

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date:

Region: Washington Regional Office
County: Martin
NC Facility ID: 5900069
Inspector's Name: Betsy Huddleston
Date of Last Inspection: 09/17/2020
Compliance Code: 3 / Compliance - inspection

<p align="center">Facility Data</p> <p>Applicant (Facility's Name): Domtar Paper Company, LLC</p> <p>Facility Address: Domtar Paper Company, LLC NC Highway 149 North Plymouth, NC 27962</p> <p>SIC: 2611 / Pulp Mills NAICS: 322121 / Paper (except Newsprint) Mills</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>						<p align="center">Permit Applicability (this application only)</p> <p>SIP: 02D .0503, .0504, .0508, .0512, .0515, .0516, .0519, .0521, .0524, .0528, .0606 NSPS: Subparts D, BB, and IIII NESHAP: Subparts S, MM, ZZZZ, and DDDDD PSD: BACT PSD Avoidance: 02D .0530(u) and 02Q .0317 NC Toxics: 02D .1100 and 02Q .0700 112(r): N/A Other: N/A</p>																																																	
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<p>Review Engineer: Heather Sands</p> <p>Review Engineer's Signature: _____ Date: _____</p>					<p align="center">Comments / Recommendations:</p> <p>Issue 04291/T49 Permit Issue Date: _____ Permit Expiration Date: _____</p>																																																		

I. Purpose of Application

Domtar Paper Company, LLC (Domtar) is an integrated Kraft pulp mill located in Plymouth, Martin County, North Carolina. Domtar currently holds Title V Permit No. 04291T48, with an expiration date of the earlier of September 30, 2022, or renewal of Permit No. 04291T42. This permit application is for a permit renewal with modification. The renewal application (Permit Application No. 5900069.16B) was received on July 27, 2016, which was at least nine months¹ prior to the original permit expiration date of June 30, 2017. This permitting action will renew the Title V Permit and will address the second step of a two-step significant modification as described below.

A. Renewal - Permit Application No. 5900069.16B

In the renewal application, Domtar also requested modifications to their air permit as follows:

- Revision to extend the timing for completion of the internal inspection requirements for pressure equipment on the No. 5 Recovery Furnace and the Nos. 1 and 2 Hog Fuel Boilers; and
- Removal of the PSD avoidance limitation on the No. 2 Hog Fuel Boiler due to a change in the permitted fuel mix that results in the potential-to-emit being significantly lower than the avoidance limit.

The internal inspection requirements were addressed in a separate permit action (Permit No. 04291T41, issued September 10, 2014). Refer to Section VI.C for the regulatory analysis to remove the PSD avoidance limitation for the No. 2 Hog Fuel Boiler.

B. Second Step of Two-Step Significant Modification – Permit Application No. 5900069.20A

On June 9, 2020, DAQ received Permit Application No. 5900069.20A for the second step of a two-step permit application. The first step permit application was Application No. 5900069.18A and Permit No. 04291T45 was issued on August 15, 2018. In Section 2.2 F.2 of the current permit (No. 04291T48), Domtar is required to submit the second step application as required in 15A NCAC 02Q .0501(b)(2) within one year from the date of beginning operation of either the electrostatic precipitator installed on the No. 2 Hog Fuel Boiler (ID No. CD-65-58-2000) or the Thermal Oxidizer (ID No. CD-64-22-2000). The Thermal Oxidizer began operation on July 13, 2019; thus this second step permit application, received on June 9, 2020, satisfies the requirement to submit a permit application. Changes to the permit associated with this permit application will be discussed in Section IV, below.

C. Installation of Lime Mud Reclaim Conveyor - Permit Application No. 5900069.20C

On November 10, 2020, DAQ received a 502(b)(10) notification for the installation of the new Lime Mud Reclaim Conveyor to transfer and reclaim lime mud that is stored in a warehouse during lime kiln outages to the Lime Mud Storage Tank (ES-14-30-1450). In their notification, Domtar stated that the stored lime mud is 80 percent solids and does not contain any volatile organic compounds (VOC), hazardous air pollutants (HAP), or toxic air pollutants (TAP). The proposed project will offset fresh lime purchased throughout the year by transferring reclaimed lime mud from the warehouse storage facility to the Lime Mud Storage Tank (ES-14-30-1450). The lime mud in the storage tank is 45 percent solids and the maximum capacity is not changing. Because the reclaimed lime mud is going to offset the use of fresh, purchased, lime, the actual annual throughput of the Lime Mud Storage Tank will not change with this project. Lime mud will be transferred from the storage warehouse, via truck or front-end loader, and dumped directly into a Lime Mud Reclaim Conveyor hopper. The lime mud will be transferred via covered conveyor from the hopper to a covered opening to be installed on the Lime Mud Storage Tank, enabling direct injection of the lime mud into the top of the Lime Mud Storage Tank and reclamation of the product. The hopper is open to the atmosphere, but the conveyor is enclosed.

Domtar determined that the potential particulate matter (PM) emissions from the new Lime Mud Reclaim Conveyor were less than 5 tons per year (tpy). These emissions were a combination of emissions from the loading of lime mud into a conveyor hopper and emissions from the front loader dropping the lime mud into the hopper.

¹ The regulations under 15A NCAC 02Q .0513 in place at the time of the renewal application required a submittal nine months prior to expiration of the permit. The current regulations require a submittal of the renewal application six months prior to permit expiration.

The PM emissions from the lime mud loading into the conveyor hopper were calculated using an emission factor from AP-42 for open truck product loading.² Domtar calculated PM emissions from the front loader using an drop equation to develop an emission factor from AP-42 for aggregate handling and storage piles.³ Domtar used a maximum lime mud reclamation rate of 11,081 tons per year (tpy) calculated based on the 2019 ratio of fresh lime to reburned lime, multiplied by the maximum lime production capacity of the lime kiln. Particulate matter less than 10 microns (PM₁₀) and PM less than 2.5 microns (PM_{2.5}) were conservatively assumed to be equal to the calculated PM emissions.

Domtar has demonstrated that the emissions from the new conveyor (the sum of the lime hopper emissions and the addition of lime into the lime hopper) are less than 5 tpy. These calculations provided by Domtar were reviewed, and DAQ agrees that the new lime mud reclaim conveyor is an insignificant activity and, as allowed under 15A NCAC 02Q .0523, no permit change is requested for these sources. As a result, the new lime mud reclaim conveyor will be added to the insignificant activities list with ID No. IES-LMRC.

II. Facility Description

Domtar provided a process description in the renewal application. The Plymouth Mill produces Kraft bleached softwood pulp from purchased wood chips and logs processed with on-site chipping operations. Softwood pulp is produced in continuous digesters, washed, separated from wood knots, screened, and bleached before being formed into fluff or market pulp in the pulp drying machines.

The strong black liquor from pulping and weak black liquor from brownstock washing are collected and concentrated through the evaporator system. The concentrated black liquor is then burned in a non-direct contact evaporator (NDCE) recovery furnace to remove organics and recover the kraft cooking chemicals. Steam produced in the recovery furnace are used for process steam and to produce energy for operations at the mill. The molten inorganic ash (smelt) from the recovery furnace is dissolved in weak wash⁴ in the smelt dissolving tanks to make green liquor.

The causticizing process combines green liquor, which has been clarified to remove undissolved solids (dregs), with fresh lime or lime from the lime kiln in the lime slaker to produce white liquor (a sodium hydroxide and sodium sulfide solution, which is used in the continuous digesters to generate pulp). Charred unburned “grits” and dregs are removed from the slaker and sent to a landfill. Calcium carbonate (lime mud) is produced as a byproduct during the slaking process which precipitates out of solution and is removed from the white liquor in a clarifier. Lime mud is washed and then calcined in a lime kiln to produce lime for use in the slaker.

The mill uses two power boilers to produce steam for power generation and process steam for mill operations. The mill is permitted to use two temporary boilers during planned maintenance outages of the permanent boilers.

High quality fluff or market pulp is produced in two pulp dryers. Pulp produced on these machines is cut to order length rolls, wrapped, and shipped to customers.

Non-condensable gases, containing hydrogen sulfide (H₂S), dimethyl sulfide (DMS), dimethyl disulfide (DMDS) and methyl mercaptan (MMC), are generated in the pulping and black liquor evaporation processes. Low volume-high concentration (LVHC) gases, collected from the evaporators, the Nos. 6 and 7 Fiberline Secondary Condensers, the No. 7 Fiberline Turpentine Decanter Weir and Tank, the Nos. 6 and 7 Evaporator Hotwells, the Concentrator Hotwell and the Stripper Feed Tank, are incinerated in the No. 5 Lime Kiln or the No. 2 Hog Fuel Boiler as a backup. High volume low concentration (HVLC) gases, collected from the Fiberline Blowtanks, Chip Bin Relief Condensers, Secondary Knotters, Quarternary Screens, Decker Hoods, Screen Dilution Tanks, Screen

² AP-42 Section 11.17-4: Product loading, open truck (1.5 lb/ton). The emission factor was adjusted to account for the difference between Domtar’s stored lime (20 percent) and the ratio of the emission factor calculated using the maximum moisture content value in the accuracy range in the AP-42 factor to the maximum moisture content of hydrated lime is around 3%.

³ AP-42 Section 13.2.4: Aggregate Handling and Storage Piles, calculated using a drop equation. The same moisture correction as for product loading was applied.

⁴ Weak wash is process water used to wash lime mud.

Rejects Tank and Decker Filtrate Tanks are permitted to be burned in the Nos. 1 or 2 Hog Fuel Boilers for combustion, or the No. 5 Recovery Furnace or Thermal Oxidizers as permitted backup control devices. Foul condensates from the digester system, turpentine system, evaporator system, and NCG gas collection systems are collected and sent to a stripper to remove methanol. The stripper off-gas (SOG) is burned in the No. 5 Lime Kiln or in the No. 2 Hog Fuel Boiler.

Domtar also operates a lignin solids removal process (LSRP) in which lignin is extracted from the black liquor stream to reduce the organic content that must be combusted by the recovery boiler to recover the spent cooking chemicals. The configuration of the LSRP is considered confidential business information and will not be discussed in this permit review. The process consists of precipitation tanks, filter presses, and chemical additive systems.

III. Application History

A. Permit History since last Title V Permit Renewal

This renewal is the first renewal of the initial Title V Permit (No. 04291T37), issued on May 31, 2012. A description of the permit modifications made since the issuance of Permit No. 04291T37 is presented in Table 1.

Table 1. Summary of Permit Modifications to Title V Permit Since Initial Permit Issuance

Permit No.	Issue Date	Application No.	Description of Permit Modifications
T37	05/31/2012	5900069.04B and .10A	<p>The purpose of this permitting action was to issue the initial Title V Air Permit. Also included the following changes from Permit R36:</p> <ul style="list-style-type: none"> • Inclusion of Case-by-Case MACT requirements for startup, shutdown and malfunctions (SSM) for sources subject to 40 CFR Part 63, Subparts S and MM. • Removal of coal as a permitted fuel for the hog fuel boilers and removal of all coal handling and storage sources. • Removal of NC4 fine paper machine line and associated starch systems. • Removal of secondary sludge dewatering process and associated equipment (except for wastewater sumps which are used by the No. 3 Landfill System). • Addition of avoidance condition under 02Q .0317 for NSPS applicability to two temporary boilers (RB1 and RB2). • Revision of the CO monitoring in the 112(j) Case-by-Case Boiler MACT requirements to allow annual compliance demonstration through stack testing in place of a CO CEMS. • Revisions of the CO emissions limit in the 112(j) Case-by-Case Boiler MACT requirements to the applicable limit for hybrid suspension grate boilers under Boiler MACT, 40 CFR Part 63, Subpart DDDDD. • Removal of the No. 1 Package Boiler. • Moved carpentry shop painting operations to the list of insignificant activities. • Moved emergency engines to the list of permitted sources and added applicable requirements. • Added requirements for control of odorous emissions under 02D .1806. • Updated 02D .1100 TAP emission limits to the rates in the March 2012 compliance demonstration. • Added requirements showing that Domtar has demonstrated compliance with the toxic AALs under 02Q .0705 • Updated list of pollutants emitted from the facility below the TAP permitted emission rates (TPERs).
T38	06/27/2012	5900069.12E	<p>The purpose of this permitting action was to process an administrative amendment to make the following corrections to the air quality permit:</p> <ul style="list-style-type: none"> • Identified ES-09-25-1050 as the condensate steam stripper instead of condensate stripper reflux condenser. • Corrected cross-reference errors throughout permit. • Added 02D .0504 and .0516 requirements for Nos. 1 and 2 Hog Fuel Boilers firing on wood residue.

Table 1. Summary of Permit Modifications to Title V Permit Since Initial Permit Issuance

Permit No.	Issue Date	Application No.	Description of Permit Modifications
			<ul style="list-style-type: none"> Revised monitoring and recordkeeping to include operating the NO_x CEMS during all periods of No. 2 Hog Fuel Boiler (HFB) operation and keeping records of NO_x emissions each month for the preceding 12-month period. Excluded NO_x emissions during periods of firing on wood residue only. Added monitoring, recordkeeping and reporting (MRR) for North and South Smelt Tank scrubbers, Lime Kiln scrubber, and No. 5 Recovery Boiler electrostatic precipitator (ESP).
T39	10/17/2012	5900069.12D	<p>The purpose of this permitting application was to process the first step of a two-step significant permit modification to make the following changes to the air quality permit:</p> <ul style="list-style-type: none"> Add Lignin Dewatering Process as a new source including precipitation tanks, filter presses and associated tanks and chemical additive system. Prevention of significant deterioration (PSD) review used projected actual emissions (PAE) and resulted in the need for a PSD avoidance condition under 02D .0530(u). Added lignin, natural gas and No. 2 fuel oil to the list of permitted fuels for the Nos. 1 and 2 HFBs. Added natural gas as a permitted fuel for the No. 5 Recovery Boiler. Added natural gas and No. 2 fuel oil as permitted fuels for the No. 5 Lime Kiln.
T40	02/19/2014	5900069.14A	<p>The purpose of this permitting action was to process a State-only permit modification and first step of a two-step significant permit modification to make the following changes to the air quality permit:</p> <ul style="list-style-type: none"> Revised ammonia and phenol TAP limits to enable the sewerage of the condensate streams from the concentrator surface condenser and the No. 6 Evaporator 5th effect. Also updated several source-specific TAP limits. Added No. 6 Evaporator 5th Effect and C3 Condensate to the list of permitted sources. Added PSD avoidance permit conditions for C3 Condensate allowing stream to be routed directly to the sewer for up to 30 days in a consecutive 12-month period. Removed recordkeeping requirements in Section 2.2 E.2.a and E.2.b.
T41	09/10/2014	5900069.13A, .14A and .14C	<p>The purpose of this permitting action was to process a significant modification and a 502(b)(10) change to make the following changes to the air quality permit:</p> <ul style="list-style-type: none"> Added portable log chipper(s) (ES-TEMP-CHIP) to the list of permitted sources. Added the 6th stage feed chute overflow line (ES-06-6SFCO) with the option to control with the No. 6 bleach plant scrubber. Changed the description of the hog fuel fired in the HFBs to “clean cellulosic biomass” and included a definition of clean cellulosic biomass as a footnote. Revised internal inspection frequency for the electroscrubbers controlling the hog fuel boilers. Allowed NSPS quarterly reports to be submitted semi-annually. Added CAM requirements for the hog fuel boilers. Changed VE monitoring frequency from monthly to quarterly. Indicated No. 6 and No. 7 Fiberline common sources, is controlled by white liquor scrubber (ID No. CD-07-36-8000) Removed the 2D .1100 permit limits for MACT-affected sources Removed the 2Q .0705 permit condition as the rule was repealed effective May 1, 2014.
T42	07/10/2015	5900069.14E and .14F	<p>The purpose of this permitting action was to process an administrative amendment (14E) and step one of a two-step modification (14F) to make the following changes to the air quality permit:</p> <ul style="list-style-type: none"> Correct typos in permit: Add new soap storage tank, black liquor separation tank, and railcar load out station Remove peroxide stages from the No. 7 bleach plant scrubber
T43	06/06/2015	5900069.14G	<p>The purpose of this permitting action was to process a significant modification to the permit for revisions to their 112(j) case-by-case MACT emission limits for the Nos. 1 and 2 HFBs. This includes replacing the existing limits with limits associated with biomass boilers that are considered hybrid suspension grate (HSG) boilers as follows:</p> <ul style="list-style-type: none"> Replacing speciated metal limits with a filterable particulate emission limit. Replacing hourly mercury limits with the mercury limit on a lb/MMBtu basis.

Table 1. Summary of Permit Modifications to Title V Permit Since Initial Permit Issuance

Permit No.	Issue Date	Application No.	Description of Permit Modifications
T44	10/31/2017	5900069.17A	The purpose of this permitting action was to process the first step of a two-step significant modification to their permit for the installation of a steam box on the NC5 pulp drying machine and a secondary turpentine decanting system.
T45	08/15/2018	5900069.18A and 5900069.17D	<p>The purpose of this permitting action was to process the first step of a two-step significant modification to their permit for a mill optimization project. Changes to the permit included:</p> <ul style="list-style-type: none"> • Updated information for the Nos. 1 and 2 Hog Fuel Boilers to include MACT Subpart DDDDD. • Updated the sludge burning footnote for Hog Fuel Boilers to correctly identify the New Bern waste treatment facility as being owned by International Paper. • Replacing the three electroscrubbers on the No. 2 HFB with an electrostatic precipitator (ESP) • Remove No. 6 fuel oil as a permitted fuel for the Nos. 1 and 2 HFBs and the No. 5 Lime Kiln. • Installation of a thermal oxidizer to serve as a backup control device for the HVLC gases • Added new Evaporator Cooling Tower to control temperatures from the Nos. 6 and 7 Evaporators and the concentrator surface condensers as an insignificant activity. • Make modifications to the NC-5 Fluff Pulp Machines and removal of NC-5 Broke Pulper Dust Collection System and associated rotocloner from the permit • Remove the Sludge Press Feed Tanks and Sludge Dewatering Building Fugitives from the permit. • Incorporate 502(b)(10) notification for green liquor tanks and white liquor clarifier replacements.
T46	04/18/2019	5900069.16C	<p>The purpose of this permitting action was to process a retroactive PSD application for the installation of the LSRP process. This permit application is in response to a special order of consent (SOC) under which Domtar agreed to update the original permit application submitted in 5900069.12D. The modifications to the permit included the following:</p> <ul style="list-style-type: none"> • Added PSD BACT for LSRP Sources in Section 2.1 Q. • Added Section 2.1 A.2 for PM emissions under .0503 and renumbered remaining conditions.
T47	08/06/2019	5900069.16A, 17B, 18B, 18C	<p>The purpose of this permitting action was to process two second-step of two-step significant modifications (16A and 18C), one one-step significant modification; and a 502(b)(10) change. Modifications to the permit were as follows:</p> <ul style="list-style-type: none"> • Revised Section 2.1 A.5.j to align the internal control device inspections with the internal boiler inspections required to certify the boiler operation. • Removed and reserved Section 2.1 A.9. 112(j) for Boilers has expired, effective May 20, 2019. • Revised Section 2.1 C.1.e to align the internal control device inspections with the internal boiler inspections required to certify the recovery boiler operation. • Removed “cyclone” from Section 2.1 F.1. These sources are no longer controlled by cyclones. • Updated Section 2.2 B.1 to incorporate Subpart MM amendments. • Corrected emission limits for smelt tanks so that each smelt tank has its own limit. • Updated Section 2.2 B.2 to add a sunset date of October 11, 2019. Renumbered remaining conditions. • Updated Section 2.2 E.2 to correct the following ID Nos.: <ul style="list-style-type: none"> ○ Dregs Surge Tank (correct ID No. is ES-14-15-0600). ○ Switched ID Nos. for Nos. 2 and 3 Lime Mud Wash Tanks. • In Section 2.2 F, removed NC5 Steam Box from requirement to submit an application.

Table 1. Summary of Permit Modifications to Title V Permit Since Initial Permit Issuance

Permit No.	Issue Date	Application No.	Description of Permit Modifications
T48	09/14/2020	5900069.20B	<p>The purpose of this permitting action was to process a permit modification under 15A NCAC 02Q .0517(a)(4) – Reopening for Cause. This modification addressed permit language associated with the 2006 prevention of significant deterioration (PSD) significant modification that was inadvertently removed from the permit beginning with Permit No. 0491T37, issued May 31, 2012. The following changes were made to the permit:</p> <ul style="list-style-type: none"> • Modified the No. 2 Hog Fuel Boiler description in the Section 1.0 equipment table by adding the underlined and italicized text as follows: "...HVLG/ Low Volume High Concentration (LVHC) gases <i>from white liquor scrubber except for periods of maintenance</i>/Stripper Off Gas (SOG) gases-fired...." • In Section 1, modified the control descriptions of the sources LVHC gases to include the white liquor scrubber prior to combustion in the No. 2 Hog Fuel Boiler. • In Section 2.1 A.6, revised the control method for TRS BACT by adding the underlined and italicized text: "good combustion practices <i>and white liquor scrubber</i>." • Added a requirement to Section 2.1 A.6 to require a performance test on the No. 2 Hog Fuel Boiler specifically bypassing the white liquor scrubber and burning LVHC gases in the boiler. • Added a requirement to Section 2.1 A.6 to require a performance test while burning LVHC gases from the white liquor scrubber to reestablish or confirm the white liquor scrubber minimum flowrate on a 3-hour rolling average basis. • Added inspection and monitoring requirements in Section 2.1 A.6 for the white liquor scrubber

B. Application Chronology

July 25, 2016	Domtar submitted Permit Application No. 5900069.16C for the renewal of their Title V Air Quality Permit. The renewal application also requested modifications to the permit to extend internal inspection requirements of the air control requirements of the No. 5 Recovery Furnace, the No. 1 Hog Fuel Boiler, and the No. 2 Hog Fuel Boiler and to remove the PSD avoidance limitation for NO _x emissions from the No. 2 Hog Fuel Boiler.
September 8, 2016	DAQ issued a determination (Applicability Determination No. 2909) that no permit was required for collecting No. 1 Hog Fuel boiler ash in the No. 2 Hog Fuel Boiler Ash Silo provided boiler ash was routed to the silo from one hog fuel boiler at a time.
January 26, 2017	DAQ issued a determination (Applicability Determination No. 2978) that no permit was required for conducting lignin dewatering trials.
March 8, 2017	DAQ issued a determination (Applicability Determination No. 3009) that no permit is required for the reintroduction of crude tall oil into the liquor stream prior to the concentrator.
July 27, 2017	DAQ issued a determination (Applicability Determination No. 3088) that the replacement of three green liquor tanks with one new green liquor clarifier and replacing the No. 3 White Liquor Clarifier with an identical sized tank can be handled in a 502(b)(10) notification.
August 24, 2017	Domtar submitted a 502(b)(10) notification for the replacement of three green liquor tanks with one new green liquor clarifier and replacing the No. 3 White Liquor Clarifier with an identical sized tank. This notification was processed as Permit Application No. 5900069.17D and consolidated with Permit Application No. 5900069.18A.

September 26, 2017	DAQ issued a determination (Applicability Determination No. 3134) that no permit is required for the use of the Screen Rejects Tank to re-inject fiber rejects (i.e., knots) from digestion instead of sending them to the sewer. This notification was initially submitted on September 21, 2017, as a 502(b)(10) notification but processed as an applicability determination.
November 27, 2017	Domtar emailed Heather Sands in DAQ concerning whether the replacement of three lignin plant tanks could be processed as a 502(b)(10) notification.
January 18, 2018	DAQ issued a determination (Applicability Determination No. 3143) that if sufficient documentation could not be provided to demonstrate that the cost of the reconstructed smelt tank does not exceed 50 percent of the cost of a new tank, the reconstructed tank would be subject to NSPS Subpart BBa and a permit would be required.
February 1, 2018	DAQ issued a determination (Applicability Determination No. 3166) that that the mill optimization project, the LSRP project, and the confidential project are separate projects with respect to PSD/NSR applicability and may be addressed with separate permit applications.
March 7, 2018	DAQ issued a determination (Permit Applicability No. 3192) that PSD applicability of the LSRP replacement tank project would need to be evaluated. If the emission increases were above PSD significance levels, a permit modification would be required. If not, the project could be considered a 502(b)(10) change.
March 20, 2018	DAQ issued a determination (Applicability Determination No. 3221) that the replacement of the South Smelt Tank was not subject to NSPS Subpart BBa, but Domtar would need to address PSD applicability and a permit modification may still be required depending on the analysis.
March 26, 2018	Domtar submitted a 502(b)(10) notification for the replacement of the LRP 40% Black Liquor Tanks, Agitated Conditioning Tank, and Agitated Buffer Tank. This notification was processed as Permit Application No. 5900069.18B and was consolidated with Permit Application No. 5900069.17B.
April 30, 2018	An updated toxics modeling review memo was issued by AQAB. This modeling analysis was conducted based on information submitted with Permit Application No. 5900069.18A.
July 27, 2018	Domtar submitted comments on draft Permit No. 04291T45 and requested that the permit condition for projected actual emissions reporting associated with Permit Application No. 5900069.09B (Section 2.2 C.1) in the current permit (T44) be removed since the five-year reporting requirement has been fulfilled. DAQ responded by indicating that this modification would be addressed during renewal of the Title V Permit.
October 4, 2018	DAQ issued a response to Permit Applicability Determination No. 3305 that the replacement North Smelt Tank was not subject to NSPS Subpart BBa, and the information provided in Permit Application No. 5900069.18A addressed PSD applicability and Permit T25, issued in August 2018 included the appropriate modification.
March 5, 2019	DAQ issued a non-hazardous secondary materials (NHSM) determination (Applicability Determination No. 3355) for brown and bleached stock. The stock meets legitimacy criteria and may be burned in the hog fuel boilers.

