NORTH CAROLINA DIVISION OF AIR QUALITY

PSD Preliminary Determination and Application Review

Issue Date:

Region: Raleigh Regional Office
County: Chatham
NC Facility ID: 1900015
Inspector's Name: Matthew Mahler
Date of Last Inspection: 03/28/2019
Compliance Code: 5 / Outstanding Penalty

Facility Data

Applicant (Facility's Name): Arauco North America, Inc.

Facility Address:
Arauco North America, Inc.
985 Corinth Road
Moncure, NC 27559

SIC: 2493 / Reconstituted Wood Products
NAICS: 321219 / Reconstituted Wood Product Manufacturing

Facility Classification: Before: Title V **After:**
Fee Classification: Before: Title V **After:**

Permit Applicability (this application only)

SIP: 02D .0530, 02Q .0317
NSPS: NA
NESHAP: NA
PSD: Yes for VOC
PSD Avoidance: Yes for NOx
NC Toxics: NA
112(r): NA
Other: NA

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Savannah Carroll EHS Manager (919) 544-3025 985 Corinth Road Moncure, NC 27559	Jeff McMillian Plant Manager (919) 545-5865 985 Corinth Road Moncure, NC 27559	Savannah Carroll EHS Manager (919) 544-3025 985 Corinth Road Moncure, NC 27559

Application Data

Application Number: 1900015.19D
Date Received: 10/30/2019
Application Type: Modification
Application **Schedule**: PSD
Existing Permit Data
Existing Permit Number: 03449/T53
Existing Permit Issue Date: 06/16/2020
Existing Permit Expiration Date: 06/30/2021

Total Actual emissions in TONS/YEAR:

CY	SO2	NOx	VOC	CO	PM10	Total HAP	Largest HAP
2018	13.75	245.13	985.75	493.30	130.56	269.46	233.06 [Methanol (methyl alcohol)]
2017	12.64	216.83	708.04	340.86	123.16	241.97	175.06 [Formaldehyde]
2016	14.52	241.64	597.49	389.07	123.90	157.11	127.51 [Formaldehyde]
2015	12.64	296.93	793.10	518.43	182.48	82.62	40.77 [Methanol (methyl alcohol)]
2014	14.18	309.21	571.44	550.64	138.51	73.16	32.11 [Methanol (methyl alcohol)]

Review Engineer: Joseph Voelker

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 03449/T54
Permit Issue Date:
Permit Expiration Date:

I. Introduction and Purpose of Application

Arauco Panels USA LLC owns and operates a facility in Moncure, NC that is permitted to produce medium density fiberboard (MDF) and particle board (PB). The purpose of this application is to:

1. increase the allowable nitrogen oxides (NOx) emissions from the MDF plant's energy system (Energy System). Arauco shut down the PB plant at the facility in April 2020. Through this application, Arauco will incorporate this permanent shutdown of the PB plant emission units and utilize a contemporaneous netting analysis to increase the allowable NOx emissions from the Energy System. The analysis will show that the increase in NOx emissions will not be considered a PSD modification and therefore will not be subject to PSD review.

2. reevaluate the VOC BACT determination at the MDF plant originally incorporated into permit no. T47 issued August 30, 2017.

This application will be processed consistent with 15A NCAC 02D .0530 "Prevention of Signification Deterioration" and as a Title V significant modification consistent with 15A NCAC 02Q .0516.

II. Chronology

Date	Description
10/30/2019	PSD application for NOx received and assigned application no. 1900015.19D
11/01/2019	Application acknowledgment letter sent requesting one additional application hardcopy. Application on HOLD.
11/08/2019	Electronic copies of application and calculations received via email
11/13/2019	Application copy requested on 11/01/2019 received by the DAQ. Application HOLD was removed.
12/16/2019	ADD INFO email sent regarding modeled emission rates, NOx BACT, etc. Application on HOLD
01/02/2020	The application was placed on HOLD to incorporate VOC into the application. The intent is for a complete new application to supplant application received on 10/30/2019.
07/17/2020	Application addendum received by the DAQ via email. The original application received on 10/30/2019 is being completely superseded by this addendum.
08/31/2020	Tom Anderson sent a copy of the revised application to the FLMs.
08/31/2020	Email received from Pleasant McNeel of the Forest Service stating: "Thank you for keeping us informed and involving the USDA Forest Service in the project review. Please continue to copy me on project communications for this facility, including the draft and final permits and any NC-DEQ Draft/Final Determination review."
08/31/2020	PSD completeness letter sent to Permittee. Application deemed "complete" as of 07/17/2020
09/04/2020	ADD INFO email sent requesting justification for the NOx netting aspects specifically related to the "Wellons burner" project
09/10/2020	SOC 2020-002 approved and accepted by the EMC.
09/11/2020	Memo issued by the AQAB addressing the required air quality analysis components of the PSD application
09/29/2020	Info requested on 09/04/2020 received via email. HOLD removed
09/30/2020	Phone conversation with John Bird. The discussion centered around a new moulding line project and how such a project would affect the current PSD application. It was decided to revise the netting calculations in the current application to account for the new project. Application placed on HOLD
10/29/2020	Revised netting calculations were received via email. Application removed from HOLD.
11/24/2020	Requested an updated netting analysis to correct the Wellons usage data to reevaluate contemporaneous and creditable status AND a list of PB plant sources that are to be removed from the permit
01/12/2021	revised netting analysis requested on 11/24/2020 was received via email
01/22/2021	list of PB sources to be removed requested on 11/24/2020 was received via email
MM DD YYYY	*Public Notice published on NCDENR DAQ website and in the Raleigh News and Observer. Concurrent public/EPA comment period begins*
MM DD YYYY	*Public comment period ends. TBD*
MM DD YYYY	*EPA comment period ends. TBD*

III. Modification Description

A. Increase the allowable nitrogen oxides (NOx) emissions from the MDF plant's energy system (Energy System)

Section 2.2.B.1 of the current permit is a PSD avoidance condition that has the following limitations applied to the MDF plant:

- Nitrogen oxide emissions shall not exceed 177.8 tons per consecutive 12-month.
- PM-2.5 emissions shall not exceed 111.9 tons per consecutive 12-month period.
- PM-10 emissions shall not exceed 116.9 tons per consecutive 12-month period.

The permittee does not wish to remove the PM2.5 and PM10 limitations.

To comply with the PSD avoidance NOx limitation the permittee is required to:

> …. maintain a minimum urea/water solution (45% urea concentration by volume) injection rate of 0.24 gpm (3-hour block average) **(ID No. CD02-A)**. This injection rate does not apply during performance testing.

The injection of this solution to control NOx emissions is believed to have implications with the proper operation and maintenance of the biofilter, which is used for control of HAP emissions as required under MACT DDDD , and for control of VOC emissions as BACT under PSD. The following is a quote of Paragraph G of SOC 2020-002 approved and accepted as of September 10, 2020.

> In addition to the foregoing, the COMPANY has raised concerns about the urea injection system used to reduce nitrogen oxide ("NOx") emissions from the MDF Facility. In particular, the COMPANY believes that the urea may be interfering with the operation and performance of the BIOFILTER and that modification or elimination of the urea injection system may be necessary to assure proper operation of the BIOFILTER. Modification or elimination of the urea injection system would require additional permitting actions on the part of the COMPANY and the DAQ.

Originally, in the PSD application received on October 30, 2019, the Permittee was requesting to remove the NOx PSD avoidance condition altogether and subject the MDF plant to PSD review for NOx consistent with 40 CFR 51.166(r)(2)(i.e., the "source obligation" requirements). However, the facility shut the PB plant down completely in April of 2020. The facility therefore has revised its approach and through the contemporaneous netting approach will avoid PSD review and simply revise its allowable emissions under the PSD avoidance condition.

Pursuant to 40 CFR 51.166(a)(7)(iv)(a) a project is a major modification for a regulated NSR pollutant if it causes both a significant emissions increase as defined in 51.166(b)(39) and a significant net emissions increase as defined in 51.166(b)(3) and (b)(23). The following analysis will show that although the increase in NOx emissions is a significant emissions increase, it is not also a significant net emissions increase. Hence it is not a PSD modification and therefore will not be subject to PSD review.

In order to improve biofilter performance, Arauco would like to minimize the use of the urea/water injection system. Arauco is proposing to replace the existing PSD avoidance NOx emission limit with a new NOx emission limit that will only require the urea/water injection on an as-needed basis to keep its annual emissions below the new NOx emission limit.

See Section IV for discussion of the existing PSD avoidance NOx limit for the MDF plant (15A NCAC 02Q .0317).

B. Revaluation of the VOC BACT determination at the MDF facility incorporated into permit no. T47 issued August 30, 2017.

As stated in the application:

> Arauco is submitting this application to amend conditions established by the SOC signed by Arauco on September 9, 2015. The 2015 SOC allowed Arauco to decommission an existing VOC control device at the MDF plant due to underperformance and safety issues. The SOC contains a clause, in Item II.A.ii,

which requires Arauco to submit a PSD application if the PSD avoidance limit for VOC in Permit Condition No. 2.2.B.1.a was exceeded while the facility was operating without the VOC control device. According to the letter from DAQ to Arauco dated October 17, 2015, DAQ deemed it necessary that Arauco submit a PSD permit application, required to be submitted within 120 days of receipt of the letter, or February 14, 2017. Arauco submitted a timely PSD permit application in January 2017; however, after construction of the device and numerous attempts of continuous operation, the vendor guarantees for the VOC control device were not achievable. On July 26, 2019, Arauco signed a Special Order by Consent (2019 SOC) which required Arauco to conduct remedial work to address structural and performance issues associated with the VOC control device. Investigatory testing performed after the completion of this remedial work has confirmed that the VOC control device cannot be modified to meet the vendor guarantees for VOC destruction and the BACT limits established in the Title V Operating Permit. Arauco expects to sign a Special Order by Consent (2020 SOC) which requires the company to submit a PSD permit application with an updated BACT analysis for the MDF plant with BACT limits expressed in WPP1* VOC pounds per oven-dried ton processed by the MFD plant. Therefore, Arauco is now requesting the revision of the Best Available Control Technology (BACT) limits with this application.

* Wood Products Protocol 1 (WPP1) as provided in U.S. EPA, document entitled, "Interim VOC Measurement Protocol for the Wood Products Industry," July 200

In summary, the VOC BACT limits imposed into permit no. T47 issued August 30, 2017, although based on vendor guarantees, were not achievable in practice so the Permittee is submitting this application to incorporate achievable BACT limits. Thus, PSD review will be applied to the VOC emissions from the MDF plant, specifically the sources controlled by the biofilter.

Current BACT Limits

The current VOC BACT limits were addressed in two previous PSD applications. Application no. 1900015.17A, which resulted in the issuance of T47, addressed the incorporation of the VOC BACT limits into the permit. Application no. 1900015.18A, which resulted in the issuance of Permit No. T50, revisited the BACT analysis for certain VOC sources that were being physically modified. Upon review, the BACT for the revaluated sources was to remain unchanged. However, the units of the BACT limits for the sources controlled by the Biofilter were changed as follows:

BACT Limits as implemented in Permit No. T47 issued August 30, 2017.

