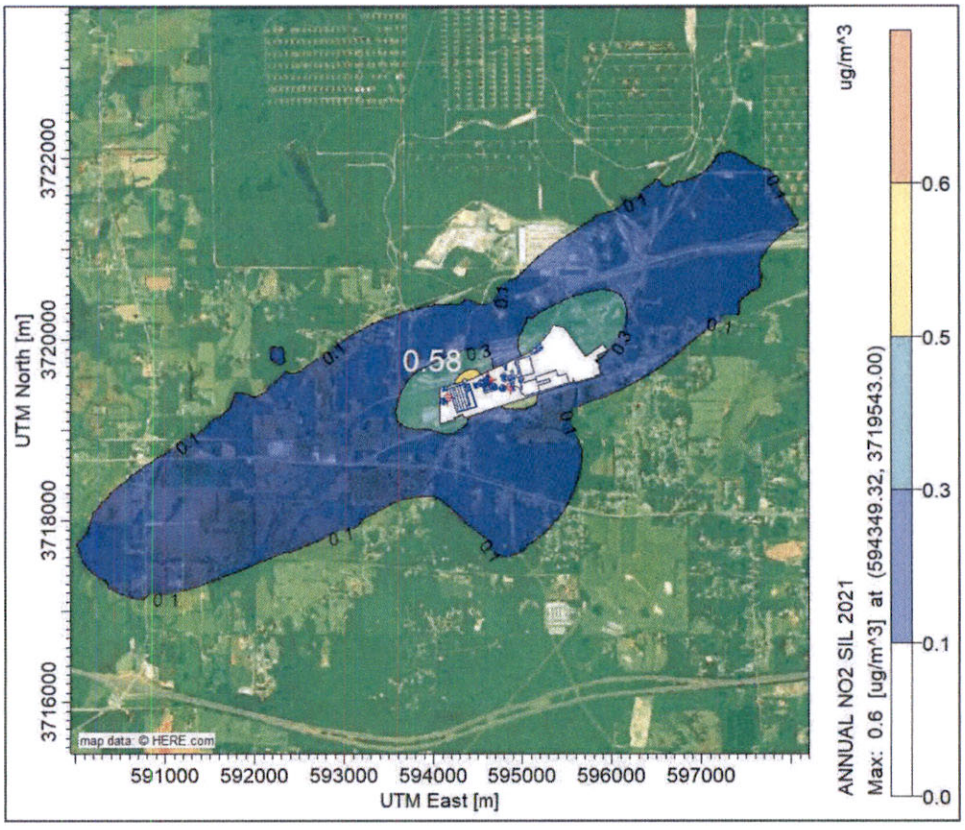


FIGURE C-3: 24-HOUR PM_{10} SIL

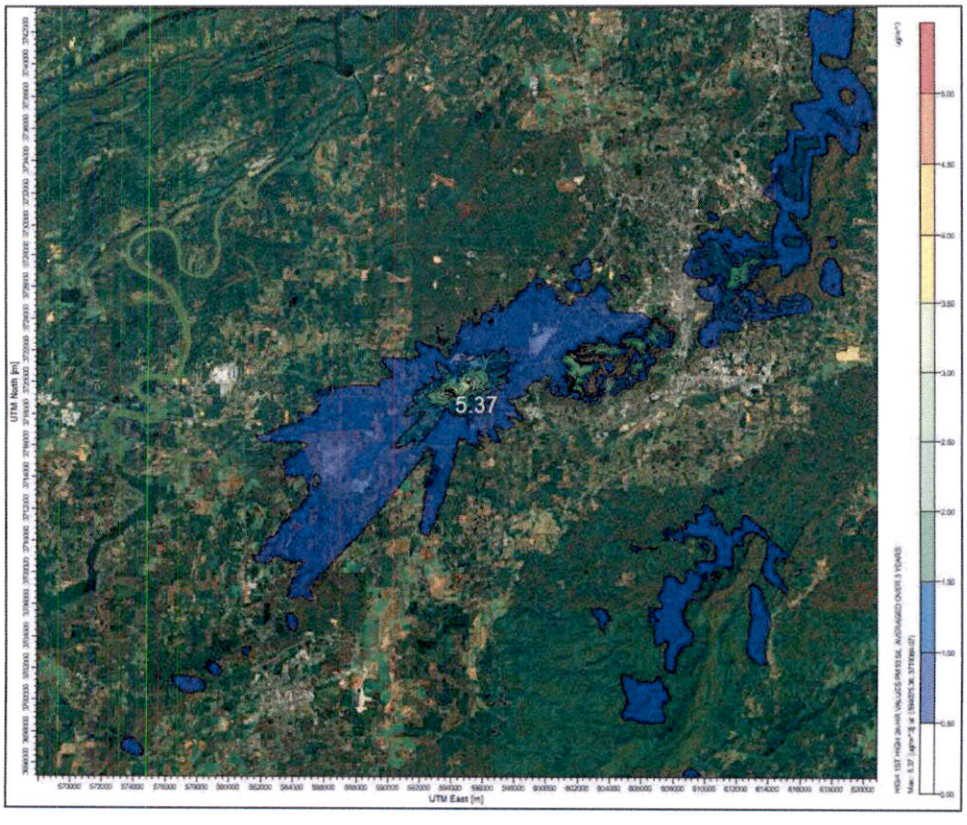


FIGURE C-4: ANNUAL PM_{10} SIL

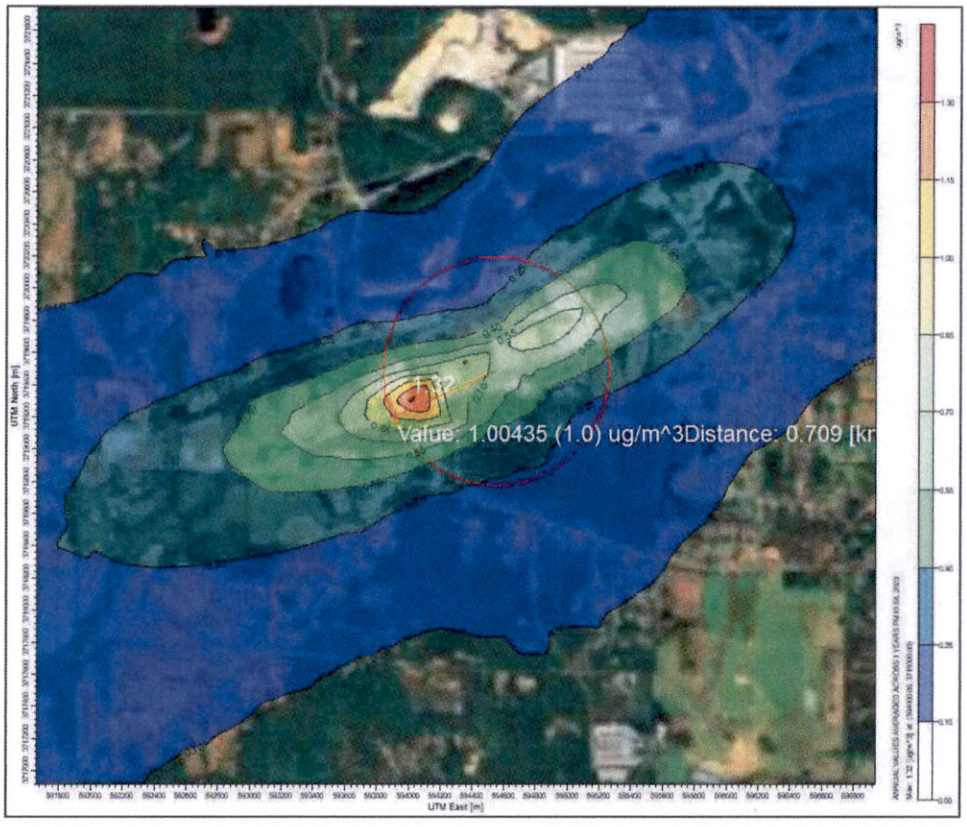


FIGURE C-5: 24-HOUR $PM_{2.5}$ SIL

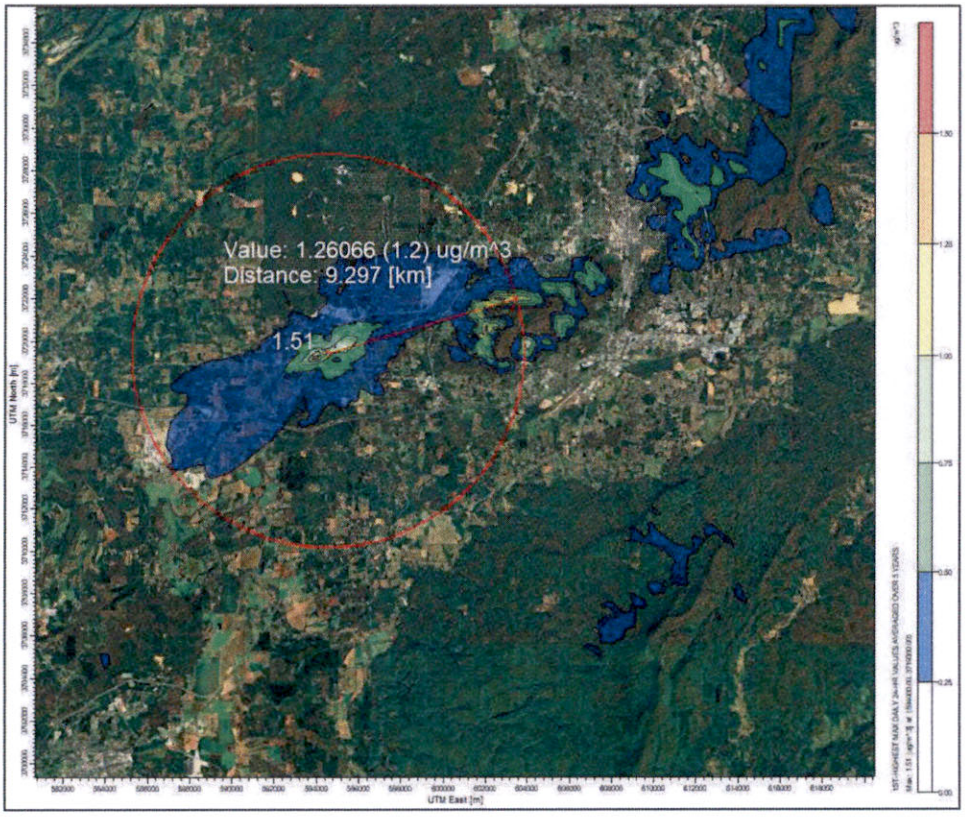


FIGURE C-6: ANNUAL $PM_{2.5}$ SIL

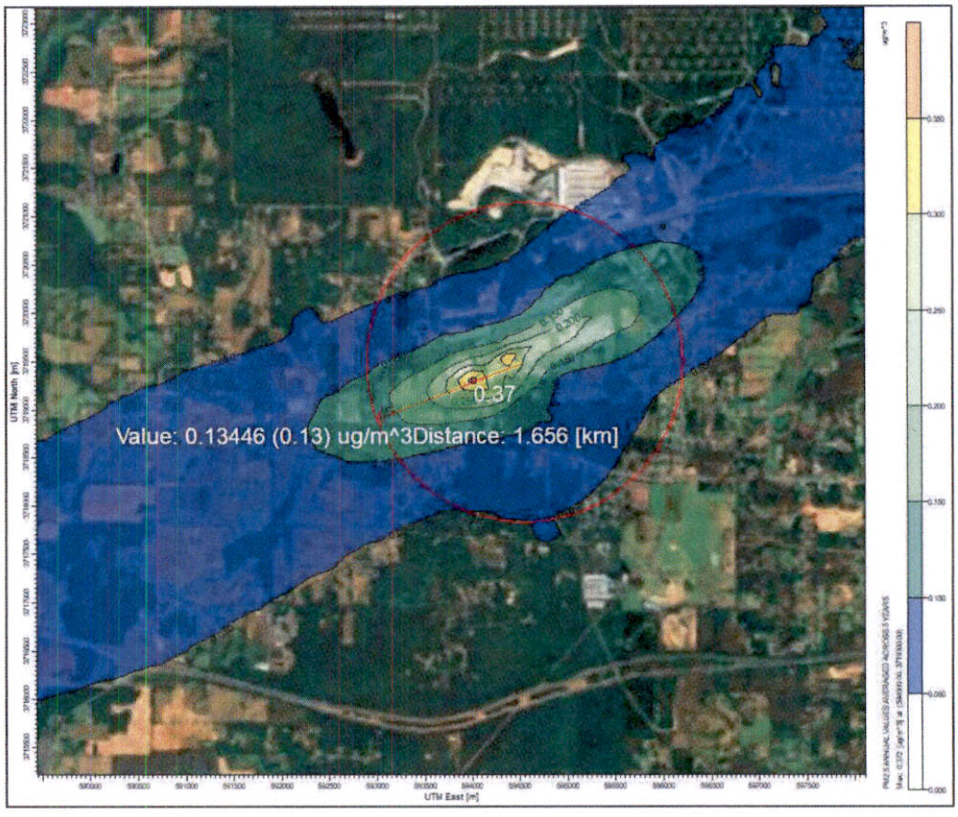


FIGURE C-7A: 1-HOUR CO SIL

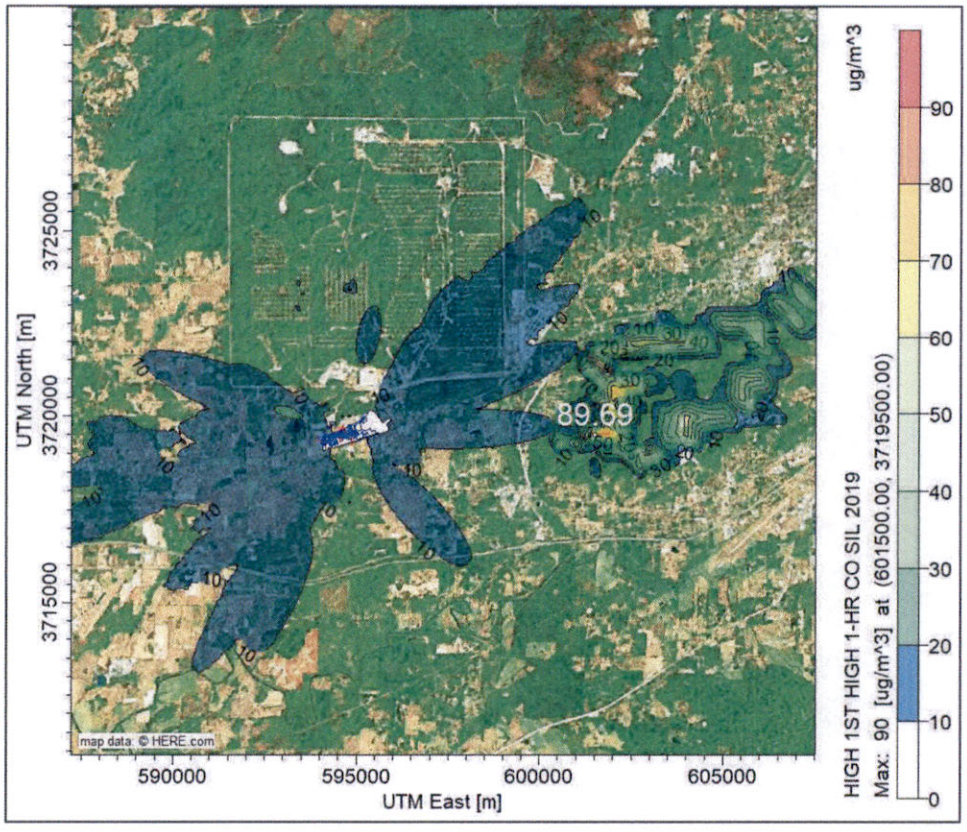


FIGURE C-7B: 1-HOUR CO SIL – MAX VALUE REFINED IN 100-M GRID SPACING

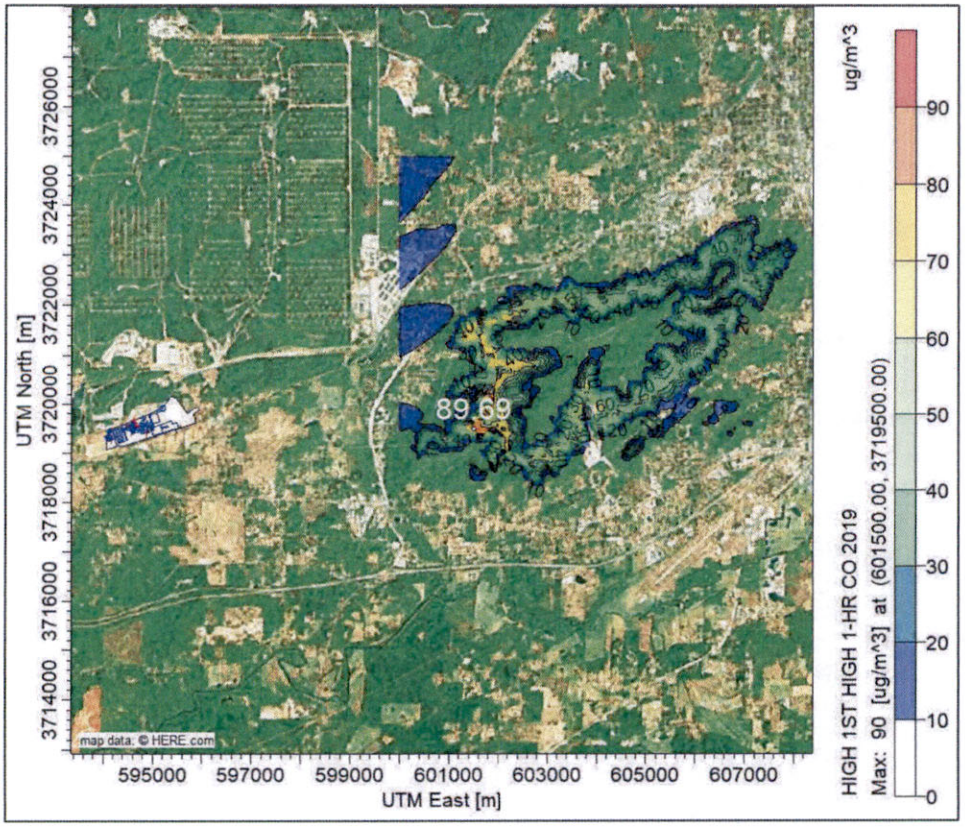


FIGURE C-8A: 8-HOUR CO SIL

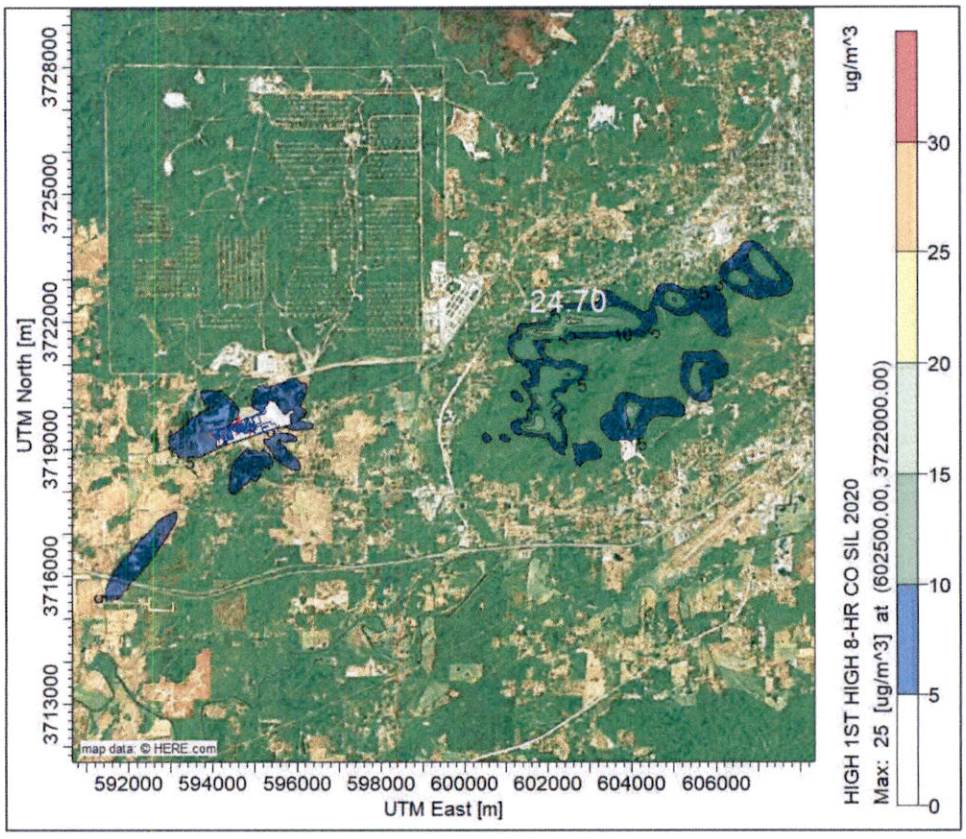