June 26, 2019	DAQ participated in a site visit at the Domtar Mill. Proposed changes to the Section 1 equipment table to be made during the renewal process were discussed.
July 5, 2019	DAQ issued a determination (Applicability Determination No. 3437) that no permit was required for burning trunnion grease as “equivalent” to “used oil” in the No. 2 Hog Fuel Boiler.
August 2, 2019	DAQ addressed request for a NHSM determination for lignin (Applicability Determination No. 3443). Under a new procedure of assessing NHSM determinations, DAQ is no longer issue approvals, but rather review determinations as part of permit applications. Therefore, DAQ did not send an approval letter to Domtar. However, lignin has been included as fuel in the permit since 2012. Jeff Twisdale, DAQ/Permitting Section, reviewed the request and agreed with the documentation in the determination, and no further action was required.
August 2, 2019	Betsy Huddleston, WaRO, sent an email to Domtar approving combustion of Sonoco paper cores in the hog fuel boilers. Jeff Twisdale, DAQ/Permitting Section, provided a letter from EPA approving Sonoco cores as a NHSM material.
August 6, 2019	Permit No. 04291T47 was issued. The modification of internal inspection requirements requested in the renewal application was addressed with this permit modification.
June 9, 2020	DAQ received Permit Application No. 5900069.20A. This application is the second step of a two-step significant application associated with the Mill Optimization Project.
August 6, 2020	DAQ provided Domtar a copy of the proposed changes to the insignificant activities list and the Section 1 equipment table and requested Domtar to provide comments.
August 17, 2020	Domtar submitted comments on the proposed changes to the insignificant activities list and Section 1 equipment table. In their comments, Domtar stated that the Air Washer was completely removed from the No. 1 Hog Fuel Boiler Ash Transport Steam Exhauster and the Bag Filters have been removed from the No. 1 Hog Fuel Boiler Ash Silo now that the silo is no longer in service. Domtar also stated that the No. 2 Hog Fuel Boiler De-Entrainment Vessels and associated control devices have been removed and can be removed from the permit.
November 2, 2020	DAQ participated in a meeting with Domtar and their permitting consultant to discuss the netting analysis for SO ₂ . After the meeting, Domtar submitted the Excel worksheets used to convert the NCG stack test data from the report units to the units used in the 2019 annual emission inventory (AEI) calculations.
November 6, 2020	Domtar provided additional explanation for the rationale used for projected actual SO ₂ emissions used in the revised PSD applicability analysis associated with Permit Application No. 5900069.18A.
November 9, 2020	DAQ sent Domtar a list of questions needed to continue the renewal permit processing.
November 10, 2020	DAQ receive a 502(b)(10) notification for the installation of a new lime mud reclaim conveyor.
November 19, 2020	The draft permit and air permit review were submitted to Domtar; the Permitting Section, Title V Permitting Branch supervisor; and Washington Regional Office for review.

November 24, 2020	DAQ sent a revised draft of the permit and air permit review to Domtar.
December 2, 2020	Comments from the WaRO were provided. See below for discussion on comments and responses.
December 8, 2020	Domtar submitted Applicability Determination No. 3605 for the White Liquor Scrubber Project.
December 11, 2020	Comments from the facility were received and incorporated. See below for discussion.
January 6, 2021	DAQ participated in a meeting with Domtar to discuss comments and questions about the draft permit.
January 22, 2021	DAQ participated in a meeting with Domtar and their permitting consulting to discuss outstanding CAM requirements.
January 22, 2021	DAQ issued a response to the December 8 th request for an Applicability Determination. A permit is required for the White Liquor Scrubber Project.
January 28, 2021	Comments from Permitting Section, Title V Permitting Branch Supervisor were provided.
February 5, 2021	Domtar requested ⁵ that the No. 1 Hog Fuel Boiler Ash Transport System (ID No. ES-64-50-0150) and Boiler Ash Silo (ID No. ES-64-50-0180) be removed from permit as emission sources. These sources are no longer operational and can be removed from the permit.
XXXX YY, 2020	Draft permit sent to public notice.
XXXX YY, 2020	Public comment period ends. <i>Summarize comments received.</i>
XXXX YY, 2020	EPA comment period ends. <i>Summarize comments received.</i>
XXXX YY, 2020	Permit No. 04291T49 issued.

IV. Permit Modifications

Many of the permit modifications were editorial in nature, revising the permit language to be consistent with the most current permit shell and updating conditions to reflect the most current rules. In addition to these changes, several other changes have been made to the permit.

A. Summary of Changes to Permit

Table 2 provides a summary of all changes to the current permit as part of the renewal. All changes to permitted emissions sources and the new insignificant emissions sources were entered into the Title V Equipment Editor (TVEE).

⁵ Email from Diane Hardison, Domtar, to Heather Sands, NCDEQ/DAQ/Permitting Section. February 5, 2021. RE: Removal of Boiler Ash Silo and Ash Transport Steam Exhauster from Permit.

Table 2. Summary of Changes to Permit No. 04291T48

Pages	Section	Description of Changes
Cover letter	NA	<ul style="list-style-type: none"> Updated permit revision and dates.
Cover Letter Attachment	Insignificant Activities list and Summary of changes to permit	<ul style="list-style-type: none"> Updated summary of changes to permit Removed Magnesium Sulfate Storage Tank (ID No. IES-08-51-1060); this source is no longer in service. Added Lime Mud Reclaim Conveyor (ID No. IES-LMRC) Removed Carpenter Shop Painting Operations (ID No. IES-94-55-0105); this source is no longer in service Removed Site Wide Maintenance Cleaners (ID No. IES-023)
Permit Cover	NA	<ul style="list-style-type: none"> Revised permit application number and dates.
1 – 113	All	<ul style="list-style-type: none"> Updated Permit Revision Number in header. Updated language to current permit shell.
3 – 17	Section 1	<ul style="list-style-type: none"> Added paper cores and bleached and unbleached pulp stock to the list of permitted biomass fuels for the Nos. 1 and 2 Hog Fuel Boilers Removed the No. 1 Hog Fuel Boiler Ash Transport Steam Exhauster (ID No. ES-64-50-0150) and Boiler Ash Silo (ID No. ES-64-50-0180). These sources are no longer in service. Updated footnotes to equipment table to reflect current DAQ policy with respect to NHSM determinations. Removed AOS/POS designations and removed North, Central and South Electroscrubbers (ID Nos. CD-65-60-0120, CD-65-60-0410, and CD-65-60-0610). These control devices were replaced with an ESP (ID No. CD-65-28-2000). Removed De-entrainment Vessels associated with the No. 2 Hog Fuel Boiler (ES-65-60-0140, ES-65-60-0430, and ES-65-60-0630). These sources are no longer in service. Rearranged table to group together HVLC, LVHC, and SOG sources. Added designation to equipment ID Nos. indicating whether the source was an HVLC, LVHC, or SOG source. Added MACT S designation to Nos. 6 and 7 Fiberline Pressure Diffuser Filtrate Tank. Removed Nos. 3 and 4 Green Liquor Clarifier and No. 3 Green Liquor Storage Tank. These sources were replaced with No. 5 Green Liquor Clarifier as part of Permit Application No. 5900069.17D Updated emission source descriptions for ID Nos. ES-09-27-3100 and ES-09-27-3200. Updated footnote for secondary turpentine sources to indicate that a permit application is due within 12 months after the first piece of equipment is placed into operation. Removed footnote for control devices CD-65-58-2000 and CD-64-22-2000. This requirement was satisfied with submittal of Permit Application No. 5900069.20A and is incorporated into this renewal.
18 – 42	Section 2.1 A	<ul style="list-style-type: none"> Updated the condition heading to be consistent with changes made to the equipment table in Section 1. Removed POS designations allowing the No. 2 Hog Fuel Boiler to operate with electroscrubbers prior to operation of the ESP. The No. 2 Hog Fuel Boiler will operate going forward with an ESP. Added AOS allowing the No. 1 Hog Fuel Boiler to operate as a “unit designed to burn gas 1” affected source under Boiler MACT, Subpart DDDDD. Corrected PM limit in condition A.2.a to 0.160 for the No. 1 Hog Fuel Boiler and 0.143 lb/million Btu. Added a condition to A.3 requiring semiannual summary reporting when firing hog fuel. Revised condition A.4.a to require compliance with the SO₂ emission limit when firing wood or natural gas in the hog fuel boilers.

Table 2. Summary of Changes to Permit No. 04291T48

Pages	Section	Description of Changes
		<ul style="list-style-type: none"> Added Visible Emissions condition as A.5 which is applicable when burning natural gas only in either of the hog fuel boilers. Updated NSPS condition (new A.6) as follows: <ul style="list-style-type: none"> to remove the startup, shutdown and malfunction (SSM) exemptions for SO₂, NO_x, and PM (filterable). The visible emissions standards retain the SSM exemption. updated entire condition to use language consistent with the regulation. Revised monitoring/recordkeeping for SO₂. Instead of requiring testing, a fuel analysis will be required for compliance demonstration. Incorporating AOS/POS for operation of the No. 1 Hog Fuel Boiler on oil and/or natural gas. Added a statement that excess emissions need to be calculated quarterly but reported semiannually Updated PSD condition (new A.7) by removing testing requirements that were completed by Domtar from A.7.c. Updated CAM condition (new A.9), which applies to the No. 1 Hog Fuel Boiler only operating under the POS, to be consistent with shell language. Removed justification condition since it was included in the permit review. Updated Boiler MACT condition (new A.10): <ul style="list-style-type: none"> to be consistent with rule language. Revise initial compliance condition to reflect that initial compliance was demonstrated. Removed reference to TSM per discussions with Domtar. Added requirements to condition A.10.m for continuous compliance with oxygen and boiler operating load operating parameter limits. Updated condition A.10.p to specify operating parameter limits and added language specifying that operation outside operating parameter limits during performance testing was not considered a period of noncompliance. Added reporting requirements consistent with rule language. Added new condition A.11 for Boiler MACT applicable to the No. 1 Hog Fuel Boiler when operating as a “unit designed to burn gas 1” affected source.
43 – 44	Section 2.1 B	<ul style="list-style-type: none"> Updated avoidance conditions in B.3 to apply to NSPS and Boiler MACT Removed condition in B.5 for avoiding Case-by-Case MACT which no longer applies.
45 - 50	Section 2.1 C	<ul style="list-style-type: none"> Added a statement to the condition header that the recovery boiler serves as a backup control device for the HVLC Collection System. Removed specific reporting requirement from 02D .0508 condition because the reporting requirement is specified as being under MACT Subpart MM. Updated NSPS condition (C.3) to reflect current rule language. Added CAM condition for particulate matter (condition C.5).
51 - 53	Section 2.1 D	<ul style="list-style-type: none"> Removed specific reporting requirement from 02D .0508 condition because the reporting requirement is specified as being under MACT Subpart MM. Added CAM condition for particulate matter (condition D.4).
54 – 59	Section 2.1 E	<ul style="list-style-type: none"> Added a statement to the condition header that the lime kiln serves as a primary control device for the LVHC Collection System. Removed specific reporting requirement from 02D .0508 condition because the reporting requirement is specified as being under MACT Subpart MM. Revised SO₂ condition E.2 as follows: <ul style="list-style-type: none"> Added a condition (E.2.c) stating that no MRR is required when firing natural gas alone in the Lime Kiln. Added requirement for keeping records when burning No. 2 fuel oil. Added periodic testing to NSPS condition, consistent with NSPS Subpart BB language

Table 2. Summary of Changes to Permit No. 04291T48

Pages	Section	Description of Changes
		<ul style="list-style-type: none"> Added CAM condition for particulate matter (condition E.7).
60 – 63	Section 2.1 F	<ul style="list-style-type: none"> Removed No. 2 Hog Fuel Boiler De-Entrainment Vessels and No. 1 Hog Fuel Boiler Ash Silo and Ash Transport Steam Exhauster Moved Lime Operations to Section 2.1 H. Updated CAM condition consistent with shell language.
66 – 69	Section 2.1 H	<ul style="list-style-type: none"> Added Lime Operations from Section 2.1 F. Added CAM condition for particulate matter (Condition H.3)
70 – 72	Section 2.1 I	<ul style="list-style-type: none"> Added North and South Chip Piles to Woodyard Operations.
73 – 76	Section 2.1 J	<ul style="list-style-type: none"> Updated condition header to reflect changes in the Section 1 equipment table. Added a condition (J.1) to address SO₂ emissions when the HVLC sources are combusted in the thermal oxidizer and renumbered remaining conditions Revised condition J.2 as follows: <ul style="list-style-type: none"> Removed minimum temperature requirement for Nos. 1 and 2 Hog Fuel Boilers. Subpart BB does not have minimum temperature requirements for when the HVLC sources are burned in power boilers. Added monitoring requirements for when the HVLC gases are burned in the thermal oxidizer. Added reporting requirement for excess emissions. Added CAM condition for TRS emissions when burned in either the hog fuel boilers or the thermal oxidizer (Condition J.3).
77 – 79	Section 2.1 K	<ul style="list-style-type: none"> Updated condition header to reflect changes in the Section 1 equipment table. Revised condition K.1 as follows: <ul style="list-style-type: none"> Removed minimum temperature requirement for Nos. 1 and 2 Hog Fuel Boilers. Subpart BB does not have minimum temperature requirements for when the LVHC sources are burned in power boilers. Added reporting requirement for excess emissions. Added CAM condition for TRS Emissions when burned in the hog fuel boiler (Condition K.2)
80 – 81	Section 2.1 L	<ul style="list-style-type: none"> Updated condition header to reflect changes in the Section 1 equipment table. Revised condition L.1 as follows: <ul style="list-style-type: none"> Removed minimum temperature requirement for Nos. 1 and 2 Hog Fuel Boilers. Subpart BB does not have minimum temperature requirements for when the LVHC sources are burned in power boilers. Added reporting requirement for excess emissions. Added CAM condition for TRS Emissions when burned in the hog fuel boiler (Condition L.2)
82 – 83	Section 2.1 M	<ul style="list-style-type: none"> Updated condition header to reflect changes in the Section 1 equipment table. Reordered the rows in the summary of limits and standards table to reflect order in which conditions appear in the permit.
84	Section 2.1 N	<ul style="list-style-type: none"> Removed emission limit conditions for particulate matter and visible emissions. These sources are wet sources and do not emit PM and are not subject to the visible emission standards.
86 – 90	Section 2.1 P	<ul style="list-style-type: none"> Updated condition header to include horsepower rating for each engine. Revised condition P.3 as follows: <ul style="list-style-type: none"> Revised MACT Subpart ZZZZ to reflect current rule language. Added a condition (P.3.b) to state that one of the engines is a new engine subject to NSPS Subpart IIII and that compliance with Subpart ZZZZ would be demonstrated by complying with the NSPS. Added NSPS Subpart IIII (Condition P.4) for the Fine Paper Fire Pump Diesel Engine.
91 – 94	Section 2.1 Q	<ul style="list-style-type: none"> Added a condition (Q.1) to address SO₂ emissions when the LSRP sources are combusted in the thermal oxidizer and renumbered remaining conditions Added CAM condition for TRS emissions when burned in either the hog fuel boilers or the thermal oxidizer (Condition Q.3).

Table 2. Summary of Changes to Permit No. 04291T48

Pages	Section	Description of Changes
96 – 97	Section 2.1 S	<ul style="list-style-type: none"> Added condition S.1.d to state that reporting is not required for PM emissions from the portable log chipper
98 – 108	Section 2.2 A	<ul style="list-style-type: none"> Updated list of affected sources under MACT Subpart S as follows: <ul style="list-style-type: none"> include the Pressure Diffuser Filtrate Tank reflect changes made in the Section 1 equipment table. Added Nos. 6 and 7 Digester Foul Condensate Tank as an affected source. Revised condition A.1 to reflect current rule language and incorporate SSM language Removed condition A.2 as the Case-by-Case MACT no longer applies given the most recent rule update incorporated SSM requirements.
109 – 114	Section 2.2 B	<ul style="list-style-type: none"> Revised the summary of limits and standards table as follows: <ul style="list-style-type: none"> update operating parameter limits based on recent testing for the smelt tanks and the lime kiln Revise the Subpart MM Bubble Limits for the smelt tanks and the overall limit based on recent testing. Removed conditions B.1.j and B.1.m because the pre-October 2019 requirements no longer apply. Renumbered remaining conditions. Removed all requirements from B.1 associated with pre October 2019 requirements. Revised condition B.1 to reflect current rule language and incorporate SSM language Removed condition B.2 as the Case-by-Case MACT no longer applies given the most recent rule update incorporated SSM requirements.
NA	Section 2.2 C	<ul style="list-style-type: none"> Removed this condition from the permit as the five-year period has expired. Renumbered remaining conditions in Section 2.2
116 – 123	Section 2.2 D	<ul style="list-style-type: none"> Updated TAP limits condition to reflect current shell language.
124	Section 2.2 E	<ul style="list-style-type: none"> Removed condition E.2 as the permit application required is consolidated with this renewal permit and the condition is no longer necessary.
125	Section 2.2 F	<ul style="list-style-type: none"> Updated Projected Actual Emissions table as requested pursuant to Permit Application No. 5900069.20A which is consolidated with this renewal permit.
126 – 135	Section 3	<ul style="list-style-type: none"> Replaced General Conditions with version 5.5, dated 08/25/2020.

B. Proposed Changes Associated with Permit Application No. 5900069.20A

As discussed in Section I, above, Domtar submitted Permit Application No. 5900069.20A as the second step of a two-step significant modification. In the first step of the two-step significant application, Domtar proposed the following modifications to existing sources and new sources: modifications to the No. 2 Hog Fuel Boiler; installation of a new backup control device for HVLC gases; installation of a new cooling tower; and modifications to NC-5 pulp machine. Domtar also included the rebuild of the North and South Smelt Tanks emissions in the first step permit application. Details of the modifications are included in the Air Permit Review associated with Permit No. 04291T45 and are included in Attachment A. With Permit Application No. 5900069.20A, Domtar requested that DAQ consider supplemental information to reflect the project as it was installed, following emission testing of the No. 2 Hog Fuel Boiler. Domtar also requested permit changes regarding the hog fuel boiler permitted fuels; addition of an alternate operating scenario for the No. 1 Hog Fuel Boiler; recalculation of 40 CFR Part 63, Subpart MM bubble calculations for the chemical recovery sources; clarification of Subpart D permit limits; and changes to the reporting requirement under 15A NCAC 02D .0530(u). The changes to the permit requested in the permit application (No. 5900069.20A) are summarized below.

1. Supplemental Information to Reflect the Project as Installed

The second step permit application (No. 5900069.20A) also provided supplemental information related to the first step application (No. 5900069.18A). Since the first step application was submitted on August 15, 2018, Domtar conducted several tests on the No. 2 Hog Fuel Boiler and determined that the emission factors used to estimate the increases in emissions related to the Mill Optimization Project did not accurately reflect the actual emissions from the combustion of the low volume high concentration (LVHC) gases and stripper off gases (SOG). Due to this additional information, Domtar provided revisions to the post project increases in emissions used in the prevention of significant deterioration (PSD) analysis with Permit Application No. 5900069.20A and requested that the tracking condition under 15A NCAC 02D .0530(u) be revised to reflect the new information. Further discussion on the proposed changes to the PSD applicability analysis will be addressed in Section VI.C, below.

The ESP installed on the No. 2 Hog Fuel Boiler replaced the electroscrubbers that were installed to control PM emissions. Domtar requested that the North, Central, and South de-entrainment vessels and associated baghouses be removed from the permit as they were associated with the electroscrubbers and are no longer needed. DAQ will remove these sources as requested.

Domtar also requested a change to the monitoring requirements associated with the No. 2 Hog Fuel Boiler ESP. As stated in their permit application, the ESP installed on the No. 2 Hog Fuel Boiler consists of a single chamber with four fields and is designed to meet applicable PM emission limits with one field out of service. Each field can be operated with one-half of the electrical field isolated and out of service. Domtar conducted a filterable PM performance test on the No. 2 Hog Fuel Boiler when the ESP was operated with only 1.5 electrical fields in operation. Domtar requested that the monitoring requirements for the ESP be revised to reflect that operation of only 1.5 electrical fields are required to maintain compliance with the applicable PM limits.

According to the Compliance Stack Test Report Review, the testing was conducted between December 16 and 19, 2019, for six combinations of hog fuel with HVLC gases, LVHC gases, and natural gas.⁶ The performance test results demonstrated compliance with filterable PM emission limits under the new source performance standards (NSPS) under 40 CFR Part 60, Subpart D and the maximum achievable control technology (MACT) for boilers under 40 CFR Part 63, Subpart DDDDD and the total PM emission limits under PSD BACT and 15A NCAC 02D .0504, by several orders of magnitude. Therefore, based on the large margin of compliance with the applicable emission limits, DAQ has made the requested changes to the monitoring requirements in the permit.

⁶ Memorandum to Fisher, R., Washington Regional Office Supervisor, NC DENR/DAQ from B. Hall, Stationary Source Compliance Branch, NC DEQ/DAQ. No. 2 Hog Fuel Boiler Emissions Testing: 6 Conditions/Fuels conducted from December 16 through 19, 2019. February 25, 2020.

Another change from the initial first step application is related to the cooling tower combined flow rate. In the March 2018 initial application, the cooling tower designed combined flow rate was 27,000 gallons per minute (gpm) and in the June 2020 second step application, the “as-built” combined flow rate was 28,500 gpm. The change in PM emissions was 0.02 tpy, calculated from the estimate for the designed flowrate of 0.24 tpy of PM, PM₁₀, PM_{2.5} and the emissions for the “as built” flowrate of 0.26 tpy for PM, PM₁₀, PM_{2.5}. This source remains an insignificant activity as represented in the current permit (T48).

2. Additional Changes Requested in Permit Application No. 5900069.20A

In addition to providing supplementary information for the initial first step permit application to reflect the post-project changes to the new and modified sources, Domtar also proposed the following changes to the permit:

- Permitted fuels for Nos. 1 and 2 Hog Fuel Boilers;
- No. 1 Hog Fuel Boiler Alternate Operating Scenario;
- 40 CFR Part 63, Subpart MM – Reestablish Bubble Limits and Operating Limits;
- 40 CFR Part 60, Subpart D – Clarify the Applicability of the PM Emission Limit; and
- Updates to the tracking requirement under 15A NCAC 02D .0530(u).

The proposed changes to the NSPS Subpart D, 40 CFR Part 63, Subpart MM, and 02D .0530(u) requirements are addressed in Sections VI.A, B, and C, respectively, below.

a. *Permitted Fuels for Nos. 1 and 2 Hog Fuel Boilers*

The Nos. 1 and 2 Hog Fuel Boilers are currently permitted to fire lignin, natural gas, biomass, No. 2 fuel oil, used oil, wastewater treatment plant residuals (i.e., sludge), and non-condensable gases (NCGs). On March 26, 2015, Domtar submitted a NHSM determination to DAQ regarding creosote treated railroad ties. On December 18, 2018, Domtar also submitted a NHSM determination regarding bleached and unbleached stock. Finally, on May 28, 2019, Domtar submitted a NHSM determination regarding the burning of paper cores. All three of these determinations were approved by DAQ and DAQ concurred that these materials fall under the definition of biomass included in the permit. Therefore, Domtar requested that these materials specifically be added as permitted fuels. DAQ will add these materials to the list of permitted fuels. However, creosote treated railroad ties is a category specified in 40 CFR 214.4 as being a NHSM. Therefore, this fuel will not be listed in the permit, but the bleached and unbleached stock and paper cores will be added to the list of permitted fuels to be burned in the Nos. 1 and 2 Hog Fuel Boilers.

Domtar also requested that the footnotes of the Section 1 Equipment Table be modified to remove the requirement to notify DAQ in writing within 30 days of beginning the use of any new biomass fuel. Per guidance from EPA, DAQ does not have the authority to make determinations regarding NHSM. Per 40 CFR 241.3, facilities are required to conduct determinations on NSHM and provide DAQ with sufficient information in a permit application to add a new fuel that will persuade DAQ that the determination is valid.⁷ Therefore the footnote was updated to reflect that a determination will not be made by DAQ and the notification to DAQ that a new fuel will be fired will be satisfied via the permit application. Footnote to the equipment table in Section 1 was updated to reflect this EPA policy.

b. *No. 1 Hog Fuel Boiler Alternate Operating Scenario*

In their permit application, Domtar stated that they have recently begun to fire only natural gas in the No. 1 Hog Fuel Boiler for certain periods of time and expects to continue to operate the No. 1 Hog Fuel Boiler on only natural gas for extended periods. The hog fuel boiler is currently permitted to burn several fuel types, including natural gas and No. 2 fuel oil. The boiler is equipped with two multicyclones operating in series followed by three electroscrubbers, operating in parallel. Section 2.1 A.5.i.i of the current permit (T48) requires the operation of the multicyclones and electroscrubbers at all times. According to Domtar, these particulate matter control devices are not necessary to demonstrate compliance with applicable PM, opacity, and mercury emission limits when firing only natural gas or No. 2 fuel oil.

⁷ Email from Langston, David, Senior Environmental Engineer, US EPA/RCRA Program to Twisdale, Jeff, NC DEQ/Division of Air Quality/Permitting Section. “RE: Non-Hazardous Secondary Material Determinations.” July 15, 2019. (See Attachment B)

As such, Domtar requested an alternate operating scenario (AOS) for the No. 1 Hog Fuel Boiler for periods when only natural gas and/or No. 2 fuel oil is fired. Because the control devices are not required to demonstrate compliance with the emission limits for PM, opacity, and mercury, Domtar requested that the AOS allow the mill to cease operation and monitoring of the air pollution control devices (i.e., secondary voltage and total number of modules in service) when firing natural gas and No. 2 fuel oil, only. A primary operating scenario (POS) and an AOS condition was added to the permit to address Domtar's request. The regulatory applicability and necessary changes to the permit are discussed in Section VI, below. No changes to the State Rules were required to incorporate the POS and AOS.

With respect to the Boiler MACT, the No. 1 Hog Fuel Boiler AOS can be considered a fuel switch that the No. 1 Hog Fuel Boiler could be considered a "unit designed to burn gas 1 fuel." Based on a call with Domtar on January 19, 2021, the hog fuel supply lines have been removed and the boiler has not been used at all. Since they wished to keep it on the permit, a Boiler MACT condition was added to the permit with the "unit designed to burn gas 1" subcategory requirements (See Section VI, below).

c. 40 CFR Part 63, Subpart MM – Reestablish Bubble Limits and Operating Limits

Domtar complies with the Subpart MM emission standards by establishing a site-specific "bubble" limit as allowed under 40 CFR 63.862(a)(1)(ii). Domtar is required under Subpart MM to conduct periodic performance testing to demonstrate compliance with the emission standards. The first of the 5-year periodic performance tests were completed on June 26, 2019 (No. 5 Recovery Boiler), June 27, 2020 (North and South Smelt Dissolving Tanks), and July 31, 2019 (No. 5 Lime Kiln).