Equipment/ Process	ID No.	Emission Limits*	Control Technology
MDF Facilities Operations			
Energy System	ES-02-A	2.88 lb WPP1 VOC/ODMT (24-hour average)	Biofilter (ID No. CD18)
Two Stage Boiler System with backup natural gas burners	ES-02-B ES-02-C ES-02-D	2.88 lb WPP1 VOC/ODMT (24-hour average)	
MDF Board Cooler and Press Hall	ES-06-B	2.88 lb WPP1 VOC/ODMT (24-hour average)	
MDF Press	ES-16	0.17 lb WPP1 VOC/MSF (24-hour average)	Biofilter (ID No. CD18)

The BACT Limits as implemented in Permit No. T50, issued November 21, 2018.

Equipment/ Process	ID No.	Emission Limits*	Control Technology
MDF Facilities Operations			
Two Stage Dryer System with backup natural gas burners	ES-02-B ES-02-C-1, C-2 ES-02-D	50% DRE of WPP1 VOC	Biofilter (ID No. CD18)
MDF Board Cooler	ES-06-B		
MDF Press and Press Hall	ES-16		

Because the sources were all commingled prior to control, there was no way to perform a source test directly to evaluate the BACT limits as presented in permit no. T47. The 50% destruction removal efficiency (DRE) value was the DRE

discussed in application no. 1900015.17A that led to the derivation of the lb VOC/MSF and lb/ODMT limits. Thus, these values were simply replaced with the 50% DRE to facilitate source testing and hence make the limits more practically enforceable.

This value was based on vendor guarantees. Paragraphs I.D through H of the SOC (SOC 2020-002) included as ATTACHMENT A to the draft permit explain the history and provide a reasonable explanation as to why the 50% DRE is an unreasonable BACT limit to be imposed to a biofilter controlling these sources at the MDF plant.
It is important to note that this biofilter is the control device used to achieve continuous compliance with MACT Subpart DDDD. The Permittee has worked with the vendor to determine the cause of the issue. The SOC at paragraph I.J states:

> Based on additional investigation of the performance issues associated with the BIOFILTER following the February 2020 investigatory testing, ARAUCO has concluded that the biological activity required to meet the methanol destruction condition is not possible due to the high temperatures of the off-gases from the process units and that that biological treatment of the methanol emissions is not feasible for the MDF Facility.

Since the imposed BACT is unachievable, the Permittee has supplied a revised PSD analysis. In the end, a BACT based on 25% DRE will be proposed.

See Section IV for full PSD discussion (15A NCAC 02D .0530).

IV. Regulatory Review

NOx only
15A NCAC 02Q. 0317: AVOIDANCE CONDITIONS for 15A NCAC 02D. 0530: PREVENTION OF SIGNIFICANT DETERIORATION

Baseline Actual Emissions (BAE) Analysis
Arauco currently complies with a PSD avoidance condition that addresses the NOx emissions from specific emission sources at the MDF plant. The PSD Avoidance condition had memorialized the emission factors to be used in Table 2.2 B.1 of the permit. The following is an excerpt of that table for the NOx emitting sources.

Emission Point	Description	NOx	
		EF	Units
EP-18/19/20	N.G. Combustion	0.098	lb/MMBtu
ES-02-A	Energy System Abort (50/50 dry/wet fuel)	0.33	lb/MMBtu
ES-02-A	Energy System Abort (dry fuel)	0.33	lb/MMBtu
EP-02/14	Dryer scrubber (SW)	0.33	lb/MMBtu
EP-02/14	Dryer scrubber (SW/HW)	0.33	lb/MMBtu
EP-02/14	Dryer scrubber (SW)(CDMDT)	0.33	lb/MMBtu
EP-02/14	Dryer scrubber (SW/HW)(CDMDT)	0.33	lb/MMBtu

Although not clear from the table above, during normal operation when the biofilter is in operation, with the exception of EP-18/19/20 (actually ES-18, -19 and -20 to avoid confusion with the emission point EP-18 for the biofilter), all of the above source emissions are commingled, subjected to the urea/water injection, routed to the biofilter and have the same exhaust point. This 0.33 lb/MMBtu emission factor was determined by site specific testing of the biofilter exhaust in November 2014 (The application incorrectly states that this factor is based on AP-42). Thus, all these sources have the same emission factor. Note it was assumed that even when the sources had separate emission points during bypass scenarios all the sources had the same emission factor. This is because all of the sources would still be subjected to the urea/water injection before being exhausted or, as in the case of the energy system abort, the 0.33 lb/MMBtu emission factor was greater and hence more conservative than the emission factor that was used prior to permit No. T44. See the permit review for T44 for further details. The sources ES-18/19/20 are three natural gas-fired hot oil heaters (also known as the Ness Heaters) with their own emission points.

The baseline emissions from these sources were based on the 24-month period of January 2015 through December 2016. Table C.2-1 shows a summary of throughputs used during this baseline period for purposes of estimating the baseline emissions.

Table C.2-1. Baseline Throughputs for MDF Plant [1]

Activity and Usage Description	Baseline Throughput
Hours of Operation	7,182 hr/yr
Mat Reject	493 hr/yr
Refiner Abort	161 hr/yr
Energy System (Teaford) Abort	53,618 MMBtu/yr
Maximum Press Production	153,502 MSF 3/4" per year
Historic Dryer Natural Gas Usage [2]	10% %
MDF Plant Production - SW	197,559 ODMT/yr
Natural Gas (MDF, plant-wide)	163,758 MMBtu/yr
Natural Gas (ES-02A)	59,607 MMBtu/yr
Furnace Wood Combustion	671,702 MMBtu/yr

1. Baseline throughputs are based on the 12-month average of throughput for the 24-month period of January 2015, through December 2016.
2. Based on natural gas runtimes in the Teaford drying system over the period of 2011 through 2016, or approximately 10% of total hours of operation.

The following is an excerpt of Table C.2-2 from the permit application showing a summary of the baseline NOx emissions.

Table C.2-2. Baseline Emissions Summary for the MDF Plant

Source	NO_X (tpy)
Energy Abort (ES-02A)	8.85
Dryers, Energy System (ES-02/06B)	113.75
Ness Burners (ES-18, 19, & 20)	5.11
Total Emissions	**127.71**

Contemporaneous Netting Analysis (Significant Net Emissions Increase)

40 CFR 51.166(b)(3)(i) defines net emissions increase as follows:

> *(a)The increase in emissions from a particular physical change or change in the method of operation at a stationary source as calculated pursuant to paragraph (a)(7)(iv) of this section; and*
>
> *(b)Any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable. Baseline actual emissions for calculating increases and decreases under this paragraph (b)(3)(i)(b) shall be determined as provided in paragraph (b)(47), except that paragraphs (b)(47)(i)(c) and (b)(47)(ii)(d) of this section shall not apply.*

The increase identified in 51.166(b)(3)(i) above was determined to be 180.32 tpy in the analysis described above in the Section entitled *Baseline Actual Emissions (BAE) to Projected Actual Emissions (PAE) Analysis (Significant Emissions increase analysis).* The other increase and decreases will be discussed below.

40 CFR 51.166(b)(3)(ii) states:

> *An increase or decrease in actual emissions is contemporaneous with the increase from the particular change only if it occurs within a reasonable period (to be specified by the State) before the date that the increase from the particular change occurs.*

A reasonable period is defined in 15A NCAC 02D.0530(b)(2) as seven years. Since this modification is to effectively remove the requirement to operate the urea/water injection system at all times, the earliest that the "increase from the particular change" could occur would be the date of permit issuance. Pursuant to 40 CFR 51.166(q)(2), the DAQ must make a final determination whether construction should be approved, approved with conditions, or disapproved within one year of the receipt of a complete permit application. Considering these facts and that the application was deemed

complete on July 17, 2020, the contemporaneous period for review purposes here is considered to be July 19, 2014 to July 17, 2021.

40 CFR 51.166(b)(3)(iii)(a) states:

> *(iii) An increase or decrease in actual emissions is creditable only if:*
> *(a) It occurs within a reasonable period (to be specified by the reviewing authority); and*

All increases or decreases in actual emissions considered in the analysis were verified to occur or are expected to occur **between July 19, 2014 and July 17, 2021.**

40 CFR 51.166(b)(3)(iii)(b) states:

> (*iii) An increase or decrease in actual emissions is creditable only if:*
> *(b) The reviewing authority has not relied on it in issuing a permit for the source under regulations approved pursuant to this section, which permit is in effect when the increase in actual emissions from the particular change occurs; and*

None of the increases/decreases considered here were relied upon in the issuance of a prior PSD permit.

40 CFR 51.166(b)(3)(iii)(c) states:

> (*iii) An increase or decrease in actual emissions is creditable only if:*
> *(c) The increase or decrease in emissions did not occur at a Clean Unit, except as provided in paragraphs (t)(8) and (u)(10) of this section.*

No sources at the Arauco facility are designated as a Clean Unit.

40 CFR 51.166(b)(3)(iii)(d) states:

> *(d) As it pertains to an increase or decrease in fugitive emissions (to the extent quantifiable), it occurs at an emissions unit that is part of one of the source categories listed in paragraph (b)(1)(iii) of this section or it occurs at an emission unit that is located at a major stationary source that belongs to one of the listed source categories. Fugitive emission increases or decreases are not included for those emissions units located at a facility whose primary activity is not represented by one of the source categories listed in paragraph (b)(1)(iii) of this section and that are not, by themselves, part of a listed source category.*

The Arauco facility is not one of the listed source categories described above, so fugitive emissions were not considered in this analysis.

40 CFR 51.166(b)(3)(iv) states:

> (*iv) An increase or decrease in actual emissions of sulfur dioxide, particulate matter, or nitrogen oxides that occurs before the applicable minor source baseline date is creditable only if it is required to be considered in calculating the amount of maximum allowable increases remaining available.*

No emission increases or decreases prior to the NOx baseline date of October 20, 1994 for Chatham County are included in this contemporaneous netting analysis.

40 CFR 51.166(b)(3)(v) states:

> *(v) An increase in actual emissions is creditable only to the extent that the new level of actual emissions exceeds the old level.*

This was taken into account. This will be discussed on as needed basis for each increase considered.

40 CFR 51.166(b)(3)(vi) states:

> *(vi) A decrease in actual emissions is creditable only to the extent that:*
> *(a) The old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds*

the new level of actual emissions;
(b) It is enforceable as a practical matter at and after the time that actual construction on the particular change begins;
(c) It has approximately the same qualitative significance for public health and welfare as that attributed to the increase from the particular change; and

This was taken into account. This will be discussed on as needed basis for each increase considered.