FIGURE C-8B: 8-HOUR CO SIL – MAX VALUE REFINED IN 100-M GRID SPACING

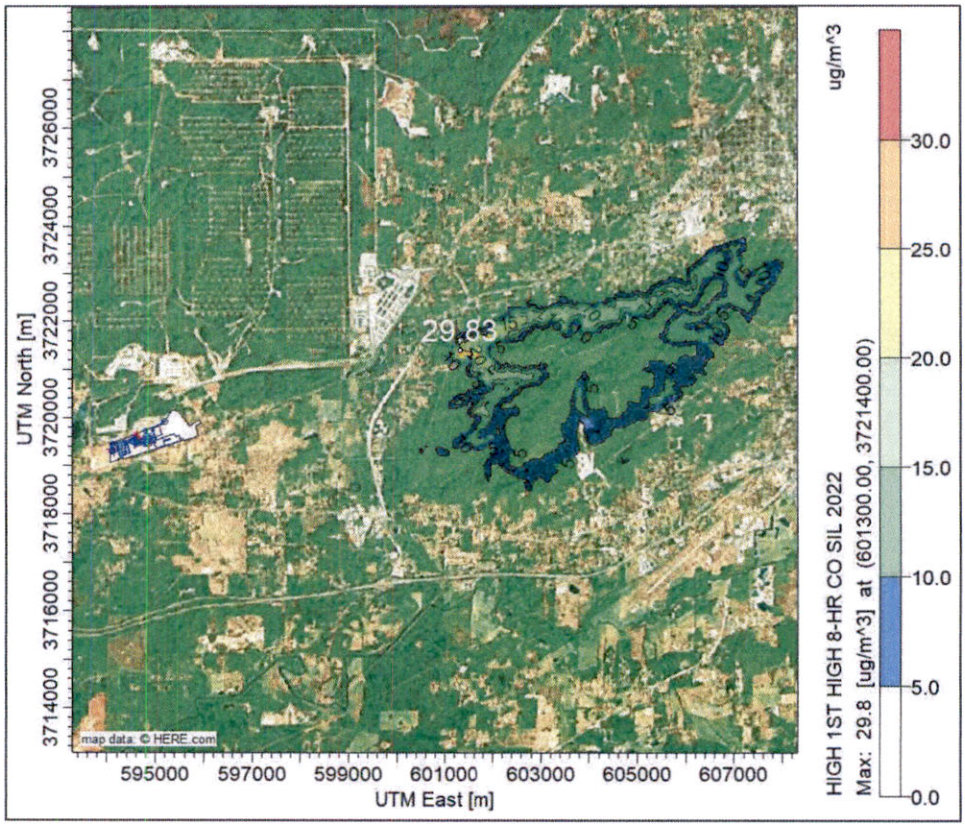


FIGURE C-9A: 1-HOUR NO_2 NAAQS

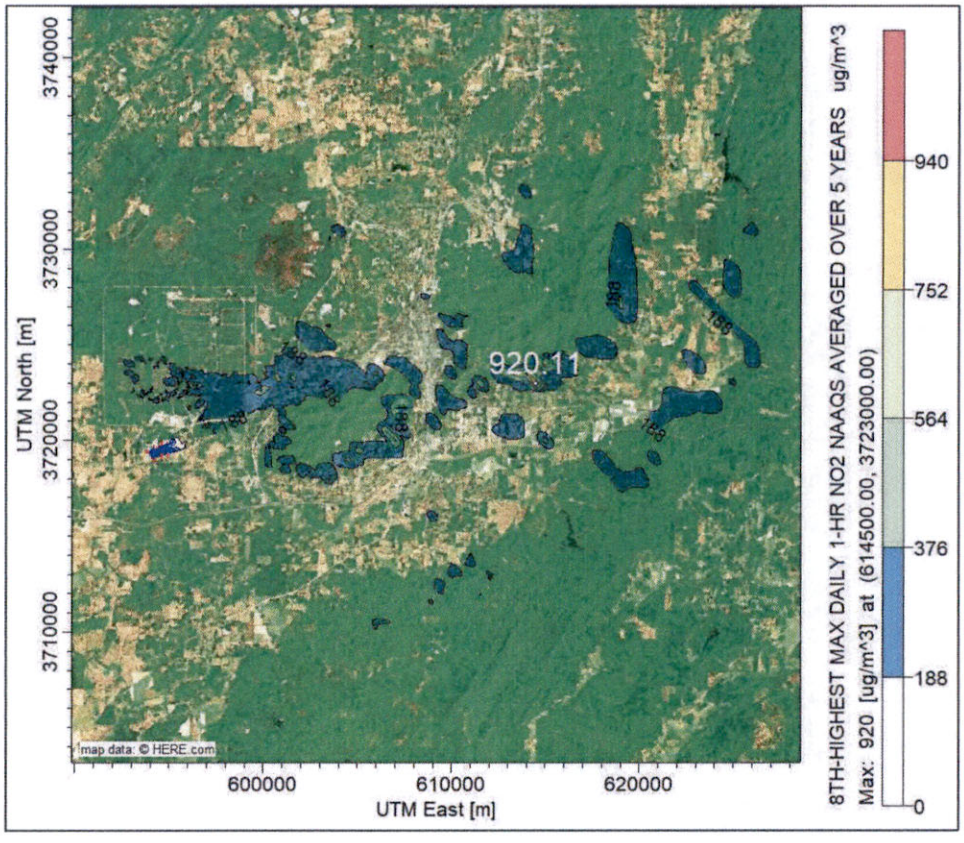


FIGURE C-9B: 1-HOUR NO_2 NAAQS – MAX VALUE REFINED IN 100-M GRID SPACING

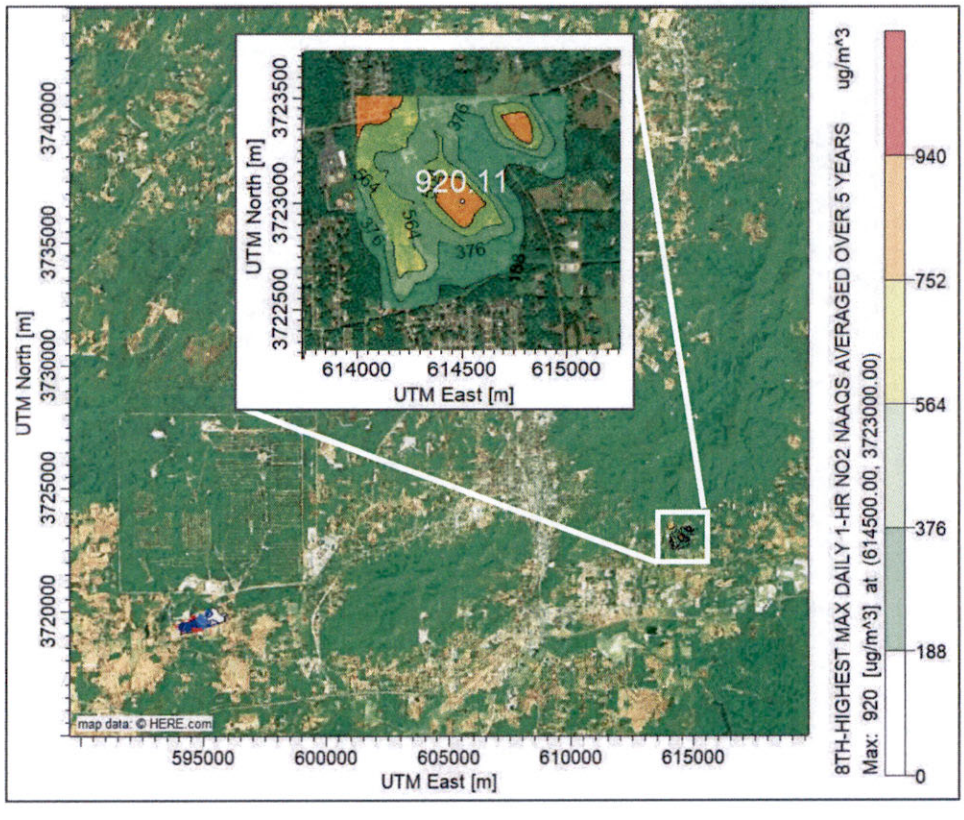


FIGURE C-10A: 24-HOUR $PM_{2.5}$ NAAQS

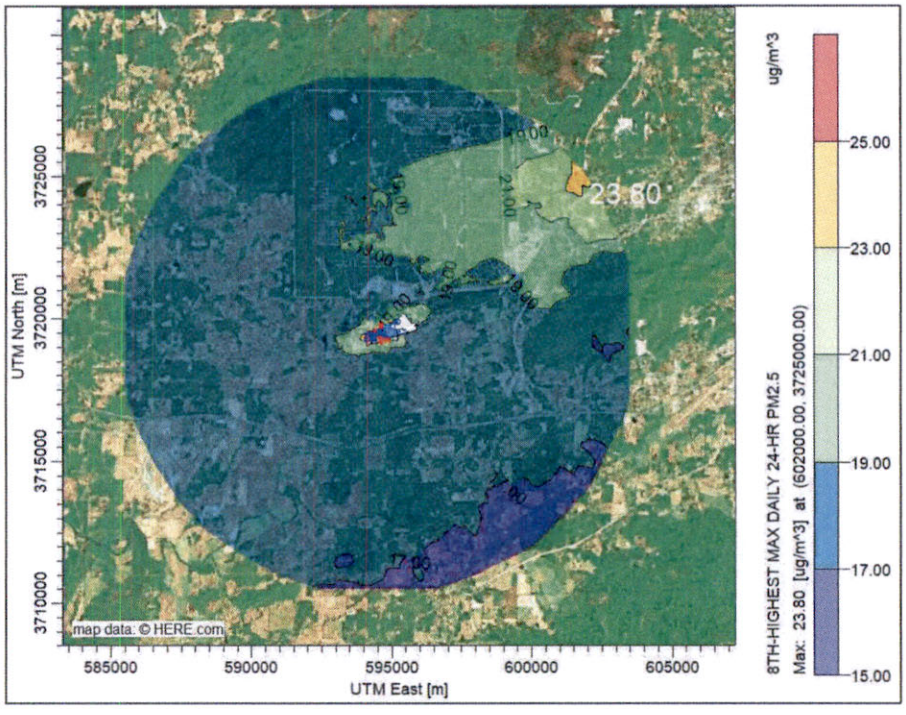


FIGURE C-10B: 24-HOUR $PM_{2.5}$ NAAQS – MAX VALUE REFINED IN 100-M GRID SPACING

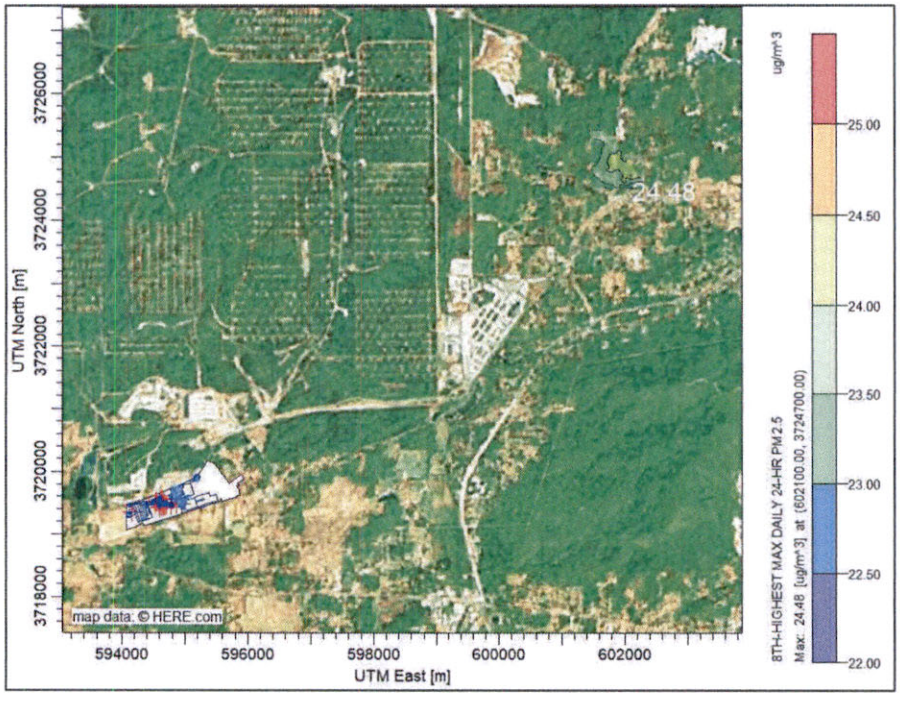


FIGURE C-11: ANNUAL $PM_{2.5}$ NAAQS

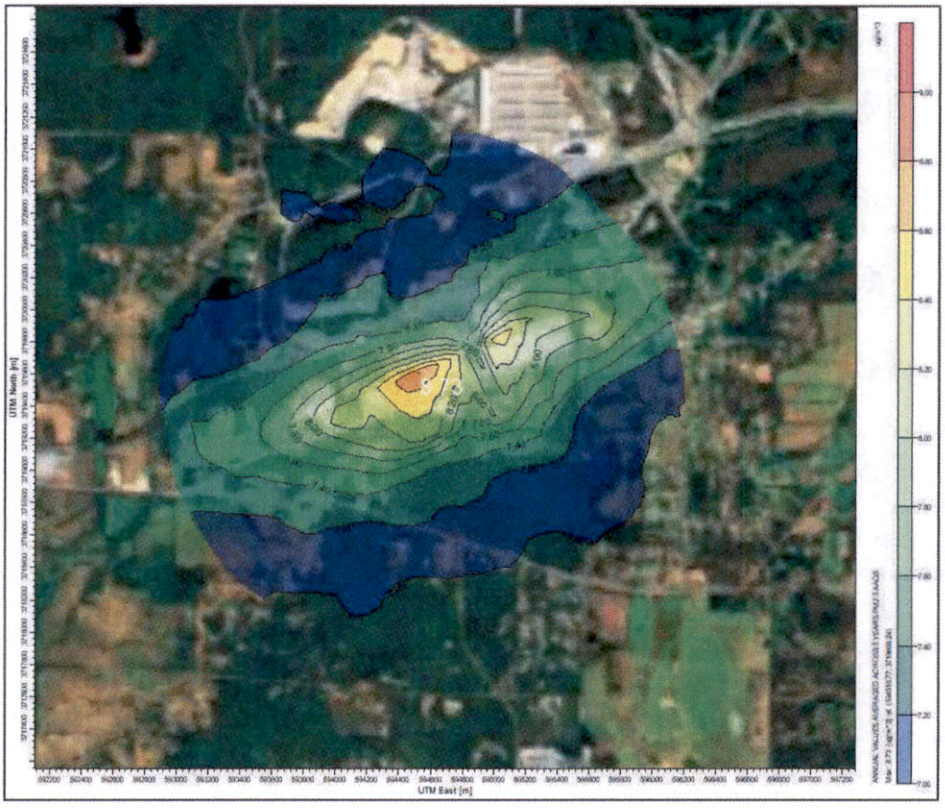