In their permit application, Domtar requested that the site-specific bubble limits be reestablished in accordance with 40 CFR 63.862(a)(ii) and the No. 5 Lime Kiln scrubber liquid injection rate in accordance with 40 CFR 63.864(j) be based on the latest performance tests. The following summarizes the requested changes to Table 2.2 B-1 of the permit.

- Change the North Smelt Tank PM emission limit to no greater than 0.073 grains per dry standard cubic feet (gr/dscf) and no greater than 0.187 pounds per ton of black liquor solids (lb/TBLS).
- Change the South Smelt Tank PM emission limit to no greater than 0.073 gr/dscf and no greater than 0.200 lb/TBLS.
- Change the No. 5 Lime Kiln PM emission limit to no greater than 0.066 gr/dscf corrected to 10 percent oxygen.
- Change the No. 5 Lime Kiln scrubber flow rate to be no less than 896 gallons per minute.
- Change the total PM emission limit from all Subpart MM sources to 1.478 lb/TBLS.

d. 40 CFR Part 60, Subpart D – Clarify the Applicability of the PM Emission Limit; and

Domtar also requested revisions to the NSPS Subpart D language in Section 2.1 A and 2.1 A.5.b of the current permit (T48) which describes the PM limit found in 40 CFR Part 60, Subpart D to read as follows: 0.10 pounds per million Btu heat input when firing fossil fuel or fossil fuel and wood residue.

Although the language in the table in Section 2.1 A indicates the limit applies "when firing oil only or oil and wood residue or natural gas and wood residue," Domtar interpreted the language in Section 2.1 A.5.b of the current permit (T48) indicates the limit applies when firing oil or oil and wood residue. The requested change was to clarify the PM requirements under 40 CFR 60.42(a)(1).

e. Updates to the tracking requirement under 15A NCAC 02D .0530(u).

In their permit application, Domtar requested updates, as an addendum to Permit Application No. 5900069.20C, to the tracking condition under 02D .0530(u) based on updates to the emissions associated with the Mill Optimization Project (See Section IV.C.4 for a detailed discussion on this change).

V. Regulatory Review – State Rules

Domtar is subject to several NC regulations. An extensive review for each applicable regulation is not included in this document, as the facility's status with respect to most of these regulations has not changed. For some regulations below more discussion is provided for clarification and background, as necessary. When necessary, the permit was updated to reflect the most current requirements and permit language for all applicable regulations.

A. 15A NCAC 02D .0503: Particulates from Fuel Burning Indirect Heat Exchangers

This rule applies to particulate matter emissions from the combustion of fuel in indirect heat exchangers, such as boilers, that are discharged from any stack or chimney into the atmosphere. The regulation provides the following equation to be used to determine the allowable emissions limit in terms of maximum heat input:

$$E = 1.090 \times Q^{-0.2594}$$

Where:

- E = allowable emissions limit for particulate matter in lb/million Btu; and
- Q = maximum heat input in million Btu/hr. The maximum heat input is the total heat content of all fuels and is the sum of maximum heat input of all fuel burning indirect heat exchangers at a plant site which are in operation, under construction, or permitted when determining the allowable emission limit for each fuel burning indirect heat exchanger.

This emissions limit does not apply when wood is burned in the Nos. 1 and 2 Hog Fuel Boilers (see Section V.B, below for more details). The following sources are subject to regulation 02D .0503:

- No. 1 Hog Fuel Boiler (ID No. ES-64-25-0290) – Firing lignin, natural gas, biomass fuel, No. 2 oil, used oil, sludge, and HVLC gases with a maximum heat input of 1,021 million British thermal units (MMBTU) per hour, 835 MMBtu/hr when firing clean cellulosic biomass in combination with any other fuel. The boiler is subject to the following PM emission limits:
 - 0.160 lb/MMBtu heat input when firing natural gas or No. 2 fuel oil;
 - 0.22 lb/MMBtu heat input when firing woodwaste alone; and
 - The PM emission limit calculated in lb/MMBtu heat input when firing woodwaste in combination with natural gas or fuel oil is discussed in Section V.B, below.
- No. 2 Hog Fuel Boiler (ID No. ES-65-25-0310) – Firing lignin, natural gas, biomass fuel, No. 2 fuel oil, used oil, sludge, and HVLC, LVHC, and SOG gases with a maximum heat input of 889 MMBtu/hr when firing any combination of fuel. The boiler is subject to the following PM emission limits:
 - 0.143 lb/MMBtu heat input when firing natural gas or No. 2 fuel oil;
 - 0.22 lb/MMBtu heat input when firing woodwaste alone; and
 - The PM emission limit calculated in lb/MMBtu heat input when firing woodwaste in combination with natural gas or fuel oil is discussed in Section V.B, below.
- Temporary Boilers (ID Nos. ES-RB1 and ES-RB2) – firing low sulfur No. 2 Fuel Oil with a maximum heat input of 85.7 MMBtu/hr, each. PM emission limit of 0.16 lb/MMBtu heat input.

The derivation of the PM emission limits for the Hog Fuel Boilers under 02D .0503 was analyzed during the processing of Permit No. 04291T46 and for the Temporary Boilers were calculated during the processing of Permit No. 04291T37. These analyses will not be reproduced in this permit review. However, the 02D .0503 permit condition in Section 2.1 A.2.a of the current permit (T48) has a typographical error with respect to the PM limits. The limits should be represented for each boiler as they are in the summary of limits and standards table in Section 2.1 A. This condition will be revised to state that the PM emission limit for the No. 1 Hog Fuel Boiler is 0.160 lb/MMBtu and the PM emission limit for the No. 2 Hog Fuel Boiler is 0.143 lb/MMBtu.

Particulate emissions from the No. 1 Hog Fuel Boiler are controlled using three electroscrubbers, operating in parallel. The No. 2 Hog Fuel Boiler is equipped with an ESP. No testing, monitoring, recordkeeping or reporting is required when only natural gas and/or No. 2 fuel oil is burned in the hog fuel boilers.

Due to the inherently low emissions associated with firing No. 2 fuel oil, no control is necessary for the Temporary Boilers to comply with the 02D .0503 emission limits. No testing, monitoring, recordkeeping, and reporting (MRR) is required for these boilers.

No further changes to these requirements are necessary as a part of this renewal and compliance is expected.

B. 15A NCAC 02D .0504: Particulates from Wood Burning Indirect Heat Exchangers

This regulation applies to boilers in which wood is burned for the primary purpose of producing heat or power. The regulation provides the following equation to be used to determine the allowable emissions limit in terms of maximum heat input:

$$E = 1.1698 \times Q^{-0.2230}$$

Where:

- E = allowable emissions limit for particulate matter in lb/million Btu; and
- Q = maximum heat input in million Btu/hr. The maximum heat input is determined using the heat content of wood specified in the rule (8,000 Btu/pound, dry basis).

The Nos. 1 and 2 Hog Fuel Boilers are subject to this rule when burning wood alone (heat inputs of 835 MMBtu/hr and 889 MMBtu/hr, respectively). Using the equation above, the allowable emissions limit when firing wood alone is:

$$E = 1.1698 \times (835 + 889)^{-0.2230}$$

$$E = 0.22 \text{ lb/million Btu}$$

The Nos. 1 and 2 Hog Fuel Boilers also combust wood in combination with other fuels. Per 02D .0504(f), the emission limit for when wood is combusted in combination with other fuels, the allowable emission limit is calculated using the equation in 02D .0503(f) as follows:

$$E_c = [(E_w)(Q_w) + (E_o)(Q_o)]/Q_t$$

Where:

- E_c = emission limit for combined firing (pound per mmBtu);
- E_w = emission limit for wood only
= 0.22 lb/MMBtu
- Q_w = actual wood heat input including woodwaste
- E_o = emission limit for other fuels (see above)
- Q_o = actual heat input other than wood heat input
- Q_t = Q_w + Q_o

Performance tests are required for these boilers to demonstrate compliance with the NSPS in 40 CFR Part 60, Subpart D (see Section VI.A). Monitoring, recordkeeping and reporting under Subpart D are also used to comply with this standard. No further changes to the permit are being made with this renewal and compliance is expected.

C. 15A NCAC 02D .0508: Particulates from Pulp and Paper Mills

This regulation applies to recovery furnaces, smelt dissolving tanks, and lime kilns as follows:

- No. 5 Recovery Furnace (ID No. ES-10-25-0110) – although the recovery furnace is subject to regulation under 02D .0524, the PM limit is for filterable PM and the PM limit in 02D .0508 is for total particulate matter. Therefore, the recovery furnace is subject to a PM emission limit of 3.0 pounds per equivalent ton

of air dried pulp (ADTP). In addition, since the No. 7 Recovery Furnace is subject to visible emission standards under 15A NCAC 02D .0524 (New Source Performance Standards), it is not subject to the visible emissions limit in 02D .0508(b).

- North and South Smelt Dissolving Tanks (ID Nos. ES-14-05-0050 and ES-14-05-0300) – the smelt dissolving tank is subject to a particulate matter emission limit of 0.6 pounds per ADTP.
- No. 5 Lime Kiln (ID No. ES-14-60-3000) – although the No. 5 Lime Kiln is subject to regulation under 02D .0524, the PM limit is for filterable PM and the PM limit in 02D .0508 is for total particulate matter. Therefore, the No. 5 Lime Kiln is subject to a particulate matter emission limit of 0.5 pounds per ADTP.

Periodic performance testing for the smelt dissolving tanks is not required. Testing for the recovery furnace and the lime kiln is required once every 5 years unless the test results are 80 percent or greater, testing will need to be conducted once every year. In the current permit, monitoring, recordkeeping and reporting requirements to demonstrate compliance with the particulate matter emission limits for all four sources under this rule are tied to the compliance requirements under the NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills under 40 CFR Part 63, Subpart MM (See Section VI.B, below, for details of the compliance requirements for the recovery furnace, smelt dissolving tank, and lime kilns).

The reporting requirements for the recovery boiler and smelt tanks in Section 2.1 C.1.h and D.1.g, respectively of the current permit (T48) is redundant to the reporting requirements under Subpart MM. In Section 2.1 E.1 of the current permit (T48), much of the monitoring/recordkeeping/reporting requirements for the lime kiln are redundant to the Subpart MM requirements and these were removed from the condition. No further changes to these requirements are necessary as a part of this renewal and compliance is expected.

D. 15A NCAC 02D .0512: Particulates from Miscellaneous Wood Products Finishing

This regulation applies to the Carpentry Woodworking operations located at the Domtar mill. Under this regulation, for particulate matter caused by the working, sanding, or finishing of wood, Domtar is required to provide, as a minimum for its collection, adequate duct work and properly designed collectors. In no case can the ambient air quality standards be exceeded beyond the property line. Collection efficiency is determined on the basis of weight.

Domtar complies with this regulation by controlling PM emissions by using a cyclone. Domtar is required to inspect the cyclone and ductwork monthly for structural integrity. Domtar is required to keep records of the inspections and any maintenance performed on the cyclone and submit semiannual summary reports. No changes to this condition are necessary as a part of this renewal, outside of updating language to reflect the current permit shell. Compliance is expected.

E. 15A NCAC 02D .0515: Particulates from Miscellaneous Industrial Processes

This rule applies to stacks, vents, or outlets emitting particulates from industrial processes with no other applicable standards. The allowable emission rate is in terms of pounds per hour and is calculated using the following equation:

For process rates up to 30 tons per hour:

$$E = 4.10(P)^{0.67}$$

For process rates greater than 30 tons per hour:

$$E = 55.0(P)^{0.11} - 40$$

Where: E = Allowable emission rate in pounds per hour
P = Process weight in tons per hour

The following emission sources are subject to 02D .0515:

- No. 1 Hog Fuel De-Entrainment Vessels - PM emissions from the West, Central, and East De-Entrainment Vessels are each controlled by baghouses. Compliance is demonstrated by monthly visual inspection of ductwork, annual internal baghouse inspection, maintenance, recordkeeping, and reporting.
- No. 1 Hog Fuel Boiler Ash Storage and Handling – The No. 1 Hog Fuel Boiler Scrubber Ash Silo is equipped with bagfilters. Compliance is demonstrated by monthly visual inspection of ductwork, annual internal baghouse inspection, maintenance, recordkeeping, and reporting.
- No. 2 Hog Fuel Boiler Ash Storage and Handling – The No. 2 Hog Fuel Boiler Ash Silos, No. 2 Hog Fuel Scrubber Ash Silos, and No. 2 Hog Fuel Boiler Air Transport Steam Exhausters are equipped with bagfilters. Compliance is demonstrated by monthly visual inspection of ductwork, annual internal baghouse inspection, maintenance, recordkeeping, and reporting.
- Lime Operations – PM emissions from the Reburned Lime Conveyor, Bucket Elevator and Bin, and Fresh Lime Bin are each controlled with baghouses. Compliance is demonstrated by monthly visual inspection of ductwork, annual internal baghouse inspection, maintenance, recordkeeping, and reporting.
- Lime Slaker and Causticizing Lines – PM emissions from the East Lime Slaker, the Nos. 1, 2, and 3 East Causticizing Lines, the West Lime Slaker, and Nos. 1, 2, and 3 West Causticizing Lines are each controlled with a particulate scrubber. Domtar is required to monitor scrubber flow rate using a continuous flow meter. The scrubber flow rates of the scrubbers are required to be greater than 45 gallons per minute. Flow rate gauges are required to be checked annually to ensure proper operation. Inspections for malfunctions and cleaning or repair are required if the flow reading is below the minimum flow rate. Compliance is demonstrated with recordkeeping and reporting.
- Reburned Lime Crusher – PM emissions are controlled either by a baghouse or are routed to the Lime Kiln Venturi Scrubber. When the No. 5 Lime Kiln is not operating, the lime crusher is vented to the baghouse through the conveyor system. Otherwise, the crusher is vented through the Lime Kiln Venturi Scrubber. When the scrubber is being used for compliance, Domtar is required to comply with the monitoring, recordkeeping, and reporting requirements of Subpart MM (since the No. 5 Lime Kiln is subject to Subpart MM and demonstrates compliance with the scrubber). When the baghouse is used for control, compliance is demonstrated by monthly visual inspection of ductwork, annual internal baghouse inspection, maintenance, recordkeeping, and reporting.
- Nos. 6 and 7 Chip Silos, Boiler Fuel Storage and Handling, and Woodyard Operations – these sources are uncontrolled. Compliance with the limit is demonstrated by maintaining records of the associated process rates in tons per hour. No reporting is required.
- Portable Log Chipper – this source is uncontrolled. Compliance with the limit is demonstrated by maintaining records of the associated process rates in tons per hour. No reporting is required.

In the current permit (T48), the East and West Lime Mud Filters have a 02D .0515 condition. According to compliance evaluation,⁸ these sources are not sources of particulate emissions because the raw material to the filters is wet. The scrubber is present to pull a vacuum on the filters and not used for emissions control. Domtar does not report particulate emissions from these sources in their annual emissions inventory. Therefore, the 02D .0515 condition in Section 2.1 N.1 of the current permit (T48) was removed.

Except as discussed above, and changes made to reflect permit shell language, no changes to the conditions in the permit with respect to this rule are necessary as part of this renewal and compliance is expected.

F. 15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources

This regulation applies to any source of combustion that emits sulfur dioxide, which is formed by the combustion of sulfur in fuels, wastes, ores, and other substances. This rule does not apply to sources subject to sulfur dioxide standards in NSPS and MACT standards under 02D .0524 and .1111, respectively. The Nos. 1 and 2 Hog Fuel Boilers are subject to sulfur dioxide standards under NSPS Subparts D when firing oil only or oil and wood

⁸ Full Compliance Evaluation for 2018 and 2019. Conducted by Betsy Huddleston, Washington Regional Office. Dated 05/16/2020.

residue and therefore are not subject to 02D .0516 when firing these fuels. Sources subject to this standard have an emission limit of 2.3 pounds of sulfur dioxide per million BTU heat input.

The following emission sources at the Domtar mill are subject to this rule:

- Nos. 1 and 2 Hog Fuel Boilers (ID Nos. ES-64-25-0290 and ES-65-25-0310) – This regulation applies when combusting wood alone or natural gas alone. Due to the inherently low sulfur content of the wood residue and natural gas, no monitoring/recordkeeping/reporting is required. The current permit states that this regulation applies when firing wood alone, but does not include the firing of natural gas. Therefore, the permit was modified to include natural gas combustion.
- Two Temporary Boilers (ID Nos. ES-RB1 and ES-RB2) – These sources only combust low-sulfur No. 2 fuel oil, which by definition has a low sulfur content. Therefore, no MRR is required for these sources.
- No. 5 Recovery Boiler (ID No. ES-10-25-0110) – The recovery boiler is permitted to burn natural gas and low-sulfur No. 2 fuel oil. Due to the inherently low sulfur content of these fuels, no MRR is required for the recovery furnace.
- No. 5 Lime Kiln (ID No. ES-09-PU-004) - Compliance with this regulation is demonstrated by fuel supplier sampling when fuel oil is being combusted in this source. The fuel oil sulfur content is limited to 2.1 percent by weight. A new paragraph was added to this condition to specify that monitoring and recordkeeping are not required when firing natural gas alone in the lime kiln.
- Diesel-fired emergency engines (ID Nos. ES-14-60-3000a, ES-53-40-0130, ES-53-40-0140, ES-53-40-0145, ES-71-95-0500, ES-73-05-4510, and ES-73-05-4580) – These sources combust diesel fuel, which has inherently low sulfur content. Therefore, no MRR is required.

The sources collected and controlled in the HVLC systems, including the LSRP sources are controlled using a thermal oxidizer as a backup to the Hog Fuel Boilers and the No. 5 Recovery Boiler. The thermal oxidizer is a combustion device that is not otherwise subject to the 02D .0516 requirements. Because these HVLC sources contain sulfur compounds, it was necessary to add 02D .0516 conditions for Sections 2.1 J. Compliance is demonstrated by keeping records of the sulfur dioxide emission calculations and submit a semiannual summary report.

Except as described above, no additional changes to the permit are required as a part of this renewal. Compliance with this regulation is expected.

G. 15A NCAC 02D .0519: Control of Nitrogen Oxides Emissions

This regulation limits nitrogen oxide emissions from oil- or gas-fired boilers and coal-fired boilers with maximum heat input capacity of 250 million Btu/hr or more. Sources subject to NSPS and 02D .0524 are exempt from this regulation. The Nos. 1 and 2 Hog Fuel Boilers are subject to NO_x standards under NSPS Subpart D and are therefore exempt from 02D .0519. The Temporary Boilers at the Domtar mill have maximum heat input capacities below the 250 MMBtu/hr threshold and are not subject to this regulation.

H. 15A NCAC 02D .0521: Control of Visible Emissions

This regulation applies to fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur. Sources subject to visible emissions standards under specifically identified rules under 02D (including .0508, .0524, and .1111) are required to meet the standards of those rules instead of the standards in 02D .0521. The Nos. 1 and 2 Hog Fuel Boilers are subject to visible emission limits under 02D .0524, NSPS Subpart D, 60.42(a)(2) when firing oil and wood and are not subject to 02D .0521 when firing those fuels. The No. 5 Recovery Furnace [02D .1111, MACT Subpart MM, 63.864(k)] is subject to visible emissions limits and is not subject to 02D .0521.

Sources manufactured prior to July 1, 1971, have a visible emissions limit of 40 percent opacity when averaged over a 6-minute period. The 6-minute averaging periods may exceed 40 percent if no 6-min period exceeds 90 percent opacity, no more than one six-minute period exceeds 40 percent opacity in one hour, and no more than

four 6-minute periods exceed 40 percent in any 24-hour period. The following sources are subject to the 40-percent opacity visible emissions standard:

- Screen house (ID No. ES-00-35-1000), Hog Fuel Handling and Transfer (ID No. FS-010); Chip Conveying (to pulping) (ID No. FS-012); Chip Handling and Transfer System in the Woodyard (ID No. FS-013); and Hog Fuel Handling and Transfer to Boiler Area (ID No. FS-021) – compliance is demonstrated with this visible emissions limit by conducting quarterly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report.
- Carpentry Woodworking Operations (ID No. ES-94-15) – compliance is demonstrated with this visible emissions limit by conducting monthly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report.

Sources manufactured after July 1, 1971, have a visible emissions limit of 20 percent opacity when averaged over a 6-minute period. The 6-minute averaging periods may exceed 20 percent if no 6-min period exceeds 87 percent opacity, no more than one six-minute period exceeds 20 percent opacity in one hour, and no more than 4 6-minute periods exceed 20 percent in any 24-hour period. Compliance with this standard is demonstrated by conducting either daily, weekly, or monthly stack observations.

- Temporary Boilers (ID Nos. ES-RB1 and ES-RB2) – Combustion of natural gas and No. 2 fuel oil has inherently low visible emissions and therefore, no MRR is required for these temporary boilers.
- North and South Smelt Tank (ID Nos. ES-14-05-0050 and ES-14-05-0300) – are equipped with scrubbers and therefore, visible emissions are only present due to uncombined water and no MRR is required. The permit language was updated to be more reflective of the 02D .0521(e) regulation language.
- No. 5 Lime Kiln (ID No. ES-14-60-3000) - the lime kiln is equipped with a scrubber and therefore, visible emissions are only present due to uncombined water and no MRR is required. The permit language was updated to be more reflective of the 02D .0521(e) regulation language.
- No. 1 Hog Fuel Boiler West, Central, and East De-Entrainment Vessels (ID Nos. ES-64-60-0180, ES-64-60-0480, and ES-64-60-0780); No. 2 Hog Fuel Boiler North, Central, and South De-Entrainment Vessels (ID Nos. ES-65-60-0140, ES-65-60-0430, and ES-65-60-0630); No. 1 Hog Fuel Boiler Scrubber Ash Silo (ID No. ES-64-60-0960); and No. 2 Hog Fuel Boiler Scrubber Ash Silo (ID No. ES-65-60-0860) – compliance is demonstrated with this visible emissions limit by conducting weekly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report.
- No. 2 Hog Fuel Boiler Ash Silo (ID No. ES-65-50-0190); No. 2 Hog Fuel Boiler Ash Transport Steam Exhauster (ID No. ES-65-50-0160); Reburned Lime Bin (ID No. ES-14-65-1030); Fresh Lime Bin (ID No. ES-14-65-1080); and Reburned Lime Conveyor, Bucket Elevator, and Bin (ID Nos. ES-14-65-1000, ES-14-65-1020 and ES-14-65-1030) – compliance is demonstrated with this visible emissions limit by conducting monthly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report. The Reburned Lime Conveyor and Bin were not included in the 02D .0521 condition in the current permit (T48) but are emitted through the same bagfilter as the Reburned Lime Bucket Elevator. These were moved to Section 2.1 H of the permit.
- East and West Lime Slakers (ID Nos. ES-14-20-2020 and ES-14-20-2085) – the slakers are each equipped with a scrubber and therefore, visible emissions are only present due to uncombined water and no MRR is required. The permit language was updated to be more reflective of the 02D .0521(e) regulation language.
- Reburned Lime Crusher (ID No. ES-14-60-3015) – the crusher is controlled with a baghouse or is routed to the No. 5 Lime Kiln scrubber. When the No. 5 Lime Kiln is not operating, the lime crusher is vented to the baghouse through the conveyor system. Otherwise, the crusher is vented through the Lime Kiln Venturi Scrubber. When the baghouse is used, compliance with the visible emissions is demonstrated by conducting weekly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report. When routed to the No. 5 Lime Kiln scrubber, the visible emissions are only present due to uncombined water and no MRR is required. The permit language was updated to be more reflective of the 02D .0521(e) regulation language and to remove reference to Subpart MM requirements. Since the Lime Dust Baghouse associated with the Reburned Lime Conveyor, Bucket Elevator, and Bin also control the emissions from the Reburned Lime Crusher, the inspection/monitoring

requirements were changed to monthly to align the Reburned Lime Crusher condition with the same baghouse.

- No. 6 Fiberline Chip Silos B and C (ID Nos. ES-06-05-2000 and ES-06-05-3000); No. 7 Fiberline Chip Silos A and B (ID Nos. ES-07-05-1000 and ES-07-05-2000); and No. 1 and No. 2 Hog Fuel Conveying (ID No. FS-007); Debarking and Chipping Line (ID No. ES-11-10-1500); and two Bark Hogs (ID No. ES-11-50-4500-1 and ES-11-50-4500-2) – compliance is demonstrated with this visible emissions limit by conducting quarterly observations for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report.
- Seven Diesel-Fired Emergency Engines (ID Nos. ES-14-60-3000a, ES-53-40-0130, ES-53-40-0140, ES-53-40-0145, ES-71-95-0500, ES-73-05-4510, ES-73-05-4580) – these engines fire diesel fuel, which has inherently low visible emissions. Therefore, no MRR is required.
- Portable Log Chipper (ID No. ES-TEMP-CHIP) – compliance is demonstrated with this visible emissions limit by conducting monthly observations when the chipper is onsite for any visible emissions above normal. Records of the observations must be maintained and submitted in the semiannual summary report.

In the current permit (T48), the East and West Lime Mud Filter – Hood Exhausts (ID Nos. ES-14-30-5000 and ES-14-30-6000) have a 02D .0521 condition. According to compliance evaluation,⁹ these sources are not sources of particulate emissions because the raw material to the filters is wet. The scrubber is present to pull a vacuum on the filters and not used for emissions control. Domtar does not report particulate emissions from these sources in their annual emissions inventory. Therefore, the 02D .0521 condition in Section 2.1 N.2 of the current permit (T48) was removed.

The current permit (T48) does not have a 02D .0521 condition for the Nos. 1 and 2 Hog Fuel Boilers when burning natural gas alone. These boilers are subject to visible emission standards under NSPS Subpart D for other fuels; however, the Subpart D standards for visible emissions do not apply when natural gas alone is burned in the boilers [40 CFR 60.42(d)]. Both boilers were constructed after 1971 and are therefore subject to the 02D .0521 visible emissions limit of 20 percent opacity when natural gas is fired alone in the boilers. An 02D .0521 condition was added to the permit for the hog fuel boilers. Both boilers are equipped with continuous opacity monitoring systems (COMS) and no additional monitoring/ recordkeeping/reporting are required under the 02D .0521 condition.

Except as described above, no additional changes to the permit are necessary as a part of this renewal and compliance is expected.