40 CFR 51.166(b)(3)(vii) states:

> *(vii) An increase that results from a physical change at a source occurs when the emissions unit on which construction occurred becomes operational and begins to emit a particular pollutant. Any replacement unit that requires shakedown becomes operational only after a reasonable shakedown period, not to exceed 180 days.*

This was taken into account. This will be discussed on as needed basis for each increase considered.

40 CFR 51.166(b)(3)(viii) states:

> *(viii) Paragraph (b)(21)(ii) of this section shall not apply for determining creditable increases and decreases.*

This was taken into account. This will be discussed on as needed basis for each increase considered.

Individual Increase/Decrease discussions
The Permittee included Table C.1-4 as a summary of all the projects it considered to be contemporaneous and creditable with the current project. The table is reproduced below. Each project will be discussed separately.

Table C.1-4. Contemporaneous Increases and Decreases (June 2013 - May 2020)

Project Name	Project Description	Baseline Period	Project Date	NO_x (tpy)
Wellons - Burner Project [1]	Added natural gas fuel for Wellons; Removed dust burner from Wellons	Oct-12 to Sep-14	October 2014	-30.27
Furnace Burner Project [2]	Added natural gas burners to ES-02A	N/A	October 2014	--
Ness Burner Replacement & Misc. Process Improvements [3]	Replaced Ness burners & implemented other process improvements	Jan-15 to Dec-16	January 2019	27.74
PB Plant Shutdown	PB plant shutdown	April-18 to March-20	April 2020	-141.09
Moulding Line(s)[4]	New Prime line project	N/A	May and Nov 2020	3.35
Total Increases and Decreases				**-140.27**

Wellons Burner Project
This change was addressed in the review for Permit No. T42 issued on January 10, 2014. Thus, the change was made enforceable on January 10, 2014.

The change can be summarized from Section 1 of that review document as follows:

> The Arauco Panels Moncure particleboard mill currently operates a biomass-fired Wellons unit (ID No. 3201) that provides heat to the particleboard press thermal oil system and exhausts to the particleboard dryers. The facility proposes to begin firing natural gas in the system using an existing natural gas burner and to vent the exhaust to the atmosphere when burning natural gas. The modification will consist of the addition of a natural gas train (piping). The facility still needs biomass firing capability in this unit; therefore, we are requesting the addition of an alternate operating scenario (AOS) to the permit for natural gas-firing.
>
> Additionally, the Permittee is requesting to fire natural gas in the Wellons unit as it is currently configured, that is, exhausting directly to the particle board dryers.

Prior to the issuance of Permit no. T42 the Wellons unit was permitted as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Particleboard Mill			
3201 **PSD** **MACT** **DDDD**	One "Wellons" wood suspension dust -fired burner (40 million Btu per hour maximum rated heat input) exhausting to either surface layer triple pass, rotary drum (#3) dryer [ID No. 1430] and/or core layer single pass, rotary drum (#1) dryer [ID No. 1420] and/or core layer single pass, rotary drum (#2) dryer [ID No. 1410]	CD-1431 AND/OR	High efficiency multi-cyclone with 2 tubes, each 132 inches in diameter
		CD-1421 AND/OR	High efficiency multi-cyclone with 4 tubes, each 80 inches in diameter
		CD-1411, AND	High efficiency multi-cyclone with 4 tubes, each 80 inches in diameter
		CD-PB-WESP CD-PB-PGT***	Wet electrostatic precipitator Packed bed scrubber with photochemical gas treatment

As a result of adding natural gas firing the unit was permitted as follows in Permit No. T42.

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
Particleboard Mill			
3201 **PSD** **MACT** **DDDD**	One "Wellons" unit operating as a: a) wood suspension dust -fired burner (40 million Btu per hour maximum rated heat input); or a b) natural gas-fired burner (21.8 million Btu per hour maximum rated heat input); exhausting to either surface layer triple pass, rotary drum (#3) dryer [ID No. 1430] and/or core layer single pass, rotary drum (#1) dryer [ID No. 1420] and/or core layer single pass, rotary drum (#2) dryer [ID No. 1410]	CD-1431 AND/OR	High efficiency multi-cyclone with 2 tubes, each 132 inches in diameter
		CD-1421 AND/OR	High efficiency multi-cyclone with 4 tubes, each 80 inches in diameter
		CD-1411, AND	High efficiency multi-cyclone with 4 tubes, each 80 inches in diameter
		CD-PB-WESP CD-PB-PGT***	Wet electrostatic precipitator Packed bed scrubber with photochemical gas treatment

The combustion of natural gas on per MMBtu basis has lower NOx emissions. Note the unit was still permitted to burn wood dust. Thus, any reductions achieved in NOx emissions in actual operation as a result of this change were not federally (or practically) enforceable at that time.

The Permittee supplied data that shows the Wellons unit last fired wood dust in September 2014 and started to fire natural gas in October 2014 onwards. Therefore, the decreases associated with the project first occurred in October 2014.

In Permit no. T49, issued February 28, 2018 the capability to fire-wood dust was removed from the permit. Thus, it was not until February 28, 2018 that any of the reductions resulting from firing natural gas in the Wellons unit could be considered federally (or practically) enforceable.

As discussed above, the contemporaneous period for this project is considered to be between July 19, 2014 and July 17, 2021. Since the emissions reductions as presented in this application occurred during the contemporaneous period and are creditable, these reductions will be included in the netting analysis.

MDF Dryer Burner Project

This change at the MDF plant was addressed in the review for Permit No. T48 issued on December 21, 2017. The change can be summarized from Section 1 of that review document as follows:

> Arauco Panels is requesting to replace the 78.5 MMBtu/hr backup natural gas burner ES-02-C with two 35 mm Btu/hr heaters in its stead to increase reliability of the plant during periods where the primary energy system, a 205 MMBtu/hr wood fired heater, is down for maintenance. During periods where the

> wood-fired energy system is not operating, the MDF plant does not operate at full capacity and struggles with quality and reliability. Also, the burner configuration, originally designed by the site's previous owner Uniboard, has a potential to increase risk for fire because the configuration is not up to modern standards for wood products safety.

The review further states:

> This project is intended to allow an increase in efficiency (i.e., throughput) of the dryers when firing natural gas. It is not intended to increase its overall "design capacity." The facility is able to achieve higher throughputs when firing wood. Even though firing natural gas will result in less emissions on a rate basis it will potentially allow for an increase in utilization of the entire MDF process on an annual basis. As such, the DAQ requested the Permittee to demonstrate that the project would not result in a significant increase in emissions as defined under PSD. The Permittee submitted a "baseline to projected actuals" analysis.

The Permittee did supply such an analysis and a 02D .0530(u) recordkeeping requirement was placed into the permit where it still exists at Section 2.1 A.6.

Note that the explanation above supports the notion that quantifying emissions directly with this project is difficult. For every MMBtu associated with wood combusted is displaced by natural gas one would expect the NOx emission to decrease but increasing utilization at the plant overall could result in more wood combustion and hence an increase in NOx elsewhere.

For the current netting analysis, the Permittee considered the project as contemporaneous but not creditable because of the inability to directly quantify. This engineer agrees with this approach.

Ness Burner Replacement & Misc. Process Improvements Project

This change at the MDF plant was addressed in the review for Permit No. T50 issued on November 21, 2018. The relevant changes for NOx concerns can be summarized from Section III of that review document as follows:

> Arauco is submitting this application for several process improvement projects that will increase emissions from the MDF mill. Since this is a physical change that will increase emissions at the mill, Arauco is providing the required analyses consistent with 15A NCAC 02D .0530 PSD. Emissions increases are compared to the significant emission rates (SER) provided in 40 CFR 51.166(b)(23)(i) to determine if PSD permitting is required. Emissions increases of VOC are expected to exceed the SER. The proposed project consists of the following:
>
> ***Thermal Oil Burner Replacement (i.e., "Ness Burner" replacement)***
> Arauco is proposing to increase the heat input capacities of the three (3) hot oil heaters (ES-18, 19, and 20) at the MDF Mill. The new burners will each have a maximum heat input capacity of 40 MMBtu/hr, but will be physically de-rated to 30.4 MMBtu/hr. The burners indirectly heat oil to heat the MDF Press (ES-16). Arauco is replacing the burners with higher-capacity burners to allow the mill to reduce downtime and increase throughput. The increased throughput allows a higher throughput in all equipment, as the equipment in the MDF process in series.
>
> In summary there will be physical modifications to emission sources and modifications to operations which are not emission sources that will allow an increase in throughput and hence an increase in emissions.

The permittee supplied a BA to PA analysis as follows:

Table 3-3. PSD Applicability of Proposed Project

Emissions	Total PM [1] (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	VOC (tpy)	SO_2 (tpy)	NO_X (tpy)	CO (tpy)	Lead (tpy)
(B) Projected Actual Emissions	92.30	92.30	91.95	426.50	9.82	143.68	250.90	0.02
(A) Baseline Actual Emissions	83.83	83.83	81.95	328.90	9.07	127.71	224.34	0.02
Total Change (B-A)	8.47	8.47	9.99	97.60	0.75	15.97	26.56	0.00
SER	25	15	10	40	40	40	100	0.6
% of SER	34%	56%	100%	244%	2%	40%	27%	< 1%
Exceeds?	No	No	No	YES	No	No	No	No

. Total PM emissions set equal to PM_{10} emissions.

The review notes that the analysis above included a baseline of January 2015 through December 2016, which was the same baseline as that for the MDF Dryer Burner Project described above. Hence, the projects were aggregated for PSD purposes and the 02D .0530(u) recordkeeping condition incorporated in Permit No. T48 at section 2.1 A.6 was revised in the issuance of T50 to include this project.

Note in the table above the project actual emissions were an increase of 15.97 tpy. In the current netting analysis, the Permittee is proposing an increase of 27.74 tpy which is a PTE estimate of the three hot oil heaters (ID Nos. ES-18, -19 and -20).

In any case, the 27.74 tpy value is greater than the PA of 15.97 tpy that covers both the *MDF Dryer Burner Project* and the *Ness Burner Replacement & Misc. Process Improvements Project*. Since these projects are both contemporaneous and creditable and represent a conservative estimate of emission increases associated with these projects, the 27.74 tpy value will be included in the netting analysis. Also note that since this value is the PTE of the Ness burners (hot oil heaters, ID Nos. ES-18, -19 and -20) and represent a creditable increase, which will have the effect of reducing the revised PSD avoidance limit, the emissions from these sources will not need to be included in the recordkeeping requirements for the revised PSD avoidance condition.

PB plant Shutdown Project

In April 2020, Arauco ceased operations of the PB plant. The following table (Table C.5-6) from the application summarizes the emissions changes for NOx.

The Permittee based this value on records of fuel combustion from the individual sources of NOx at the PB plant over the 24-month period of April 2018 through March 2020. This is clearly considered contemporaneous. It will be made creditable by making it practically enforceable by removing the sources from the revised permit. A review of the emissions inventory shows that this value is consistent with the emissions inventory data. Therefore this 141.09 tpy value will be included in the netting analysis.