FIGURE C-12: ANNUAL PM_{10} INCREMENT

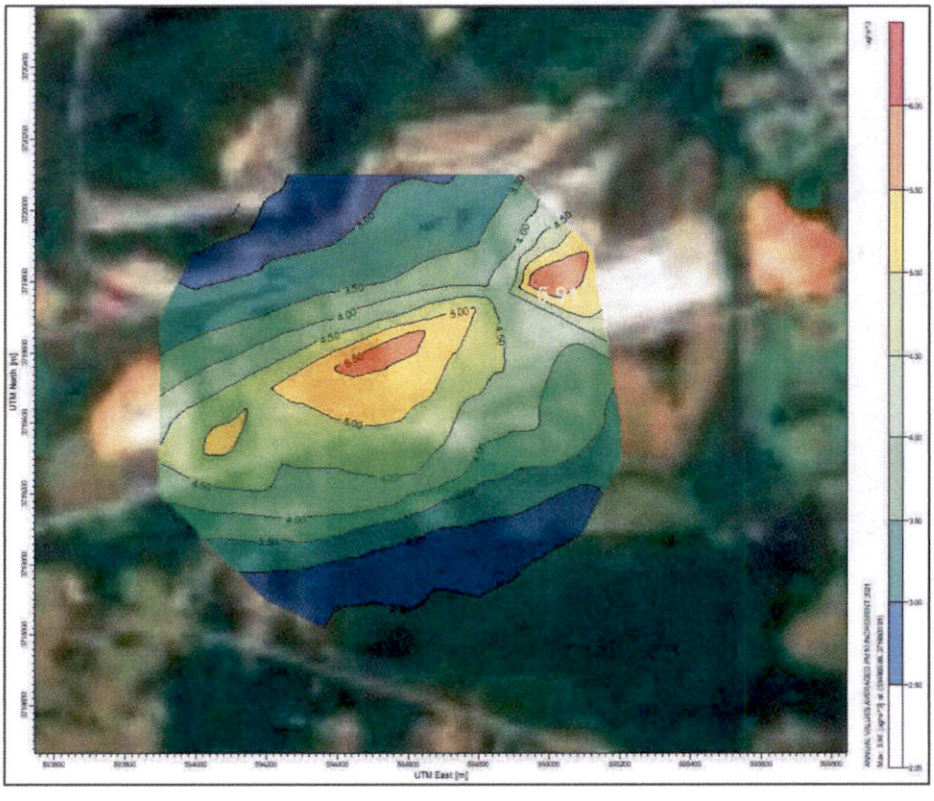


FIGURE C-13A: 24-HOUR $PM_{2.5}$ INCREMENT

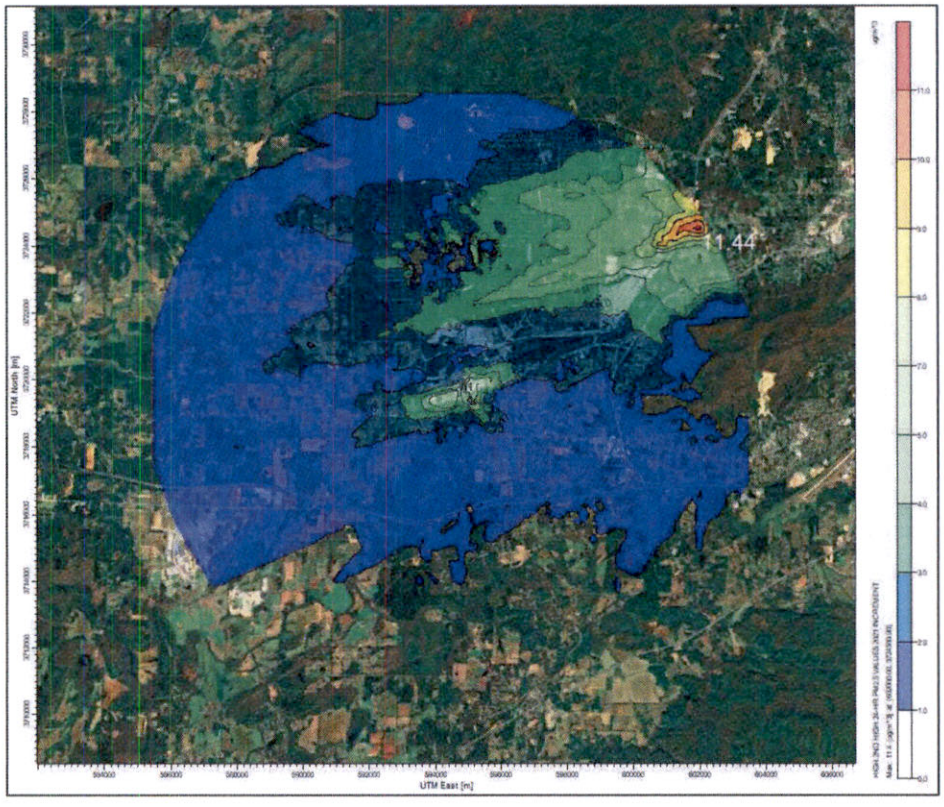


FIGURE C-13B: 24-HR $PM_{2.5}$ INCREMENT – MAX VALUE REFINED IN 100-M GRID SPACING

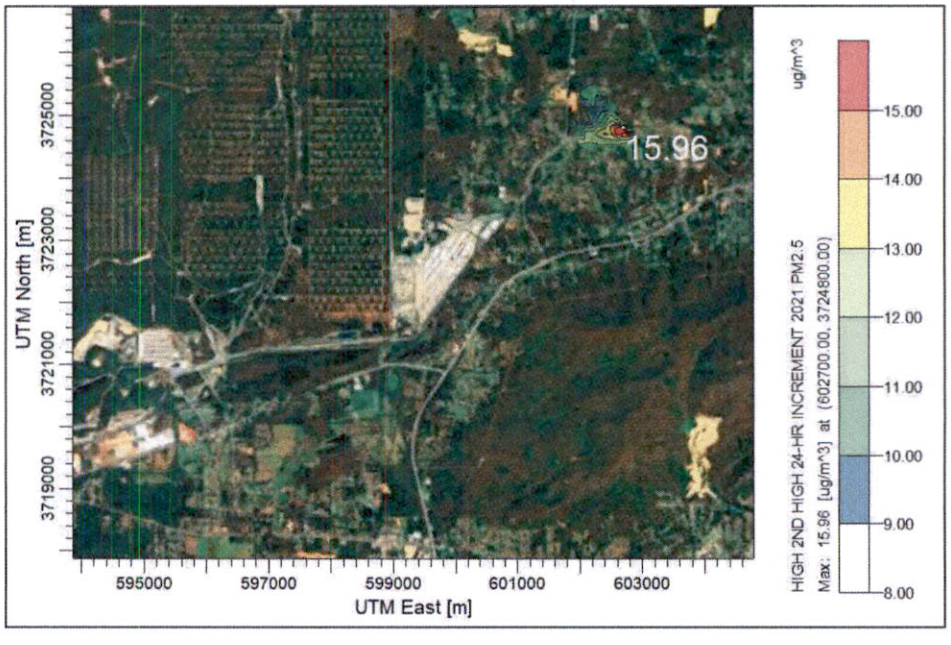


FIGURE C-14: ANNUAL $PM_{2.5}$ INCREMENT

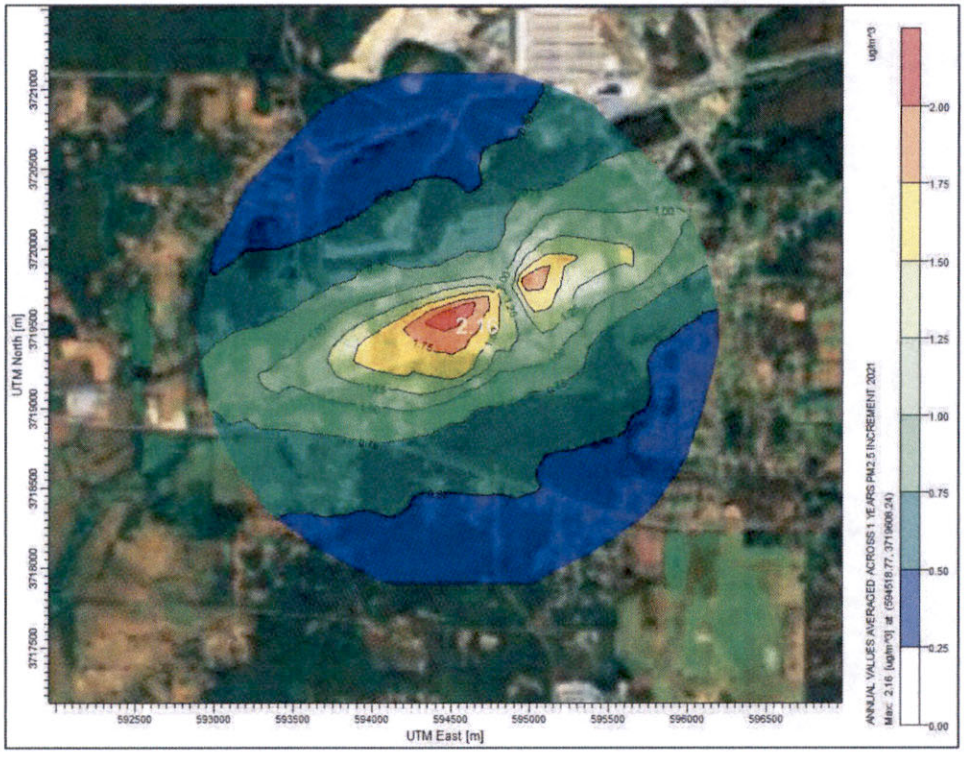
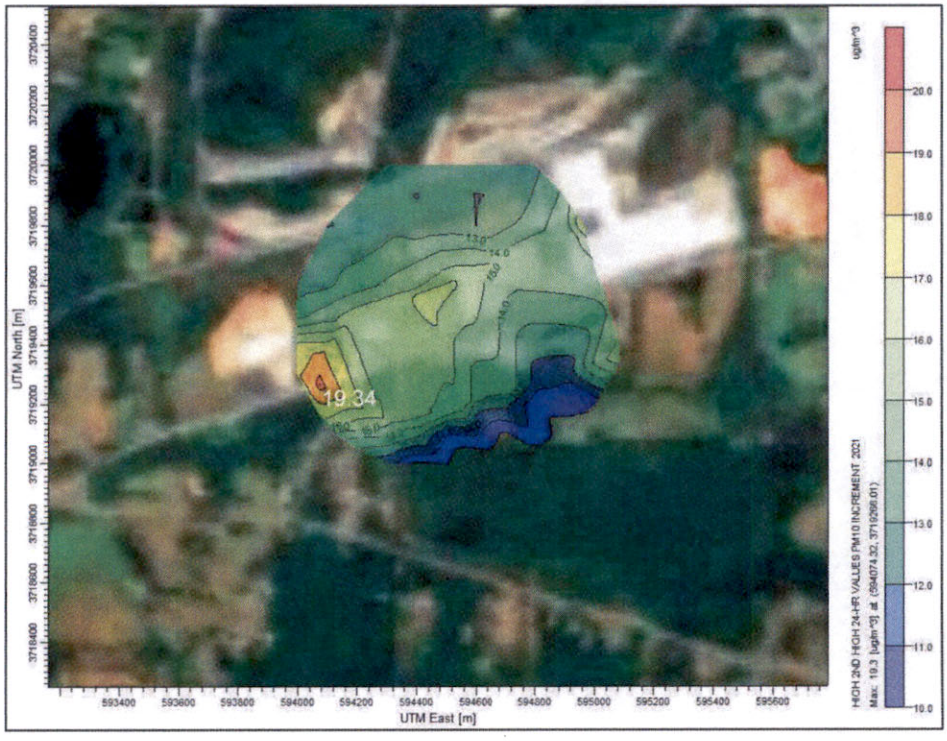


FIGURE C-15: 24-HR PM_{10} INCREMENT



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APPENDIX D SOURCE CULPABILITY SUMMARY – 1-HOUR NO_2 NAAQS AND $PM_{2.5}$ INCREMENT