I. 15A NCAC 02D .0524: New Source Performance Standards

Domtar is subject to the following new source performance standards (NSPS) under 40 CFR Part 60:

- Subpart D –Nos. 1 and 2 Hog Fuel Boilers are subject to emission limits of PM and visible emissions (when firing oil or oil in combination of wood), SO₂, and NO_x standards under the NSPS for Fossil-Fuel-Fired Steam Generators.
- Subpart BB – The HVLC Collection System Sources,¹⁰ LVHC Collection Sources,¹¹ and Condensate Stripper Reflux Condenser and associated Stripper Off Gas (SOG) NCG collection system are subject to total reduced sulfur (TRS) standards, the No. 5 Lime Kiln is subject to PM and TRS standards, and the No. 5 Recovery Furnace is subject to PM, visible emissions, and TRS standards under the NSPS for Kraft Pulp Mills.
- Subpart IIII – the new Fine Paper Fire Pump engine is subject to standards under NSPS for Compression Ignition Internal Combustion Engines.

⁹ Full Compliance Evaluation for 2018 and 2019. Conducted by Betsy Huddleston, Washington Regional Office. Dated 05/16/2020.

¹⁰ HVLC Collection System includes chip bins, digester blow tanks, pressure diffuser filtrate tanks, knotters, screen dilution tanks, decker hoods, and decker filtrate tanks in the Nos. 6 and 7 Fiberlines.

¹¹ LVHC Collection System includes Nos. 6 and 7 Black Liquor Evaporator Systems, Concentrator Hotwells, Secondary Turpentine Decanter Tank, Secondary Turpentine Decanter Weir, Secondary Turpentine Underflow Tank, Secondary Turpentine Storage Tanks, Nos. 6 and 7 Fiberline Digester Flash Condensers, Turpentine Decanter Weir, Turpentine Tank, Turpentine Decanter Tank, Turpentine Decanter Underflow Tank, and Condensate Stripper Tank.

- Subpart JJJJ – the new Lime Kiln Natural Gas Engine is subject to standards under the NSPS for Spark Ignition Internal Combustion Engines.

See Section VI.A, below, for a detailed discussion regarding NSPS requirements.

J. 15A NCAC 02D .0528: Total Reduced Sulfur from Kraft Pulp Mills

This regulation applies to recovery furnaces, digester systems, multiple-effect evaporator systems, lime kilns, smelt dissolving tanks, and condensate stripping systems of kraft pulp mills not subject to 15A NCAC 02D .0524. The North and South Smelt Tanks are subject to regulation 02D .0528 and are limited to 0.032 pounds of TRS per ton of black liquor solids (lb/TBLS). A review of the TRS emission factors from smelt dissolving tanks published by the National Council for Air and Stream Improvement (NCASI) shows that TRS emissions from smelt dissolving tanks are on average 0.0143 lb/TBLS.¹² Therefore, due to the large margin of compliance, the MRR would not be necessary to demonstrate compliance with the TRS emission limit. No changes to the permit are necessary as part of this renewal and compliance is expected.

K. 15A NCAC 02D .0530: Prevention of Significant Deterioration

As a kraft paper mill, Domtar is one of the 28 source categories listed in the federal prevention of significant deterioration (PSD) regulation as being subject to regulation with potential emissions greater than 100 tpy of any PSD-regulated pollutant. The Domtar mill is a major source under PSD for several pollutants. Based on previously conducted Final BACT Determinations, the following sources have PSD BACT emission limits for several criteria pollutants.:

- Nos. 1 and 2 Hog Fuel Boilers
- No. 5 Recovery Furnace
- No. 5 Lime Kiln
- Nos. 6 and 7 Bleach Plants
- Lignin Recovery Process Operations

The current permit (T48) contains conditions under 02D .0530(u) for the use of projected actual emissions to avoid applicability of PSD requirements. These conditions apply to the following sources:

- No. 5 Recovery Furnace
- Nos. 1 and 2 Hog Fuel Boiler D-Entrainment Vessels, Nos. 1 and 2 Hog Fuel Boiler Ash Storage and Handling, and Lime Operations
- Nos. 6 and 7 Fiberline Chip Silos
- Nos. 6 and 7 Fiberline Operations
- Lignin Recovery Process Operations

See Section VI.C for a detailed discussion on PSD conditions in the permit.

L. 15A NCAC 02D .0606: Sources Covered by Appendix P of 40 CFR Part 51

This regulation applies to fossil fuel-fired steam generators required to install continuous emission monitoring systems (CEMS) or continuous opacity monitoring systems (COMS) to comply with state regulations and specifies the minimum monitoring requirements. Sources subject to NSPS under 02D .0524 are exempt from 02D .0606. The Nos. 1 and 2 Hog Fuel Boilers are subject to and complying with 02D .0524 (for NSPS Subpart D) and this regulation does not apply.

¹² NCASI Technical Bulletin No. 1050, Table 4.62.

M. 15A NCAC 02D .0608: Other Large Coal or Residual Oil Burners

Under this regulation, Permittees are required to determine sulfur dioxide emissions to the air if the emissions unit combusts coal or residual oil, is not subject to 02D .0524 or 02D .0606, has a total heat input of more than 250 million Btu per hour from coal and residual oil, and has a capacity factor greater than 30 percent. None of the combustion sources at the Domtar mill burn coal or residual oil.

N. 15A NCAC 02D .0614: Compliance Assurance Monitoring

The compliance assurance monitoring (CAM) rule requires owners and operators to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Monitoring focuses on emissions units that rely on pollution control device equipment to achieve compliance with applicable standards. In the current permit (T48), only the Nos. 1 and 2 Hog Fuel Boilers and the Hog Fuel Boiler De-Entrainment Vessels, Reburned and Fresh Lime Bins, and Ash Silos are subject to CAM requirements. See Section VI.E, below for a full analysis of the CAM requirements.

O. 15A NCAC 02D .1100: Toxic Air Pollution Emissions (State-enforceable Only)

Domtar has facility-wide permit limits for several pollutants (see Table in Section 2.2 E.2 of the current permit) and source-specific emission limits for ammonia, benzene, chloroform, cresol, formaldehyde, hydrogen sulfide, methyl mercaptan that apply to several sources. A detailed discussion of the NC Air Toxics is found in Section VII, below.

P. 15A NCAC 02D .1109: 112(j) Case-by-Case Maximum Achievable Control Technology

The current permit (T48) has Case-by-Case MACT provisions under 02D .1109 and Clean Air Act (CAA) section 112(j) for SSM conditions in 40 CFR Part 63, Subpart S and Subpart MM Requirements. With the promulgation of revisions to Subparts S and MM based on the risk and technology review (RTR), SSM standards are now incorporated into the NESHAP. Therefore, these 112(j) requirements will no longer be necessary and will be removed from the permit.

In addition, the current permit (T48) has Case-by-Case MACT avoidance provisions under 02D .1109 and CAA section 112(j) for the Temporary Boilers. This condition no longer applies and was removed from the permit.

Q. 15A NCAC 02D .1111: Maximum Achievable Control Technology

Domtar is subject to the following maximum achievable control technology (MACT) standards:

- Subpart S – the following sources are subject to MACT standards under the NESHAP from the Pulp and Paper Industry under 40 CFR Part 63:
 - HVLC Collection System Sources¹³
 - LVHC Collection System Sources¹⁴
 - Condensate Stripper Reflux Condenser and associated Stripper Off Gas (SOG) NCG collection system
 - Nos. 6 and 7 Fiberline Operations¹⁵
- Subpart MM – the following sources are subject to the MACT standards under the NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills under 40 CFR Part 63:
 - No. 5 Recovery Furnace (ID No. ES-10-25-0110)

¹³ HVLC Collection System includes chip bins, digester blow tanks, pressure diffuser filtrate tanks, knotters, screen dilution tanks, decker hoods, and decker filtrate tanks in the Nos. 6 and 7 Fiberlines.

¹⁴ LVHC Collection System includes Nos. 6 and 7 Black Liquor Evaporator Systems, Concentrator Hotwells, Secondary Turpentine Decanter Tank, Secondary Turpentine Decanter Weir, Secondary Turpentine Underflow Tank, Secondary Turpentine Storage Tanks, Nos. 6 and 7 Fiberline Digester Flash Condensers, Turpentine Decanter Weir, Turpentine Tank, Turpentine Decanter Tank, Turpentine Decanter Underflow Tank, and Condensate Stripper Tank.

¹⁵ Fiberline Operations includes: Nos 6 and 7 Bleach Plant Controlled Sources (washer filtrate tanks, and towers)

- North and South Smelt Tanks (ID No. ES-14-05-0050 and ES-14-05-0300)
- No. 5 Lime Kiln (ID No. ES-14-60-3000)
- Subpart ZZZZ – the following sources are subject to MACT standards under the NESHAP for Stationary Reciprocating Internal Combustion Engines under 40 CFR Part 63:
 - Diesel-fired emergency engines (ID Nos. ES-14-60-3000a, ES-53-40-0130, ES-53-40-0140, ES-53-40-0145, ES-71-95-0500, ES-73-05-4510, and ES-73-05-4580)
- Subpart DDDDD – the Nos. 1 and 2 Hog Fuel Boilers (ID No. ES-64-25-0290 and ES-65-25-0310) are subject to MACT standards under the NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters under 40 CFR Part 63.

R. 15A NCAC 02Q .0317: Avoidance Conditions

Domtar has accepted permit conditions under 02Q .0317 in the current permit (T48) to avoid applicability for 02D .0530, PSD as follows:

- Limit NO_x emissions from the No. 2 Hog Fuel Boiler (ID No. ES-65-25-0310) on a tons per consecutive 12-month period.
- Limit PM emissions from the No. 5 Lime Kiln (ID No. ES-14-60-3000) by limiting reburned calcium oxide (CaO) in bone dry tons per consecutive 12-month average.
- Limit VOC emissions from the Woodyard Operations¹⁶ to 120 tons per consecutive 12-month period and by limiting the green tons of softwood species processed in the woodyard (i.e., logs converted onsite to chips) per consecutive 12-month period.
- Limit TRS emissions by routing C3 Condensate (ID No. ES-09-25-1050) to the waste water treatment plant without first being processed through the condensate stripper reflux condenser for no more than 30 days in any consecutive 12-month period.

Additional information is provided in Section VI.C, below.

Domtar has also taken a limit to avoid the applicability of NSPS for the Temporary Boilers (ID Nos. ES-RB1 and ES-RB2) which states that the boilers cannot be onsite for more than 180 consecutive days to be classified as temporary boilers to avoid applicability of 02D .0524, NSPS Subpart Dc. Additional information is provided in Section VI.A, below.

Finally, Domtar has taken limits to avoid 02D .1109, Case-by-Case MACT under 112(j) for the Temporary Boilers (ID Nos. ES-RB1 and ES-RB2) which states that the boilers cannot be onsite for more than 180 consecutive days to be classified as temporary boilers to avoid applicability of 02D .1109, Case-by-Case MACT. NOTE: This will be converted to an avoidance condition to MACT Subpart DDDDD. Additional information is provided in Section VI.B, below.

S. 15A NCAC 02Q .0700: Emission Rates Requiring a Permit (State-enforceable Only)

Domtar previously triggered a toxics review for several TAP. A detailed discussion of the NC Air Toxics is found in Section VII.

VI. Regulatory Review - Federal Rules (NSPS, NESHAP/MACT, NSR/PSD, 112(r), and CAM)

A. New Source Performance Standards

Domtar is subject to the NSPS under 40 CFR Part 60, Subpart D, Subpart BB, Subpart IIII, and potentially Subpart Dc. The following is a summary of each NSPS.

¹⁶ Screen house (ID No. ES-00-35-1000); debarking and chipping line (ID No. ES-11-10-1500); two bark hogs (ID No. ES-11-50-4500-1 and ES-11-50-4500-2); hog fuel handling and transfer in woodyard (ID No. FS-010); chip conveying (to pulping) (ID No. FS-012); chip handling and transfer system in woodyard (ID No. FS-013); and hog fuel handling and transfer to boiler area (ID No. FS-021)

1. 40 CFR Part 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The Temporary Boilers are potentially subject to Subpart Dc. Subpart Dc applies to boilers constructed after July 9, 1989, with a maximum heat input of less than or equal to 100 MMBtu/hr. Temporary boilers are exempt from Subpart Dc. Temporary boilers are defined in Subpart Dc as follows:

“...a steam generating unit that combusts natural gas or distillate oil with a potential SO₂ emissions rate no greater than ...0.060 lb/MMBtu..., and the unit is designed to, and is capable of, being carried or moved from one location to another by means of, for example, wheels, skids, carrying handles, dollies, trailers, or platforms. A steam generating unit is not a temporary boiler if any one of the following conditions exists:

- (1) The equipment is attached to a foundation.
- (2) The steam generating unit or a replacement remains at a location for more than 180 consecutive days. Any temporary boiler that replaces a temporary boiler at a location and performs the same or similar function will be included in calculating the consecutive time period.
- (3) The equipment is located at a seasonal facility and operates during the full annual operating period of the seasonal facility, remains at the facility for at least 2 years, and operates at that facility for at least 3 months each year.
- (4) The equipment is moved from one location to another in an attempt to circumvent the residence time requirements of this definition.”

Domtar has taken an avoidance limit under 02Q .0317 to avoid applicability to Subpart Dc for the Temporary Boilers. Under this avoidance limit, Domtar is required to burn distillate oil with potential SO₂ emission rate no greater than 0.060 lb/MMBtu and the boilers must be capable of moving from one location to another, and remain onsite for 180 days or less. No changes to this requirement are needed during the renewal process.

2. 40 CFR Part 60, Subpart D: Standards of Performance for Fossil-Fuel-Fired Steam Generators

This rule applies to fossil-fuel-fired steam generating units constructed, modified or reconstructed after August 17, 1971, and regulates SO₂, PM (including opacity), and NO_x emissions from boilers with maximum design capacity of 100 MMBtu/hr or greater. The Nos. 1 and 2 Hog Fuel Boilers were installed after August 17, 1971 and have maximum heat input capacities of greater than 100 MMBtu/hr.

The Nos. 1 and 2 Hog Fuel Boilers are subject to particulate, SO₂, NO_x, and visible emissions standards under Subpart D. To demonstrate compliance with the Subpart D requirements, Domtar is required to conduct annual particulate emissions testing, and install continuous monitoring systems for NO_x and opacity. Domtar is required to test for PM and SO₂ emissions once every five years.

The NSPS emission limit table in the current permit (T48) states that the requirements do not apply during periods of SSM. However, Subpart D does not contain any SSM requirements or exemptions. The only SSM exemption is specified for opacity in the general provisions under 40 CFR Part 60, Subpart A. Therefore, the SSM exemptions were removed for SO₂, NO_x and PM (filterable).

Under Subpart D, SO₂ emissions from the hog fuel boilers are limited to 0.80 lb/MMBtu heat input when firing oil only or oil and wood residue. Domtar is required to test the boilers once every five years for SO₂ emissions. The current permit does not include the monitoring requirements for SO₂ emissions. According to Subpart D [40 CFR 60.45(b)(2)], an SO₂ CEMS is not required if Domtar monitors SO₂ emissions with fuel sampling and analysis. Since an SO₂ CEMS is not installed on the hog fuel boilers, a condition requiring fuel sampling and analysis or fuel receipts was added to the permit.

Compliance is also demonstrated by keeping records and submitting reports as required. Except as described above, no significant changes to the permit conditions for Subpart D were made. The language was updated to reflect current permit shell language and formatting. Additionally, the Subpart D condition in the current permit (T48) includes primary and alternate operating scenarios for the No. 2 Hog Fuel Boiler. The boiler will no longer

be operating under the primary operating scenario and this scenario has been removed from the Subpart D condition.

In their June 2020 permit application, Domtar identified a typographical error in the emission limit table in Section 2.1 A.5.b for the particulate matter emission limit. The NSPS limit applies when firing oil or oil and wood residue or natural gas and wood residue, but the table did not include “natural gas and wood residue.” This correction was made to the table. In addition, the emission limits for SO₂, NO_x, and PM were updated to reflect the number of significant figures as published in Subpart D.

As discussed above, Domtar has requested that the No. 1 Hog Fuel Boiler be allowed to operate under an AOS to reflect that the boiler will primarily burn natural gas and No. 2 fuel oil. No monitoring under NSPS Subpart D is required for filterable PM emissions from the combustion of natural gas and No. 2 fuel oil [40 CFR 60.45(b)(1)]. The permit was modified to incorporate the AOS under which no monitoring is required when the boiler is burning natural gas or No. 2 fuel oil. The inspection requirement was also modified to state that the monthly external control device inspections and annual internal inspections are not required when only natural gas or No. 2 fuel oil is fired (these conditions are contained in Section 2.1 A.6.i and A.6.j in the revised permit).

On October 27, 2020, the Technical Services Section issued a memorandum regarding the reporting frequency for CEMS-affected facilities.^{17,18} According to this memorandum, the reporting period for all sources required to install CEMS (including COMS) will be determined by the implementing rule. In this case, NSPS Subpart D specifies that the reporting period is semiannually [40 CFR 60.45(g)]. However, emissions calculation and monitoring system performance results must be calculated on a quarterly basis, pursuant to the authority allowed under 40 CFR 60.7(c). Therefore, the reporting requirements of Section 2.1 A.6 were updated to require semiannual reporting for the reporting for the COMS and NO_x CEMS installed on the Nos. 1 and 2 Hog Fuel Boilers, with quarterly excess emissions and monitoring system performance results. According to this memorandum, the quarterly calculation results are necessary to ensure the sources’ compliance status and determine whether the facility is following good operating and maintenance (O&M) practices.

3. 40 CFR Part 60, Subpart BB: Standards of Performance for Kraft Pulp Mills

The Kraft Pulp Mill NSPS applies to the following affected facilities: each Digester system, each brownstock washer system, each multiple-effect evaporator system, and each recovery furnace, smelt dissolving tank, lime kiln, and condensate stripper system constructed, reconstructed, or modified after September 24, 1976. At the Domtar Mill, the HVLC Collection System Sources,¹⁹ LVHC Collection Sources,²⁰ and Condensate Stripper Reflux Condenser and associated Stripper Off Gas (SOG) NCG collection system are subject to TRS standards, the No. 5 Lime Kiln is subject to PM and TRS standards, and the No. 5 Recovery Furnace is subject to PM, visible emissions, and TRS standards under the NSPS for Kraft Pulp Mills.

- The HVLC Collection System Sources, are subject to the TRS limit of 5 parts per million by volume (ppmv), corrected to 10 percent oxygen. Compliance with this limit is demonstrated by combusting the HVLC Collection System gases in either the Nos. 1 or 2 Hog Fuel Boilers, the No. 5 Recover Boiler, or the Thermal Oxidizer. Subpart BB requires monitoring the combustion temperature of the thermal oxidizer (when the devices are controlling the HVLC Collection System) with a continuous parameter monitoring system (CPMS), as well as recordkeeping and reporting. The current permit (T48) did not include this monitoring requirement. As such, it was added to the permit. Excess emissions reporting was also added to this condition.

¹⁷ Memorandum to van der Vaart, D.R., Chief Permit Section, NC DEQ/DAQ from Igboke, D., through L. Daniel, Chief, Technical Services Section and Michael Pjetraj, Supervisor, Stationary Source Compliance Branch, NC DEQ/DAQ. “Legal Authority for Requiring Quarterly Excess Emission Reporting for CEM Affected Facilities under NSPS Subpart A.” July 2, 2009. Available online at [Permitting Procedures Memos and Guidance: July 2, 2009 Memo](#)

¹⁸ Memorandum to Cuilla, M. Acting Chief, Permitting Section, NC DEQ/DAQ from Hall, S., Chief, Technical Services Section. “Legal Basis for Calculation and Reporting Frequencies for CEMS-affected Facilities. October 27, 2020. Available online at [Permitting Procedures Memos and Guidance: July 31, 2020 Memo](#)

¹⁹ HVLC Collection System includes chip bins, digester blow tanks, pressure diffuser filtrate tanks, knotters, screen dilution tanks, decker hoods, and decker filtrate tanks in the Nos. 6 and 7 Fiberlines.

²⁰ LVHC Collection System includes Nos. 6 and 7 Black Liquor Evaporator Systems, Concentrator Hotwells, Secondary Turpentine Decanter Tank, Secondary Turpentine Decanter Weir, Secondary Turpentine Underflow Tank, Secondary Turpentine Storage Tanks, Nos. 6 and 7 Fiberline Digester Flash Condensers, Turpentine Decanter Weir, Turpentine Tank, Turpentine Decanter Tank, Turpentine Decanter Underflow Tank, and Condensate Stripper Tank.

Per EPA Applicability Determination No. 0200009, temperature monitoring is not required when these gases are burned in the hog fuel boilers.

- The LVHC Collection Sources, and Condensate Stripper Reflux Condenser and associated Stripper Off Gas (SOG) NCG collection system are subject to the TRS limit of 5 parts per million by volume (ppmv), corrected to 10 percent oxygen. Compliance with this limit is demonstrated by combusting these gases in either the No. 5 Lime Kiln or the No. 2 Hog Fuel Boiler. Per EPA Applicability Determination No. 0200009, temperature monitoring is not required when these gases are burned in the hog fuel boilers. A condition was added to the permit to specify temperature monitoring is not required when the LVHC sources are burned in these units. Excess emissions reporting was also added to this condition.
- The No. 5 Recovery Boiler is subject to a particulate matter emissions limit of 0.044 grains per dry standard cubic feet (gr/dscf), corrected to 8 percent oxygen; a TRS emissions limit of 5 ppmv on a dry basis, corrected to 8 percent oxygen; and a visible emission limit of 35 percent opacity. Compliance with the particulate matter emissions limit is demonstrated by operating and maintaining a ESP and performing inspections and maintenance on the ESP and complying with the monitoring requirements in accordance with the Subpart MM NESHAP requirements, in addition to periodic compliance testing, recordkeeping, and reporting. Compliance with the TRS limit is demonstrated using a TRS CEMS and compliance with the opacity limit is demonstrated using a continuous opacity monitoring system (COMS).
- The No. 5 Lime Kiln is subject to a particulate matter emissions limit of 0.13 gr/dscf corrected to 10 percent oxygen when firing No. 2 fuel oil and 0.066 gr/dscf corrected to 10 percent oxygen when firing natural gas and a TRS emissions limit of 8 ppmv on a dry basis, corrected to 10 percent oxygen based on a 12-hour average. Compliance with the PM limit is demonstrated by operating a scrubber and complying with the monitoring requirements in accordance with Subpart MM. Compliance with the TRS limit is demonstrated by using a TRS CEMS and an oxygen continuous monitoring system. This condition was updated so that the testing requirement no longer cross referenced the 02D .0508 condition. The testing condition was also updated to specify the periodic testing five-year schedule.

As discussed above, DAQ's policy is to require reporting frequency as specified in the implementing rule with emission calculation and monitoring system performance results determined on a quarterly basis. Subpart BB requires semiannual reports of excess emissions. Reporting requirements in Section 2.1 C.3 and Section 2.1 E.4 of the permit were updated to reflect this new policy.

In addition, permit language was updated to reflect the current permit shell. No further changes to the Subpart BB conditions are necessary as a part of this renewal. Compliance is expected.

4. 40 CFR Part 60, Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The NSPS for Stationary Compression Ignition (CI) Internal Combustion Engines (ICE) applies to new stationary CI ICE, defined as ICE that commenced construction after July 11, 2005, but were manufactured after April 1, 2006. According to the full compliance evaluation,²¹ the Fine Paper Fire Pump Diesel Engine was manufactured after April 1, 2006 and constructed after July 11, 2005. Therefore, Domtar owns and operates one stationary CI ICE subject to this NSPS, the Fine Paper Fire Pump Diesel Engine (ID No. ES-53-40-0130). However, the current permit (T48) does not have a condition for Subpart IIII. Therefore, a condition was added to the permit for Subpart IIII, applicable to the Fine Paper Fire Pump Diesel Engine. The engine is certified by the manufacturer to comply with the emission standards that apply to the same model year (2013) and maximum engine power (237 hp, 177 kiloWatts) as the generator as follows [60.4201 and 40 CFR 89.112, Table 1 as cross referenced by 60.4204(b)]:

NMHC and NOX: 4.0 grams per kiloWatt-hour (g/kW-hr);
CO: 3.5 g/kW-hr; and
PM: 0.20 (g/kW-hr).

²¹ Full Compliance Evaluation for 2018 and 2019. Conducted by Betsy Huddleston, Washington Regional Office. Dated 05/16/2020.

The engine is also subject to fuel requirements where the diesel fuel is required to have a maximum sulfur content of 15 ppm and a minimum cetane index of 40 or a maximum aromatic content of 35 percent by volume [40 CFR 60.42047(b) and 80.510(b)].

The engine is considered an emergency engine and is required to operate according to the emergency engine requirements in Subpart IIII. The engine cannot be operated in non-emergency situations for more than 50 hours per year and no more than 100 hours per year in maintenance and readiness testing situations. There is no limit on operation in emergency situations.

Compliance with these standards is demonstrated by purchasing an engine certified by the manufacturer to meet the emissions standards. This engine is required be equipped with a non-resettable hour meter. Continuous compliance is demonstrated by continuing to operate the engine according to manufacturer's instructions and keeping records of hours of operation in each mode. Monitoring, recordkeeping, and reporting requirements are also specified to demonstrate ongoing compliance. Compliance is expected.

5. Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

The NSPS for Stationary Spark Ignition ICE applies to new stationary spark ignition ICE, defined as ICE that commenced construction after July 12, 2006, but were manufactured after January 1, 2009. According to the full compliance evaluation,²² the Lime Kiln Natural Gas engine is subject to Subpart JJJJ. However, this source is an insignificant activity and no conditions are included in the permit.

B. National Emission Standards for Hazardous Air Pollutants

Domtar is subject to NESHAP under 40 CFR Part 63: Subpart S, Subpart MM, Subpart ZZZZ. and Subpart DDDDD. The following is a summary of each of these subparts and the applicable requirements.