Table C.5-6. PB Plant Shutdown Emissions Summary

Emissions	NO_X (tpy)
(B) Post Project, Actual Emissions	--
(A) Baseline Actual Emissions	141.09
Total Change (B-A)	-141.09

MDF Moulding Lines project

A MDF moulding line was added to the facility via permit No. T53 issued June 16, 2020. The line includes a small source of NOx (a natural gas drying oven with a total heat input of 2.6 MMBtu/hr, ID No. ES-M1B). This source is up and operational and hence contemporaneous with the proposed project. As it is considered a new unit for PSD purposes its PTE of NOx emissions must be considered. On October 29, 2020, the Permittee included a revised netting analysis to include two more moulding lines that are yet to be permitted and constructed but anticipated to be so before this PSD permit is issued (or the contemporaneous period ends). As such these new moulding lines are also considered contemporaneous. The revised netting analysis includes a PTE estimate for all the MDF moulding lines as 3.35 tpy. This value will be included in the netting analysis.

Netting Summary

Based on the discussions provided above and the submitted application with revisions, the DAQ finds the projects and increases and decreases summarized in Table C.1-4 as creditable and contemporaneous with the proposed project.

Revised PSD Avoidance Limitation

The revised PSD avoidance condition can be set as follows:

Baseline actual emissions:	127.71	tpy
Contemporaneous Increases and Decreases (net):	140.27	tpy
NOx PSD Significance Level:	40	tpy
Sum equals PSD avoidance limit:	308	tpy

Thus, 308 tpy is the level of annual NOx emissions below which the Permitee will have to limit the following MDF sources. Recall these sources during normal operation all have the same emission point and the gas stream is commingled prior to the urea/water injection system:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description	Emission Point
ES-02-A	Energy System consisting of a dry/wet wood/woodwaste-fired burner (205 million Btu per hour heat input)	CD02-A	Urea/water injection system	EP18
		CD02 in series with CD18	Venturi scrubber Biofilter	EP18
		CD14 in series with CD18	Venturi scrubber Biofilter	EP18
ES-02-B, ES-02-C-1, ES-02-C-2 and ES-02-D	Two Stage Dryer System Three backup natural gas-fired dryer burners (35, 35 and 17 million Btu per hour heat input respectively)	CD02 in series with CD18	Venturi scrubber Biofilter	EP18
		CD14 in series with CD18	Venturi scrubber Biofilter	EP18

The Permittee proposes to monitor the NOx emissions by tracking fuel consumption with the following emission factors:

- 0.791 lb NOx/ MMBtu uncontrolled wood-fired NOx emissions – source: NCASI TB 1020, Table 10.4, average for highly resinated wood (>20%), uncontrolled.

- 0.33 lb NOx/ MMBtu controlled wood-fired NOx emissions – source: November 4, 2014 source test on the combined outlet of ES-02-A and ES-02B as configured in permit No. T43

- 100 lb NOx/ MMscf uncontrolled natural gas-fired NOx emissions – source: AP-42 Section 1.4, External Combustion Sources: Natural Gas combustion

This approach seems reasonable. Source testing within 180 days of permit issuance (or other date if approved by DAQ) will be required to validate the uncontrolled and controlled wood-fired emission factors. During the testing the permittee will be required to establish/reestablish the minimum urea/water injection rate required when the injection system is in operation. The Permittee will be required to track operation of the urea/water injection system and use the appropriate NOx emission factors accordingly. Typical recordkeeping and reporting requirements will also be required. Testing every 5 years will be required to confirm or reestablish the emission factors and monitoring parameters.

VOC only

15A NCAC 02D .0530: PREVENTION OF SIGNIFICANT DETERIORATION

The PSD regulations are designed to ensure that the air quality in current attainment areas does not significantly deteriorate beyond baseline concentration levels. PSD regulations specifically apply to the construction and/or modification of EPA-defined Major Stationary Sources in areas designated as attainment or unclassified attainment for at least one of the criteria pollutants. North Carolina has incorporated EPA's PSD regulations (40 CFR 51.166) into its air pollution control regulations in 15A NCAC 02D .0530. Once it is determined that a pollutant exceeds the major source threshold, each of the remaining pollutants is subject to PSD review if the potential to emit (PTE) exceeds the Significant Emission Rates (SER).

The elements of a PSD review are as follows:

1) A Best Available Control Technology (BACT) Determination as determined by the permitting agency on a case-by-case basis in accordance with 40 CFR 51.166(j),
2) An Air Quality Impacts Analysis including Class I and Class II analyses, and
3) An Additional Impacts Analysis including effects on soils and vegetation and impacts on local visibility in accordance with 40 CFR 51.166(o).

Best Available Control Technology (BACT) Determination

Under PSD regulations, the basic control technology requirement is the evaluation and application of BACT. BACT is defined as follows [40 CFR 51.155 (b)(12)]:

> ***An emissions limitation...based on the maximum degree of reduction for each pollutant... which would be emitted from any proposed major stationary source or major modification which the reviewing authority, on a case-by-case basis, taking into account energy, environment, and economic impacts and other costs, determines is achievable... for control of such a pollutant.***

As evidenced by the statutory definition of BACT, this technology determination must include a consideration of numerous factors. The structural and procedural framework upon which a decision should be made is not prescribed by Congress under the Act. This void in procedure has been filled by several guidance documents issued by the federal EPA. The only final guidance available is the October 1980 "Prevention of Significant Deterioration – Workshop Manual." As the EPA states on page II-B-1, "A BACT determination is dependent on the specific nature of the factors for that **particular case**. The depth of a BACT analysis should be based on the quantity and type of pollutants emitted and the **degree of expected air quality impacts**." (emphasis added). The EPA has issued additional DRAFT guidance suggesting the use of what they refer to as a "top-down" BACT determination method. While the EPA Environmental Appeals Board recognizes the top-down approach for delegated state agencies,[1] this procedure has never undergone rulemaking and as such, the process is not binding on fully approved states, including North Carolina.[2] The Division prefers to follow closely the statutory language when making a BACT determination and therefore bases the determination on an evaluation of the statutory factors contained in the definition of BACT in the Clean Air Act. As stated in the legislative history and in EPA's final October 1980 PSD Workshop Manual, each case is different and the State must decide how to weigh each of the various BACT factors. North Carolina is concerned that the application of EPA's DRAFT suggested a top-down process will result in decisions that are inconsistent with the Congressional intent of PSD and BACT. The following are passages from the legislative history of the Clean Air Act and provide valuable insight for state agencies when making BACT decisions.

> The decision regarding the actual implementation of best available technology is a key one, and the **committee places this responsibility with the State**, to be determined on a case-by-case judgment. It is recognized that the phrase has broad flexibility in how it should and can be interpreted, depending on site.
>
> In making this key decision on the technology to be used, the State is to take into account energy, environmental, and economic impacts and other costs of the application of best available control technology. **The weight to be assigned to such factors is to be determined by the State**. Such a flexible approach allows the adoption of improvements in technology to become widespread far more rapidly than would occur with a uniform Federal standard. The only Federal guidelines are the EPA new source performance and hazardous emissions standards, which represent a floor for the State's decision.
>
> This directive enables the State to consider the size of the plant, the increment of air quality which will be absorbed by any particular major emitting facility, and such other considerations as anticipated and desired economic growth for the area. This allows the States and local communities to judge how much of the defined increment of significant deterioration will be devoted to any major emitting facility. If, under the design which a major facility proposes, the percentage of increment would effectively prevent growth after the proposed major facility was completed, the State or local community could refuse to permit construction, or limit its size. **This is strictly a State and local decision; this legislation provides the parameters for that decision.**
>
> One of the cornerstones of a policy to keep clean areas clean is to require that new sources use the best available technology available to clean up pollution. One objection which has been raised to requiring the use of the best available pollution control technology is that a technology demonstrated to be applicable in one area of the country in not applicable at a new facility in another area because of the differences in feedstock material, plant configuration, or other reasons. **For this and other reasons the Committee voted to permit emission limits based on the best available technology on a case-by-case judgment at the State level.** [**emphasis added**]. This flexibility should allow for such differences to be accommodated and still maximize the use of improved technology.

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[1] See, http://es.epa.gov/oeca/enforcement/envappeal.html for various PSD appeals board decisions including standard for review.

[2] North Carolina has full authority to implement the PSD program, 40 CFR Sec. 52.1770

Legislative History of the Clean Air Act Amendments of 1977.

The BACT analysis provided by Arauco for the proposed Project was conducted consistent with the above BACT definition as well as EPA's five step "top-down" BACT process. The "top down" methodology results in the selection of the most stringent control technology in consideration of the technical feasibility and the energy, environmental, and economic impacts. Control options are first identified for each pollutant subject to BACT and evaluated for their technical feasibility. Options found to be technically feasible are ranked in order of their effectiveness and then further evaluated for their energy, economic, and environmental impacts. In the event that the most stringent control identified is selected, no further analysis of impacts is performed. If the most stringent control is ruled out based upon economic, energy, or environmental impacts, the next most stringent technology is similarly evaluated until BACT is determined.

After establishing the baseline emissions levels required to meet any applicable NSPS, NESHAPs, or SIP limitations, the "top-down" procedure followed for each pollutant subject to BACT is outlined as follows:

- Step 1: Identify of all available control options - from review of EPA RACT/BACT/LAER Clearinghouse (RBLC), agency permits for similar sources, literature review and contacts with air pollution control system vendors.
- Step 2: Eliminate technically infeasible options - evaluation of each identified control to rule out those technologies that are not technically feasible (i.e., not available and applicable per EPA guidance).
- Step 3: Rank remaining control technologies - "Top-down" analysis, involving ranking of control technology effectiveness.
- Step 4: Evaluate most effective controls and document results – Economic, energy, and environmental impact analyses are conducted if the "top" or most stringent control technology is not selected to determine if an option can be ruled out based on unreasonable economic, energy or environmental impacts.
- Step 5: Select the BACT – the highest-ranked option that cannot be eliminated is selected, which includes development of an achievable emission limitation based on that technology.

Much of the following text is excerpted directly out of the application. Where DAQ interpretation differs from the text comments or text is abbreviated, *comments will be provided in italics*. Section numbers consistent with the application will also be provided to facilitate cross referencing with the application.

5.2 BACT REQUIREMENT

The proposed BACT permitting request is for those sources with VOC emissions controlled by the biofilter. There will be no new or modified emission sources at the facility.

5.3 BACT ASSESSMENT METHODOLOGY

The following sections provide details on the assessment methodology utilized in preparing the revised BACT analyses for the Moncure facility. As previously noted, the minimum control efficiency to be considered in a BACT assessment must result in an emission rate less than or equal to any applicable NSPS or NESHAP emission rate for the source. The units undergoing BACT are not subject to any NSPS or NESHAP emission limits for VOCs. While a NESHAP exists that regulates HAP emissions from plywood and composite wood (PCWP) sources, Arauco complies with the add-on control option under the PCWP NESHAP (40 CFR 63, Subpart DDDD), which does not contain numerical HAP limitations that could be considered BACT for VOC.