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TABLE D-1: SOURCE CONTRIBUTIONS TO 1-HOUR NO_2 NAAQS EXCEEDANCES

X	Y	AVERAGE CONC	ZELEV	ZHILL	ZFLAG	AVE	GRP	RANK	ALL	KRON_P	KRON_E	KRON_ALL	OFFSITE
600250	3722750	332.72	189.11	516.48	0	1-HR	ALL	26TH	332.72	2.15	4.77	6.92	294.80
600250	3722750	326.69	189.11	516.48	0	1-HR	ALL	31ST	326.69	1.84	3.93	5.77	289.92
600250	3722750	358.15	189.11	516.48	0	1-HR	ALL	19TH	358.15	1.71	4.44	6.15	321.00
600250	3722750	307.46	189.11	516.48	0	1-HR	ALL	49TH	307.46	1.69	3.38	5.06	271.39
600250	3722750	281.87	189.11	516.48	0	1-HR	ALL	82ND	281.87	1.68	3.77	5.45	245.42
600250	3722750	325.55	189.11	516.48	0	1-HR	ALL	32ND	325.55	1.67	3.39	5.06	289.49
600250	3722750	340.98	189.11	516.48	0	1-HR	ALL	23RD	340.98	1.67	3.77	5.44	304.53
600250	3722750	339.31	189.11	516.48	0	1-HR	ALL	24TH	339.31	1.66	4.08	5.74	302.57
600250	3722750	290.90	189.11	516.48	0	1-HR	ALL	69TH	290.90	1.63	3.23	4.86	255.03
600250	3722750	279.03	189.11	516.48	0	1-HR	ALL	85TH	279.03	1.58	3.26	4.84	243.19
600250	3722750	317.41	189.11	516.48	0	1-HR	ALL	41ST	317.41	1.57	3.25	4.82	281.58
600250	3722750	307.92	189.11	516.48	0	1-HR	ALL	48TH	307.92	1.53	3.40	4.93	272.00
600250	3722750	320.18	189.11	516.48	0	1-HR	ALL	36TH	320.18	1.52	3.25	4.78	284.40
600250	3722750	328.45	189.11	516.48	0	1-HR	ALL	29TH	328.45	1.52	3.27	4.79	292.66
600250	3722750	291.40	189.11	516.48	0	1-HR	ALL	68TH	291.40	1.51	3.07	4.58	255.81
600250	3722750	311.01	189.11	516.48	0	1-HR	ALL	46TH	311.01	1.50	3.10	4.60	275.41
600250	3722750	313.34	189.11	516.48	0	1-HR	ALL	44TH	313.34	1.46	2.88	4.34	278.00
600250	3722750	329.93	189.11	516.48	0	1-HR	ALL	28TH	329.93	1.42	3.33	4.75	294.18
600250	3722750	283.52	189.11	516.48	0	1-HR	ALL	79TH	283.52	1.39	2.88	4.26	248.25
600250	3722750	289.72	189.11	516.48	0	1-HR	ALL	71ST	289.72	1.38	2.77	4.15	254.57
600250	3722750	305.63	189.11	516.48	0	1-HR	ALL	51ST	305.63	1.35	2.66	4.01	270.62
600250	3722750	286.21	189.11	516.48	0	1-HR	ALL	76TH	286.21	1.32	2.69	4.02	251.20
600250	3722750	305.42	189.11	516.48	0	1-HR	ALL	52ND	305.42	1.29	2.64	3.94	270.49
600250	3722750	312.32	189.11	516.48	0	1-HR	ALL	45TH	312.32	1.28	2.97	4.25	277.07
600250	3722750	244.34	189.11	516.48	0	1-HR	ALL	125TH	244.34	1.26	2.72	3.98	209.36
600250	3722750	242.38	189.11	516.48	0	1-HR	ALL	128TH	242.38	1.25	2.73	3.99	207.40
600250	3722750	300.87	189.11	516.48	0	1-HR	ALL	57TH	300.87	1.25	2.42	3.66	266.21
600250	3722750	263.73	189.11	516.48	0	1-HR	ALL	104TH	263.73	1.24	2.49	3.74	228.99
600250	3722750	316.05	189.11	516.48	0	1-HR	ALL	42ND	316.05	1.24	2.92	4.16	280.89
600250	3722750	306.50	189.11	516.48	0	1-HR	ALL	50TH	306.50	1.24	2.48	3.72	271.78
600250	3722750	319.12	189.11	516.48	0	1-HR	ALL	38TH	319.12	1.24	2.52	3.76	284.36
600250	3722750	282.41	189.11	516.48	0	1-HR	ALL	81ST	282.41	1.22	2.43	3.65	247.75
600250	3722750	304.27	189.11	516.48	0	1-HR	ALL	53RD	304.27	1.20	2.36	3.57	269.70
600250	3722750	282.88	189.11	516.48	0	1-HR	ALL	80TH	282.88	1.18	2.25	3.44	248.44

X	Y	AVERAGE CONC	ZELEV	ZHILL	ZFLAG	AVE	GRP	RANK	ALL	KRON_P	KRON_E	KRON_ALL	OFFSITE
600250	3722750	319.70	189.11	516.48	0	1-HR	ALL	37TH	319.70	1.15	2.25	3.39	285.30
600250	3722750	299.15	189.11	516.48	0	1-HR	ALL	60TH	299.15	1.15	2.34	3.49	264.66
600250	3722750	275.92	189.11	516.48	0	1-HR	ALL	88TH	275.92	1.15	2.20	3.35	241.57
600250	3722750	252.81	189.11	516.48	0	1-HR	ALL	116TH	252.81	1.14	2.21	3.35	218.47
600250	3722750	278.09	189.11	516.48	0	1-HR	ALL	86TH	278.09	1.13	2.19	3.32	243.77
600250	3722750	273.19	189.11	516.48	0	1-HR	ALL	92ND	273.19	1.13	2.53	3.66	238.53
600250	3722750	294.02	189.11	516.48	0	1-HR	ALL	65TH	294.02	1.12	2.08	3.21	259.82
600250	3722750	264.93	189.11	516.48	0	1-HR	ALL	102ND	264.93	1.12	2.13	3.25	230.68
600250	3722750	327.75	189.11	516.48	0	1-HR	ALL	30TH	327.75	1.11	2.74	3.84	292.90
600250	3722750	258.36	189.11	516.48	0	1-HR	ALL	110TH	258.36	1.07	2.03	3.10	224.25
600250	3722750	263.21	189.11	516.48	0	1-HR	ALL	105TH	263.21	1.07	2.17	3.24	228.97
600250	3722750	290.36	189.11	516.48	0	1-HR	ALL	70TH	290.36	1.06	2.41	3.48	255.89
600250	3722750	296.29	189.11	516.48	0	1-HR	ALL	63RD	296.29	1.06	2.03	3.09	262.20
600250	3722750	241.68	189.11	516.48	0	1-HR	ALL	129TH	241.68	1.03	1.94	2.98	207.70
600250	3722750	302.06	189.11	516.48	0	1-HR	ALL	56TH	302.06	1.03	2.11	3.13	267.93
600250	3722750	287.08	189.11	516.48	0	1-HR	ALL	75TH	287.08	1.02	1.98	3.00	253.08
600250	3722750	300.16	189.11	516.48	0	1-HR	ALL	58TH	300.16	1.02	2.31	3.33	265.83
600250	3722750	279.73	189.11	516.48	0	1-HR	ALL	84TH	279.73	1.01	2.05	3.07	245.67
600250	3722750	261.49	189.11	516.48	0	1-HR	ALL	107TH	261.49	1.01	2.09	3.10	227.39
600750	3723000	235.60	193.11	516.48	0	1-HR	ALL	69TH	235.60	1.01	2.92	3.93	200.67
600250	3722750	336.93	189.11	516.48	0	1-HR	ALL	25TH	336.93	1.01	2.72	3.72	302.21
600250	3722750	273.54	189.11	516.48	0	1-HR	ALL	91ST	273.54	1.01	2.21	3.21	239.33
600250	3722750	288.28	189.11	516.48	0	1-HR	ALL	73RD	288.28	1.00	1.93	2.93	254.35
600750	3723000	237.78	193.11	516.48	0	1-HR	ALL	68TH	237.78	1.00	2.40	3.40	203.38
600250	3722750	297.26	189.11	516.48	0	1-HR	ALL	62ND	297.26	1.00	1.93	2.93	263.33

Notes: Table shows a subset of MAXDCONT results ranked by maximum contributions from the proposed project (KRON_P). Also shown are contributions from existing Kronospan sources (KRON_E), total Kronospan contribution (KRON_ALL), and total offsite source contribution (OFFSITE).

TABLE D-2: SOURCE CONTRIBUTIONS TO 24-HOUR $PM_{2.5}$ INCREMENT EXCEEDANCES

Model Year	AERMOD Event ID	UTM X (m)	UTM Y (m)	Date	24-hr avg modeled conc. (µg/m³)	Source Contributions (µg/m³)			
						Kronospan Project	Kronospan Existing	Kronospan Total	Offsite Total
2019	TH24000001	601500	3725500	19052424	9.80	0.047	0.106	0.153	9.65
2019	TH24000002	601500	3725500	19071724	9.55	0.016	0.009	0.025	9.53
2019	TH24000003	601500	3725500	19090224	10.41	0.001	0.003	0.004	10.40
2019	TH24000004	601500	3725500	19091324	9.99	0.008	0.005	0.013	9.98
2019	TH24000005	601500	3725500	19093024	9.78	0.030	0.023	0.053	9.73
2020	TH24000001	602500	3724000	20080624	9.42	0.023	0.015	0.038	9.39
2020	TH24000002	602500	3724000	20102124	9.22	0.001	0.002	0.003	9.22
2021	TH24000001	600750	3724000	21090424	9.19	0.004	0.004	0.007	9.18
2021	TH24000002	601000	3724000	21090424	9.14	0.004	0.003	0.007	9.13
2021	TH24000003	601000	3724250	21090424	9.03	0.004	0.003	0.007	9.02
2021	TH24000004	601250	3724250	21090424	9.99	0.003	0.003	0.007	9.98
2021	TH24000005	601500	3724500	21090424	9.17	0.003	0.003	0.007	9.16
2021	TH24000006	602000	3724500	21090424	10.41	0.003	0.003	0.006	10.40
2021	TH24000007	601000	3724000	21091224	9.11	0.003	0.004	0.006	9.10
2021	TH24000008	601000	3724250	21091224	9.32	0.003	0.004	0.006	9.32
2021	TH24000009	601250	3724250	21091224	9.93	0.003	0.003	0.006	9.93
2021	TH24000010	601500	3724500	21091224	10.45	0.003	0.003	0.006	10.45
2021	TH24000011	602000	3724500	21091224	11.49	0.002	0.003	0.005	11.49
2021	TH24000012	601500	3724500	21091324	9.45	0.058	0.067	0.124	9.32
2021	TH24000013	601500	3724500	21101024	9.63	0.004	0.003	0.007	9.62
2021	TH24000014	602000	3724500	21101024	10.16	0.003	0.003	0.006	10.15
2021	TH24000015	600750	3724000	21101324	9.30	0.001	0.005	0.006	9.29
2021	TH24000016	601000	3724250	21101324	11.33	0.001	0.005	0.006	11.32
2021	TH24000017	601250	3724250	21101324	11.20	0.001	0.005	0.006	11.20
2021	TH24000018	601500	3724500	21101324	12.53	0.001	0.004	0.005	12.53
2021	TH24000019	602000	3724500	21101324	11.44	0.000	0.002	0.003	11.44
2022	TH24000001	601500	3725500	22092024	9.84	0.072	0.054	0.127	9.71
2022	TH24000002	601500	3725500	22092124	9.22	0.003	0.004	0.007	9.22
2023	TH24000001	601000	3725000	23090924	10.15	0.004	0.003	0.007	10.15
2023	TH24000002	601500	3725000	23090924	10.08	0.004	0.003	0.007	10.07
2023	TH24000003	601000	3725000	23093024	9.09	0.002	0.003	0.005	9.09
2023	TH24000004	601500	3725000	23093024	10.04	0.002	0.003	0.005	10.04

Notes: Table shows source contributions to each occurrence of an exceedance of the 24-hour average PSD increment of 9 µg/m³ across the five modeled years from AERMOD EVENTS processing runs.

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Protocol for Dispersion Modeling Analysis

Kronospan OSB Plant Expansion

PREPARED FOR
Kronospan LLC

DATE
Revised 14 July 2025

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SIGNATURE PAGE

Protocol for Dispersion Modeling Analysis

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1. PROJECT DESCRIPTION

On behalf of Kronospan, LLC (Kronospan) ERM is submitting this dispersion modeling protocol to the Alabama Department of Environmental Management (ADEM) summarizing the modeling methodology and approach for performing a Prevention of Significant Deterioration (PSD) air quality analysis for Kronospan's Eastaboga, Alabama facility. The protocol is prepared in accordance with current U.S. Environmental Protection Agency Guideline on Air Quality Models[1] (Appendix W) and ADEM's PSD Air Quality Analysis Modeling Guidelines[2] and follows the Modeling Protocol Checklist sections in Appendix E of ADEM's Modeling Guidelines. The protocol is based on final project information provided by Kronospan staff and changes are not expected.

Kronospan operates a particle board production facility in Eastaboga, Alabama in Calhoun County. The facility is a major source with respect to PSD and Title V. Figure 1-1 shows an aerial overview map showing the location of the facility. The proposed project is an expansion of the facility to include construction and operation of an Oriented Strand Board (OSB) plant and modification to the facility wood handling operations which feed wood into the existing facility operations.

Kronospan anticipates that the expected air emission increases associated with the proposed plant expansion will trigger requirements of major source permitting under PSD and require PSD review for VOC, NO_X, PM_{10}, $PM_{2.5}$, and CO. Table 1-1 shows the project's estimated potential to emit for each pollutant of concern.

TABLE 1-1 – PROJECT POTENTIAL TO EMIT

Pollutant*	Project Potential to Emit (TPY)	PSD Significant Emissions Rate (TPY)	Project Exceeds SER?
CO	435	100	Yes
NO_X	383	40	Yes
PM	218	25	Yes
PM_{10}	217	15	Yes
$PM_{2.5}$	103	10	Yes
SO_2	20	40	No
VOC	812	40	Yes

*PM includes filterable PM only; PM_{10} includes both filterable PM_{10} and condensable PM; $PM_{2.5}$ includes both filterable $PM_{2.5}$ and condensable PM.

[1] United States Environmental Protection Agency. 2017. Guideline on Air Quality Models (Appendix W to 40 CFR Part 51). Available at: https://www.epa.gov/sites/default/files/2020-09/documents/appw_17.pdf
[2] Alabama Department of Environmental Management. 2023. PSD Air Quality Analysis Modeling Guidelines. Available at: https://www.adem.alabama.gov/programs/air/airquality/AeromodModelingGuidelines.pdf

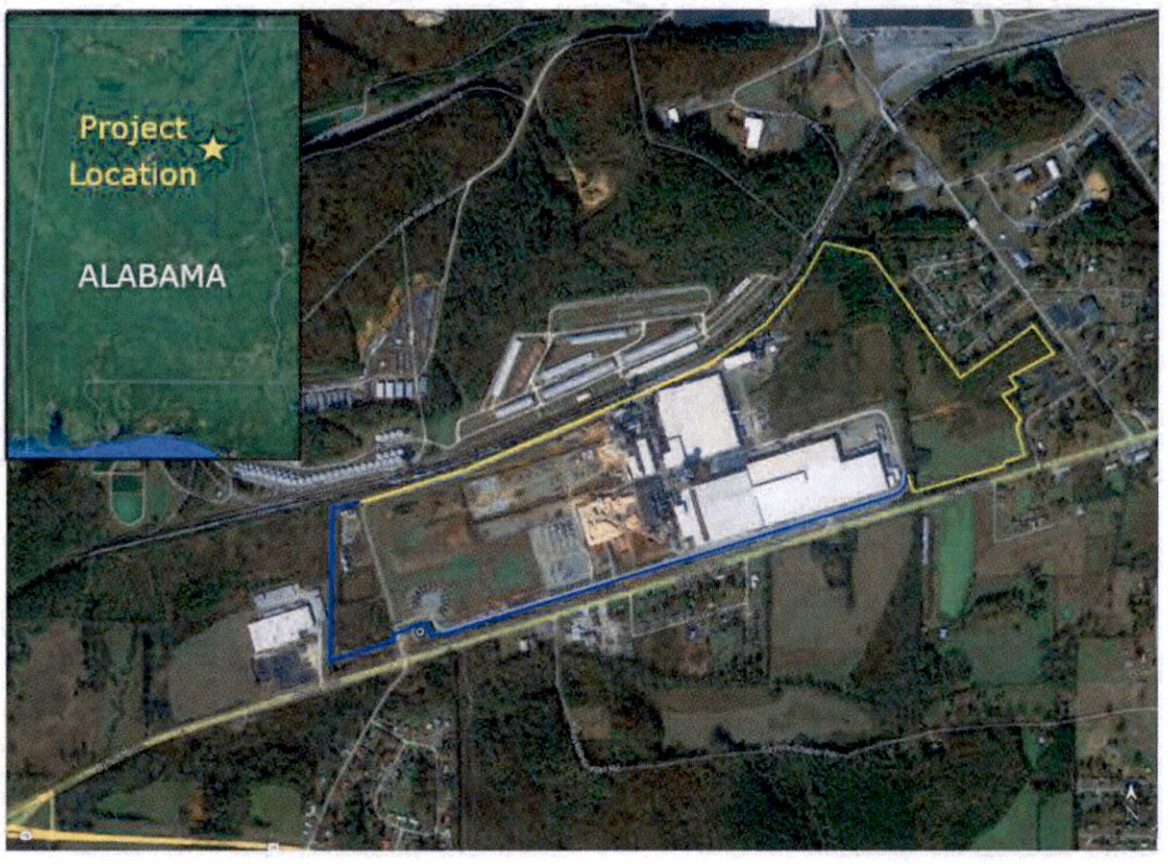


FIGURE 1-1 – KRONOSPAN FACILITY AERIAL OVERVIEW

2. SOURCE CHARACTERIZATION | INFORMATION

The proposed OSB plant expansion will include 26 new emission points of air pollutants to be modeled. Three new emergency generators (emergency generators 6, 7, and 8) associated with the project and included in the project emissions in Table 1-1 are excluded from the modeling as they will be operated as emergency only. Table 2-2 includes the stack parameters and locations of each new source associated with the proposed project included in the modeling. Table 2-3 includes the emission rates for each new source associated with the proposed project included in the modeling. The BIOMASS emission point is an exhaust stack that will be shared by six heaters proposed to be installed with the project: 2 biomass heaters and 4 natural gas-fired thermal oil heaters. These heaters will be run in only two different potential combinations:

- Scenario 1: 2 biomass heaters running with 2 natural gas-fired thermal oil heaters
- Scenario 2: No biomass heaters running and all 4 natural gas-fired thermal oil heaters running

Table 2-1 shows a comparison of emissions from Scenario 1 and Scenario 2 and shows that Scenario 1 emits significantly more across all pollutants compared to Scenario 2. Therefore, Scenario 1 is the worst-case for air emissions impacts and is the scenario modeled for the BIOMASS stack.