1. 40 CFR Part 63, Subpart S: NESHAP from the Pulp and Paper Industry

The pulp and paper NESHAP applies to the pulping systems, bleaching systems and pulping condensate systems at chemical pulp mills. Affected sources are required to control HAP emissions using the MACT. The MACT standards require mills to reduce HAP emissions, in general, by collecting and incinerating pulping process vent emissions; collecting and controlling bleaching process vent emissions with a caustic scrubber, eliminate the use of certain bleaching chemicals, and collect and treat process condensate streams to remove HAPs. Several changes to Section 2.2 A of the permit were made that were mostly editorial in nature and were intended to clarify the applicable requirements with which Domtar was already complying. No changes in applicability of the Subpart S requirements were made as a part of this renewal.

The current permit (T48) did not include the September 11, 2012, Subpart S amendments which required 5-year periodic performance testing, revisions to address periods of startup, shutdown, and malfunction (SSM); a requirement for electronic reporting of performance test reports; additional test methods for measuring methanol emissions, and other technical and editorial changes. These requirements, as applicable, were added to the permit as part of this renewal.

For the Nos. 6 and 7 Oxygen Delignification systems, Domtar is complying with Subpart S per the Clean Condensate Alternative under 40 CFR 63.447. The approach was approved January 23, 2006 and supplemented with updated baseline calculations January 19, 2008. Domtar uses methanol biodegradation by the wastewater treatment system to offset methanol emissions from the oxygen delignification systems. To demonstrate compliance Domtar is:

- tracking the ratio of biological oxygen demand to aerator horsepower on a 30-day rolling average. The upper limit is 36.9. Daily horsepower is determined by summing the horsepower of aerators that are in operation. If there are issues with the ratio, Domtar relies on dissolved oxygen measurements between zones 2 and 3 to

²² Full Compliance Evaluation for 2018 and 2019. Conducted by Betsy Huddleston, Washington Regional Office. Dated 05/16/2020.

ensure methanol is being adequately destroyed. As long as dissolved oxygen is better than 0.5 mg/l, the treatment system is considered to be adequately operating.

- Taking Wastewater samples several times a day (Sunday through Thursday) at the feed to the aeration basin.
- Grid sampling of the treatment system for methanol is being conducted once per year. Domtar has to make sure that retention is supporting the baseline and model.

The tracking requirements are not included as permit conditions as of the current permit (T48). Therefore, these requirements have been added to the permit.

a. Subpart S Requirements

At the Domtar mill, several sources are subject to Subpart S. The following summarizes the sources subject to Subpart S along with a brief description of the requirements:

- LVHC System Sources – HAP emissions from the LVHC system sources are required to be collected via a closed vent system and are required to be controlled by being controlled in the LVHC White Liquor Scrubber and then combusted in the No 5. Lime Kiln or being controlled in the LVHC White Liquor Scrubber (except during periods of scrubber maintenance) followed by the No. 2 Hog Fuel Boiler.²³ The LVHC system sources include the following:
 - Nos. 6 and 7 Fiberline Digester Flash Condenser;
 - Nos. 6 and 7 Fiberline (common facilities) Turpentine Decanter Weir, Turpentine Tank, Turpentine Decanter Tank, and Turpentine Underflow Tank;
 - Nos. 6 and 7 Black Liquor Evaporator System, Concentrator Hotwell, Secondary Turpentine Decanter Tank, Secondary Turpentine Decanter Weir, Secondary Turpentine Underflow Tank, and Secondary Turpentine Storage Tank;
 - Condensate Stripper Feed Tank
- HVLC System Sources – HAP emissions from the HVLC system sources are required to be collected via a closed vent system and are required to be controlled by being combusted primarily in the No. 2 Hog Fuel Boiler, or the No. 1 Hog Fuel Boiler, the No. 5 Recovery Boiler, or the Thermal Oxidizer as backups. The HVLC system sources include the following:
 - Nos. 6 and 7 Fiberline Chip Bin Relief Condenser
 - Nos. 6 and 7 Fiberline Pressure Diffuser Filtrate Tank (Note: these sources vent through the Digester Blow Tanks and are not directly collected in the HVLC system.)²⁴
 - Nos. 6 and 7 Fiberline Digester Blow Tank
 - Nos. 6 and 7 Fiberline Secondary Knotter
 - Nos. 6 and 7 Fiberline Quaternary Screen
 - Nos. 6 and 7 Fiberline Screen Dilution Tank
 - Nos. 6 and 7 Fiberline Decker Hood
 - Nos. 6 and 7 Fiberline Decker Filtrate Tank
- Pulping process condensate – HAP emissions from the condensate stripper reflux condenser are collected in the SOG system and routed to the No. 5 Lime Kiln or the No. 2 Hog Fuel Boiler.

The closed vent standards require the following:

- The ductwork, piping, enclosures, and connections to covers on each closed vent system is required to be visually inspected every 30 days for visible evidence of defects.
- Each enclosure is required to maintain negative pressure at each enclosure or hood opening. Visual inspections of the closure mechanism are required to be performed every 30 days to ensure that the opening is maintained in the closed position and sealed. Valves or closure mechanisms are required to be inspected at least 30 days to ensure that the valve is maintained in the closed position and the emission point gas stream is not diverted through the bypass line.

²³ Due to a PSD BACT determination, Domtar is required to route the LVHC system through a white liquor scrubber prior to combustion in the No. 2 Hog Fuel Boiler (see Permit Review for Permit No. 04921.T48).

²⁴ A closed vent system is defined in Subpart S as follows: "...a system that is not open to the atmosphere and is composed of piping, ductwork, connections, and, if necessary, flow-inducing devices that transport gas or vapor from an emission point to a control device." [emphasis added] Because the Pressure Diffuser Filtrate Tanks vents to the Digester Blow Tanks, they do not vent to the control device. Therefore, the piping that routes the Diffuser Filtrate Tanks to the Digester Blow Tanks is not subject to the standards for closed vent system under 40 CFR 63.460.

- Each component of the closed-vent system used is required to be operated at positive pressure and located prior to a control device and be designed for and operated with no detectable leaks as indicated by an instrument reading of less than 500 parts per million by volume above background. The positive pressure closed vent systems are required to have no detectable leaks measured annually.
- Bypass lines in the closed-vent system that could divert vent streams containing HAP to the atmosphere without meeting the emission limitations is required to do the following:
 - On each bypass line, the bypass line is required to be installed in such a way as to indicate flow in the bypass line. The flow indicator is required to be capable of taking periodic readings as required by Subpart S.
 - For bypass line valves that are not computer controlled, the bypass line valve needs to be maintained in the closed position with a car seal or a seal placed on the valve or closure mechanism in such a way that valve or closure mechanism cannot be opened without breaking the seal.
- Leaks are defined as instrument readings above 500 ppm or greater above background.
- Corrective action is required if a leak is detected, visible defects in ductwork, piping, enclosures, or connections to covers, or if enclosure openings are not maintained at negative pressure. A first effort to repair or correct the closed-vent system is required to be made no later than 5 days after the problem is identified and the repair or corrective action is required to be completed no later than 15 calendar days after the problem is identified.

b. Testing and Startup, Shutdown, and Malfunction

As discussed above, Subpart S was amended in 2012 and the issues related to the vacated SSM provisions were addressed as part of this renewal process. Section 2.2 A.1 of the permit was updated to incorporate these new provisions. These SSM provisions remove the need for Case-by-Case 112(j) standards for SSM and these conditions have been removed.

Another major change to Subpart S was to add the periodic testing requirement in 40 CFR 63.457(a)(2) for the pulping vent gases. Sources subject to the standards for pulping vent gases would be required to conduct tests once every five years (or no more than every 60 months).

2. 40 CFR Part 63, Subpart MM: NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills

This NESHAP applies to chemical combustion sources located at kraft, soda, sulfite, and stand-alone semichemical pulp mills. The NESHAP has separate emission limits for recovery furnaces, smelt dissolving tanks, and lime kilns. The following sources at the Domtar mill are subject to the existing source standards under Subpart MM:

- No. 5 Recovery Furnace;
- North and South Smelt Tanks; and
- No. 5 Lime Kiln.

Subpart MM allows existing recovery furnaces, smelt dissolving tanks, and lime kilns that operate over 6,300 hours per year to demonstrate compliance with the particulates standard via a bubble calculation. This alternative limit allows the mill to establish an overall particulate limit that applies to all three emissions unit types and is based on mill-specific data and performance test data. The mill is required to reestablish the bubble calculation limit when and if the air pollution control system is modified or replaced or the emission units are shut down for more than 60 consecutive days.

In their June 2020, permit application (No. 5900069.20A), Domtar stated that they had completed the first of the five-year periodic performance tests for the No. 5 Recovery boiler (conducted on June 26, 2019 and approved October 10, 2019), North and South Smelt Tanks (conducted on June 27, 2019 and approved on November 5, 2019), and No. 5 Lime Kiln (conducted on July 31, 2019 and approved on October 22, 2019). Based on information from these performance tests, Domtar requested the reestablishment of the site-specific bubble emissions limit [40 CFR 63.862(a)(ii)] and a revision to the No. 5 Lime Kiln scrubber liquid injection rate [40

CFR 63.864(j)]. The bubble limits are presented in the current permit (T48) in Table 2.2 B-1. The current limits/standards in Table 2.2 B-1 and revised values are presented in Table 3. The bubble limits cannot be less stringent than the limits under NSPS Subpart BB. DAQ has reviewed the revised limits and the bubble limits meet this requirement. Table 2.2 B-1 was therefore revised as requested by Domtar.

The No. 5 Recovery Furnace is equipped with an ESP and the North and South Smelt Tanks and the No. 5 Lime Kiln are equipped with wet scrubbers for PM control. Domtar has installed a COMS at the outlet of the recovery furnace ESP to monitor visible emissions. Continuous monitoring systems are also installed on the lime kiln scrubber outlets to monitor scrubber pressure drop, liquid nozzle header pressure, and scrubbing liquid flow rate. Continuous monitoring systems are installed to monitor pressure drop, scrubber spray header flow rate, and rod box flow rate on the smelt tanks. Compliance is demonstrated by maintaining the operating parameters within the appropriate ranges as determined during performance tests. Recordkeeping and reporting requirements also apply.

Testing and Startup, Shutdown, and Malfunction

Subpart MM was amended on October 11, 2017 and the issues related to the vacated SSM provisions were addressed. Section 2.2 B.1 of the permit was updated to incorporate these new provisions. These SSM provisions removes the need for Case-by-Case 112(j) standards for SSM and these conditions have been removed.

Another major change to Subpart MM was to add the periodic testing requirement in 40 CFR 63.865 for the recovery boiler, smelt tanks, and lime kiln. Sources subject to the Subpart MM standards are now required to conduct tests once every five years following the previous performance tests (or no more than every 60 months). Therefore, the next performance tests will be required to be conducted no later than: June 26, 2024 for the No. 5 Recovery Boiler; June 27, 2019 for the North and South Smelt Dissolving Tanks; and July 31, 2024 for the No. 5 Lime Kiln.

The current permit (T48) has Subpart MM requirements that begin on October 11, 2019. Since this date has passed, the pre-October 11, 2019, requirements that no longer apply will be removed from the permit and the October date will also be removed.

The reporting condition was updated to reflect the recent guidance on sources equipped with CEMS, discussed above. For the semiannual summary reports, the emissions and monitoring system performance reports will be calculated on a quarterly basis. No further substantive changes were made to the Subpart MM requirements in the permit under this renewal. Compliance is expected.

3. 40 CFR Part 63, Subpart ZZZZ: NESHAP for Stationary Reciprocating Internal Combustion Engines

Subpart ZZZZ applies to new and existing stationary reciprocating internal combustion engines (RICE) located at both major and area sources. The Domtar mill operates seven existing emergency engines that are subject to Subpart ZZZZ: Spare Diesel Engine Backup (ID No. ES-14-60-3000a); Fine Paper Fire Pump Diesel Engine (ID No. ES-53-40-0130); Warren Neck Creek East Fire Pump Diesel Engine (ID No. ES-53-40-0140); Warren Neck Creek West Fire Pump Diesel Engine (ID No. ES-53-40-0145); Backup Communication System Diesel Engine (ID No. ES-71-95-0500); Backup Lift Station Runoff Collection Diesel Engine (ID No. ES-73-05-4510); and Backup Fiberline Lift Station Diesel Engine (ID No. ES-73-05-4580). These engines must meet the following operational requirements:

- Unlimited use for emergencies (e.g., power outage, fire, flood);
- Emergency engines may operate for 100 hr/yr for maintenance/testing; and
- 50 hr/yr of the 100 hr/yr allocation can be used for non-emergency situations and cannot be used for peak shaving or non-emergency demand response or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

Table 3. Current and Revised 40 CFR Part 63, Subpart MM Bubble Limits

Subpart MM Affected Source	Pollutant or Operating Parameter	Current Limit/Standards	Revised Limit/Standards
No. 5 Recovery Boiler	PM Emissions	0.044 gr/dscf corrected to 8 percent O ₂	No change
	Opacity	35 percent for more than 2 percent of the operating time within any semiannual period	No change
North Smelt Tank	PM Emissions	0.078 gr/dscf and no greater than 0.191 lb/TBLS	0.073 gr/dscf and no greater than 0.187 lb/TBLS
	Scrubber spary header flow	Minimum 3-hour average of 75 gallons per minute	No change
	Rod Box Flow	Minimum 3-hour average of 50 gallons per minute	No change
	Scrubber pressure drop	Minimum 3-hour average of 3 inches of H ₂ O	No change
South Smelt Tank	PM Emissions	0.078 gr/dscf and no greater than 0.190 lb/TBLS	0.073 gr/dscf and no greater than 0.200 lb/TBLS
	Scrubber spary header flow	Minimum 3-hour average of 75 gallons per minute	No change
	Rod Box Flow	Minimum 3-hour average of 50 gallons per minute	No change
	Scrubber pressure drop	Minimum 3-hour average of 3 inches of H ₂ O	No change
No. 5 Lime Kiln	PM emissions	0.13 gf/dscf, corrected to 10 percent O ₂ , when firing fuel oil; or 0.066 gf/dscf, corrected to 10 percent O ₂ , when firing natural gas	0.066 gf/dscf, corrected to 10 percent O ₂
	Scrubber liquid flow	Minimum 3-hour average of 800 gallons per minute	Minimum 3-hour average of 896 gallons per minute
	Scrubber pressure drop	Minimum 3-hour average of 5 inches of H ₂ O	No change
	Liquid nozzle header	Pressure range from 240 to 275 psig (3-hour average)	No change
Overall Chemical Recovery System	Total PM Emissions	1.528 lb/TBLS	1.478 lb/TBLS

Additionally, the emergency engines are subject to work practice standards requiring oil and filter changes at least once a year or every 500 hours of operation. A fuel analysis program as specified in Subpart ZZZZ can be used to extend the time between oil changes. Domtar is also required to inspect the air cleaner every 1,000 hours of operation and inspect the hoses and belts every 500 hours of operation. At a minimum, these inspections are required to be conducted annually. Subpart ZZZZ also specifies that during startup, the time the engines spend at idle should be minimized, not to exceed 30 minutes. Compliance is demonstrated by keeping records of maintenance performed and hours of operation of each engine and submitting semiannual reports.

A new RICE (for those with site rating equal to or less than 500 bhp and located at major sources) is defined as one that commenced construction on or after June 12, 2006. According to Subpart ZZZZ [40 CFR 63.6590(c)(6)], a new emergency RICE with a site rating less than or equal to 500 bhp must meet the requirements of Subpart ZZZZ by meeting the requirements of NSPS Subpart IIII for CI ICE or NSPS Subpart JJJJ for Spark Ignition ICE.

As discussed above, Domtar operates two new emergency engines, the Fine Paper Fire Pump Diesel Engine and the Lime Kiln Natural Gas Engine that are subject to the MACT standard and compliance will be demonstrated by demonstrating compliance with NSPS Subpart IIII and Subpart JJJJ, respectively. A new permit condition was added to the permit to address the MACT ZZZZ applicability.

Avoidance conditions for NESHAP Subpart ZZZZ

As discussed under Section VI.A, above, for NSPS Subpart IIII, the Portable Log Chipper is considered a mobile source and therefore not subject to requirements of Subpart ZZZZ.

4. 40 CFR Part 63, Subpart DDDDD: NESHAP for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

The Nos. 1 and 2 Hog Fuel Boilers are subject to the Boiler MACT under 40 CFR Part 63, Subpart DDDDD. Section 2.1 A.10 of the current permit (T48) was added to the permit as a part of the first step permit application for the Mill Optimization Project. A detailed regulatory analysis of the Boiler MACT conditions is included in the Air Permit Review for Permit No. 04291T45, included as Attachment A to this permit review.

The changes to the Boiler MACT condition were primarily editorial in nature or were made to clarify the requirements published under Subpart DDDDD. Language was added to the testing requirements to indicate that operation outside of previously approved parametric operating ranges was not required during testing to reestablish these values. Also added was instructions as to how changes to the operating values would be processed. Under the continuous compliance demonstration condition in Section 2.1 A.7.m of the revised permit, requirements for oxygen content operating parameter limits were added. In the same condition, operating parameter continuous compliance requirements were also added.

In their June 2020, permit application (No. 5900069.20A), Domtar discussed the possibility that the No. 1 Hog Fuel Boiler might be considered in a different subcategory based on switching fuels. A new condition Section 2.1 A.11 was added to incorporate the requirements of a “unit designed to burn gas 1 fuels.” This subcategory is defined including boilers that burn only natural gas, refinery gas, and/or other gas 1 fuels. The Boiler MACT allows a boiler in this subcategory to burn liquid fuel for no more than 48 hours per year for periodic testing of the liquid fuel, maintenance, or operator training. In addition, fuel oil can be burned during periods of gas curtailment or gas supply interruptions of any duration.

Existing boilers in the “unit(s) designed to burn gas 1 subcategory” are not subject to emissions limits. When the No. 1 Hog Fuel Boiler is operating under the AOS, it will be subject to work practices, including periodic boiler tune-ups. The boiler is not equipped with an oxygen trim system. As such, the boiler will have to be tuned-up annually. The first tune-up will be required no more than 60 days of the date the fuel usage switch [40 CFR 63.7515(d)]. Compliance with the work practice standards will be demonstrated by records documenting the boiler tune-ups.

Domtar will be required to submit notifications if using fuel oil during periods of curtailment or natural gas supply interruptions is necessary. Domtar will be required to maintain records of fuel usage and records associated with demonstration of compliance the work practice standards. Recordkeeping and reporting are also required for boilers in this subcategory.

As previously discussed, per the CEMS-affected sources memoranda, Domtar will be required to determine excess emissions and monitoring system performance on a quarterly basis.

No further substantive changes were made to the Subpart DDDDD requirements in the permit under this renewal. Compliance is expected.

C. Prevention of Significant Deterioration

As discussed above, the Domtar mill is a major source under PSD for several pollutants. The PSD conditions as well as PSD avoidance conditions are described below.

1. PSD Limits

As previously discussed, kraft paper mills are listed as one of the 28 source categories under federal PSD regulation as being subject to regulation with potential emissions greater than 100 tpy of any PSD-regulated pollutant. The Domtar mill is a major source under PSD and has PSD BACT limits on the Nos. 1 and 2 Hog Fuel Boilers, the No. 5 Recovery Boiler, the No. 5 Lime Kiln, the Nos. 6 and 7 Bleach Plants, and the Lignin Recovery Process Operations.

a. *Nos. 1 and 2 Hog Fuel Boilers*

The Nos. 1 and 2 Hog Fuel Boilers are subject to BACT limits for carbon monoxide when HVLC NCG are being fired with wood/lignin. The control method associated with these limits is good combustion control. In addition, the No. 2 Hog Fuel Boiler is subject to the following BACT limits:

- A PM₁₀ emission limit for all fuels fired in the boiler. The control method is a multicyclone in series with an electrostatic precipitator.
- A SO₂ emission limit when firing oil and wood/lignin. The control method is combination firing of oil with bark/wood/lignin residue.
- A H₂SO₄ mist limit when firing LVHC gases and SOG. The control method is good combustion practices.
- A TRS limit when firing LVHC gases and SOG. The control method is good combustion practices when firing LVHC and SOG and when firing LVHC gases the control method is the white liquor scrubber except for periods of scrubber maintenance prior to combustion in the hog fuel boiler.

Compliance with these PSD limits is demonstrated by testing, monitoring, recordkeeping, and reporting. The testing condition was modified to specify that parametric monitoring values are to be confirmed or reestablished during performance testing and operation outside of the parameter value ranges during the performance test is not a violation. No changes outside of those made to reflect current permit shell are necessary as a part of this renewal process. Compliance is expected.

b. *No. 5 Recovery Boiler*

The No. 5 Recovery Boiler is subject to BACT limits for carbon monoxide, NO_x, SO₂, and sulfuric acid (H₂SO₄) mist, and fuel sulfur content. Compliance is demonstrated by testing for carbon monoxide and NO_x, fuel sulfur content monitoring via fuel supplier certification each month, limiting the amount of black liquor solids fired in the recovery boiler. Compliance is also demonstrated by keeping records and submitting reports. No changes outside of those made to reflect current permit shell are necessary as a part of this renewal process. Compliance is expected.

c. *No. 5 Lime Kiln*

The No. 5 Lime Kiln is subject to a BACT limit for carbon monoxide when burning LVHC gases and SOG in the kiln. Compliance is demonstrated by keeping records of the amount of time the gases are burned in the kiln each

month and submitting reports. No changes outside of those made to reflect current permit shell are necessary as a part of this renewal process. Compliance is expected.

d. Nos. 6 and 7 Bleach Plants

The Nos. 6 and 7 Bleach Plants are subject to BACT limits for carbon monoxide. Compliance is demonstrated using established carbon monoxide emission factors on a pound per bone dry tons of unbleached pulp basis and by limiting the bleach plant production each day. Domtar is required to maintain records of production and submit summary reports. No changes outside of those made to reflect current permit shell are necessary as a part of this renewal process. Compliance is expected.

e. Lignin Recovery Process Operations

The Lignin Recovery Process Operations are subject to BACT limits for TRS (as H₂S) and H₂S. Domtar is required to limit the production rate of the process. Compliance is demonstrated by monitoring production rates, keeping records and submitting summary reports. No changes outside of those made to reflect current permit shell are necessary as a part of this renewal process. Compliance is expected.

2. PSD Avoidance Condition under 15A NCAC 02D .0530(u)

Domtar has accepted PSD avoidance conditions under 15A NCAC 02D .0530(u) for use of projected actual emissions (PAE) in the PSD applicability determinations. The following summarizes these conditions and any necessary changes to the permit during the renewal process.

a. NC-5 Paper Machine Project.

The current permit (T48) has a .0530(u) condition for the use of projected actual emissions to avoid PSD applicability for the No. 5 Paper Machine Project. The requirement was to maintain keep records of production, pulp production, and hours of burning HVLC gases in the No. 5 Recovery Boiler. The requirement was to maintain these records for five years following regular operations after the change. The 5-year recordkeeping and reporting condition has expired and is being removed from the permit as a part of this permitting action.

b. Lignin Dewatering Process and Other Energy Improvements.

The current permit (T48) has a .0530(u) condition for the use of projected actual emissions for the Lignin Dewatering Process and Other Energy Improvements. Under this condition, Domtar is required to submit a report showing that pulp production did not exceed 536,657 air dried unbleached metric tons of pulp per year. This reporting requirement is required for 10 years after regular operations after the change. No changes in this condition are required as part of this permitting action.

c. Mill Optimization Project.

The current permit (T48) has a .0530(u) condition for the use of PAE for the post project emissions from existing sources modified as a part of the Mill Optimization Project begun in 2018. Upon commencement of regular operation of the modified No. 2 Hog Fuel Boiler, the Thermal Oxidizer, and the modified NC-5 Pulp Machine, Domtar is required to maintain records of annual CO, Lead, NO_x, PM, PM less than 10 microns in diameter (PM₁₀), PM less than 2.5 microns in diameter (PM_{2.5}), SO₂, H₂SO₄ mist, H₂S, TRS (sum of compounds), VOC, Fluorides, and carbon dioxide equivalents (CO₂e) emissions in tons per year, on a calendar year basis. The Thermal Oxidizer began regular operation on July 11, 2019. Therefore, this 5-year recordkeeping and reporting requirement was triggered. Domtar is required to submit a comparison of annual actual emissions to the projected actual emissions. Domtar is requesting changes to this condition due to changes in emission factors due to recent emissions testing. See Section IV.C.4, below, for a detailed description of the changes to this condition.

3. PSD Avoidance Conditions under 15A NCAC 02Q .0317

Domtar has accepted avoidance conditions under 15A NCAC 02Q .0317 to avoid PSD applicability. The following summarizes these conditions and any necessary changes to the permit during the renewal process.

a. PSD Avoidance for NO_x Emissions from the No. 2 Hog Fuel Boiler

In their permit renewal application, Domtar requested the removal of the PSD avoidance limitation on the No. 2 Hog Fuel Boiler due to a change in the permitted fuel mix that results in potential to emit (PTE) being significantly lower than the avoidance limit. In the current permit (T48), NO_x emissions from the No. 2 Hog Fuel Boiler are limited to 1,773.3 tons per consecutive 12-month period.

This PSD avoidance permit condition was established in 1992 when the No. 1 Package Boiler (no longer a permitted emission source) was permitted to burn No. 6 fuel oil and the No. 2 HFB was permitted as a backup control device for burning LVHC gasses and SOG, capable of burning No. 6 fuel oil, coal, woodwaste, wastewater sludge, and waste oil.

The PSD regulations have Source Obligation provision under 40 CFR 51.166(r)(2) as follows:

"... at such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of paragraphs (j) through (s) of this section shall apply to the source or modification as though construction had not yet commenced on the source or modification."

In plain language, the relaxation of a limit would mean that when the modification was made, the modification would have been a major modification and would have to go through the PSD process as though the project had never been constructed.

Therefore, based on this obligation, in order to remove the permit condition, DAQ would need assurance that the removal of the avoidance limit would not result in the 1992 project being a major modification. Therefore, the following was considered:

- In 1992, the original avoidance limit of 1,124 tpy for NO_x was established using the comparison of baseline actual emissions (BAE) to potential to emit (PTE) and represented an increase in emissions of less than 40 tpy. Therefore, it is necessary to demonstrate that the PTE of the *current* boiler configuration is less than the actual emissions used to evaluate the 1992 project. This would provide assurance that removing the avoidance condition would not result in the 1992 project being a major modification.
- Based on information provided in the renewal application, the 1,124 tpy NO_x limit initially established to avoid PSD was reset to 1,771.3 tpy based on conversations between the Domtar mill and Gary Saunders of DAQ.²⁵
- The PTE of the current boiler configuration should be based on the maximum permitted boiler heat input (presumably 889 MMBtu/hr), 8,760 hr/yr, and any applicable emission standards that limit NO_x (i.e., NSPS Subpart D).