On January 29, 2016, Arauco submitted a construction permit application to install a single biofilter on the vents from the dryer system and duct burners (ES-02-B, C-1, C-2, and D), the energy system (ES-02-A), the board cooler and press hall (ES-06-B), and the MDF press (ES-16). DAQ issued a construction permit for the biofilter on July 1, 2016. As discussed below, the biofilter is proposed as BACT for VOC emissions from these sources. Proposed BACT for sources of VOC not routed to the biofilter is proper maintenance and operating practices.

In order to operate efficiently, wood products facilities use the wood shavings and fines produced onsite as fuel, which is the standard in the industry. To burn another type of fuel onsite would require Arauco to ship the fuel produced onsite to another location and to receive wood from another facility for use as fuel. This is highly inefficient and is not a part of the operation of an efficient wood products manufacturing operation. A wood products facility burning wood from another facility would "redefine the source" as provided in New Source Review Workshop Manual, EPA, October 1990, Section 3, pg. B.13, which states, "EPA has not considered the BACT requirement as a means to redefine the design of the source

when considering available control alternatives." Therefore, switching the wood fuel is considered out of the scope of a BACT analysis.

5.3.1. Identification of Potential Control Technologies

Potentially applicable emission control technologies were identified for the Moncure facility by researching the U.S. EPA control technology database, technical literature, control equipment vendor information, state permitting authority files, and by using process knowledge and engineering experience. The Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Rate (LAER) Clearinghouse (RBLC), a database made available to the public through the U.S. EPA's Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network (TTN), lists technologies and corresponding emission limits that have been approved by regulatory agencies in permit actions. These technologies are grouped into categories by industry and can be referenced in determining what emissions levels were proposed for similar types of emission units.

Arauco performed searches of the RBLC database in April 2020 to identify the emission control technologies and emission limits that were imposed by permitting authorities as BACT within the past ten years for emission sources comparable to the Arauco facility. The following categories were searched:

Board Presses (RBLC Code 30.520)
Board Mfg. Dryers (RBLC Code 30.530)

Furthermore, the RBLC search results were supplemented with BACT determinations from several recently issued air permits. Appendix D provides BACT cost effectiveness calculations, and Appendix E provides the RBLC search. As noted previously, no other units are subject to BACT review. Therefore, no additional RBLC searches or other technical reviews were performed.

5.4 DRYER, ENERGY SYSTEM, COOLER – BACT FOR VOCS

The energy system is composed of one (1) wood and woodwaste-fired burner rated at 205 MMBtu/hr heat input. The dryer system comprises a two-stage system accompanied by three (3) backup natural gas-fired burners rated at 35 MMBtu/hr, 35 MMBtu/hr, and 17 MMBtu/hr. This vent stream also contains exhaust from the MDF board cooler and press hall. This stream is being analyzed for VOC emissions to determine BACT.

5.4.1 Identification of Potential Control Techniques (Step 1)

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

- Biofiltration
- Catalytic Oxidation
- Thermal Oxidation
- Proper Maintenance and Operating Practices (base case)

These control technologies are briefly described in the following sections.

5.4.1.1 Biofiltration

In biofiltration, off-gases containing biodegradable organic compounds are vented, under controlled temperature and humidity, through a biologically active material. The process uses a biofilm containing a population of microorganisms immobilized on a porous substrate such as peat, soil, sand, wood, compost, or numerous synthetic media. As an air stream passes through the biofilter, the contaminants in the air stream partition from the gaseous phase to the liquid phase of the biofilm. Once contaminants pass into the liquid phase, they become available for the complex oxidative process by the microorganisms inhabiting the biofilm.

5.4.1.2 Catalytic Oxidation

See application for full narrative.

Arauco has experience utilizing RCO technology on continuous wood products presses (similar model and same manufacturer of the Moncure MDF press). The nature of lubrication from the continuous press fouls the precious metal catalyst bed in a matter of months. Industry practice has illustrated that RCO technology has not been successfully applied to wood dryers. An RBLC search displayed no instances of an RCO being applied as BACT to a dryer or wood furnace. For all these reasons, RCO technology is not considered in this BACT analysis.

5.4.1.3 Thermal Oxidation

See application for full narrative.

Based on previous BACT determinations found in the RBLC search and literature review, RTOs in use in the wood products industry have been shown to meet 95% control efficiency for VOC emissions.

5.4.1.4 Proper Maintenance and Operating Practices

VOC emissions can be reduced through proper maintenance and operating practices of the emission sources. The manufacturer's recommendations should be used when determining the appropriate operating specifications and developing a schedule for routine maintenance. This option is considered the base case for this analysis.

5.4.2 Elimination of Technically Infeasible Control Options (Step 2)

After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. The following sections evaluate the feasibility of the above-mentioned control technologies for reducing VOC emissions from the combined vent stream.

5.4.2.1 Biofiltration

While the microorganisms used in biofiltration are sensitive to temperature, Arauco considers this control technology technically feasible for a combined vent stream with the MDF press. From the RBLC and literature searches, biofiltration has been implemented on board presses previously.

The VOCs present in lumber are long-chained hydrocarbons such as terpenes and α-pinene, which are hydrophobic. Because of the nature of the long-chained hydrocarbons in the exhaust stream, a biofilter with a reasonable footprint/retention time will have a reduced control efficiency relative to a unit treating streams with large concentrations of methanol or formaldehyde. The microorganisms require a much longer retention time/size of a unit in order to provide an increased efficiency. While the emissions from the MDF process will contain a large proportion of methanol and formaldehyde, the dryer system vent also contains long-chained hydrocarbons. Since Arauco is proposing to continue to operate one biofilter to control emissions from both the dryer/energy system and the MDF press, Arauco proposes a 25% control efficiency for the combined stream, accounting for the reduced control efficiency for long-chain hydrophobic compounds. This 25% control efficiency is the highest efficiency shown in testing of the biofilter for total VOC control.

5.4.2.2 Catalytic Oxidation

As discussed in Section 5.4.1.2, catalytic oxidation is not technically feasible for this process. Therefore, it will not be discussed further in this BACT analysis.

5.4.2.3 Thermal Oxidation

Thermal oxidation has been shown to be a technically feasible option for minimizing VOC emissions from dryers and energy systems. Therefore, thermal oxidation will be considered further in the future steps for BACT determination.

5.4.2.4 Proper Maintenance and Operating Practices

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

5.4.3 Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-1. The efficiencies are vendor quotes when available, or accepted industry literature values. These values are provided for informational and ranking purposes only. They are not to be construed as emission limits or a request for enforceable restrictions.

Table 5-1. Dryer, Energy System, and Cooler: Remaining VOC Control Technologies

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	RTO	95%
	Biofilter	25%
	Proper Maintenance and Operating Practices	(Base Case)

5.4.4 Evaluation of Most Stringent Controls (Step 4)

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

5.4.4.1 Regenerative Thermal Oxidation

The definition of BACT in the Clean Air Act and in the Code of Federal Regulations states that BACT is decided "on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs." Arauco maintains that the use of an RTO and WESP is also not BACT due to energy and environmental impacts, as well as technical considerations for use of an RTO in the wood products industry.

As discussed earlier in Section 5.4.2.3 of this analysis, RTO control systems experience problems with the media due to loading of particulate matter. This has been the case even with the use a WESP or other particulate control system upstream of the RTO. Arauco estimates that the RTO ceramic media would have to be replaced on a bi-annual basis due to build-up of particulate matter.

While the control efficiency of an RTO is more effective at reducing VOC emissions than other technologies considered, the use of an RTO is extremely energy intensive and results in an increase in NOx and CO emissions (as combustion products). The remaining control option, biofiltration, does not present any of these adverse environmental impacts. Selection of thermal oxidation over biofiltration, therefore, leads to the generation of substantially more CO and NOx emissions. NOx emissions, in particular, have the additional environmental impact of increasing ground-level ozone.

The consideration of this trade-off between VOCs and NOx is a legitimate "environmental impact" to be evaluated in determining BACT for this source. In this instance, the area in which the facility is located does not have NOx non-attainment issues, but there are regional aspects to the consideration of this trade-off. Ozone formation is the result of the interaction between NOx and VOCs, and ground-level ozone formation is the impact of concern in relation to VOC emissions. In heavily forested rural areas, there is already a substantial load of naturally-occurring VOCs, resulting in very high VOCs to NOx ratios. In such areas, ozone formation is strongly NOx-limited, and the introduction of additional NOx into the regional airshed has a directly proportional relationship to ozone formation. To decrease VOC emissions at the expense of increasing NOx emissions, another ozone precursor, is at cross purposes, especially when rural ozone formation is more sensitive to NOx. Figure 5-1(*see application*), from NASA, shows NOx- and VOC-limited areas of the United States[13]; the southeastern United States, including North Carolina, is a heavily NOx-limited area, such that the addition of NOx to the atmosphere will have a much higher impact on ozone formation than the addition of VOCs.

See application for additional discussion.

As a result of the adverse environmental impacts of RTO technology and the technical issues resulting from constant TSP/PM10 loading when applied to the continuous direct-fired drying and energy systems (e.g. the need for wet control technology), Arauco eliminates this control option from consideration. In the next section, Arauco proposes a more energy and environmentally sound alternative as BACT for dryer and energy system VOC control.

The DAQ supports the selection of control that does not add NOx emissions. However, the facility already has wet control devices upstream of the current biofilter so the PM loading argument is not supportive of eliminating the RTO from consideration.

5.4.4.2 Biofiltration

Arauco is proposing the current biofilter as BACT technology for this application. Biofilter technology provides an energy efficient and environmentally sound alternative to an RTO for VOC removal from the exhaust from the dryer,

energy system, and board cooler. In particular, a biofilter has several benefits over RTO systems, including no consumption of fossil fuel, no additional (i.e., via control device fuel combustion) CO or NOx emissions, and limited greenhouse gas emissions.

Based on discussions with the biofilter manufacturer, Arauco has found that biofilters are very effective (over 90%) in control of organic hazardous air pollutants (HAPs) in accordance with the Plywood and Composite Wood Products Maximum Achievable Control Technology (MACT) requirements. They are less effective in control of some of the long-chain organic compounds resulting from wood decomposition, such as pinenes, due to residence time and water solubility issues. As such, their overall efficiency from a total VOC standpoint ranges cannot be guaranteed over 25%. Based on these considerations, Arauco proposes a biofilter minimum DRE of 25 percent or maximum emission rate of 7.10 lb WPP1 VOC/ODT as BACT for VOC control of the dryer and energy systems and board cooler.

5.4.4.3 Proper Maintenance and Operating Practices

Arauco has proposed a more stringent technology than proper maintenance and operating practices as BACT. Therefore, this control method will not be considered further.