TABLE 2-1 – HEATER SCENARIO EMISSIONS

	Heater	CO (lb/hr)	CO TPY	NO_X (lb/hr)	NO_X TPY	PM (lb/hr)	PM TPY	PM_{10} (lb/hr)	PM_{10} TPY	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ TPY	SO_2 (lb/hr)	SO_2 TPY	VOC (lb/hr)	VOC TPY
Scenario 1	Biomass Heater K7	36.65	160.53	36.65	160.53	3.67	16.05	6.19	27.11	5.87	25.69	2.25	9.86	2.76	12.07
	Biomass Heater K8	36.65	160.53	36.65	160.53	3.67	16.05	6.19	27.11	5.87	25.69	2.25	9.86	2.76	12.07
	gas-fired thermal oil heater K9	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K10	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K11	-		-		-		-		-		-		-	
	gas-fired thermal oil heater K12	-		-		-		-		-		-		-	
Scenario 2	Biomass Heater K7	-		-		-		-		-		-		-	
	Biomass Heater K8	-		-		-		-		-		-		-	
	gas-fired thermal oil heater K9	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K10	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K11	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13
	gas-fired thermal oil heater K12	0.26	1.14	2.5	10.95	0.15	0.66	0.47	2.06	0.47	2.06	0.034	0.15	0.03	0.13

		CO (lb/hr)	CO TPY	NO_X (lb/hr)	NO_X TPY	PM (lb/hr)	PM TPY	PM_{10} (lb/hr)	PM_{10} TPY	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ TPY	SO_2 (lb/hr)	SO_2 TPY	VOC (lb/hr)	VOC TPY
Scenario 1	**Total Emissions**	73.82	323.33	78.30	342.95	7.63	33.42	13.32	58.34	12.67	55.49	4.57	20.01	5.57	24.40
Scenario 2	**Total Emissions**	1.04	4.56	10.00	43.80	0.60	2.63	1.88	8.23	1.88	8.23	0.14	0.60	0.12	0.53

Emissions in Table 1-1 include Scenario 1 emissions for the heaters as this represents the maximum potential to emit for the project. Kronospan will request that the permit include an enforceable condition specifying that the operation of the heaters will be limited to only these two scenarios.

Five of the proposed project sources are volume sources representing fugitive emissions from the Strander Hall building (FSR_0001 through FSR_0005). These emissions will originate from four OSB flakers, three OSB stranders, and a log chipper that will not exhaust directly to the atmosphere via stacks but will instead have the exhaust filtered (through cyclones/dust collectors for the flakers and cyclones/dust collectors for the stranders) and then vented into the Strander Hall building. The building enclosure is assumed to trap 90% of these filtered emissions from the flakers, stranders, and chipper, with the remaining 10% emitted to the atmosphere from the building as fugitive emissions, represented as volume sources in AERMOD. Detailed emission calculations are provided in the permit application for the project.

The part of the Strander Hall building that will emit the fugitive emissions is approximately 486 ft long by 88 ft wide by 73.15 ft tall (Figure 2-1). Because a volume source in AERMOD must have a square footprint, it was determined that 5 volume sources evenly spaced along the length of the building would maximize coverage of the building footprint and be more representative of the building's fugitive emissions than one volume source. The total fugitive emissions for the building were divided evenly between the five volume sources.

The release height, initial horizontal dimensions, and initial vertical dimensions were calculated based on U. S. EPA guidance for volume sources (Table 3-3 of the U. S. EPA User's Guide for AERMOD). Calculation details are provided in the footnotes for Table 2-2.

Table 2-4 and Table 2-5 also list four co-gen engine emission units that were previously permitted but will be changing location and will exhaust through a single exhaust stack. Although the four co-gen engines are not part of the project, ADEM is requiring that they be included in the Significant Impact Level (SIL) modeling at their new location. A Good Engineering Practice (GEP) stack height analysis will be conducted based on the specifications of facility buildings and structures according to USEPA procedures.[3] Releases below GEP stack height are potentially subject to building wake effects. Table 2-6 lists the structures associated with the new project that will be included in the modeling, including building height and UTM coordinate locations. Table 2-7 lists the existing structures at the facility that will be included in the modeling.

Figure 2-2 and Figure 2-3 show scaled source location maps with the locations of all project sources and all buildings to be included in the model.

For off-property sources, an inventory of baseline and increment sources that must be included in NAAQS and PSD increment modeling was requested from ADEM on March 6, 2025. The modeling report will include tables identifying baseline and increment sources included in the modeling, including applicable stack parameters.

[3] U.S. Environmental Protection Agency, Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised), June 1985.

The selection of either rural or urban dispersion coefficients will follow the procedures listed in 40 CFR 51 Appendix W Section 7.2.1. The preferred Land Use Procedure classifies the land use within a 3-km radius circle about the source using the Auer land use typing scheme. If the urban Auer land use types I1, I2, C1, R2, and R3 (Industrial, Commercial, and Compact Residential) account for 50 percent or more of the area within 3-km of the site, urban dispersion coefficients should be used. Sources located in areas defined as rural should be modeled using the rural dispersion parameters.

AERSURFACE (version 24142) will be used to analyze 2016 NLCD land cover data within 3-km of the project site. The NLCD land use categories 23 (Developed, Medium Intensity) and 24 (Developed, High Intensity) are equivalent to the urban Auer land use types. The analysis indicates that more than 92 percent of the area around the site is rural (Table 2-8). Based on this assessment, the site will be characterized as rural in the modeling.

TABLE 2-2 – PROJECT SOURCE PARAMETERS

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Stack Temp (F)	Exit Diameter (ft)	Exit Velocity (ft/s)
POINT SOURCES									
GLUE	Glueing	Vertical	594425.49	3719457.94	603.33	100	86	2.95	86.11
SIFTER	Sifter / Screening	Vertical	594521.47	3719479.02	603.33	100	86	3.28	92.88
DUST1	HP Dust dryer 1-3	Vertical	594671.24	3719481.75	603.33	98.43	86	0.66	71.66
DUST2	HP Dust screening/gluing/forming	Vertical	594669.33	3719481.17	603.33	98.43	86	0.66	100.35
DUST3	HP Dust sanding	Vertical	594667.28	3719480.52	603.33	98.43	86	0.66	100.35
GRAN1	HP Granulate forming line	Vertical	594667.46	3719486.90	603.33	98.43	86	0.66	100.35
DUST4	HP OSB Dust to boiler dust	Vertical	594769.71	3719462.10	603.33	98.43	86	0.98	91.03
DUST5	HP boiler Dust to MDF dust	Vertical	594944.13	3719472.93	603.33	98.43	86	0.98	91.03
DUST6	HP MDF Dust to boiler dust	Vertical	594772.42	3719462.96	603.33	98.43	86	0.98	71.52
DUST7	HP dust strander to dust silo	Vertical	594672.11	3719478.99	603.33	98.43	86	0.66	100.35
GRAN2	HP MDF Granulate to boiler granulate	Vertical	594778.79	3719464.96	603.33	98.43	86	0.98	91.03
GRAN3	HP Granulate from PB to OSB	Vertical	594532.84	3719508.90	603.33	98.43	86	0.98	91.03
GRAN4	HP Granulate from OSB to PB flaker silo	Vertical	594845.15	3719621.21	603.33	98.43	86	0.98	91.03
GRAN5	HP Granulate saws	Vertical	594666.23	3719490.81	603.33	98.43	86	0.98	71.52
DUST8	HP dust from saw filter to dust silo	Vertical	594670.14	3719478.41	603.33	98.43	86	0.98	71.52
GRAN6	HP Granulate screening to granulate silo	Vertical	594666.85	3719488.86	603.33	98.43	86	0.98	91.03
GRAN7	HP Granulate screening dust to dust silo	Vertical	594668.13	3719477.82	603.33	98.43	86	0.66	100.35
BELTDRY1	Belt dryer 1	Vertical	594628.82	3719558.61	603.33	230	131	13.78	102.03
BELTDRY2	Belt dryer 2	Vertical	594600.88	3719539.74	603.33	230	131	13.78	102.03
BELTDRY3	Belt dryer 3 and Press exhaust	Vertical	594556.57	3719516.08	603.33	230	125	13.78	128.35
BIOMASS	Biomass Heaters #1 and #2 (K7 and K8), two of four[1] gas-fired thermal oil heaters (K9-K12)	Vertical	594867.12	3719479.78	603.33	230	338	8.5	72.02

1. Kronospan is proposing to install four gas-fired thermal oil heaters. The modeled parameters for the BIOMASS stack represent the worst-case scenario of 2 biomass heaters running with 2 gas-fired thermal oil heaters.

Source ID	Description	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Release Height[3] (ft)	Initial Horizontal Dimension[4] (ft)	Initial Vertical Dimension[5] (ft)
VOLUME SOURCES[2]							
FSR_0001	Fugitive emissions from Strander Hall	594569.91	3719420.28	603.33	36.575	20.465	34.023
FSR_0002	Fugitive emissions from Strander Hall	594618.22	3719428.99	603.33	36.575	20.465	34.023
FSR_0003	Fugitive emissions from Strander Hall	594646.53	3719437.70	603.33	36.575	20.465	34.023
FSR_0004	Fugitive emissions from Strander Hall	594674.83	3719446.41	603.33	36.575	20.465	34.023
FSR_0005	Fugitive emissions from Strander Hall	594703.14	3719455.12	603.33	36.575	20.465	34.023

2. Emissions from four (4) OSB flakers, three (3) OSB stranders, and the chipper vent into the Strander Hall. Fugitive emissions from the building are represented by five (5) volume sources along the length of the building.
3. Release height: Building height / 2 = 73.15 ft / 2 = 36.575 ft
4. Initial horizontal dimension: Building width / 4.3 = 88 ft / 4.3 = 20.465 ft
5. Initial vertical dimension: Building height / 2.15 = 73.15 ft / 2.15 = 34.023 ft

TABLE 2-3 – PROJECT SOURCE MODELED EMISSION RATES

Source ID	Description	CO (lb/hr)	NO_x (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
GLUE	Glueing	-	-	0.45	0.08
SIFTER	Sifter / Screening	-	-	0.60	0.11
DUST1	HP Dust dryer 1-3	-	-	0.020	0.003
DUST2	HP Dust screening/gluing/forming	-	-	0.03	0.005
DUST3	HP Dust sanding	-	-	0.03	0.005
GRAN1	HP Granulate forming line	-	-	0.03	0.005
DUST4	HP OSB Dust to boiler dust	-	-	0.050	0.01
DUST5	HP boiler Dust to MDF dust	-	-	0.050	0.01
DUST6	HP MDF Dust to boiler dust	-	-	0.040	0.008
DUST7	HP dust strander to dust silo	-	-	0.03	0.005
GRAN2	HP MDF Granulate to boiler granulate	-	-	0.050	0.01
GRAN3	HP Granulate from PB to OSB	-	-	0.050	0.01
GRAN4	HP Granulate from OSB to PB flaker silo	-	-	0.050	0.01
GRAN5	HP Granulate saws	-	-	0.040	0.008
DUST8	HP dust from saw filter to dust silo	-	-	0.040	0.008
GRAN6	HP Granulate screening to granulate silo	-	-	0.050	0.01
GRAN7	HP Granulate screening dust to dust silo	-	-	0.03	0.005
BELTDRY1	Belt dryer 1	3.84	0.31	9.66	1.76
BELTDRY2	Belt dryer 2	3.84	0.31	9.66	1.76
BELTDRY3	Belt dryer 3 and Press exhaust	16.61	6.55	14.92	6.91
BIOMASS	Biomass Heaters #1 and #2 (K7 and K8), two of four[1] gas-fired thermal oil	73.82	78.30	13.32	12.67
FSR_0001	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0002	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0003	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0004	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112
FSR_0005	Fugitive emissions from Strander Hall	-	-	0.0424	0.0112

1. Kronospan is proposing to install four gas-fired thermal oil heaters. The modeled parameters for the BIOMASS stack represent the worst-case scenario of 2 biomass heaters running with 2 gas-fired thermal oil heaters.