Based on the information provided by Domtar, the 1992 project PSD applicability was reevaluated. This evaluation is presented in Table 4. As shown in Table 4, the 1992 NO_x PSD applicability analysis was conducted using the 2-year average BAE-to-PTE calculation. The result was that NO_x emissions increased by 189 tpy, which is greater than the NO_x PSD significant emission rate (SER) of 40 tpy. When contemporaneous emission increases and decreases were included (for the period between September 1985 and September 1992), the project resulted in a net emissions decrease of 60 tpy and therefore, PSD analysis was not required.

In 2001, an analysis was performed that revised the net emissions increase based on more equations developed from more current test data.²⁵ In this analysis, equations were developed for calculating annual emissions from wood only firing, emissions from coal firing providing between 20 and 46 percent of the annual heat input, and emissions from coal firing providing greater than 46 percent of the heat input. Based on these calculations, a revised BAE for NO_x was calculated to be 1487 tpy. Based on this higher BAE and using the same contemporaneous increases and decreases used in 1992, it was determined that the net increase NO_x emissions

²⁵ "Findings on Weyerhaeuser Hog Fuel Boiler 2 and PSD Issues." Received by Weyerhaeuser 12/18/2001. (See Attachment C)

Table 4. NO_x Netting for 1992 Project with Updated Fuel Mix

	NO _x Emissions (tpy)		
	Netting conducted in 1992 ²⁶	Netting conducted with revised NO _x factors ²⁷	Netting with Coal Removed
<i>Potential Annual Emissions from Fuels Fired</i>			
No. 6 Fuel Oil	12	Not provided. Revised calculation was conducted for coal and wood only.	Not calculated for individual fuels. CEM data was used representing mix of fuels after coal firing was removed
Pulverized Coal	496		
Hog Fuel	485		
WW sludge	32		
Waste Oil	<1		
Total PTE	1,025	1,771*	1,515**
2-year Average BAE	836	1,487***	1,487***
Net Project Change (PTE-BAE)	189	284	27
PSD SER	40	40	40
Netting required?	Yes	Yes	No
<i>Contemporaneous Emission Increases and Decreases (from Sept 1985 to Sept 1992)</i>			
Shutdown of sulfur burner	0	0	Not necessary. The project was determined to have not triggered PSD using the current fuel firing configuration of the boiler
Shutdown of Nos. 1 and 2 Power Boilers	-64	-64	
Shutdown of No. 1 Lime Kiln	-72	-72	
Shutdown of No. 2 Lime Kiln	-75	-75	
Startup of No. 5 Lime Kiln	124	124	
Shutdown of No. 3 Lime Kiln	-88	-88	
Shutdown of No. 4 Lime Kiln	-86	-86	
Startup of NCG System	11	11	
Allow firing of waste oil	1	1	
Allow burning of wastewater sludge	0	0	
Increase Firing Rate of No. 2 HFBB	189	284	
Total net change in emissions	-60	35	
PSD SER	40	40	
Is PSD Required?	No	No	

*PSD Avoidance Limit (see Attachment C).

**Calculated by Domtar using CEM data from August 2019 to present. Highest hourly average.

889 MMBtu/hr (max heat input rate)²⁸ x 0.389 lb/MMBtu (CEM Data) = 1,515 tpy

***Revised actual emissions calculated by Gary Saunders in Memo dated 12/18/2001 (See Attachment C).

²⁶ 1992 Netting Analysis Provided by Domtar in email dated September 1, 2020. (See Attachment D)

²⁷ "Findings on Weyerhaeuser Hog Fuel Boiler 2 and PSD Issues." Received by Weyerhaeuser 12/18/2001 (See Attachment C). Baseline actual emissions were revised using equations based on test data for coal and wood firing mixes. PSD Avoidance limit was calculated by determining the maximum emission increase once contemporaneous increases and decreases were considered that would still result in a net emissions increase 5 tpy less than the 40-tpy PSD SER for NO_x.

BAE = 1,487 + 284 = 35 tpy net emissions increase.

²⁸ Maximum heat input rate in current permit (T488).

from the No. 2 HFB could not exceed 289 tpy and still remain below the NO_x PSD SER of 40 tpy. To be conservative, the increase was reduced to 284 tpy to ensure that the 40 tpy SER was not exceeded. Therefore, the PSD avoidance limit was calculated as the BAE (1,487 tpy) plus 284 tpy, resulting in a maximum PTE of 1771 tpy.

As previously discussed, the PSD avoidance limit was determined when the No. 2 HFB was permitted to burn coal and No. 6 fuel oil. These fuels have since been replaced by No. 2 fuel oil and natural gas to supplement the firing of wood waste in the boiler. In order to remove this limit, it was necessary to determine whether a comparison of the BAE (determined in 2001) to the PTE of the current boiler configuration would result in the 1992 project being considered a major modification. To determine the new boiler PTE, the highest hourly average NO_x emission rate using CEMS data from August 1, 2019 through September 1, 2020 was determined to be 0.389 lb/MMBtu.²⁹ Using the CEMS data and the maximum permitted boiler firing of 889 MMBtu/hr, the revised PTE for NO_x was calculated to be 1516 tpy. A comparison of PTE to the revised BAE (1516 tpy – 1487 tpy) is 29 tpy. Because this value is less than the 40-tpy PSD SER, contemporaneous netting was not required. This analysis therefore demonstrates that relaxing (i.e., removing) the PSD avoidance condition would not result in the 1992 project being a significant modification when using the current No. 2 HFB firing mix. As such, the NO_x avoidance condition was removed from the permit as requested by Domtar.

b. PSD Avoidance for No. 5 Lime Kiln.

The No. 5 Lime Kiln is subject to a PSD avoidance condition, under which the lime kiln is limited to a production rate of 182,500 bone dry tons of reburned lime (as calcium oxide, CaO) per consecutive 12-month period. Compliance is demonstrated by maintaining records of reburned lime produced. Reports summarizing the monitoring and keeping records of reburned lime production on a consecutive 12-month period for the previous 17 months are required.

c. PSD Avoidance for Woodyard Operations.

The woodyard operations are subject to a PSD avoidance condition, under which the woodyard operations are subject to a VOC emissions limit of less than 120 tons per consecutive 12-month period to avoid applicability of PSD. No more than 2,238,545 green tons of softwood species (logs converted onsite into chips) may be processed through the woodyard per any consecutive 12-month period. Domtar is required to record green tons on a monthly basis and submit semi-annual summary reports. Domtar reports monthly tonnages of wood for the previous 17 months, along with the rolling 12-month totals.

d. PSD Avoidance for C3 Condensate.

The permit contains an avoidance condition limiting TRS emissions from the direct sewerage of the C3 Condensate to less than 10 tons per year per consecutive 12-month period. Domtar is permitted to route the C3 Condensate directly to the wastewater treatment plant without first being processed through the condensate stripper reflux condenser for no more than 30 days in any consecutive 12-month period.

e. PSD Avoidance for the Portable Log Chipper.

To avoid PSD applicability, the Portable Log Chipper is limited to no more than 14.9 tons of PM₁₀ per consecutive 12-month period. Domtar is required to maintain records of the monthly tons of logs processed and monthly PM₁₀ emissions.

4. Revisions to Mill Optimization Project PSD Analysis

In 2018, Domtar submitted a permit application for their Mill Optimization Project (Permit Application No. 5900069.18A). A detailed description of the project is included in the permit review for Permit No. 04291T45, included as Attachment A. The Mill Optimization Project included modifications to existing emission units and installation of new units. Therefore, PSD applicability was determined using a hybrid approach. Under this

²⁹ Email from Wynne, D., Environmental Engineer, Domtar Paper Company, LLC, to H.P. Sands, Environmental Engineer, NC DEQ/DAQ. No. 2 HFB NO_x Emissions. September 2, 2020. (See Attachment E).

approach, the post project emissions were represented by PAE for existing sources and potential to emit (PTE) for new sources. Based on the calculations included in Permit Application No. 5900069.18A, the result of the PSD applicability analysis was that the project was not considered to be a significant modification under PSD and no PSD review was necessary.

In their June 2020, permit application (No. 5900069.20A), Domtar provided updates to the PSD applicability analysis based on information resulting from emissions testing on the No. 2 Hog Fuel Boiler. As discussed in the June 2020, permit application, in December 2019 and March 2020, Domtar performed emission testing on the No. 2 Hog Fuel Boiler for multiple NCG firing scenarios to determine if a permit modification was needed to increase the hours of LVHC gas and SOG firing in the No. 2 Hog Fuel Boiler.³⁰ Upon review, Domtar determined that the emission factors used for the Mill Optimization Project were not representative of NCG firing in the No. 2 Hog Fuel Boiler. Therefore, Domtar submitted supplemental information to provide an updated PSD applicability analysis and requested updated PAE in the tracking condition. DAQ has reviewed the calculations provided by Domtar and approves their approach. The following discussion summarizes the revisions to the applicability analysis and proposed changes to the permit.

a. Sulfur Dioxide

Sulfur dioxide emissions from HVLC firing in the hog fuel boilers were calculated for the project using emission factors that were based on 2013 emissions testing and were reported on heat input (i.e., lb/MMBtu) basis. The December 2019 and March 2020 emissions testing results indicated that these emission factors underestimated SO₂ emissions for two reasons:

- The SO₂ emissions are driven by the amount of HVLC gases fired in the boiler and is related to pulp production, not heat input; and
- In the 2013 testing, HVLC gases were being fired in the boiler for only one of the three test runs for each hog fuel boiler and therefore, the emission factor underrepresented SO₂ emissions during HVLC firing.

Additionally, an assumption made to estimate emissions associated with the Mill Optimization Project was that SO₂ emissions emitted from the firing of HVLC gases in the No. 2 Hog Fuel Boiler was the same as the SO₂ emissions from firing HVLC gases in the Thermal Oxidizer. However, this assumption did not take into account the inherent SO₂ control in hog fuel boilers due to bark scrubbing.³¹ Therefore, the SO₂ emissions from the Thermal Oxidizer were underestimated for firing HVLC gases at the same pulp production basis.

The revised emission estimates addressed the sources of underestimation. The revised emissions use SO₂ factors from firing HVLC and LVHC gases and SOG in the hog fuel boilers on a pound per pulp production basis derived from the December 2019 and March 2020 emission testing. The thermal oxidizer emissions were estimated using HVLC header sampling conducted in 2014 and conservatively assuming 100 percent of sulfur compounds are converted to SO₂.

b. Hydrogen Sulfide and Total Reduced Sulfur

In the original Mill Optimization Project applicability analysis, H₂S and TRS emission factors were based on sampling of the NCG headers and were derived on a lb/hr basis. Domtar stated that the emission factors from these gases are more accurately represented on a pound per pulp production basis rather than an hourly basis because the mass loading of NCG is not constant and varies based on the rate of pulp production.

In the revised PSD calculations, Domtar estimated H₂S and TRS emissions on a pound per pulp production basis derived from the recent testing. Because speciated TRS compounds (i.e., methyl mercaptan, dimethyl sulfide, and dimethyl disulfide) were not measured during the testing, Domtar estimated these emissions using ratios from the NCG header sampling. The HVLC header sampling data were also used to estimate emissions from the Thermal Oxidizer by converting them to pound per pulp production basis and conservatively assuming 98 percent reduction efficiency.

³⁰ Applicability Determination No. 3541, dated May 14, 2020.

³¹ Someshwar, A.V., and Jain, A. K, National Council of Paper Industry for Air and Stream Improvement. *Sulfur capture in combination bark boilers*. July 1, 1993.

c. *Sulfuric Acid*

Sulfuric acid emissions for NCG firing in the hog fuel boilers and the Thermal Oxidizer were replaced with production-based emission factors obtained from the December 2019 stack testing. The emission factor for HVLC firing in the Thermal Oxidizer was assumed to be equal to the tested factor from the No. 2 Hog Fuel Boiler.

d. *Volatile Organic Compounds*

The revised VOC emissions were calculated by converting the HVLC header sampling results to a pound per pulp production basis. These factors were supplemented by emission factors from NCASI Technical Bulletin No. 1050, to determine a total VOC emission factor. The revised LVHC VOC emissions were updated using NCASI emission factors from Technical Bulletin No. 1050. Finally, the VOC emission factors for hog fuel firing and natural gas firing in the hog fuel boilers and Thermal Oxidizer (on a lb/MMBtu basis) were also updated to reflect the factors in Technical Bulletin No. 1050.

e. *Filterable Particulate Matter*

Filterable PM emissions for HVLC and hog fuel firing were revised to reflect the December 2019 performance test results with 1.5 electrical fields of the ESP installed on the No. 2 Hog Fuel Boiler in service. Filterable PM emissions from LVHC gas and SOG firing in the No. 2 Hog Fuel Boiler were updated using emission factors from NCASI Technical Bulletin No. 1020. The filterable PM emissions from the combustion of HVLC gases in the Thermal Oxidizer were revised using the emission factors for LVHC/SOG combustion as published in NCASI Technical Bulletin No. 1020.

f. *Particulate Matter Less than 10 and 2.5 Microns in Diameter*

Emissions of PM₁₀ and PM_{2.5} from HVLC and hog fuel firing were based on the filterable PM December 2019 performance test data in terms of lb/MMBtu heat input. Ratios of PM₁₀/PM_{2.5} to filterable PM presented in NCASI Technical Bulletin No. 1020 were applied to the December 2019 test data.

The PM₁₀ and PM_{2.5} emissions from LVHC/SOG firing in the No. 2 Hog Fuel Boiler were revised using emission factors from NCASI Technical Bulletin No. 1020 plus the sulfuric acid emission factor from NCASI Technical Bulletin No. 1050, which is assumed to represent condensable PM from LVHC/SOG firing.

g. *Revisions to Baseline Actual Emissions and Projected Actual Emissions*

Using the updated emission factors described above, Domtar recalculated the BAE using the original baseline period of August 2015 to July 2017 and revised the methodology for calculating PAE. The following narrative is largely taken from the permit application.

Domtar also revised the PAE estimates for the Mill Optimization Project. As was done in the initial Permit Application No. 5900069.18A, PAE from existing sources (except for NCG firing in the Nos. 1 and 2 Hog Fuel Boilers and the Thermal Oxidizer) were estimated using a worst-case scenario based on two post-project methods of determining maximum annualized production rate the Mill will achieve when all the optimization projects are complete: (1) operating at a lower pulp production rate, which requires more steam per ton of pulp since less steam is generated from combustion of black liquor solids in the Recovery Furnace; and (2) a higher pulp production rate. The worst-case scenario maximum production rate was determined on a source by source basis. The PTE for the new cooling tower was not revised in this application.

Per 40 CFR 51.166(b)(40)(ii)(c), PAE "...shall exclude, in calculating any increase in emissions that results from a particular project, that portion of the unit's emissions following the project that an existing unit could have accommodated during the consecutive 24-month period used to establish the baseline actual emissions...and that are unrelated to the particular project, including any increased utilization due to project demand growth." These excluded emissions are commonly referred to as "could have accommodated" (CHA) emissions.

Domtar used the CHA emissions to re-calculate PAE from NCG firing. This was done by annualizing the maximum monthly fiberline production rate during the baseline period; however, because the annualized maximum production during the baseline period was greater than the projected actual annual production, the

projected actual production rate was used to calculate emissions that could have been accommodated during the baseline period. HVLC firing was apportioned between the Nos. 1 and 2 Hog Fuel Boilers such that there was no concurrent firing of HVLC and LVHC in the No. 2 Hog Fuel Boiler.

Finally, the LVHC firing rate that could have been accommodated in the No. 2 Hog Fuel Boiler was calculated. Based on production data provided by Domtar³² the maximum monthly pulp production that was associated with the firing of the LVHC gases in the No. 2 Hog Fuel Boiler was 20,728 oven dried tons of unbleached pulp (ODTUBP). This resulted in an annualized rate of 248,741 ODTUBP. This number is significantly higher than the projected actual pulp production (147,701 ODTUBP/yr) associated with the combustion of LVHC gases in the No. 2 Hog Fuel Boiler. Therefore, Domtar used the projected actual pulp production rate as the amount the No. 2 Hog Fuel Boiler could have accommodated during the baseline period.

The PAE were then recalculated for two NCG firing scenarios. For the first scenario, Domtar assumed that all HVLC gases would be fired in the Thermal Oxidizer and LVHC gases would be fired in No. 2 Hog Fuel Boiler to the maximum extent without exceeding the significant emission rate for SO₂ (considering CHA emissions as described above). For the second scenario, Domtar assumed LVHC firing in the No. 2 Hog Fuel Boiler would be equal to the projected actual emissions of 552.4 tons per year of SO₂, and HVLC gases would be fired in the Thermal Oxidizer to the maximum extent without exceeding the significant emission rate for SO₂ (again considering emissions that could have been accommodated). The two scenarios were considered to provide the Mill with operational flexibility to shift NCG firing as needed.

Emissions increases as a result of the project were then calculated by subtracting the BAE from the PAE, excluding the emissions from NCG firing that could have been accommodated during the baseline period. This calculation is presented as Tables 5a and 5b. As shown in Tables 5a and 5b, the Mill Optimization Project with the revised emissions does not result in a significant emissions increase. Because the Mill continues to rely on PAE for the purposes of demonstrating that the Project did not result in a significant emissions increase, the Mill must comply with the actual emissions tracking requirements. Domtar requested that the more conservative PAE from Table 5b be included in the tracking requirement. Emissions tracking requirements based on the PAE presented in Application No. 5900069.18A can be found in Section 2.2 G.1 of the current permit (T48).

DAQ has reviewed the calculations and methodologies presented in Permit Application No. 5900069.20A and has determined that Domtar has provided sufficient information to demonstrate that, considering the revised emissions as described above, the Mill Optimization Project was not a significant PSD modification. Therefore, the permit will be modified to incorporate the revised PAE. The “Revised Projected Actual Emissions” are presented in Table 6 and represents the maximum PAE from the two firing scenarios by pollutant. The permit will be revised to replace the PAE associated with Permit Application No. 5900069.18A with the revised emissions presented in Table 6.

D. Section 112(r) of the Clean Air Act

The 1990 Clean Air Act Amendments established provisions in Title 1, Part A, Section 112(r) for the prevention and mitigation of accidental chemical releases. The EPA published regulations under 40 CFR Part 68, “Chemical Accident Prevention Provisions.” The goal of Part 68, and the risk management program required under Part 68, is to prevent accidental releases of substances that can cause serious harm to the public and the environment from short-term exposures and to mitigate the severity of releases that do occur.

Any tank, drum, container, pipe, or other “process” at a facility that contains any of the extremely hazardous toxic and flammable substances listed in 40 CFR 68.130 in an amount above the “threshold quantity” specified for that substance, the facility is required to develop and implement a risk management program (RMP).

³² Email from Crawford, P., Consulting Engineer, ALL4 Inc. to H. Sands, Permit Engineer, NC DEQ/DAQ/Permitting Section. “Response to NCDAQ question on Domtar Plymouth Optimization Part II Application.” November 9, 2020.

Table 5a. Revised Prevention of Significant Deterioration Applicability Analysis for Mill Optimization Project (Case 1)³³

	Emissions (TPY)													
	CO	Pb	NO _x	PM	PM ₁₀	PM _{2.5}	SO ₂	SAM ^a	H ₂ S	TRS (SOC) ^b	TRS (as H ₂ S)	VOC	F	CO _{2e}
Baseline Actual Emissions	8,652	6.15x10 ⁻²	1,840	618	546	422	1,306	10.3	19.1	64.5	56.5	660	0.246	2,057,143
Could Have Accommodated Emissions	8,652	6.15x10 ⁻²	1,840	619	547	423	1,577	10.8	20.6	70.3	60.2	665	0.246	2,057,143
Projected Actual Emissions	7,188	5.92x10 ⁻²	1,688	531	403	304	1,617	10.8	20.8	78.0	66.4	691	0.157	1,896,866
PSD Significant Emission Rate	100	0.6	40	25	15	10	40	7	10	10	10	40	3	75,000
Project Emissions Change (PAE - CHA)	-1,464	-2.32x10⁻³	-153	-87.9	-144	-119	39.5	-9.63x10⁻³	0.16	7.69	6.19	25.6	-8.86x10⁻²	-160,277
PSD Review Required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No

^aSAM = Sulfuric acid mist^bTRS (SOC) = TRS as "sum of compounds"**Table 5b. Revised Prevention of Significant Deterioration Applicability Analysis for Mill Optimization Project (Case 2)³⁴**

	Emissions (TPY)													
	CO	Pb	NO _x	PM	PM ₁₀	PM _{2.5}	SO ₂	SAM ^a	H ₂ S	TRS (SOC) ^b	TRS (as H ₂ S)	VOC	F	CO _{2e}
Baseline Actual Emissions	8,652	6.15x10 ⁻²	1,840	618	546	422	1,306	10.3	19.1	64.5	56.5	660	0.246	2,057,143
Could Have Accommodated Emissions	8,652	6.15x10 ⁻²	1,840	619	547	423	1,577	10.8	20.6	70.3	60.2	665	0.246	2,057,143
Projected Actual Emissions	7,184	5.91x10 ⁻²	1,630	523	394	295	1,617	11.1	22.1	74.3	63.8	692	0.157	1,896,866
PSD Significant Emission Rate	100	0.6	40	25	15	10	40	7	10	10	10	40	3	75,000
Project Emissions Change (PAE - CHA)	-1,468	-2.40x10⁻³	-210	-95.8	-153.1	-128.6	39.39	0.345	1.43	4.00	3.67	26.64	-8.86x10⁻²	-180,693
PSD Review Required?	No	No	No	No	No	No	No	No	No	No	No	No	No	No

^aSAM = Sulfuric acid mist^bTRS (SOC) = TRS as "sum of compounds"³³ Case 1 is based on firing all HVLC gases in the Thermal Oxidizer and LVHC gases would be fired in the No. 2 Hog Fuel Boiler to the maximum extent without exceeding the significant emission rate for SO₂.³⁴ Case 2 is based on maintaining the SO₂ emissions less than 552.4 tpy and HVLC gases would be fired in the Thermal Oxidizer to the maximum extent without exceeding the significance emission rate for SO₂.

Table 6. Current and Revised Projected Actual Emissions for 02D .0530(u) Condition

Pollutant	Current Projected Actual Emissions* (tons per year)	Revised Projected Actual Emissions* (tons per year)
Carbon Monoxide	7,064	7,200
Lead	5.64×10^{-2}	5.92×10^{-2}
Nitrogen Oxides	1,620	1,641
PM (filterable only)	565	531
PM ₁₀	456	403
PM _{2.5}	337	304
SO ₂	615	1,617
Sulfuric Acid Mist	8.57	11.1
H ₂ S	23.3	22.1
TRS (Sum of Compounds)	82.2	78.0
VOC	692	692
Fluorides	0.17	0.16
Carbon Dioxide Equivalents	1,880,854	1,896,865

*These projections are not enforceable limitations. If projected emissions are exceeded, consistent with 15A NCAC 02D .0530, Domtar shall include, in its annual report, an explanation as to why the actual rates exceeded the projection.

Domtar is NOT subject to Section 112(r) of the Clean Air Act requirements because it does not store or process any of the regulated substances in quantities above the thresholds in the Rule.

E. Compliance Assurance Monitoring

The CAM rule requires owners and operators to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Monitoring focuses on emissions units that rely on pollution control device equipment to achieve compliance with applicable standards. An emission unit is subject to CAM, under 40 CFR Part 64, if all of the following three conditions are met:

- The unit is subject to any (non-exempt, e.g., pre-November 15, 1990, Section 111 or 112 standard) emission limitation or standard for the applicable regulated pollutant.
- The unit uses any control device to achieve compliance with any such emission limitation or standard.
- The unit's pre-control potential emission rate exceeds 100 percent of the amount required for a source to be classified as a major source; i.e., either 100 tpy (for criteria pollutants) or 10 tpy of any individual/25 tpy of any combination of HAP.

In addition, an emissions unit is not subject to CAM for pollutants subject to the following emissions limitations or standards:

- Emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 or 112 of the Act (e.g., MACT or NSPS).
- Stratospheric ozone protection requirements under title VI of the Act.
- Acid Rain Program requirements pursuant to sections 404, 405, 406, 407(a), 407(b), or 410 of the Act.
- Emission limitations or standards or other applicable requirements that apply solely under an emissions trading program approved or promulgated by the Administrator under the Act that allows for trading emissions within a source or between sources.
- An emissions cap that meets the requirements specified in §70.4(b)(12) or §71.6(a)(13)(iii) of this chapter.
- Emission limitations or standards for which Title V permit contains a continuous compliance determination method, as defined in 40 CFR 64.1, unless the applicable compliance method includes an assumed control device emission reduction factor that could be affected by the actual operation and maintenance of the control device (e.g., a surface coating line controlled by an incinerator for which continuous compliance is determined by calculating emissions on the basis of coating records and an assumed control device efficiency factor based on an initial performance test; in this example, this part would apply to the control device and capture system, but not to the remaining elements of the coating line, such as raw material usage).

Table 7, below, presents an analysis of the permitted emissions units from Section 1 of the permit. The following describes rationale behind the development of this table:

- Sources that are only subject to TAP limits are not included in Table 7 because TAPs are not regulated pollutants for the purposes of CAM.
- There were no sources that were subject to a numerical standard for regulated pollutants that used a control device to comply with that standard.

In the current permit (T48), Domtar has conditions to address CAM for the following sources (any changes to the CAM requirements are included in these summaries):

- No. 1 Hog Fuel Boiler – CAM was updated for the hog fuel boiler based on guidance from SSCB for similar sources. Since the NESHAP Subpart DDDDD requires 10 percent opacity, the indicator range for this source was changed to the MACT requirement.
- No. 2 Hog Fuel Boiler – CAM was updated for the hog fuel boiler based on guidance from SSCB for similar sources. Since the NESHAP Subpart DDDDD requires 10 percent opacity, the indicator range for this source was changed to the MACT requirement.
- No. 1 Hog Fuel Boiler De-Entrainment Vessels, No. 2 Hog Fuel Boiler Ash Silo, Reburned Lime Bin, Fresh Lime Bin – CAM language was updated based on guidance for similar sources.