5.4.5 Select BACT for Energy System/Dryer (Step 5)

Step 5 is the selection of a BACT control strategy and emission limit for VOC. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Section 3 and Appendix C of this report (Facility Emissions).

Comparisons were made between Arauco's proposed emissions and summarized RBLC limits. Since emissions expressed in terms of lb/hr are dependent on production rates, a meaningful comparison of lb/hr emission limits proposed as BACT for Arauco sources cannot be made with those entries in the RBLC. Similar facilities in North Carolina have BACT limits for the combined dryers and press at 7.49 lb VOCs/ODT.

A biofilter is considered BACT for VOCs. Arauco proposes a limit of 7.10 lb WPP1 VOCs/ODT for the combined vent stream from the dryer system, energy system, and board cooler. Arauco will monitor the bed temperature to ensure that the biofilter is operating correctly.

The DAQ agrees with this BACT. Because the BACT limit is based on the use of the biofilter, whose proper operation and maintenance is regulated under MACT Subpart DDDD, the Permittee will be required to meet all the MACT DDDD requirements for the biofilter for PSD purposes as well. The Permit will be simplified as necessary.

To be consistent with the units of the other BACT limits and with the recordkeeping at the facility, the limit of 7.10 lb WPP1 VOCs/ODT *(oven dry ton) will be converted to an oven dry metric ton basis.*

This conversion yields 7.83 WPP1 VOC/ODMT.

5.5 MDF PRESS – VOC BACT

Arauco operates one MDF press that vents to the dryer/energy system exhaust. VOCs from the press was previously controlled by the PGT system in series with a packed tower PGT system and will be controlled for VOC with the technology selected as BACT in this analysis. The BACT analysis for VOC emissions from the press is presented below.

5.5.1 Identification of Potential Control Techniques (Step 1)

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

- Biofiltration
- Catalytic Oxidation
- Thermal Oxidation
- Proper Maintenance and Operating Practices (base case)

These control technologies are briefly described in the following sections.

5.5.1.1 Biofiltration

See Section 5.4.1.1 for a discussion of biofiltration. Biofilters have been used previously for composite wood presses.

5.5.1.2 Catalytic Oxidation

See Section 5.4.1.2 for a discussion of catalytic oxidation. Unlike the dryer and energy system vent gas, the TSP/PM10 loading from the board press does not preclude the use of an RCO as control. An RBLC search displayed multiple instances of an RCO used as control for board presses. Therefore, RCO technology will be considered in the BACT analysis for the MDF press.

5.5.1.3 Thermal Oxidation

See Section 5.4.1.3 for a discussion of thermal oxidation. RTO technology is used elsewhere in the wood products industry for board presses and will be considered further in this analysis.

5.5.1.4 Proper Maintenance and Operating Practices

As with the dryer and energy system sources, VOC emissions can be reduced through proper maintenance and operating practices of the emission sources. This option is considered the base case for this analysis.

5.5.2 Elimination of Technically Infeasible Control Options (Step 2)

After the identification of control options, the second step in the BACT assessment is to eliminate any technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that would prohibit the implementation of the control or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits. The following sections evaluate the feasibility of the above-mentioned control technologies for reducing VOC emissions from the combined vent stream.

5.5.2.1 Biofiltration

While the microorganisms used in biofiltration are sensitive to temperature, Arauco considers this control technology technically feasible for the combined vent stream. From the RBLC and literature searches, biofiltration has been implemented on board presses previously.

The VOCs present in lumber are long-chained hydrocarbons such as terpenes and α-pinene, which are hydrophobic. Because of the nature of the long-chained hydrocarbons in the exhaust stream, a biofilter with a reasonable footprint/retention time will have a reduced control efficiency relative to a unit treating streams with large concentrations of methanol or formaldehyde. The microorganisms require a much longer retention time/size of a unit in order to provide an increased efficiency. While the emissions from the MDF press will contain a large proportion of methanol and formaldehyde, the dryer system vent contains long-chained hydrocarbons in a much higher proportion. Since Arauco is proposing to install one biofilter to control emissions from both the dryer/energy system and the MDF press, Arauco proposes a 25% control efficiency for the combined stream, accounting for the reduced control efficiency for long-chain hydrophobic compounds.

This 25% control efficiency is the highest efficiency guaranteed by the manufacturer for total VOC control.

The biofilter has already been installed and has been used to demonstrate compliance with MACT DDDD.

5.5.2.2 Catalytic Oxidation

Catalytic oxidation has been shown to be a technically infeasible option for minimizing VOC emissions from board presses due to fouling of the precious metals from the specialized lubrication of continuous presses. Therefore, RCO technology will not be considered further in the future steps for BACT determination.

5.5.2.3 Thermal Oxidation

Thermal oxidation has been shown to be a technically feasible option for minimizing VOC emissions from board presses. Therefore, thermal oxidation will be considered further in the future steps for BACT determination

5.5.2.4 Proper Maintenance and Operating Practices

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

5.5.3 Rank of Remaining Control Technologies (Step 3)

The third of the five steps in the top-down BACT assessment procedure is to rank technically feasible control technologies by control effectiveness. The remaining control technologies are presented in Table 5-2. The efficiencies are vendor quotes when available, or accepted industry literature values. These values are provided for informational and ranking purposes only. They are not to be construed as emission limits or a request for enforceable restrictions.

Table 5-2. MDF Press: Remaining VOC Control Technologies

Pollutant	Listed Control Technologies	Potential Control Efficiency (%)
VOC	RTO	95%
	Biofilter	25%
	Proper Maintenance and Operating Practices	(Base Case)

5.5.4 Evaluation of Most Stringent Controls (Step 4)

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

5.5.4.1 Regenerative Thermal Oxidation

As discussed earlier in this section, RTO systems are considered infeasible for BACT due to environmental impacts. Particulate-laden exhaust streams present problems for RTO systems even with when combined with upstream particulate control. Also, as discussed in Section 5.4.4.1, the use of combustion in RTO systems as control introduces NOx impacts, which have a higher correlation with ground-level ozone formation than VOC emissions in the southeastern United States. Therefore, Arauco does not consider RTO systems feasible for BACT from the MDF press.

5.5.4.2 Biofiltration

Arauco is proposing the current biofilter as BACT technology for this application. Biofilter technology provides an energy efficient and environmentally sound alternative to an RTO for VOC removal from the press exhaust. In particular, a biofilter has several benefits over RTO systems, including no consumption of fossil fuel, no additional (i.e., via control device fuel combustion) CO or NOx emissions, and limited greenhouse gas emissions. Since the biofilter will concurrently control emissions from the dryer and energy systems and the board cooler as well as the MDF press, Arauco proposes a similar 25% level of control for the MDF press vent stream, resulting in a BACT controlled emission rate of 0.26 lb WPP1 VOC/MSF of MDF throughput. Arauco proposes to monitor the bed temperature to ensure that the biofilter is operating correctly.

5.5.4.3 Proper Maintenance and Operating Practices

Arauco has proposed a more stringent technology than proper maintenance and operating practices as BACT. Therefore, this control method will not be considered further.

5.5.5 Select BACT for MDF Press (Step 5)

Step 5 is the selection of a BACT control strategy and emission limit for VOCs. The selected control technologies are those remaining from Step 4, and emission limits are proposed using data presented in Section 3 and Appendix C of this report (Facility Emissions).

A biofilter is considered BACT for VOCs. Arauco proposes a controlled emission limit of 0.26 lb WPP1 VOCs/MSF3/4 for the MDF press vent stream.

Recall the press emissions are commingled with the energy system and dryers prior to the biofilter. The press cannot operate independently of the energy system and dryers. Therefore, a source test to evaluate compliance with this BACT limit would be impossible. Since this source contributes relatively little to the total VOC emissions, the BACT limit will be combined with the BACT limit determined in Section 5.4.

Therefore, the proposed BACT limit will be 7.10 lb WPP1 VOCs/ODT (or 7.83 lb WPP1 VOC/ODMT) for the combined vent stream from the press, dryer system, energy system, and board cooler.

Because the BACT limit is based on the use of the biofilter, whose proper operation and maintenance is regulated under MACT Subpart DDDD, the Permittee will be required to meet all the MACT DDDD requirements for the biofilter for PSD purposes as well. The Permit will be simplified as necessary.

Air quality Analysis

Introduction

The PSD modeling analysis described in this section was conducted in accordance with current NCDAQ and USEPA PSD directives and modeling guidance. A summary of the modeling results is presented in the last topic, PSD Air Quality Modeling Results Summary. A detailed description of the modeling and modeling methodology is described below.

Project Description / Significant Emission Rate (SER) Analysis

Arauco Panels USA LLC (Arauco) plans to modify the Energy System to improve biofilter performance. One pollutant (VOC) exceeded the PSD Significant Emissions Rate (SER) and thus require a PSD analysis. These emission rates are provided in Table 1 below:

Table 1 – Pollutant Netting Analysis

Pollutant	Projected Emission Rate Increase (tons/yr)	Significant Emission Rate (tons/yr)	PSD Review Required?
NO_x	15.97	40	No
PM_{10}	8.47	15	No
$PM_{2.5}$	9.99	10	No
TSP*	8.47	25	No
SO_2	0.75	40	No
CO	26.56	100	No
VOC's	97.6	40	Yes

*N.C. requirement only.

Class II Area Significant Impact Air Quality Modeling Analysis

A significant impact analysis was conducted only for VOC's as an ozone precursor given that project emission increases were below SERs for the other PSD pollutants with Class II Area Significant Impact Levels (SIL).

Class II Area Tier 1 Screening Analysis for Ozone Precursors

A Tier 1 screening analysis was conducted to evaluate project precursor emissions impacts on secondary formation of ozone in Class II areas. The screening analysis was based on methodologies taken from EPA's *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier I Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program*. MERPs are defined as the screening emission level (tpy) above which project precursor emissions would conservatively be expected to have a significant impact on secondary $PM_{2.5}$ or ozone formation. A MERP value is developed for each precursor pollutant from photochemical modeling validated by EPA and a "critical air quality threshold". The MERPs guidance relies on EPA's 2016 draft SILs for $PM_{2.5}$ and ozone as the critical air quality threshold to develop conservative MERPs values. As such, NO_X and VOC project emissions were assessed by separately derived ozone MERPs values. The project impacts on secondary ozone were determined by summing the VOC project emissions as a percentage of the VOC MERP with the NO_X project emissions as a percentage of the NO_X MERP. A value less than 100% indicates that the combined impacts of VOC and NOx will not exceed the critical air quality threshold. As shown in Table 2, project impacts on 8-hour ozone were below the 100% threshold demonstrating that the project will not cause or contribute to a violation of the NAAQS.