TABLE 2-4 – CO-GEN ENGINES STACK PARAMETERS

Source ID	Description	Release Type	UTM Easting (m)	UTM Northing (m)	Base Elevation (ft)	Stack Height (ft)	Stack Temp (F)	Exit Diameter (ft)	Exit Velocity (ft/s)
NGES_W	Cogens 7, 8, 9, and 10 exhaust stack	Vertical	594154.74	3719380.84	603.33	35	446	4.00	72.72

TABLE 2-5 – CO-GEN ENGINES EMISSION RATES

Source ID	Description	CO (lb/hr)	NOx (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)
NGES_W	Cogens 7, 8, 9, and 10 exhaust stack	4.64	3.91	2.28	2.04

TABLE 2-6 – NEW BUILDING DETAILS

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)
WKSHP	Workshop	57.50	4	594137.33	3719460.70	594101.41	3719449.74	594108.98	3719424.93	594144.90	3719435.89	-	-	-	-
		58.00	4	594137.33	3719460.70	594101.41	3719449.74	594107.09	3719431.13	594143.01	3719442.09	-	-	-	-
		58.49	4	594137.33	3719460.70	594101.41	3719449.74	594105.20	3719437.34	594141.12	3719448.30	-	-	-	-
		58.99	4	594137.33	3719460.70	594101.41	3719449.74	594103.30	3719443.54	594139.22	3719454.50	-	-	-	-
OSB	OSB Warehouse	32.25	6	594352.22	3719514.13	594356.75	3719499.87	594401.91	3719514.12	594482.25	3719261.56	594259.91	3719191.14	594175.23	3719457.96
		34.00	6	594352.22	3719514.13	594356.75	3719499.87	594401.91	3719514.12	594482.25	3719261.56	594289.41	3719200.50	594204.73	3719467.32
		35.75	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		37.50	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		39.25	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		41.00	10	594352.22	3719514.13	594356.75	3719499.87	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09
		42.70	10	594347.54	3719496.97	594394.03	3719511.63	594444.22	3719353.35	594452.24	3719355.87	594460.46	3719330.09	594452.37	3719327.56
		54.60	6	594347.54	3719496.97	594394.03	3719511.63	594474.08	3719258.97	594379.07	3719228.89	594366.69	3719267.91	594415.24	3719283.20
		117.17	4	594372.55	3719417.99	594347.54	3719496.97	594394.03	3719511.63	594419.07	3719432.63	-	-	-	-
		118.84	4	594372.55	3719417.99	594347.54	3719496.97	594378.54	3719506.72	594403.58	3719427.72	-	-	-	-
		120.50	4	594372.55	3719417.99	594347.54	3719496.97	594363.04	3719501.81	594388.08	3719422.81	-	-	-	-
GLUE	Glue Hall	52.80	6	594480.12	3719527.28	594443.49	3719515.70	594462.45	3719455.76	594493.11	3719465.41	594480.36	3719505.65	594486.23	3719507.69
		67.70	4	594474.19	3719525.48	594443.49	3719515.70	594462.45	3719455.76	594493.11	3719465.41	-	-	-	-
		87.70	4	594480.14	3719506.49	594449.43	3719496.77	594462.45	3719455.76	594493.11	3719465.41	-	-	-	-
		99.70	6	594484.30	3719493.35	594468.23	3719488.14	594473.77	3719470.96	594459.02	3719466.61	594462.45	3719455.76	594493.11	3719465.41
		103.20	4	594484.30	3719493.35	594468.23	3719488.14	594477.12	3719460.41	594493.11	3719465.41	-	-	-	-
STRNDR	Strander Hall	49.20	8	594709.74	3719484.67	594671.03	3719472.63	594674.25	3719462.16	594585.59	3719434.37	594579.54	3719453.23	594565.10	3719448.93
		50.50	6	594713.00	3719474.31	594585.59	3719434.37	594579.54	3719453.23	594565.10	3719448.93	594579.39	3719404.14	594721.19	3719448.84
		73.15	4	594713.00	3719474.31	594571.11	3719429.85	594579.39	3719404.14	594721.19	3719448.84	-	-	-	-
DRYER1	Belt Dryer 1	75.00	4	594573.35	3719484.52	594552.04	3719551.49	594565.24	3719555.69	594586.55	3719488.72	-	-	-	-
		77.00	4	594573.35	3719484.52	594552.04	3719551.49	594558.64	3719553.59	594579.95	3719486.62	-	-	-	-
DRYER2	Belt Dryer 2	33.00	6	594593.40	3719492.24	594569.62	3719567.05	594582.82	3719571.25	594604.13	3719504.28	594614.19	3719507.44	594616.64	3719499.57
		73.00	4	594590.93	3719500.08	594569.62	3719567.05	594582.82	3719571.25	594604.13	3719504.28	-	-	-	-
		77.00	4	594597.51	3719502.18	594576.24	3719569.15	594582.82	3719571.25	594604.13	3719504.28	-	-	-	-
DRYER3	Belt Dryer 3	75.00	4	594610.63	3719590.02	594631.94	3719523.05	594618.74	3719518.85	594597.43	3719585.82	-	-	-	-
		77.00	4	594610.63	3719590.02	594631.94	3719523.05	594625.34	3719520.95	594604.03	3719587.92	-	-	-	-
ENERGY	Energy Center	35.25	4	594792.54	3719448.06	594754.96	3719436.28	594750.01	3719452.08	594787.59	3719463.86	-	-	-	-
		37.01	4	594792.54	3719448.06	594754.96	3719436.28	594752.49	3719444.18	594790.07	3719455.96	-	-	-	-

(Corners 7 through 10 continued for OSB Warehouse and Strander Hall):

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)	Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)
		35.75	10	594452.37	3719327.56	594474.08	3719258.97	594318.91	3719209.86	594234.23	3719476.68
		37.50	10	594452.37	3719327.56	594474.08	3719258.97	594348.41	3719219.23	594263.73	3719486.05
		39.25	10	594452.37	3719327.56	594474.08	3719258.97	594377.90	3719228.59	594293.22	3719495.41
		41.00	10	594452.37	3719327.56	594474.08	3719258.97	594407.40	3719237.95	594322.72	3719504.77
		42.70	10	594474.08	3719258.97	594379.07	3719228.89	594366.69	3719267.91	594415.24	3719283.20
STRNDR	Strander Hall	49.20	8	594579.39	3719404.14	594721.19	3719448.84	-	-	-	-
		50.50	6	-	-	-	-	-	-	-	-
		73.15	4	-	-	-	-	-	-	-	-

TABLE 2-7 – EXISTING BUILDING DETAILS

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 1 East (X)	Corner 1 North (Y)	Corner 2 East (X)	Corner 2 North (Y)	Corner 3 East (X)	Corner 3 North (Y)	Corner 4 East (X)	Corner 4 North (Y)	Corner 5 East (X)	Corner 5 North (Y)	Corner 6 East (X)	Corner 6 North (Y)	Corner 7 East (X)	Corner 7 North (Y)	Corner 8 East (X)	Corner 8 North (Y)
PBplant	Particle Board Plant	38	14	595080.42	3719816.66	594957.96	3719778.54	594956.81	3719782.22	594921.16	3719770.66	594928.17	3719744.67	594920.13	3719742.20	594926.41	3719721.33	594934.21	3719723.86
		55.5	15	594957.96	3719778.54	594956.81	3719782.22	594921.16	3719770.66	594928.17	3719744.67	594920.13	3719742.20	594926.41	3719721.33	594934.21	3719723.86	594965.95	3719617.93
		70	8	594998.14	3719589.46	594978.50	3719653.49	594957.26	3719646.94	594965.95	3719617.93	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13
MDF	MDF Warehouse	38	14	595526.07	3719527.18	595497.09	3719623.09	595402.19	3719593.58	595382.73	3719657.05	595152.29	3719584.00	595156.33	3719568.99	595013.95	3719524.62	595008.12	3719544.30
		57	14	595201.08	3719424.51	595177.51	3719495.71	595310.69	3719538.20	595302.33	3719562.73	595169.21	3719521.90	595156.33	3719568.99	595013.95	3719524.62	595008.12	3719544.30
		70	4	594991.64	3719478.73	594967.72	3719470.59	594975.60	3719445.27	594999.91	3719453.30	-	-	-	-	-	-	-	-
Resin	Resin Plant	42	6	595161.75	3719875.24	595093.24	3719854.48	595102.03	3719828.7	595179.13	3719851.21	595171.43	3719874.23	595162.97	3719871.54	-	-	-	-
		57	4	595161.75	3719875.24	595093.24	3719854.48	595102.03	3719828.7	595169.98	3719848.54	-	-	-	-	-	-	-	-
		80	4	595130.52	3719865.79	595134.91	3719852.85	595165.76	3719862.22	595161.75	3719875.24	-	-	-	-	-	-	-	-
FPHouse1	Fire Pump House 1	30	4	594133.81	3719305.56	594130.52	3719316.18	594114.52	3719310.87	594118.34	3719300.12	-	-	-	-	-	-	-	-
FPHouse2	Fire Pump House 2	30	4	594127.70	3719324.95	594124.29	3719335.48	594108.24	3719330.27	594112.09	3719319.67	-	-	-	-	-	-	-	-
PAL	PAL Building	30	6	594926.45	3719432.47	594900.84	3719513.98	594909.73	3719516.79	594905.48	3719530.48	594865.45	3719517.94	594896.33	3719422.75	-	-	-	-
		45	5	594909.73	3719516.79	594905.48	3719530.48	594865.45	3719517.94	594869.88	3719504.32	594900.84	3719513.98	-	-	-	-	-	-
Mntnc	Maintenance Building	30	4	594897.47	3719557.04	594868.94	3719651.86	594894.3	3719659.49	594922.83	3719564.67	-	-	-	-	-	-	-	-
Flaker	Flaker Building	30	8	594889.30	3719553.80	594850.40	3719542.62	594846.48	3719555.87	594855.94	3719558.94	594843.29	3719600.58	594866.23	3719607.06	594879.38	3719566.15	594885.09	3719567.82
CYT	Cyclone Tower	80	4	594984.00	3719540.15	595021.51	3719552.14	595015.44	3719571.14	594977.94	3719559.15	-	-	-	-	-	-	-	-
DstBrnr	Dust Burner	60	6	594803.86	3719679.78	594810.08	3719658.66	594829.87	3719664.62	594826.95	3719673.47	594814.98	3719670.12	594811.24	3719681.98	-	-	-	-
WESP	Wet Electrostatic Precipitator	60	4	594808.84	3719711.95	594815.65	3719689.69	594829.76	3719694.02	594822.96	3719716.28	-	-	-	-	-	-	-	-

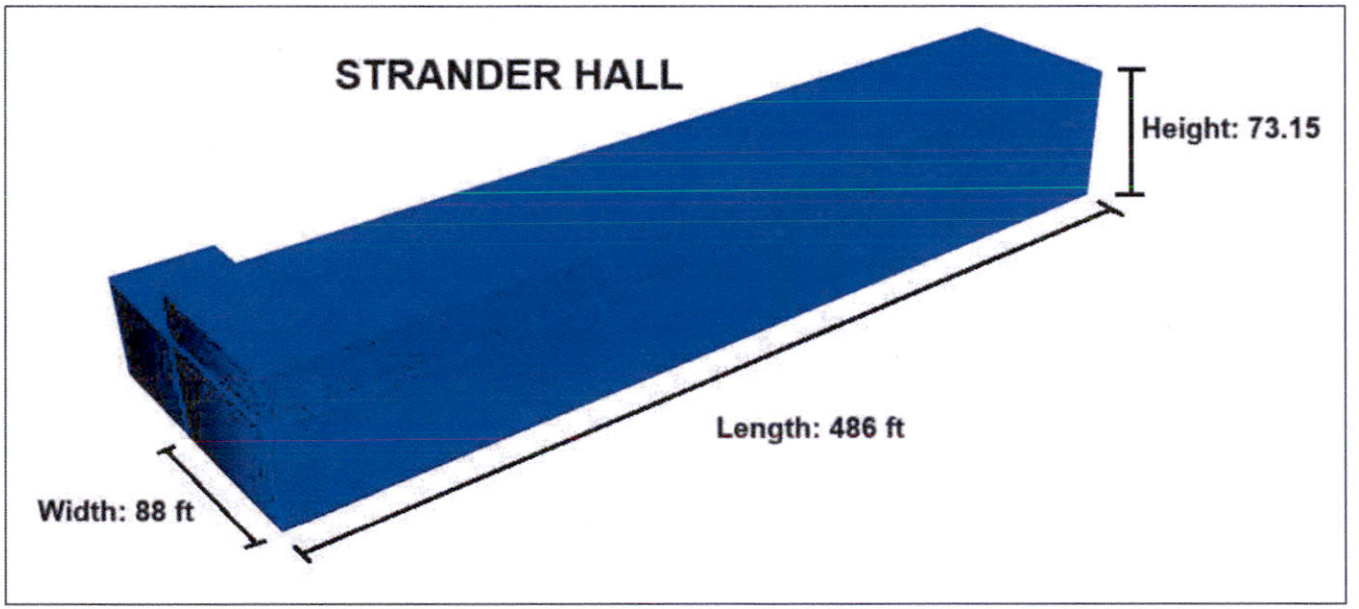
(Corners 9 through 15 continued for PBplant and MDF):

Building ID	Description	Tier Height (ft)	Number of Corners	Corner 9 East (X)	Corner 9 North (Y)	Corner 10 East (X)	Corner 10 North (Y)	Corner 11 East (X)	Corner 11 North (Y)	Corner 12 East (X)	Corner 12 North (Y)	Corner 13 East (X)	Corner 13 North (Y)	Corner 14 East (X)	Corner 14 North (Y)	Corner 15 East (X)	Corner 15 North (Y)
PBplant	Particle Board Plant	38	14	594965.95	3719617.93	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13	595137.98	3719633.03	-	-
		55.5	15	594957.55	3719615.07	594956.78	3719617.39	594934.10	3719609.61	594945.76	3719573.13	594998.14	3719589.46	594952.55	3719738.13	594968.81	3719743.29
		70	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MDF	MDF Warehouse	38	14	594975.18	3719534.65	594991.64	3719478.73	594967.72	3719470.59	594993.37	3719391.84	595016.94	3719398.39	595027.06	3719369.54	-	-
		57	14	594975.18	3719534.65	594991.64	3719478.73	594967.72	3719470.59	594993.37	3719391.84	595016.94	3719398.39	595027.06	3719369.54	-	-
		70	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2-8 – LAND USE ANALYSIS FOR 3-KM RADIUS AREA AROUND KRONOSPAN FACILITY

NLCD Category	Description	Area (m^2)	Percent
11	Open Water:	275,400	1.0%
12	Perennial Ice/Snow:	0	0.0%
21	Developed, Open Space:	4,550,400	16.1%
22	Developed, Low Intensity:	1,802,700	6.4%
23[a]	Developed, Medium Intensity:	1,341,900	4.7%
24[a]	Developed, High Intensity:	747,900	2.6%
31	Barren Land (Rock/Sand/Clay):	66,600	0.2%
32	Unconsolidated Shore:	0	0.0%
41	Deciduous Forest:	6,830,100	24.2%
42	Evergreen Forest:	3,488,400	12.3%
43	Mixed Forest:	1,510,200	5.3%
51	Dwarf Scrub:	0	0.0%
52	Shrub/Scrub:	752,400	2.7%
71	Grasslands/Herbaceous:	585,000	2.1%
72	Sedge/Herbaceous:	0	0.0%
73	Lichens:	0	0.0%
74	Moss:	0	0.0%
81	Pasture/Hay:	6,033,600	21.3%
82	Cultivated Crops:	215,100	0.8%
90	Woody Wetlands:	49,500	0.2%
91	Palustrine Forested Wetland:	0	0.0%
92	Palustrine Scrub/Shrub Wetland:	0	0.0%
93	Estuarine Forested Wetland:	0	0.0%
94	Estuarine Scrub/Shrub Wetland:	0	0.0%
95	Emergent Herbaceous Wetland:	21,600	0.1%
96	Palustrine Emergent Wetland:	0	0.0%
97	Estuarine Emergent Wetland:	0	0.0%
98	Palustrine Aquatic Bed:	0	0.0%
99	Estuarine Aquatic Bed:	0	0.0%
	Total:	**28,270,800**	**100.0%**
	Total Rural:	26,181,000	92.6%
	Total Urban:	2,089,800	7.4%