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
UNITS FOR WHICH CAM IS NOT APPLICABLE								
ES-64-25-0290	No. 1 Hog Fuel Boiler	None	SO ₂	02D .0515 NSPS (Subpart D)	NA	NA	No	these units do not use a control device to achieve compliance with the emission limitation or standard. [CAM is not applicable pursuant to 15A NCAC 02D .0614(a)(2)]
			NO _x	NSPS (Subpart D)	NA	NA	No	
			CO	PSD BACT	NA	NA	No	
ES-65-25-0310	No. 2 Hog Fuel Boiler	None	SO ₂	02D .0515 NSPS (Subpart D)	NA	NA	No	
			NO _x	NSPS (Subpart D)	NA	NA	No	
			CO	PSD BACT	NA	NA	No	
			Sulfuric Acid Mist	PSD BACT	NA	NA	No	
			TRS	PSD BACT	NA	NA	No	
ES-RB1	Temporary Boiler	None	PM	02D .0503	NA	NA	No	
			SO ₂	02D .0516				
ES-RB2	Temporary Boiler	None	PM	02D .0503	NA	NA	No	
			SO ₂	02D .0516				
ES-06-05-2000	No. 6 Bleach Plant Chip Silo B	None	PM	02D .0515	NA	NA	No	
ES-06-05-3000	No. 6 Bleach Plant Chip Silo C	None	PM	02D .0515	NA	NA	No	
ES-06-31-0180	No. 6 Bleach Plant Oxygen Delignification System ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-06-31-1000	No. 6 Bleach Plant 1 st Stage O ₂ Surge Tank ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-06-32-2060	No. 6 Bleach Plant 2 nd Stage O ₂ Reactor Blow Tube ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-06-32-2100	No. 6 Bleach Plant 2 nd Stage Wash Tower ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-06-32-2120	No. 6 Bleach Plant 2A/2B Filtrate Tank ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-06-32-2300	No. 6 Bleach Plant No. 28 High Density Tank	None	CO	PSD BACT	NA	NA	No	
ES-06-32-2340	No. 6 Bleach Plant No. 29 High Density Tank	None	CO	PSD BACT	NA	NA	No	

³⁵ No control required per Clean Condensate Alternative under 40 CFR 63.447

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
ES-06-32-2380	No. 6 Bleach Plant No. 30 High Density Tank	None	CO	PSD BACT	NA	NA	No	
ES-06-32-2460	No. 6 Bleach Plant 2C Washer	None	CO	PSD BACT	NA	NA	No	
ES-06-32-2480	No. 6 Bleach Plant 2C Washer Filtrate Tank ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-06-33-3060	No. 6 Bleach Plant 3 rd Stage Tower - ClO ₂ Stage ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-06-34-4080	No. 6 Bleach Plant 4 th Stage Extraction Tower ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-06-34-4100	No. 6 Bleach Plant 4 th Stage Extraction Filtrate Tank ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-06-35-5060	No. 6 Bleach Plant 5 th Stage Tower – ClO ₂ Stage ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-06-35-5080	No. 6 Bleach Plant 5 th Stage Filtrate Tank – ClO ₂ Stage ³⁶	None	CO	PSD BACT	NA	NA	NA	
ES-08-67-1400	No. 6 Bleach Plant Acid Sewer	None	CO	PSD BACT	NA	NA	NA	
ES-07-05-1000	No. 7 Fiberline Chip Silo A	None	PM	02D .0515	NA	NA	No	
ES-07-05-2000	No. 7 Fiberline Chip Silo B	None	PM	02D .0515	NA	NA	No	
ES-07-31-1000	No. 7 Bleach Plant 1 st Stage O ₂ Surge Tank	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-31-1100	No. 7 Bleach Plant Oxygen Delignification System ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-31-1140	No. 7 Bleach Plant 1 st Stage O ₂ Reactor Blow Tube ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-31-1180	No. 7 Bleach Plant 1 st Stage Wash Tower ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-31-1200	No. 7 Bleach Plant 1A/1B Filtrate Tank ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-33-3000	No. 7 Bleach Plant 3 rd Stage Feed Tank ³⁵	None	HAP	MACT (Subpart S)	NA	NA	No	
			CO	PSD BACT				
ES-07-33-3080	No. 7 Bleach Plant 3 rd Stage Tower - ClO ₂ Stage ³⁶	None	CO	PSD BACT	NA	NA	No	
ES-07-35-5060	No. 7 Bleach Plant 5 th Stage Tower – ClO ₂ Stage ³⁶	None	CO	PSD BACT	NA	NA	No	
ES-07-35-5080	No. 7 Bleach Plant 5 th Stage Filtrate Tank ³⁶	None	CO	PSD BACT	NA	NA	No	

³⁶ This source is routed through the bleach plant scrubber, but the scrubber does not reduce CO emissions.

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/ Exemptions
ES-07-33-Blendbox	No. 7 Bleach Plant Blend Box (sump) ³⁶	None	CO	PSD BACT	NA	NA	No	
ES-07-34-4080	No. 7 Bleach Plant 4 th Stage Extraction Tower	None	CO	PSD BACT	NA	No	Yes	
ES-07-34-4100	No. 7 Bleach Plant 4 th Stage Extraction Filtrate Tank	None	CO	PSD BACT	NA	No	Yes	
ES-07-36-6040	No. 7 Bleach Plant Peroxide 6 th Stage Extraction Tower	None	CO	PSD BACT	NA	NA	No	
ES-08-50-3140	10% Sulfuric Acid Day Tank	None	CO	PSD BACT	NA	NA	No	
ES-08-67-1200	Base Effluent Neutralization Tank	None	CO	PSD BACT	NA	NA	No	
ES-08-67-1300	Acid Effluent Neutralization Tank	None	CO	PSD BACT	NA	NA	No	
ES-00-35-1000	Screen House	None	PM	02D .0515	NA	NA	No	
ES-11-10-1500	Debarking and Chipping Line	None	PM	02D .0515	NA	NA	No	
ES-11-50-4500-1 ES-11-50-4500-2	Two Bark Hogs	None	PM	02D .0515	NA	NA	No	
FS-010	Hog Fuel Handling and Transfer in Woodyard	None	PM	02D .0515	NA	NA	No	
FS-012	Chip Conveying to Pulping	None	PM	02D .0515	NA	NA	No	
FS-013	Chip Handling and Transfer System in Woodyard	None	PM	02D .0515	NA	NA	No	
FS-021	Hog Fuel Handling and Transfer to Boiler Area	None	PM	02D .0515	NA	NA	No	
ES-TEMP-CHIP	One or More Portable Log Chipper(s)	None	PM	02D .0515	NA	NA	No	
ES-14-60-3000a	Spare Diesel Engine Backup	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-53-40-0130	Fine Paper Fire Pump Diesel Engi	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
			NMHC, NO _x , CO, PM	NSPS (Subpart IIII)				
ES-53-40-0140	Warren Neck Creek East Fire Pump Diesel Engine	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-53-40-0145	Warren Neck Creek West Fire Pump Diesel Engine	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-71-95-0500	Backup Communication System Diesel Generator	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-73-05-4510	Backup Lift Station Runoff Collection Diesel Engin	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-73-05-4580	Backup Fiberline Lift Station Diesel Engine	None	HAP	MACT (Subpart ZZZZ)	NA	NA	No	
ES-09-27-1000	LRP 40% Black Liquor Tank	None	H ₂ S, TRS	PSD BACT	NA	NA	No	
ES-09-27-3000	LRP Press Building Fugitives (Filter Press 2)	None	H ₂ S, TRS	PSD BACT	NA	NA	No	

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
ES-09-27-3100	LRP Secondary Cloth Wash Tank	None	H ₂ S, TRS	PSD BACT	NA	NA	No	
ES-10-25-0110	No. 5 Recovery Boiler	None	SO ₂	02D .0516 PSD BACT	NA	NA	No	
		None	TRS	NSPS (Subpart BB)	NA	NA	No	
		None	CO	PSD BACT	NA	NA	No	
		None	NO _x	PSD BACT	NA	NA	No	
		None	Sulfuric acid mist	PSD BACT	NA	NA	No	
ES-14-05-0050	North Smelt Tank	None ³⁷	TRS	NSPS (Subpart BB)	NA	NA	No	
ES-14-05-0300	South Smelt Tank	None ³⁷	TRS	NSPS (Subpart BB)	NA	NA	No	
ES-14-60-3000	No. 5 Lime Kiln	None	SO ₂	02D .0516	NA	NA	No	
ES-08-52-1060	R8/10 Chlorine dioxide generator	Scrubber	None	None	NA	NA	No	These units have a control device, but the unit is not subject to an emission limitation or standard. [CAM is not applicable pursuant to 15A NCAC 02D .0614(a)(1)]
ES-08-52-1760, ES-08-52-1770, ES-08-52-1780	Chlorine Dioxide Tanks	Scrubber	None	None	NA	NA	No	
ES-06-6SCFO	No. 6 Bleach Plant 6th Stage Feed Chute Overflow Line	Scrubber	None	None	NA	NA	No	
ES-08-70-1000	White Liquor Oxidation Tank	Scrubber	None	None	NA	NA	No	
ES-10-08-0010	Salt Cake Mix Tank	Scrubber	None	None	NA	NA	No	
ES-14-30-5000	East Lime Mud Filter – Hood Exhaust	Scrubber not for PM control	None	None	NA	NA	No	
ES-14-30-6000	West Lime Mud Filter - Hood Exhaust							
ES-64-60-0960	No. 1 Hog Fuel Boiler Scrubber Ash Silo	Bagfilters	PM	02D .0515	<100 tpy ³⁸	No	No	These units have a control device and the control device is being used to comply with an applicable standard. The potential emissions prior to control are less than 100 percent of the amount required for a source to be considered major (i.e., less than 100 tpy). [CAM is not applicable pursuant to 15A NCAC 02D .0614(a)(3)]
ES-65-60-0860	No. 2 Hog Fuel Boiler Scrubber Ash Silo	Bagfilters	PM	02D .0515	<100 tpy	No	No	
ES-14-20-2020	East Lime Slaker	Scrubber	PM	02D .0515	<100 tpy	No	No	
ES-14-20-2040	No. 1 East Causticizing Line							
ES-14-20-2050	No. 2 East Causticizing Line							
ES-14-20-2060	No. 3 East Causticizing Line							
ES-14-20-2085	West Lime Slaker	Scrubber	PM	02D .0515	<100 tpy	No	No	
ES-14-20-2105	No. 1 West Causticizing Line							
ES-14-20-2115	No. 2 West Causticizing Line							
ES-14-20-2125	No. 3 West Causticizing Line							

³⁷ According to the 2019 emission inventory, the scrubber installed on the North and South Smelt Tanks does not control TRS emissions.

³⁸ This PTE rate was confirmed by Domtar via email on 02/05/2021 from Claire Corta, Project Manager, All4. See Attachment F.

Table 7. Compliance Assurance Monitoring Analysis

[illegible]

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
LVHC.ES-06-10-2420	No. 6 Fiberline Digester Flash Condenser	LVHC Collection System burned in No. 5 Lime Kiln (primary)	HAP	MACT (Subpart S)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
LVHC.ES-07-10-2420	No. 7 Fiberline Digester Flash Condenser		TRS	NSPS (Subpart BB)	NA	Equipped with a CEMS for TRS	No	The permit contains a continuous compliance method consistent with 40 CFR 64.1. [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(F)]
ES-07-10-2480	No. 6 and 7 Digester Contaminated Condensate Tank							
LVHC.ES-08-61-1000	Turpentine Decanter Tank	LVHC Collection System burned in No. 5 Lime Kiln (primary)	HAP	MACT (Subpart S)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
LVHC.ES-08-61-1020	Turpentine Decanter Weir							
LVHC.ES-08-61-1040	Turpentine Underflow Tank							
LVHC.ES-08-61-1080	Turpentine Tank (32,000-gallon capacity)							
LVHC.ES-09-20-0320	No. 6 Black Liquor Evaporator System							
LVHC.ES-09-25-0510	No. 7 Black Liquor Evaporator System							
LVHC.ES-09-35-0200	Concentrator Hotwell							
LVHC.ES-09-DECANT	Secondary Turpentine Decanter Tank							
LVHC.ES-09-WEIR	Secondary Turpentine Decanter Weir							
LVHC.ES-09-UND	Secondary Turpentine Underflow Tank							
LVHC.ES-09-STOR	Secondary Turpentine Storage Tank							
LVHC.ES-09-25-1000	Condensate Stripper Feed Tank							
ES-09-25-1050	Condensate Stripper Reflux Condenser	SOG collection system to No. 5 Lime Kiln (primary)	HAP	MACT (Subpart S)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
			TRS	NSPS (Subpart BB)	NA	TRS CEMS	No	The permit contains a continuous compliance method consistent with 40 CFR 64.1. [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(F)]
ES-06-33-3060	No. 6 Bleach Plant 3 rd Stage Tower - ClO ₂ Stage	Scrubber	HAP	MACT (Subpart S)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/ Exemptions
ES-06-34-4080	No. 6 Bleach Plant 4 th Stage Extraction Tower							5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
ES-06-34-4100	No. 6 Bleach Plant 4 th Stage Extraction Filtrate Tank							
ES-07-33-3080	No. 7 Bleach Plant 3 rd Stage Tower - ClO ₂ Stage							
ES-07-33-3080	No. 7 Bleach Plant 3 rd Stage Tower - ClO ₂ Stage	Scrubber	HAP	MACT (Subpart S)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
ES-07-35-5060	No. 7 Bleach Plant 5 th Stage Tower – ClO ₂ Stage							
ES-07-35-5080	No. 7 Bleach Plant 5 th Stage Filtrate Tank							
ES-10-25-0110	No. 5 Recovery Boiler	ESPs	HAP (PM ₁₀ Surrogate) PM ₁₀	NSPS (Subpart BB) MACT (Subpart MM) PSD BACT	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
ES-14-05-0050	North Smelt Tank	Scrubber	HAP (PM ₁₀ Surrogate)	MACT (Subpart MM)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
ES-14-05-0300	South Smelt Tank	Scrubber	HAP (PM ₁₀ Surrogate)	MACT (Subpart MM)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
ES-14-60-3000	No. 5 Lime Kiln	Scrubber	HAP (PM ₁₀ Surrogate)	MACT (Subpart MM)	NA	NA	No	This unit is subject to MACT standards applicable to the regulated pollutant proposed after November 5, 1990 [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(A)]
			TRS	NSPS (Subpart BB)	NA	TRS CEMS	No	The permit contains a continuous compliance method consistent with 40 CFR 64.1. [Exempt from CAM pursuant to 15A NCAC 02D .0614(b)(1)(F)]
THE FOLLOWING UNITS ARE SUBJECT TO CAM								
ES-64-25-0290	No. 1 Hog Fuel Boiler	Multiclones in series with electro-scrubbers	PM (total)	02D .0503, .0504	>100 tpy	COMS	Yes	Permit contains CAM conditions
ES-65-25-0310	No. 2 Hog Fuel Boiler	Multiclone in series with an ESP	PM (total)	02D .0503, .050465-	>100 tpy	COMS	Yes	Permit contains CAM conditions
ES-64-60-0180 ES-64-60-0480 ES-64-60-0780	No. 1 Hog Fuel Boiler De-Entrainment Vessels	Baghouses	PM (total)	02D .0515	>100 tpy	No	Yes	Permit contains CAM conditions

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
ES-65-50-0190	No. 2 Hog Fuel Boiler Ash Silo	Bagfilters	PM (total)	02D .0515	>100 tpy	No	Yes	Permit contains CAM conditions
ES-14-65-1030	Reburned Lime Bin	Baghouse	PM (total)	.02D .0515	>100 tpy	No	Yes	Permit contains CAM conditions
ES-14-65-1080	Fresh Lime Bin							
ES-14-65-3015	Reburned Lime Crusher (only vented through baghouse when No. 5 Lime Kiln is not operating)							
ES-06-10-2380	No. 6 Fiberline Chip Bin Relief Condenser	HVLC Collection System burned in No. 2 Hog Fuel Boiler (primary), and No. 1 Hog Fuel Boiler, No.5 Recovery Boiler, and Thermal Oxidizer (backup)	TRS	NSPS (Subpart BB)	>100 tpy	No	Yes	CAM condition needed (NOTE: the Subpart BB requirement for a temperature monitoring device are not in the current permit but are being added as part of the renewal)
ES-06-21-1100	No. 6 Fiberline Pressure Diffuser Filtrate Tank							
ES-06-21-1200	No. 6 Fiberline Digester Blow Tank							
HVLC.ES-07-10-2380	No. 7 Fiberline Chip Bin Relief Condenser							
HVLC.ES-07-21-1100	No. 7 Fiberline Pressure Diffuser Filtrate Tank							
HVLC.ES-07-21-1200	No. 7 Fiberline Digester Blow Tank							
HVLC.ES-07-22-1080	No. 7 Fiberline Secondary Knotter							
ES-10-25-0110	No. 5 Recovery Boiler	ESPs	PM (total)	02D .0508	>100 tpy	COMS	Yes	CAM Condition needed
ES-14-05-0050	North Smelt Tank	Scrubber	PM (total)	02D .0508 NSPS (Subpart BB)	>100 tpy	No	Yes	CAM Condition needed
ES-14-05-0300	South Smelt Tank	Scrubber	PM (total)	2D .0508 NSPS (Subpart BB)	>100 tpy	No	Yes	CAM Condition needed
ES-14-60-3000	No. 5 Lime Kiln (Includes PM emissions from Reburned Lime Crusher)	Scrubber	PM (total)	02D .0508	>100 tpy	No	Yes	CAM Condition needed

Table 7. Compliance Assurance Monitoring Analysis

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant(s)	Applicable Standards	Pre-control PTE (tpy)	CEMS or COMS Installed?	Is CAM Applicable?	CAM Disqualification/Exemptions
ES-09-27-1100	40% Black Liquor Cooler	HVLC Collection System burned in No. 2 Hog Fuel Boiler (primary), and No. 1 Hog Fuel Boiler, No.5 Recovery Boiler, and Thermal Oxidizer (backup)	TRS and H ₂ S	PSD BACT	>100 tpy	No	Yes	CAM Condition needed
ES-09-27-1200	Filtrate 1 Storage Tank							
ES-09-27-1400	Carbonator Tower							
ES-09-27-1800	Agitated Conditioning Tank							
ES-09-27-2000	Agitated Buffer Tank							
ES-09-27-2100	LRP Primary Filter Press ³⁹							
ES-09-27-2300	Cloth Wash Water Tank 1							
ES-09-27-2400	Filtrate Tank 1							
ES-09-27-2500	Filtrate 1 Buffer Tank	LVHC Collection System to No. 2 Hog Fuel Boiler (backup)	TRS	NSPS (Subpart BB)	NA	No	Yes	CAM Condition needed
ES-09-27-2610	Dewatered Lignin Conveyor 1							
LVHC.ES-06-10-2420	No. 6 Fiberline Digester Flash Condenser							
LVHC.ES-07-10-2420	No. 7 Fiberline Digester Flash Condenser							
ES-07-10-2480	No. 6 and 7 Digester Contaminated Condensate Tank	SOG collection system to No. 2 Hog Fuel Boiler (backup)	TRS	NSPS (Subpart BB)	NA	No	Yes	CAM Condition needed
ES-09-25-1050	Condensate Stripper Reflux Condenser							

³⁹ LRP Primary Filter Press is partially controlled by vacuum pull to HVLC System

As shown in Table 7, below, there are several emission units that are subject to a nonexempt emission standard, use a control device to meet the standard, **and** have uncontrolled potential emissions greater than 100 tpy. Therefore, conditions to address CAM will be added to the permit for the following emission units:

- No. 5 Recovery Boiler;
- North Smelt Tank;
- South Smelt Tank;
- No. 5 Lime Kiln;
- Sources collected in the HVLC collection system and controlled in the No. 2 Hog Fuel Boiler as the primary control device and the No. 1 Hog Fuel Boiler or the Thermal Oxidizer as backup: No. 6 Fiberline Chip Bin Relief Condenser, No. 6 Fiberline Pressure Diffuser Filtrate Tank, No. 6 Fiberline Digester Blow Tank, No. 7 Fiberline Chip Bin Relief Condenser, No. 7 Fiberline Pressure Diffuser Filtrate Tank, No. 7 Fiberline Digester Blow Tank, No. 7 Fiberline Secondary Knotter;
- LSRP Sources collected in the HVLC collection system and controlled in the No. 2 Hog Fuel Boiler as the primary control device and the No. 1 Hog Fuel Boiler as backup: 40% Black Liquor Cooler, Filtrate 1 Storage Tank, Carbonator Tower, Agitated Conditioning Tank, Agitated Buffer Tank, LRP Primary Filter Press, Cloth Wash Water Tank 1, Filtrate Tank 1, Filtrate 1 Buffer Tank, Dewatered Lignin Conveyor 1;
- Sources collected in the LVHC collection system and controlled in the No. 2 Hog Fuel Boiler as backup to the No. 5 Lime Kiln: No. 6 Fiberline Digester Flash Condenser; No. 7 Fiberline Digester Flash Condenser; No. 6 and 7 Digester Contaminated Condensate Tank; and
- Condensate Stripper Reflux Condenser collected in the SOG collection system and controlled in the No. 2 Hog Fuel Boiler as backup to the No. 5 Lime Kiln.

The following discussion briefly summarizes the CAM requirements for the units listed above. The proposed monitoring approach was based on guidance from the Stationary Source Compliance Branch.

1. Recovery Furnaces, Lime Kilns, and Smelt Dissolving Tanks

As shown in Table 7, CAM is required for the recovery boiler, lime kiln, and smelt dissolving tanks for the PM standards in 02D .0508 (Particulates from Pulp and Paper Mills). For PM control, the recovery furnace is equipped with ESPs and the smelt dissolving tanks and lime kiln are equipped with scrubbers. A correlation between PM emissions and opacity was considered for the recovery furnaces and a correlation between PM emissions and scrubber pressure drop and scrubber liquid flow rate was considered for the smelt dissolving tanks and lime kiln. Developing a correlation between PM emissions and either opacity or scrubbing parameters was not possible for these sources using the existing performance test data. Previous performance tests were conducted at a single load for these sources and do not provide data across all ranges of operations and would not result in correlations that could be used for CAM. In lieu of conducting performance tests at multiple load ranges to determine a correlation between PM emissions and opacity or scrubber parameters, an alternative for indicator range was evaluated.

All of these sources are subject to the MACT standards under 40 CFR Part 63, Subpart MM, which regulates PM as a surrogate for metal HAP. Under Subpart MM, sources equipped with ESPs are required to install and operate COMS to measure opacity as an indicator of ESP performance. Corrective action is triggered when the COMS measures 10 consecutive 6-minute average opacity readings greater than 20 percent. A violation of the Subpart MM standards is considered to have occurred when opacity is greater than 35 percent for 6 percent or more of the operating time during any quarterly period.

Similarly, Subpart MM requires sources equipped with scrubbers to be equipped with continuous monitors to measure pressure drop and scrubber liquid flow rate. Corrective action is triggered when any 3-hour average pressure drop or scrubber liquid flow rate is outside of the compliance range determined during performance tests. A violation of the standards is considered to have occurred if six or more 3-hour average parameter values are outside of the compliance range during any 6-month reporting period.

The Subpart MM standards regulate PM emissions as measured by Method 5, which provides the filterable portion of PM emissions. In contrast, the 02D .0508 standards regulate PM emissions as measured by both Method 5 and Method 202. Therefore, it is more stringent to monitor opacity or scrubber parameters designed to demonstrate compliance with only the filterable portion of PM. Since the recovery furnace, smelt dissolving tanks, and lime kiln are already complying with these requirements, the indicator ranges for CAM were based on the corrective action triggers associated with Subpart MM.

DAQ policy is to require a quality improvement plan (QIP), which is a written plan that outlines the procedures that will be used to evaluate problems that affect the performance of control equipment. According to EPA's guidance document for CAM,⁴⁰ the permitting authority may require a source to develop and implement a QIP after a determination that the source has failed to use acceptable procedures in responding to an excursion or exceedance. Also, the rule allows the permitting authority flexibility to specify an appropriate threshold level for requiring the implementation of a QIP. The rule states that an appropriate threshold may be specified as "...an accumulation of exceedances or excursions exceeding 5 percent duration of a pollutant-specific emissions unit's operating time for a reporting period...." Furthermore, the rule states that the "...threshold level may be set at a higher or lower percent or may rely entirely on other criteria" that indicate whether the emissions unit and control device are being operated and maintained properly. [See 40 CFR 64.8(a)]

To determine the appropriate threshold level for requiring a QIP, a 5-percent duration of the operating time during the 6-month reporting period was considered for these sources only if the resulting duration was not less stringent than the Subpart MM monitoring exceedances definitions. For recovery furnaces equipped with ESPs, Subpart MM defines a monitoring exceedance as being when the opacity is greater than 35 percent for 6 percent or more of the operating time during a quarterly reporting period. Since the reporting period is semiannual for 02D .0508, a 12-percent duration over a 6-month period would be an equivalent number of hours (a maximum of 11 days per 6-month reporting period). A 5-percent duration of the operating time would be a maximum of 9 days per 6-month reporting period and is less than the Subpart MM duration for monitoring exceedances. Therefore, the QIP threshold for the recovery furnaces was set to 5 percent of the operating time during the reporting period.

For the lime kiln and smelt dissolving tanks, a QIP threshold equal to a 5-percent duration of the operating time during the 6-month reporting period was also evaluated. For lime kilns and smelt dissolving tanks equipped with scrubbers, Subpart MM defines a monitoring exceedance as 6 or more 3-hour average monitoring parameter values out of range within a 6-month reporting period and also specifies no more than one exceedance will be attributed in any given 24-hour period. Therefore, the under Subpart MM, a maximum of 6 days of exceedances could be allowed. Five percent of the operating time of these sources would be a maximum of 9 days per 6-month reporting period. Therefore, setting the QIP threshold equal to a 5-percent duration of operating time would be less stringent than Subpart MM. As a result, the QIP threshold was set equal to the Subpart MM definition of monitoring exceedances (no more than six 3-hour average monitoring parameter values out of range within a 6-month reporting period).