Table 2 – Results of Tier I Screening Analysis for Ozone Precursors

Precursor	MERP (TPY)	Emission Increase (TPY)	Percentage of MERP
NOx	253	39	15 %

VOC	5,876	793	13 %
		Total	28 %

Class II Area Full Impact Air Quality Modeling Analysis

Class II Area NAAQS and PSD Increment full impact analyses were not required because project emission increases were below SERs for PSD pollutants with established NAAQS and Class II Area PSD Increments.

Additional Impacts Analysis

Additional impact analyses were conducted for growth, soils and vegetation, and visibility impairment. These analyses are discussed in the following sections.

Growth Impacts

The Arauco plant is an existing facility and there will be no additional permanent jobs added due to the proposed project. Therefore, this project is not expected to cause a significant increase in growth in the area.

Soils and Vegetation

VOCs are regulated as precursors to tropospheric ozone. Ozone is formed by the interaction of NO_x, VOC and sunlight. Elevated ozone concentrations can damage plant life and reduce crop production. The Arauco Moncure mill is located in Chatham County which is classified as attainment or unclassifiable for NO_2 and ozone. The Tier 1 Screening Analysis for Ozone Precursors estimated that Arauco's impact on ozone would be 28% of the MERP. Therefore, this project is not expected to cause a significant impact on soil and vegetation.

Class II Visibility Impairment Analysis

A Class II visibility impairment analysis was not conducted since there are not any visibility sensitive areas with the Class II Significant Impact Area.

Class I Area - Additional Requirements

There are four Federal Class I Areas within 300 km of the Arauco project – Swanquarter NWR, Linville Gorge Wilderness Area, James River Face Wilderness, and Cape Romain National Wildlife Refuge. The Federal Land Manager for each of those areas was contacted and none of them required any analysis; thus, no analysis was conducted.

Class I Area Significant Impact Level Analysis

A Class I Area significant impact screening analysis was not required because project emission increases were below SERs for PSD pollutants with established Class I PSD Increments.

Class I Increment/Air Quality Related Values (AQRV) Regional Haze Impact and Deposition Analyses

The project does not include significant emissions of pollutants with established Class I Area Increments or Deposition Analysis Thresholds. The project also does not include significant emissions of visibility-impairing pollutants such as NO_X, SO_2, $PM_{2.5}$, and PM_{10}. Therefore, analysis of project impacts on Class I Area Air Quality Related Values (AQRVs) was not required.

PSD Air Quality Modeling Result Summary

Based on the PSD air quality ambient impact analysis performed, the proposed Arauco Panels USA LLC modification will not cause or contribute to any violation of the Class II NAAQS, PSD increments, Class I increments, or any FLM AQRVs.

V. Permitting History since last renewal

The Permitting history for the facility since the last permit renewal (permit no. T45) is provided below. The discussion of permit no. T47 describes the background for the triggering of the PSD BACT that the Permittee is reevaluating in the current application.

Permit No.	Issue Date	Application No.	Application type
T53	06/16/2020	20A	TV-minor

Purpose of Application:
The purpose of this application is to construct and operate a new moulding production line at the MDF plant.

Permit No.	Issue Date	Application No.	Application type
T52	01/02/2020	18B, 19C	TV-significant

Purpose of Application:
The purpose of this combined application is:

Application No. 18B

- to incorporate monitoring parameters established during MACT DDDD(4D) required performance testing
- to address questions concerning emission factors incorporated into the PSD Avoidance condition found at Section 2.2 B.1.

Application No. 19A

- to remove wastewater evaporator (EVAP-1) from the permit;
- to revise MACT 5D boiler tune requirements for sources ES-18, -19 and -20;
- to add Routine control device maintenance exemption as allowed under MACT 4D;
- to satisfy the permit application submittal requirement of Section 2.2 B.3 in the current permit

Permit No.	Issue Date	Application No.	Application type
T51	03/06/2019	19A	TV-administrative

Purpose of Application:
The purpose of this application is for a name change as listed below:

New Facility Name: Arauco North America, Inc.
Former Facility Name: Arauco Panels USA LLC

Permit No.	Issue Date	Application No.	Application type
T50	11/21/2018	18A	Modification PSD and TV-Sign-501(b)(2) Part I

Purpose of Application:
Arauco has submitted a permit application to increase actual throughput in the MDF operation by making upgrades to plant equipment. No changes that are to be made will affect throughput of the PB operations. See the attached Preliminary Determination for full details.

This application was processed consistent with 15A NCAC 02D .0530 Prevention of Signification Deterioration. For Title V purposes, the changes were considered to be significant modifications. Because the changes to the permit were determined to not contravene or conflict with any conditions in the existing permit, the application was also processed in a two-step fashion consistent with 15A NCAC 02Q .0501(b)(2) and 02Q .0504. The Permittee shall file an amended application following the procedures of Section 15A NCAC 02Q .0500 (Title V) no later than 12 months after the issuance of permit no. 03449T50. *(The second step was addressed in the issuance of Permit No. T52.)*

Permit No.	Issue Date	Application No.	Application type
T49	02/28/2018	17B	TV-Significant

Purpose of Application:
The purpose of this application is as follows (excerpt from permit application):

On November 15, 2015, Arauco entered into a Special Order by Consent (SOC) to remove the existing PGT Control devices (CD02-2, CD14-2, CD16-2, and CD-PB-PGT). Alternative control systems have been evaluated and Arauco is submitting this Air Permit Modification Application to convert the particleboard green rotary dryers to dry rotary dryers, as defined in Part 63.2292, and to demonstrate PCWP MACT compliance for the particleboard press through successful demonstration of the production based compliance option as defined in Table A to Subpart DDDD of Part 63.

The SOC referenced above addresses the steps by which compliance with 40 CFR 63 Subpart DDDD will be achieved for the MDF plant and the PB plant. This includes the submittal of permit applications. This application will address compliance of the PB plant. Compliance by the MDF plant was addressed in application no. 16A which resulted in the issuance of permit no. T45. This application will be processed as a significant modification pursuant to 15A NCAC 02Q .0516.

In addition, permit no. T48, issued December 21, 2017 addressed a significant modification to the MDF plant backup burners (application no. 1900015.17D, see chronology). It was processed via the two-step process pursuant to 15A NCAC 02Q .0504. That modification will also be subjected to public and EPA review along with the modifications addressed specifically in this application. The review for permit no. T48 will be included as an attachment to this review.

Permit No.	Issue Date	Application No.	Application type
T48	12/21/2017	17D	TV-Sign-501(b)(2) Part I

Purpose of Application:
The purpose of this application is as follows (excerpt from permit application):

Arauco Panels is requesting to replace the 78.5 MMBtu/hr backup natural gas burner ES-02-C with two 35 mm Btu/hr heaters in its stead to increase reliability of the plant during periods where the primary energy system, a 205 MMBtu/hr wood fired heater, is down for maintenance. During periods where the wood-fired energy system is not operating, the MDF plant does not operate at full capacity and struggles with quality and reliability. Also, the burner configuration, originally designed by the site's previous owner Uniboard, has a potential to increase risk for fire because the configuration is not up to modern standards for wood products safety.

The new burners will be subject the Plywood and Composite Wood Products NESHAP (PCWP MACT DDDD) as they will directly fire the existing blow line MDF dryer. The burners ES -02-C and ES-02-A were deemed to not be subject to NSPS subpart Dc by the DAQ in 2011.

This application will be processed as a two-step significant modification pursuant to 15A NCAC 02Q .0504. *(The second step was addressed in the issuance of Permit No. T49.)*

Permit No.	Issue Date	Application No.	Application type
T47	08/30/2017	17A	PSD

Purpose of Application:
The purpose of this application is as follows (excerpt from permit application):

This Prevention of Significant Deterioration (PSD) application does not include the PB plant at the facility and addresses only the MDF plant. Best Available Control Technology (BACT) limits for the PB plant were established prior to the installation of the Photo-catalytic Gas Treatment (PGT) systems at Arauco, and the existing BACT limits for the PB plant are not affected by this modification.

Background and PSD Project
Arauco has used PGT systems to control pollutants from its PB and MDF plants. The PB plant included one PGT system (ID No. CD-PB- PGT), while the MDF plant used three PGT systems (ID Nos. CD02-2, CD14-2, and CD16-2) for pollutant control. The PGT systems were installed by Uniboard USA, LLC, a previous owner of the Moncure facility. The PGT units oxidize and thereby destroy emissions of volatile organic compounds (VOCs) and certain hazardous air pollutants (HAPs), including formaldehyde and methanol, using hydrogen peroxide and UV lighting systems. The PGT systems require significant quantities of proprietary ferrous sulfate and oxalic acid solutions for catalyzing the oxidation reaction. Further, the UV lighting systems are difficult to maintain and

require frequent replacement due to the difficult operating environment. In addition to operational issues, the PGT systems and the associated chemicals have resulted in safety issues at the facility, including fires and chemical exposure to employees.

On September 9, 2015, Arauco entered into Special Order by Consent (SOC) 2015-002 with the North Carolina Division of Air Quality (NCDAQ) to request removal of the PGT units and to address the resulting noncompliance with 40 CFR Part 63 Subpart DDDD, "National Emission Standards for Hazardous Air Pollutants (NESHAP) for Plywood and Composite Wood Products." The SOC became final on November 2, 2015. The SOC allowed Arauco to decommission the PGT systems due to underperformance and safety issues noted above. Arauco has previously accepted PSD avoidance limits for the MDF plant, and the SOC also addressed the possibility decommissioning the PGT systems in the MDF plant could result in an exceedance of the avoidance limit for VOCs. In the event the PSD avoidance limit for VOCs was exceeded, Paragraph II.A.ii of the SOC required the Permittee to submit a PSD application if deemed necessary by the NCDAQ. Per a letter dated October 17, 2016, NCDAQ deemed it necessary that Arauco submit a PSD permit application because VOC emissions from the MDF plant had exceeded the PSD avoidance limit from June through September 2016. (Note exceedances of the PSD avoidance limit have been ongoing ever since June 2016.) The PSD application was due within 120 receipt of the letter (i.e., by February 14, 2017).

Permit No.	**Issue Date**	**Application No.**	**Application type**
T46	07/31/2017	17C	TV-Sign-501(c)(2) Part I

Purpose of Application:
The purpose of this application is as follows (excerpt from permit application):

The purpose of this application is to request a permit for a wastewater evaporator (WWE) that has already been constructed at the facility.

The Permitee had previously requested an applicability determination for the WWE on August 5, 2016. The DAQ responded on September 23, 2016 stating:

> The NCDAQ has reviewed your request and concluded that based on the limited information available the evaporator unit appears to have potential uncontrolled emissions of particulate matter greater than 5 tons per year and therefore does not qualify as an insignificant activity pursuant to 15A NCAC 02Q .0503(8).