FIGURE 2-1 – STRANDER HALL DIMENSIONS USED TO CALCULATE VOLUME SOURCE PARAMETERS



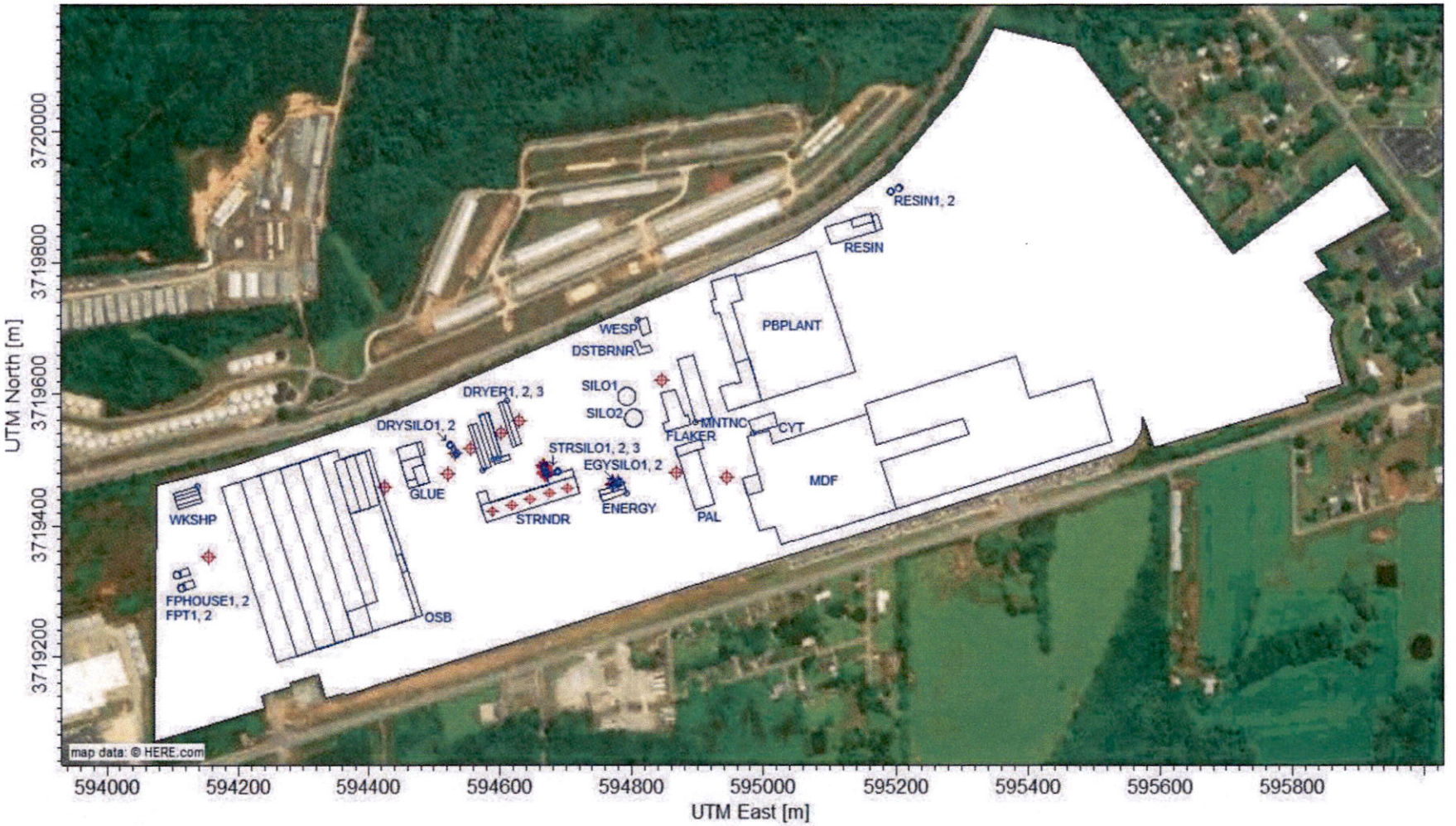


FIGURE 2-2 – SCALED MAP WITH LAYOUT OF BUILDINGS AT THE KRONOSPAN FACILITY

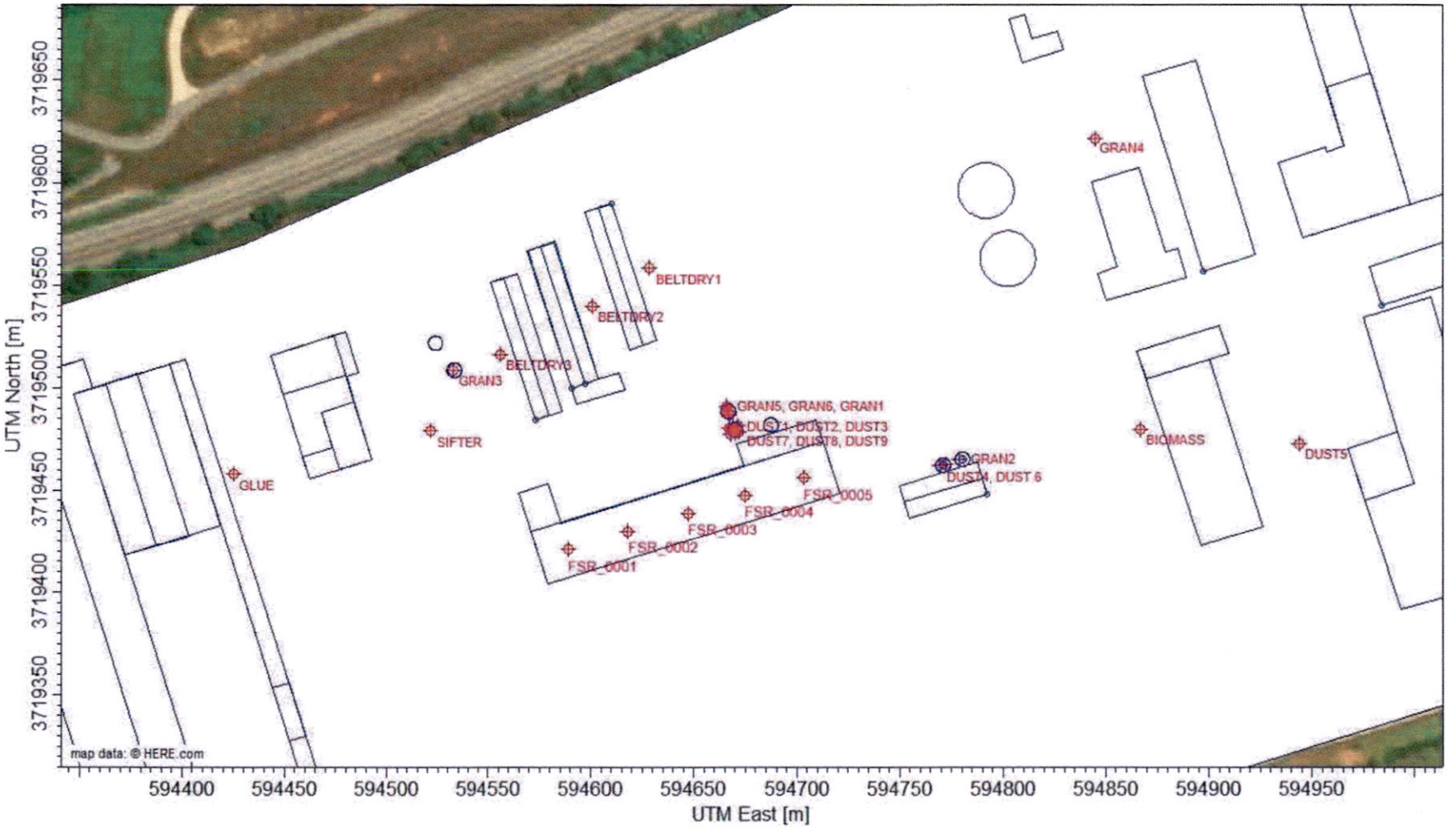


FIGURE 2-3 – SCALED MAP WITH LAYOUT OF PROJECT SOURCES AT THE KRONOSPAN FACILITY

3. PSD AIR QUALITY ANALYSIS

The PSD air quality analysis will include atmospheric dispersion modeling using a U.S. EPA-approved model to simulate the downwind transport and predicted off-site concentrations from emissions of the affected pollutants related to the OSB Expansion Project.

Modeled concentrations resulting from the maximum potential emissions from the new project sources will be compared against significant impact levels (SILs); if SIL thresholds are exceeded, a full impacts analysis will be done including a PSD increment analysis and NAAQS analysis, as described in this protocol.

The ambient air boundary for the facility is defined by a combination of physical fencing and signage to preclude public access from the facility. The ambient air boundary is shown in the facility aerial map in Figure 1-1 (physical fencing boundary in blue, signage boundary in yellow).

As shown in the figure, the physical fence encloses most of the western and southern boundary of the facility. Kronospan has then installed signage beginning approximately 190 feet east of the existing laminate plant near the southeast corner, extending around the eastern and northern boundary of the facility and terminating at the beginning of the physical fence near the northwest corner. The property boundary is not regularly patrolled; however, the northern boundary of the facility is directly adjacent to the Anniston Army Depot and the facility is fitted with multiple cameras around the processes.

Background concentrations were requested from ADEM for inclusion in the modeling. Table 3-1 summarizes the background concentrations that will be used for comparison to the NAAQS.

TABLE 3-1 – AMBIENT BACKGROUND CONCENTRATION VALUES

Monitor Name	Monitor ID Number	Pollutant	Averaging Period	Rank	Years	Monitor Value ($\mu g/m^3$)
Ward, Sumter Co.	01-119-0003	$PM_{2.5}$	24-hour	98th percentile	2021-2023	16
			Annual	Arithmetic mean	2021-2023	6.2
Tarrant	01-073-6002	PM_{10}	24-hour	H2H	2021-2023	57
Yorkville,	13-223-0003	NO_2	1-hour	98th percentile	2013-2015	31
Statewide Value			Annual	Arithmetic mean	-	7.5

To fulfill preconstruction monitoring requirements and pre-operation/post-operation ozone monitoring requirements, Kronospan will request Air Quality System (AQS) reports from ADEM that provide monitoring data from ADEM's existing air monitoring network to satisfy these requirements. The AQS reports will be documented in the final modeling report.

An off-property emissions inventory was requested from ADEM on March 6, 2025. Table 3-2 lists the significant impact area for each pollutant above the SIL in modeling. For the increment

modeling and NAAQS modeling, Kronospan will use the inventories provided by ADEM without change.

TABLE 3-2 – SIGNIFICANT IMPACT AREAS FOR POLLUTANTS ABOVE THE SIL

Pollutant	SIA (km)	Centroid UTM (Zone 16, NAD83)
NO_2 1-hour	50	594510.90, 3719455.00
$PM_{2.5}$ Annual	1.66	594549.40, 3719486.00
$PM_{2.5}$ 24-hour	9.30	594549.40, 3719486.00
PM_{10} Annual	0.71	594549.40, 3719486.00
PM_{10} 24-hour	0.58	594549.40, 3719486.00

To account for building downwash effects on emissions, building dimensions and locations for all existing buildings at the facility and all new buildings associated with the project will be entered into USEPA's BPIP-PRIME (version 04274) software. BPIP-PRIME will create direction-specific structure dimensions and dominant downwash structure parameters which will be incorporated into the dispersion model for the purpose of estimating the impact of aerodynamic downwash.

Table 2-2 includes the base elevation of each source. The Kronospan site will be graded and base elevations included in the modeling for sources and buildings have been provided by Kronospan.

4. METEOROLOGICAL DATA

Based on the location of the facility in Calhoun County, Alabama, the representative NWS surface station for the project is Anniston, Alabama (ID: 13871) and the representative NWS upper air station for the project is Alabaster, Alabama (ID: 53823).

Kronospan requested from ADEM the most recently available five years (2019 – 2023) of meteorological data for these stations, preprocessed with AERMET version 24142. Kronospan will use this data, without change, in the modeling analysis.

5. AIR QUALITY MODEL SELECTION | MODELING

The dispersion modeling analysis will be conducted using the latest version (24142) of USEPA's American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). AERMOD is recommended by the EPA's Appendix W Guidance for determining near-field impacts (impacts within a 50 km radius of the facility) and is approved for regulatory determinations. All model assessments will be performed using the regulatory default options using the "MODELOPT DFAULT" keyword. Tables of the model-predicted concentrations for all pollutants and averaging periods will be provided in the modeling report for comparison to the applicable thresholds.

Input parameters for all applicable sources to be included in the modeling are in Table 2-2 and Table 2-3, including UTM stack locations, stack parameters, and emission rates. Off-property

source inventories were requested from ADEM on March 6, 2025, and the off-property source stack parameters and locations will be included in the final modeling report.

For NO_2 modeling, Kronospan proposes to use the regulatory default ARM2 option with the default minimum and maximum NO_2/NO_X ratios of 0.5 and 0.9 to calculate conversion of NO_X to NO_2. Should impacts predicted with the ARM2 approach result in modeled exceedances of any threshold or standard, Kronospan would work with ADEM to obtain approval to use a more refined screening technique (PVMRM or OLM). If a refined screening technique will be used for NO_2 modeling, Kronospan will update the modeling protocol to discuss the method used as well as in-stack ratios and ozone data, for approval by ADEM.

For estimating the project impacts on secondary $PM_{2.5}$ and ozone formation, Kronospan will complete a Modeled Emission Rates for Precursors (MERPs) analysis. Ozone precursors are emissions of VOC and NO_X. Secondary $PM_{2.5}$ precursors are emissions of NO_X and SO_2.

Kronospan will use U.S. EPA's MERPs Guidance[4] as a first-tier assessment of impacts on secondary $PM_{2.5}$ and ozone formation. The analysis requires identifying a representative hypothetical source from EPA's MERPs modeling results and using Equation 1 to estimate the project's air quality impacts for secondary Ozone and $PM_{2.5}$:

$$\text{Project Air Quality Impact} = Project\ emission\ rate * \frac{Modeled\ air\ quality\ impact\ from\ hypothetical\ source}{Modeled\ emission\ rate\ from\ hypotheical\ source}$$

The Tallapoosa, Alabama hypothetical source is the nearest hypothetical source, approximately 85 km south of the Kronospan facility. It is located in an area of similar terrain and land use, with at least 90% of the surrounding area around the project and around the hypothetical source comprised of rural land use such as pastures and forested land. Due to the relatively close proximity to the project site, it is expected that the hypothetical source will experience similar meteorological conditions and will therefore be representative of the project site. Table 5-1 shows the modeled emission rates and maximum modeled air quality impact for the Tallapoosa hypothetical source.

TABLE 5-1 – TALLAPOOSA, ALABAMA HYPOTHETICAL SOURCE MODELED EMISSION RATES AND MODELED AIR QUALITY IMPACTS

Metric	Precursor	Emissions (TPY)	Stack Height (meters)	Maximum Modeled Air Quality Impact
8-hr Ozone	NO_X	500	10	1.87 ppb
8-hr Ozone	VOC	500	10	6.29E-02 µg/m^3
Annual $PM_{2.5}$	NO_X	500	10	3.38E-03 µg/m^3
Annual $PM_{2.5}$	SO_2	500	10	9.75E-03 µg/m^3

[4] United States Environmental Protection Agency. 2024. Clarification on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program.

Metric	Precursor	Emissions (TPY)	Stack Height (meters)	Maximum Modeled Air Quality Impact
Daily $PM_{2.5}$	NO_X	500	10	9.15E-02 µg/m^3
Daily $PM_{2.5}$	SO_2	500	10	3.25E-01

Table 5-2 shows the project's estimated secondary air quality impacts using Equation 1 and the Tallapoosa hypothetical source details.

TABLE 5-2 – PROJECT SECONDARY AIR QUALITY IMPACTS

Metric	Project Air Quality Impact
8-hr	1.54 ppb
Annual	2.98E-03 µg/m^3
Daily	0.083 µg/m^3

The project's estimated ozone impacts are greater than the ozone SIL of 1 ppb. Table 5-3 shows the project's ozone impacts added to a background monitor ozone value. The nearest active monitor with three recent years of complete data is the Southside monitor (ID: 01-055-0011). Because of its proximity to the plant site, this monitor provides the best representative ozone data for the area of the Kronospan facility.

TABLE 5-3 – SUMMARY OF PROJECT OZONE IMPACTS AND BACKGROUND OZONE VALUE NAAQS COMPARISON

Background Ozone Value (2021-2023)	Project Ozone Impacts	Total Ozone Impacts	Ozone NAAQS	Exceeds NAAQS?
61 ppb	1.54 ppb	62.54 ppb	70 ppb	No

As shown in the table, the total ozone impact including the background ozone value is less than the NAAQS; therefore, this analysis shows that the project is expected to demonstrate compliance with the ozone NAAQS in all areas.

The project's estimated secondary annual and daily $PM_{2.5}$ impacts will be added to the primary annual and daily $PM_{2.5}$ impacts modeled with AERMOD to obtain the total impacts on $PM_{2.5}$ before comparing to applicable thresholds. If the primary $PM_{2.5}$ impacts plus secondary $PM_{2.5}$ impacts

exceed the applicable SIL for either the annual or daily $PM_{2.5}$ averaging period, then a full impacts analysis will be conducted for the applicable pollutant/averaging period.

The impact of secondary $PM_{2.5}$ from existing nearby sources must also be evaluated; ADEM will provide this analysis.

6. RECEPTOR GRID & COORDINATE SYSTEM

Terrain data used will be 1/3 arcsecond resolution USGS National Elevation Data (NED) terrain files. The latest version of the AERMAP program (version 24142) will be used to process these NED terrain files to develop hill scale and terrain elevation inputs for each receptor. All coordinates for the project will be based on the NAD83 datum.

A discrete Cartesian receptor grid will be created extending from the fence line out to 10 km. Initial receptor spacing will consist of:

- 100 m spacing along the facility fence line;
- 100 m spacing from the fence line out to 4 km;
- 250 m spacing from 4 km to 7 km;
- 500 m spacing from 7 km to 10 km.

This receptor grid will be used to determine the Significant Impact Area (SIA) for each pollutant and averaging period that is modeled at or above the SIL. If necessary, the grid will be extended with receptor spacing of 500 m out to 20 km and a spacing of 1,000 m up to 50 km for identifying the maximum impacts, ensuring that concentrations are decreasing at the edges of the grid, and determining the significant impact area for each pollutant. Kronospan will ensure that maximum concentrations are resolved to 100 m. The NAAQS and PSD increment modeling domains will include the entire SIA for each pollutant and averaging period, as applicable. The SIA is defined as a circular area centered on the proposed sources with a radius equal to the distance to the farthest receptor at or above the SIL. The SIA will be established for every averaging period of every applicable pollutant for every year of meteorological data, and the largest of these SIAs will be used for each applicable pollutant for the NAAQS and/or increment compliance modeling.