This application will be processed as the 1st step of the 2-step significant modification process as allowed pursuant to 15A NCAC 02Q .0504. *(The second step was addressed in the issuance of Permit No. T52.)*

Permit No.	**Issue Date**	**Application No.**	**Application type**
T45	07/31/2017	08D, 12C, 16A	TV-Renewal/Significant Modification

Purpose of Application:
The purpose of this application is as follows (excerpt from permit application):

Task	**Description**
1	The renewal of permit no. T34, which expired on July 31, 2009 (application no. 9800015.**08D**)
2	The Part II application for the Part I applications 1900015.07A, 08C and 09B that addressed the rebuilding and modifications to the MDF plant (application no. 9800015.**12B**) (this application was consolidated into 9800015.**12C**)
3	Compliance of the particle board plant with MACT DDDD (application no. 9800015.**12C**)
4	Compliance of the MDF plant with MACT DDDD (application no. 9800015.**12A**) (this application was consolidated into 9800015.**12C**)
5	Modifications to the MDF plant performed primarily for compliance with MACT DDDD (application no. 9800015.**16A**).

VI. NSPS, NESHAPS, PSD, Toxics, Attainment Status, 112(r), and CAM

NSPS
The changes addressed in this permit application do not affect the ability of the facility to comply with any existing MACT applicable compliance requirements no trigger any new requirements.

NESHAP/MACT
The facility is major source of HAP. The changes addressed in this permit application do not affect the ability of the facility to comply with any existing MACT applicable compliance requirements no trigger any new requirements.

PSD
Chatham County is in attainment for all pollutants. See PSD discussions in Section IV. Chatham County has triggered increment tracking under PSD for PM10, SO2 and NOx. Only NOx is expected to increase from these modifications. The allowable increase in emissions from the biofilter controlled sources associated with the netting analysis is not expected to result in an hourly increase in NOx from the plant. This is simply shifting emissions from existing sources to the biofilter controlled sources. However, the PSD avoidance allows for an increase up to 40 tpy of NOx (the PSD significance level). So, for conservatism, 40 tpy spread over 8760 hours is equal to approximately 9 lb/hr of NOx.

CAM
The modifications discussed in this application do not trigger any additional CAM review. No new control devices are being installed.

112r
The Permittee is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in 112(r). This permit modification does not affect the 112(r) status of the facility.

NC Toxics
The modifications discussed in this application do not trigger any review under the state enforceable only toxics rules at 15A NCAC 02Q .0700 and 02D .1100.

VII. Compliance History

The most recent compliance inspection was conducted on March 28, 2019 and the facility appeared to be in compliance with all applicable air quality requirements with some exceptions. Arauco is working under a Special Order of Consent (SOC 2020-002) to address violations associated with the operation of the biofilter at the MDF plant.

The current permitting action if successful should allow the facility to comply with an "achievable" BACT limit and provide resolution to the SOC.

VIII. Changes Implemented in Revised Permit

Existing Condition No.	**New Condition No.**	**Changes**
Cover Letter	Same	• Updated permit revision numbers, issue and effective dates, etc. • Removed the minor modification language • Updated increment consumption statement
Permit, page 1	Same	• Revised dates, permit numbers, etc.
Section 1	Same	• Removed PB sources from the permit as requested by the Permittee • Remove "Case-by-Case MACT" indicator from ID No. Pr-Heat1 as it no longer applies.
Section 2.1 A	same	• Removed PB sources from the permit as requested by the Permittee
Section 2.1 C.6	Same	• The PSD applicability review for the current project NOx emissions used January 2015 through December 2016 as the baseline period, which is the same period used in this 02D .05330(u) recordkeeping condition. Therefore, the NOx recordkeeping requirements will be removed from this condition.

Existing Condition No.	**New Condition No.**	**Changes**
Section 2.1 E	Same	• Removed PB sources from the permit as requested by the Permittee • Some conditions remain; Instead of renumbering, removed conditions were replaced with "RESERVED"
Section 2.1 F.5	RESERVED	• Removed boiler MACT 112(j) condition as it no longer applies.
Section 2.1 F.6	Same	• Removed 112(j) sunset language at 2.1 F.6.a.i
Section 2.1 G.	Section 2.1 G	• Corrected the regulatory references 15A NCAC 02Q .0308(a) to 02Q .0508(f) consistent with 02Q .0515 minor modification procedures. 02Q .0308(a)was used incorrectly in permit No. T53
Section 2.2. A.1	**Same**	**MACT DDDD Condition**
		• Substantially revised the MACT DDDD condition reflect the permanent shut down of the PB plant. • Many conditions were renumbered to reflect the removal of no longer applicable requirements.
h	same	• This paragraph contains the biolfilter monitoring parameters. This table will be updated upon initial testing after the permit is issued. However, the existing monitoring parameters were revised based on the amended MACT DDDD rule of August 13, 2020. The parameters were revised consistent with 63.2262(m). The existing parameters are : minimum biofilter bed temperature: **132 ºF** maximum biofilter bed temperature: **145 ºF** **these will be revised to:** minimum biofilter bed temperature: **119 ºF** maximum biofilter bed temperature: **154 ºF** • Added the phrase "These parameters do not apply during periods of performance testing. Parameters shall be confirmed or reestablished during performance testing." consistent with current DAQ policy to allow testing for monitoring parameter revisions consistent with MACT DDDD
m(i)	NA	• Removed biofilter specific testing requirements as it is redundant with the requirements in the revised condition m.
j, k, l, Table 2.2 A.1.l, and x	NA	• Removed PB plant specific requirements
p through t	m	• Revised layout of test requirements for the MDF plant biofilter. • Revised testing requirements from "the completion of the remedial work as described in the Special Order of Consent 2019-001(Attachment C)" to "within 180 days after issuance of permit no. T54." • Added the requirement to submit an administrative permit application with the first test after the issuance of permit No. T54 to revise the biofilter monitoring parameters. • Clarified the testing requirements after the initial test and how the monitoring parameters for the biofilter can be revised pursuant to administrative or minor modification procedures consistent with current DAQ policy.

Existing Condition No.	**New Condition No.**	**Changes**
w.i	p.i	• Revised requirement as follows: FROM: The Permittee shall monitor and record the MDF Plant Biofilter (ID No. CD18) bed temperature and the PB Plant dryers (ID Nos. 1420 and 1430) average inlet temperature with continuous parameter monitoring systems (CPMS). TO: The Permittee shall monitor and record the MDF Plant Biofilter (ID No. CD18) bed temperature with a continuous parameter monitoring system (CPMS).
y	q	• Revised requirement as follows: FROM: For the biofilter (ID No. CD18), and dryers (ID No. 1420 and 1430) the Permittee shall determine the 24-hour block average of …. TO: For the biofilter (ID No. CD18), the Permittee shall determine the 24-hour block average of ….
Section 2.2 B.1	**Same**	**02Q .0317 Condition (PSD AVOIDANCE)**
		• Removed all PSD avoidance conditions and requirements related to NOx emissions. NOx PSD avoidance requirements are included in a separate new condition. • In paragraph a, revised reference from Section 1 to Table 2.2 B.1, since it identifies all sources subject to the PSD avoidance requirements at the MDF plant. • Revised testing requirement to reflect testing required within 180 days of the issuance of the permit. • Corrected the Table 2.2 B.1 to reflect correct descriptors of the emission points. • Renumbered condition throughout. No changes in intent were made.
Section 2.2 B.2	**Same**	**02D .0530 VOC PSD condition**
a	Same	• The BACT for the biofilter controlled sources was revised from 50% DRE of WPP1 VOC to 7.83 lb WPP1 VOCs/ODMT • Revised all monitoring requirements for the biofilter controlled sources to reference the requirements under the MACT DDDD condition (Section 2.2 B.1) • Renumbered condition throughout. No changes in intent were made.
NA	**Section 2.2 B.3**	• Added PSD avoidance condition for NOx • Included default emission factors to be used to calculate emissions • Included a testing condition to verify default wood combustion emission factors
Section 3 General Conditions	Same	▪ Revised from (5.3, 08/21/2018) to 5.5 (08/25/2020). Changes include: ▪ Condition Y – fix typographical spacing error ▪ Condition BB – correct regulatory reference from 02Q .0507(d)(4) to (d)(3) ▪ Condition CC – correct regulatory reference from 02Q .0501(e) to (d) ▪ Condition JJ – clarified the applicable requirements for sources required to test pursuant to .0524, .1110, and .1111. ▪ Condition NN – correct regulatory references from 02Q .0501(c)(2) to (b)(2) in paragraph 1. And from 02Q .0501(d)(2) to (c)(2) in paragraph 2.

Existing Condition No.	New Condition No.	Changes
ATTACHMENT A - List of acronyms	Same	• Revised list substantially
ATTACHMENT C	SAME	• Removed SOC 2019-001 and replaced with SOC 2020-002

IX. Public Notice/EPA and Affected State(s) Review

PSD procedures

To meet the permitting requirements for PSD permit applications, the following shall be conducted:

In accordance with 40 CFR 51.166(q), public participation, the reviewing authority (NCDAQ) shall meet the following:

1) Make a preliminary determination whether construction should be approved, approved with conditions, or disapproved.

   This document satisfies this requirement providing a preliminary determination that construction should be approved consistent with the permit conditions described herein.

2) Make available in at least one location in each region in which the proposed source would be constructed a copy of all materials the applicant submitted, a copy of the preliminary determination, and a copy or summary of other materials, if any, considered in making the preliminary determination.

   This preliminary determination, application, and draft permit will be made available in the Raleigh Regional Office and in the Raleigh Central Office, with the addresses provided below.

   Raleigh Regional Office
   3800 Barrett Drive
   Raleigh, NC 27609

   Raleigh Central Office
   217 West Jones Street
   Raleigh, NC 27603

   In addition, the preliminary determination and draft permit will be made available on the NCDAQ public notice webpage.

3) Notify the public, by advertisement in a newspaper of general circulation in each region in which the proposed source would be constructed, of the application, the preliminary determination, the degree of increment consumption that is expected from the source or modification, and of the opportunity for comment at a public hearing as well as written public comment.

   The NCDAQ prepared a public notice that will be published in a newspaper of general circulation in the region, in this case the Raleigh News and Observer.

4) Send a copy of the notice of public comment to the applicant, the Administrator and to officials and agencies having cognizance over the location where the proposed construction would occur as follows: Any other State or local air pollution control agencies, the chief executives of the city and county where the source would be located; any comprehensive regional land use planning agency, and any State, Federal Land Manager, or Indian Governing body whose lands may be affected by emissions from the source or modification.

   The NCDAQ will send the public notice to all such agencies via email including the Chatham County Manager at PO Box 1809, Pittsboro, NC 27312.

5) Provide opportunity for a public hearing for interested persons to appear and submit written or oral comments on the air quality impact of the source, alternatives to it, the control technology required, and other appropriate considerations.

The NCDAQ public notice provides contact information to allow interested persons to submit comments and/or request a public hearing.

Title V Significant Modification Procedures

6) With respect to Title V permitting procedures under 15A NCAC 02Q .0500, this modification will also be processed pursuant to 15A NCAC 02Q .0516 Significant Modifications. To this end, a notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 02Q .0521 above.

X. Recommendations

TBD