Figure 6-1, Figure 6-2, and Figure 6-3 show maps of the fence line, near-field, and far-field receptor grids, respectively.

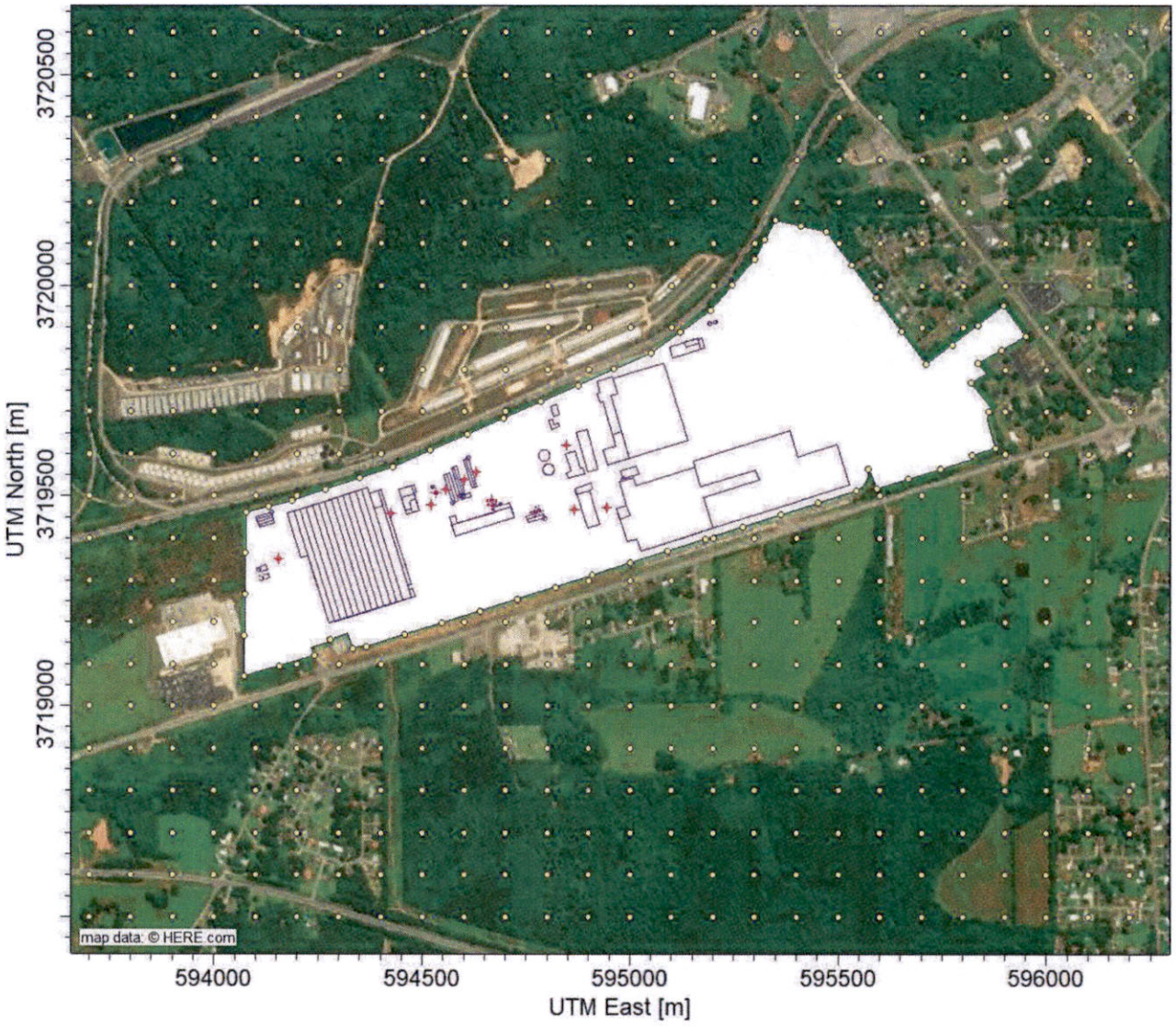


FIGURE 6-1 – FENCE LINE RECEPTOR GRID

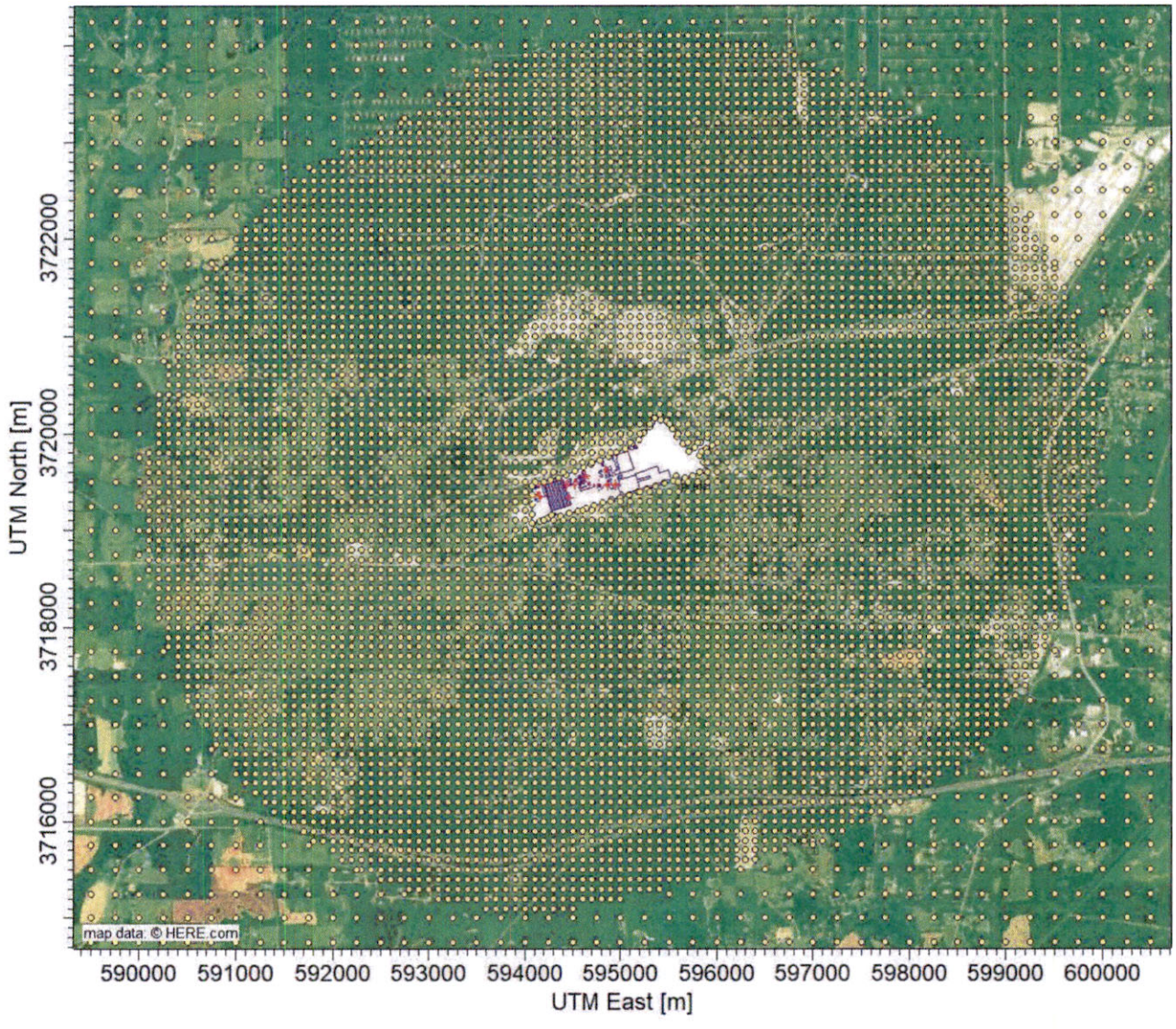


FIGURE 6-2 – NEAR-FIELD RECEPTOR GRID

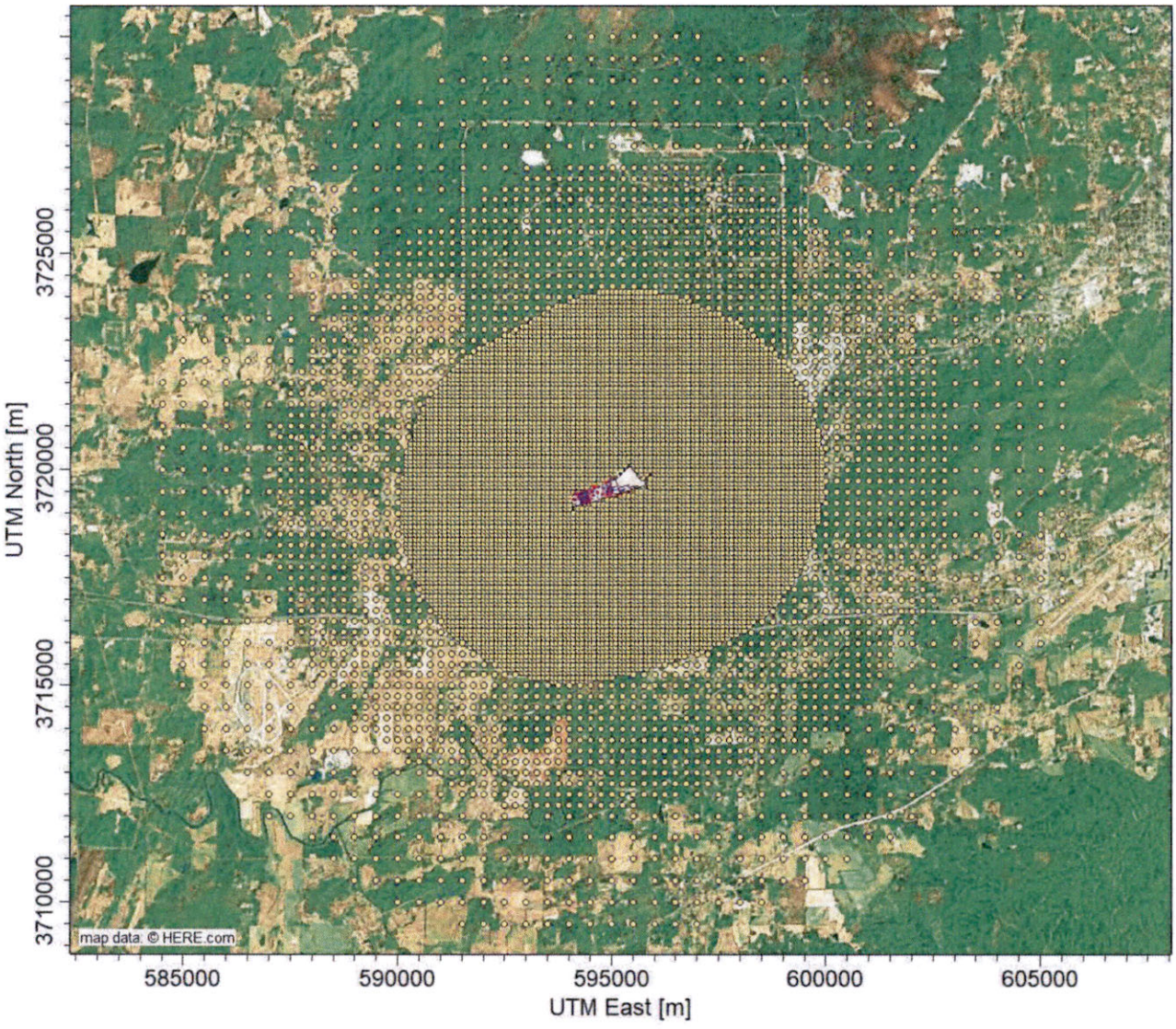


FIGURE 6-3 – FAR-FIELD RECEPTOR GRID

7. PSD FEDERAL CLASS I AREA IMPACTS

The analysis will address long range impacts to Air Quality Related Values (AQRVs) (such as visibility and deposition) in Class I Areas, following the procedures outlined in the Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase 1 Report – Revised (2010) for Class I areas. FLAG addresses assessments for sources proposed for locations at large distances (greater than 50 km) from these areas which is applicable to the Kronospan facility.

Following FLAG guidance, Kronospan will apply the Q/D test (Q = annual emissions in tons per year, D = distance in km, where Q/D<=10 warrants no further analysis) for proposed sources greater than 50 km from a Class I area to determine whether or not any further analysis is necessary. Table 7-1 summarizes the results of the Q/D test and indicates that additional analysis of AQRV impacts will not be necessary. Kronospan will notify the Federal Land Manager (FLM) of the project and the Q/D results using the ADEM-provided Applicability Request Form and will include ADEM on all correspondence with the FLM. ADEM is not requiring a Class I increment analysis for this project.

TABLE 7-1 –Q/D SUMMARY FOR SIPSEY WILDERNESS CLASS I AREA

Potential Project Emissions in TPY				Total (Q)	D (km)	Q/D
NO_X	SO_2	SAM	PM_{10}			
383	20	0	217	620	149	4.16

8. ADDITIONAL IMPACTS

The elements of the growth analysis for this project will include: (1) a projection of the associated industrial, commercial, and residential source growth that will occur in the area due to the source, (2) an estimate of the air emissions generated by the above associated industrial, commercial, and residential growth, and (3) a determination whether or not this growth will cause an increase in air emissions that could have an adverse impact on air quality, visibility, soils and vegetation.

The soil and vegetation analysis will be based on an inventory of the soil and vegetation types found in the impact area. This inventory will include all vegetation with any commercial or recreational value.

9. CONCLUSION/COMPLIANCE

Table 9-1 lists the applicable SILs, PSD increments, and NAAQS thresholds. If the predicted maximum impacts from the analysis for significant impacts from the project are below the applicable SIL thresholds, Kronospan will assert that the proposed project does not cause or contribute to any exceedance of any applicable increment or standard. However, as indicated above, if predicted impacts from the proposed project exceed the SILs, a cumulative impacts assessment will be conducted for demonstration of compliance with PSD increments and NAAQS

and will include additional nearby sources of the applicable pollutants as described in this modeling protocol.

For PSD increment analysis, the project sources and emissions will be modeled with all nearby increment consuming and expanding sources from the inventory provided by ADEM and compared to the applicable PSD Class II increment. The PSD increment analysis will also identify all sources at Kronospan that are baseline sources or that consume or expand increment using the applicable baseline date for each pollutant. The major and minor source baseline dates for PM_{10} and SO_2 are January 6, 1975 and August 7, 1977, respectively. The major source baseline date for NO_X is February 8, 1988. The major source baseline date for $PM_{2.5}$ is October 20, 2010.

For NAAQS analysis, the new project sources will be modeled with the remainder of the existing Kronospan facility sources as well as other nearby sources from the inventory provided by ADEM. The maximum predicted impacts within the SIA will be added to ambient background concentrations provided by ADEM, and the combined total will be compared to the applicable NAAQS.

TABLE 9-1 – THRESHOLDS APPLICABLE TO THE PROJECT

Pollutant	Averaging Time	SIL (µg/m³)	PSD Increment (µg/m³)	NAAQS (µg/m³)
CO	8-hour	500	-	10,000
	1-hour	2000	-	40,000
NO_2	Annual	1	25	100
	1-hour	7.5	-	188
PM_{10}	Annual	1	17	-
	24-hour	5	30	150
$PM_{2.5}$	Annual	0.13	4	9
	24-hour	1.2	9	35

Once the modeling protocol is approved by ADEM, Kronospan will complete the modeling analysis following the methodology in the approved protocol to demonstrate compliance with the NAAQS and PSD increments. Kronospan will request ADEM review of the SIL modeling and will proceed with refined modeling after ADEM indicates agreement with the model setup and execution. Kronospan will submit a modeling report as part of the PSD permit application for the proposed project. The modeling report will summarize the modeling approach and methodology followed and will provide predicted concentration tables and isopleth maps for all pollutants and averaging periods, as applicable. Kronospan will also submit all input and output files from the modeling to ADEM for review along with the modeling report. The modeling will be run in regulatory mode with no parallel processing and no partitioning.

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