2. Sources Collected and Controlled in HVLC System

As shown in Table 7, the sources that are considered to be HVLC sources are subject to TRS standards under NSPS Subpart BB. The LSRP sources are collected in the HVLC system and are subject to TRS and H₂S limits under PSD BACT. Compliance is demonstrated by collecting and controlling the HVLC and LSRP sources in the No. 2 Hog Fuel Boiler as the primary control device, backed up by the No. 1 Hog Fuel Boiler, No. 5 Recovery Boiler, and Thermal Oxidizer. The No. 5 Recovery Boiler is equipped with a CEMS for TRS. Because the CEM directly measures the pollutant of interest, no CAM is required for the combustion of HVLC sources in the No. 5 Recovery Boiler for these sources.

The Thermal Oxidizer is required under NSPS Subpart BB to be equipped with a continuous temperature monitoring device to ensure that the combustion temperature is maintained above the 1200°F temperature

⁴⁰ Technical Guidance Document: Compliance Assurance Monitoring. U.S Environmental Protection Agency. OAQPS - Emission Measurement Center, Research Triangle Park, NC. August 1998. <https://www.epa.gov/sites/production/files/2016-05/documents/cam-tgd.pdf>

requirement. Although temperature monitoring is continuous, the temperature measurement does not represent TRS emissions directly. Therefore, CAM is required for the Thermal Oxidizer

The Nos. 1 and 2 Hog Fuel Boilers are not equipped with a continuous emissions monitor for the combustion of HVLC and LSRP sources. NSPS Subpart BB does not include a monitoring requirement for the combustion of these gases in a boiler. The EPA issued Applicability Determination No. 020009,⁴¹ which confirms that the hog fuel boilers are not required to monitor temperature. Therefore, CAM applies to these sources.

a. Indicator, Measuring Approach, and Indicator Range

For control of HVLC sources, NSPS Subpart BB requires continuous temperature monitoring to demonstrate compliance with the TRS emissions standards when using an incinerator as the control device. Therefore, a correlation between TRS emissions and thermal oxidizer temperature has been established by EPA. For the Thermal Oxidizer, corrective action will be triggered when the continuous temperature monitoring device measures a temperature less than 1260°F, which is 5 percent above the NSPS Subpart BB requirement of 1200°F.

Since Subpart BB requires temperature monitoring for sources controlled in an incinerator, temperature monitoring was considered as the indicator for the Nos. 1 and 2 Hog Fuel Boilers. However, based on conversations with Domtar personnel, a continuous temperature monitor is technically infeasible for the boilers. Instead, Domtar proposed monitoring of steam rate as the indicator. A study performed by Jansen⁴² demonstrated that a steam rate of 120,000 lb of steam per hour or greater correlated to a boiler temperature of 1200°F, as required. Corrective action will be required when the steam rate falls below 126,000 lb of steam per hour, which is 5 percent above the 120,000 lb-hr steam rate.

b. QIP Threshold

As with the No. 5 Recovery Boiler, North and South Smelt Tanks, and No. 5 Lime Kiln, DAQ policy is to require a QIP, which outlines the procedures for evaluating problems that affect the performance of the control equipment. Generally, DAQ requires a 3-percent threshold for good operation and maintenance purposes for all continuous monitoring devices, unless specified otherwise by the applicable regulation.

For the Thermal Oxidizer, NSPS Subpart BB specifies that no more than six excursions below the indicator range in any semiannual reporting period are allowed. Therefore, the QIP threshold was set at the NSPS Subpart BB level. For the hog fuel boilers, NSPS Subpart BB does not include a similar requirement. Therefore, the QIP threshold was established as 3 percent per DAQ policy.

c. Performance Criteria

For the Nos. 1 and 2 Hog Fuel Boilers, Data Representativeness was specified as a valid hour of data, and at least four valid data points are required to calculate the hourly average (i.e., one data point in each 15-minut quadrant of the hour). For the Thermal Oxidizer, Data Representativeness was established by requiring the location of the temperature sensor, with a minimum tolerance and minimum chart recorder sensitivity.

QA/QC practices and criteria, monitoring frequency, data collection procedures, and averaging period were also established. For the Nos. 1 and 2 Hog Fuel Boilers, QA/QC practices and criteria include the calibration and inspections which will be conducted according to manufacturer's specifications and according to a site-specific monitoring plan established for Boiler MACT, Subpart DDDDD. The steam flow is to be measured continuously and recorded on a data acquisition system, with an hourly averaging period.

For the Thermal Oxidizer, thermocouple will be calibrated and inspected according to manufacturer's recommendations. The minimum chart recorder sensitivity is 20°F.

⁴¹ EPA Applicability Determination No. 020009. "Alternative Monitoring Proposals." Neely, R. Douglas, Air Toxics and Monitoring Branch – Air, Pesticides, and Toxics Management Division. EPA Region 4. February 13, 2002.

https://cfpub.epa.gov/adi/index.cfm?fuseaction=home.dsp_show_file_contents&CFID=150649924&CFTOKEN=42215318&id=0200009

⁴² Submitted via email from Don Wynne of Domtar on January 25, 2021.

3. Sources Collected and Controlled in the LVHC and SOG System

Sources that are considered the LVHC/SOG sources are subject to TRS standards under NSPS Subpart BB, including the No. 6 Fiberline Digester Flash Condenser; No. 7 Fiberline Digester Flash Condenser; No. 6 and 7 Digester Contaminated Condensate Tank; and Condensate Stripper Reflux Condenser. Compliance is demonstrated by collecting and controlling these sources in the No. 5 Lime Kiln as the primary control device, with the No. 2 Hog Fuel Boiler as backup. When controlled in the No. 5 Lime Kiln, the LVHC/SOG sources are not subject to CAM because the kiln is equipped with a TRS CEMS. Similar to the HVLC sources, when the LVHC/SOG sources controlled in the No. 2 Hog Fuel Boiler, the boiler is required to be equipped with a continuous temperature monitoring device to ensure that combustion temperature is maintained above the 1200°F temperature requirement under Subpart BB. Therefore, CAM is required when the LVHC and SOG sources identified in Table 7, below, are burned in the No. 2 Hog Fuel Boiler.

The CAM requirements for the No. 2 Hog Fuel Boiler were established in Section VI.E.2, above. These same requirements will be used for the LVHC and SOG sources.

VII. Facility Wide Air Toxics

Domtar previously triggered toxics analysis and compliance with the acceptable ambient levels (AALs) was demonstrated for 31 TAP. Compliance was demonstrated on a source-by-source basis for the facility and the current permit contains both facility wide and source-by-source TAP limits. To allow for operational flexibility, the permitted emission rates were developed for each source by optimizing the emissions such that the peak modeled concentration would be no higher than 98 percent of the applicable AAL. The permitted emission rates were developed by developing an optimization factor by dividing 98 percent of the AAL by the maximum modeled concentration. Because compliance was demonstrated on a source-by-source basis, the permit limits are normally established on source-by-source bases; in this case however, where the optimization factor is greater than 10 (meaning that the facility wide maximum modeled concentration was 9.8 percent or less of the AAL), the compliance margin was considered to be sufficiently high to ensure compliance with the AAL on a facility wide basis. Therefore, facility wide emission limits were established for TAP for which the maximum modeled concentration was 9.8 percent or less of the AAL. The following summarizes changes to the toxics condition in the permit.

The most recent TAP analysis was approved April 30, 2018, and toxics modeling review occurred with Permit No. 04291T47. Domtar is currently undergoing a PSD permit application process and toxics will be evaluated again under that application. Therefore, no toxics analysis will be addressed in this permitting action.

VIII. Facility Emissions Review

The table on the first page of this permit review presents the criteria pollutant (plus total HAP) from the latest available approved facility emissions inventory (2018). The HAP emitted in the largest quantity from the facility is methanol. This renewal does not increase the potential to emit any emissions from this facility.

IX. Facility Compliance Status

NC DAQ has reviewed the compliance status of this facility. The most recent full inspection was completed during site visits between November 29, 2018, and August 15, 2019. Betsy Huddleston of the WaRO indicated that the facility appeared to be in compliance with all applicable requirements, a failed Subpart MM particulate test on the lime kiln that was conducted on June 24th to 25th, 2019 (see below for further discussion).

- A NOD was issued on August 30, 2016, for two MACT Subpart S and Subpart MM related deviations related to the No. 6 Bleach Plant Third Stage Tower and Recovery Boiler corrective action plan check sheets. The NOD has been resolved.

- A NOV was issued on December 9, 2016, because downtime of the NO_x CEMS installed on the No. 2 Hog Fuel Boiler exceeded the DAQ guideline level of 6 percent for demonstration of proper operation and maintenance practices. The NOV was resolved as of January 11, 2017.
- A NOV was issued on February 24, 2017, because downtime of the NO_x CEMS installed on the No. 1 Hog Fuel Boiler exceeded the DAQ guideline level of 6 percent for demonstration of proper operation and maintenance practices. The NOV was resolved as of February 24, 2017.
- A NOV/NRE was issued on September 8, 2017, for exceedance of the NSPS Subpart BB TRS limit on the No. 5 Lime Kiln, exceedance of the NSPS Subpart D NO_x limit on the No. 1 Hog Fuel Boiler, and exceedance of the NSPS Subpart D opacity limit on the No. 1 Hog Fuel Boiler. A civil penalty in the amount of \$19,837, including costs, was issued on December 13, 2017. The civil penalty was paid in full and the NOV/NRE was closed on March 3, 2018.
- A NOV was issued on September 7, 2018, for incomplete records associated with secondary voltage monitoring of the No. 2 Hog Fuel Boiler electroscrubber modules. A civil penalty in the amount of \$9,456 was paid in full and the NOV was closed on April 2, 2019.
- A NOV was issued on November 28, 2018, because downtime of the TRS CEMS installed on the No. 5 Lime Kiln exceeded the DAQ guideline level of 6 percent for demonstration of proper operation and maintenance practices. The NOV was resolved as of January 11, 2019.
- A NOV/NRE was issued on March 4, 2019, for exceedances of the NSPS opacity emission standards applicable to the No. 1 Hog Fuel Boiler and No. 2 Hog Fuel Boiler NO_x CEM downtime. This issue has as resolved as of April 25, 2019.
- An informal NOV was issued on December 17, 2019, for a failed Subpart MM and Subpart BB particulate test on the No. 5 Lime Kiln that was conducted on June 24 and 25, 2019. A successful performance test was conducted on July 31, 2019. This issue was resolved on December 17, 2019.
- An informal NOV was issued on March 16, 2020, for the exceedance of the NO_x emission limit on the No. 2 Hog Fuel Boiler during the November 29, 2019 performance testing. This issue was resolved on May 5, 2020.
- An informal NOV was issued on October 12, 2020, for failure to conduct the tests on the No. 6 and No. 7 bleach plant scrubbers within 60 months of the previous test dates (due August 2020). A performance test was conducted on September 22 and 23, 2020 and indicated compliance. This issue was resolved on October 22, 2020.

X. Draft Permit Review Summary

A copy of the draft permit was submitted to the WaRO on November 19, 2020. The WaRO responded on December 2, 2020. No comments were received.

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

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 is provided to the public under 15A NCAC 02Q .0521 above.

The Commonwealth of Virginia is an affected area within approximately 50 miles of the facility.

Notice of the DRAFT Title V Permit to Affected States ran from XXXX YY, 2020, to XXXX YY, 2020. *No comments from Affected States were received.*

Public Notice of the DRAFT Title V Permit ran from XXXX YY, 2020, to XXXX YY, 2020. *No public comments were received.*

EPA's 45-day review period ran concurrent with the 30-day Public Notice, from XXXX YY, 2020, to XXXX YY, 2020. *No comments from EPA and U.S. EPA Region 4 were received regarding the DRAFT Title V Permit.*

XII. Conclusions, Comments and Recommendations

PE Seal

Pursuant to 15A NCAC 2Q .0112 "Application requiring a Professional Engineering Seal," a professional engineer's seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

- (1) design;
- (2) determination of applicability and appropriateness; or
- (3) determination and interpretation of performance; of air pollution capture and control systems.

A professional engineer's seal (PE Seal) was **NOT** required for this renewal.

Zoning

A Zoning Consistency Determination per 2Q .0304(b) was **NOT** required for this renewal.

Recommendations

This permit modification application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Recommend Issuance of Permit No. 04291T49. WaRO has received a copy of this permit and submitted comments that were incorporated as described in Section X.

ATTACHMENT A

Air Permit Review for Permit No. 04291T45, Dated August 15, 2018

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: August 15, 2018

Region: Washington Regional Office
County: Martin
NC Facility ID: 5900069
Inspector's Name: Betsy Huddleston
Date of Last Inspection: 05/17/2018
Compliance Code: B / Violation - emissions

Facility Data Applicant (Facility's Name): Domtar Paper Company, LLC Facility Address: Domtar Paper Company, LLC NC Highway 149 North Plymouth, NC 27962 SIC: 2611 / Pulp Mills NAICS: 322121 / Paper (except Newsprint) Mills Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			Permit Applicability (this application only) SIP: 02D .1111 NSPS: NESHAP: Subpart DDDDD PSD: PSD Avoidance: 02D .0530(u) NC Toxics: 112(r): Other:				
Contact Data			Application Data Application Number: 5900069.18A Date Received: 03/06/2018 Application Type: Modification Application Schedule: TV-Sign-501(c)(2) Part I Existing Permit Data Existing Permit Number: 04291/T44 Existing Permit Issue Date: 10/31/2017 Existing Permit Expiration Date: 09/30/2022				
Facility Contact Diane Hardison Environmental Manager (252) 793-8611 PO Box 747 Plymouth, NC 27962	Authorized Contact Allan Bohn Vice President/Mill Manager (252) 793-8111 PO Box 747 Plymouth, NC 27962	Technical Contact Diane Hardison Environmental Manager (252) 793-8611 PO Box 747 Plymouth, NC 27962					
Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2016	715.26	1828.25	722.00	8993.07	531.43	458.32	323.65 [Methanol (methyl alcohol)]
2015	739.44	1875.67	806.12	6803.05	557.95	473.97	353.81 [Methanol (methyl alcohol)]
2014	664.83	2029.18	756.56	5434.00	577.58	425.40	321.19 [Methanol (methyl alcohol)]
2013	715.41	1998.32	646.18	4201.37	617.74	376.63	270.62 [Methanol (methyl alcohol)]
2012	684.06	1974.11	582.85	2424.90	868.32	370.29	270.54 [Methanol (methyl alcohol)]
Review Engineer: Heather Sands Review Engineer's Signature:					Comments / Recommendations: Issue 04291/T45 Permit Issue Date: August 15, 2018 Permit Expiration Date: September 30, 2018		

I. Purpose of Application

Domtar Paper Company, LLC (Domtar) is an integrated Kraft pulp mill located in Plymouth, Martin County, North Carolina. Domtar currently holds Title V Permit No. 04291T44, with an expiration date of the earlier of September 30, 2022, or renewal of Permit No. 04291T42. On March 13, 2018, DAQ received Permit Application No. 5900069.18A for the first step of a two-step significant modification to their permit for a mill optimization project.

II. Project Description

As discussed in their permit application, Domtar is planning a mill optimization program that consists of several projects designed to optimize mill performance by improving efficiency and streamlining operations. Permit Application No. 5500069.18A addresses the initial phase of this program by applying for a permit modification for the currently well-defined mill optimization projects. The following modifications to existing sources and new sources were proposed: modifications to the No. 2 Hog Fuel Boiler; installation of a new backup control device for HVLC gases; installation of a new cooling tower; and modifications to NC-5 pulp machine. Domtar has also included the rebuild of the North and South Smelt Tanks emissions in this permit application.

In addition to the modifications being made as part of the mill optimization program, Permit Application No. 5900069.17D addresses a 502(b)(10) notification to replace two green liquor clarifiers and one green liquor storage tank with one new green liquor clarifier and replacing the No. 3 White Liquor Clarifier with an identical No. 5 White Liquor Clarifier.

The following discussion summarizes the details provided in Permit Application No. 5900069.18A.

A. No. 2 Hog Fuel Boiler Modification

The No. 2 Hog Fuel Boiler is currently permitted to burn lignin, natural gas, biomass fuel, No. 6 fuel oil, No. 2 fuel oil, used oil, and sludge. The boiler also serves as a control device for high volume low concentration (HVLC) gases, low volume high concentration (LVHC) gases, and stripper off gases (SOG). The boiler is equipped with a multicyclone followed by three electroscrubbers in parallel to reduce PM emissions. The mill is proposing to replace the three electroscrubbers with a new electrostatic precipitator (ESP). The primary purpose of replacing the PM control device is to ensure continued compliance with the current PM limits and establish a margin of compliance with the upcoming boiler national emission standards for hazardous air pollutants (NESHAP; 40 CFR Part 63, Subpart DDDDD) PM and mercury limits.

In addition, to improve boiler efficiency and sustain proper safe operation, Domtar is proposing to make the following modifications to the boiler:

- portions of the boiler generating bank tubes will be replaced with tubes of the same size;
- the nose arch tubes will be replaced with tubes of the same size;
- the design of the superheater will change to a single metallurgy and improved support for easier maintenance with no change in steam generating capacity;
- the economizer size will be increased by 75 percent to improve waste heat recovery without increasing steam capacity;
- the upper and lower economizer sections will be replaced due to reliability issues; and
- the boiler feedwater flow will be redirected to run first through the spray water condenser and then the economizer.

Domtar further stated that these modifications, in addition to some combustion air and process control system improvements, will optimize biomass combustion, minimize ash and char carryover, improve waste heat recovery, and reduce excess air usage. Domtar previously requested a determination that overfire air improvements did not require a

permit modification.⁴³ Domtar also stated that distributed control system (DCS) upgrades do not impact emissions but allow for better operational control.

Finally, Domtar requested that No. 6 fuel oil be removed as a permitted fuel for the boiler. In addition to removing this fuel from the No. 2 Hog Fuel Boiler, Domtar has also requested that this fuel be removed as a permitted fuel from the No. 1 Hog Fuel Boiler and the No. 5 Lime Kiln.

B. Backup Control Device for HVLC Gases

Domtar is currently permitted to control HVLC gases in the No. 2 Hog Fuel Boiler (primary), the No. 1 Hog Fuel Boiler (backup), or the No. 5 Recovery Boiler (backup). According to their permit application, Domtar is considering shutting down the No. 1 Hog Fuel Boiler. Therefore, Domtar is proposing to install a new natural gas-fired Thermal Oxidizer as a backup control device to ensure continued compliance when the boilers are out of service. Domtar stated that the oxidizer will be designed and operated in compliance with the Pulp and Paper NESHAP (40 CFR Part 63, Subpart S) and the new source performance standards (NSPS) for the pulp and paper industry (40 CFR Part 60, Subpart BB). Domtar requested that the No. 1 Hog Fuel Boiler and the No. 5 Recovery Boiler be retained in the permit as backup control devices for the HVLC system.

C. Evaporator Cooling Tower

Domtar is proposing to install a new Evaporator Cooling Tower to control temperatures to and from the Nos. 6 and 7 Evaporators and the concentrator surface condensers. The cooling tower is intended to eliminate non-contact cooling water discharge. As provided in their permit application, Domtar has calculated emissions from the proposed cooling towers. Using the maximum design cooling tower circulation rate of 27,000 gpm, the potential to emit particulate matter (PM) were estimated to be approximately 0.24 tons per year (tpy). It was assumed that all PM was emitted as PM_{2.5}. Because the emissions from the cooling towers are less than 5 tpy, these sources are considered insignificant activities under 15 NCAC 02Q .0503(8) and will be added to the insignificant activities list. The cooling towers will not be discussed further in this permit review. It should be noted that because an activity is insignificant does not mean that the activity is exempted from an applicable requirement or that the Permittee is exempted from demonstrating compliance with any applicable requirement.

D. NC-5 Fluff Pulp Machine Modifications

Domtar is proposing to make the following potential modifications to the NC-5 Fluff Pulp Machine to improve performance and quality:

- Replacement of dilution water pumps and piping with larger components;
- Replacement of broke screen media;
- Modifications to some steam users to change from 150-pound steam to 40-pound steam in order to maintain proper wet end temperature;
- Adding dryer cans;⁴⁴
- Rebuilding the winder and associated systems;
- Reconfiguring the roll handling systems and adding a new wrap line; and
- Improving building ventilation by increasing exhaust fan capacities.

The modifications to the pulp machine should enable Domtar to achieve a pulp production rate of 1,400 air dried tons of fluff pulp per day (ADTFP/day). Additionally, as part of this permit modification, Domtar requested that, since the NC-5 Broke Pulper Dust Collection System (ID No. ES-49-70-0180) and associated rotoclone (ID No. CD-49-70-2180) have been permanently shut down, they be removed from the permit.

⁴³ DAQ previously determined that the overfire air system did not require any changes to the terms and conditions of the air permit and a modification to the permit was not necessary to replace the overfire air system. See Applicability Determination No. 2516 letter dated December 10, 2014.

⁴⁴ Permit No. 04291T44 was issued on October 31, 2017 for a modification requested in Permit Application No. 5900069.17A to add a steam box (which serves the dryer cans) to the NC-5 Pulp Machine.

E. Additional Mill Optimization Items and Other Concurrent Work

In addition to the project descriptions above, Domtar requested the following permit modifications:

- Remove the permit condition for projected actual emissions reporting associated with Permit Application No. 5900069.09B (Section 2.2 C.1) in the current permit (T44) since the five-year reporting requirement has been fulfilled. DAQ reviewed this request and since it requires removal of a recordkeeping and reporting requirement, it needs be processed with a modification that will go through the public notice process. Therefore, it will be handled during the next significant modification or during the permit renewal process.
- Remove the sludge press feed tanks (ES-73-20-1080 and ES-73-20-1120) and sludge dewatering building fugitives (FS-019) from the permit. Since these sources have been permanently shut down, and have no applicable Title V requirements, DAQ agrees that they can be removed from the permit with this permit modification.

In their permit application, Domtar also stated that as the mill optimization project is implemented, other mill equipment may be modified or removed from service. The sludge press has been permanently shut down. The following summarizes some of the additional projects anticipated; however, Domtar is not requesting permit modifications at this time. (See Section V.E, below, for further discussion on project increases with respect to Prevention of Significant Deterioration.)

- The NC-2 Pulp Machine was permanently shut down on February 9, 2018.
- Modifications to the digester system and fiberlines are not well defined at this time and will be permitted under a separate permit application.

Additionally, Domtar is including the following recent projects in evaluating emissions related to the mill optimization:

- Replacement of three green liquor tanks (No. 4 Green Liquor Clarifier, No. 3 Green Liquor Clarifier, and No. 3 Green Liquor Storage Tank) with the new No. 5 Green Liquor Clarifier, and replacement of the existing No. 3 White Liquor Clarifier with a new No. 5 White Liquor Clarifier.⁴⁵
- Rebuild of the North and South Smelt Tanks.⁴⁶

III. Application History

March 13, 2018	DAQ received Permit Application No. 5900069.18A for the Mill Optimization Project.
May 2, 2018	DAQ submitted an additional information request via email regarding the emission factors used in the project increase calculations.
May 10, 2018	Domtar responded to the May 2 nd additional information request via email explaining the calculations.
May 11, 2018	DAQ submitted an additional information request via email regarding the VOC emissions calculations for the project increase calculations.
May 15, 2018	DAQ requested references for cost calculations related to NSPS applicability.
May 16, 2018	Domtar responded to the May 15 th additional information request via email and provided the cost references.
June 14, 2018	Domtar provided revised PSD calculations in response to the May 11 th information request.
July 23, 2018	DAQ sent a preliminary draft permit to Domtar. The preliminary draft contained several questions that arose while drafting the permit.

⁴⁵ Letter from Willets, W., Section Chief DEQ/DAQ/Permitting to D. Hardison, Environmental Manager, Domtar Paper Company, LLC. Applicability Determination No. 3088. July 31, 2017.

⁴⁶ Letter from Willets, W., Section Chief DEQ/DAQ/Permitting to A. Bohn, Vice President/Mill Manager, Domtar Paper Company, LLC. Applicability Determination No. 3221. March 20, 2018.

July 27, 2018	Domtar submitted comments on the preliminary draft permit. The comments included responses to questions identified in the July 23 rd version. DAQ sent an email to Domtar with some follow-up questions.
July 30, 2018	Domtar responded to DAQ July 27 th follow-up questions.
July 31, 2018	Domtar sent an email with two additional comments on the preliminary draft permit.
August 1, 2018	Draft Permit and Permit Review submitted to applicant and WaRO for review.
August 2, 2018	WaRO comments were received. See Section IX, below.
August 7, 2018	Comments from applicant were received. See Section IX, below.
August 15, 2018	Permit Issued

IV. Permit Modifications

Table 1 describes the changes to the current permit as a part of this modification.

Table 1. Summary of Changes to Permit No. 04291T44

Pages	Section	Description of Changes
Cover letter	NA	<ul style="list-style-type: none"> Updated permit revision and dates.
Cover Letter Attachment	Insignificant Activities list and Summary of changes to permit	<ul style="list-style-type: none"> Updated summary of changes to permit. Added a new source, Evaporator Cooling Tower (ID No. IES-09-03-1000), to the list of insignificant activities.
Permit Cover	NA	<ul style="list-style-type: none"> Revised permit application number and dates.
1 – 114	All	<ul style="list-style-type: none"> Updated Permit Revision Number in header. Updated permit language to match permit shell.
3 – 14	Section 1	<ul style="list-style-type: none"> Updated page numbers. Updated information for the Nos. 1 and 2 Hog Fuel Boilers to include MACT Subpart DDDDD and remove No. 6 oil as a permitted fuel. Also moved the footnotes associated with the No. 1 Hog Fuel Boiler from the end of the table to the bottom of the page. Updated the sludge burning footnote to correctly identify the New Bern waste treatment facility as being owned by International Paper. Updated information for the No. 2 Hog Fuel Boiler to label the three electroscrubbers as a primary operating scenario (POS) and add the new electrostatic precipitator (ID No. CD-65-58-2000) as an alternate operating scenario (AOS). Added the new Thermal Oxidizer (ID No. CD-64-22-2000) as a backup control device for all sources routed through the HVLC collection system identified in the table under Nos. 6 and 7 Fiberlines and Lignin Recovery Process. For the bleach plant and oxygen delignification sources not required to be controlled per Clean Condensate Alternative under 40 CFR 63.447, clarified the control device description to identify how the Domtar mill offsets methanol emissions. Corrected emission source description of “6th Stage Peroxide Stage O2 Reactor Blow Tube (ID No. ES-06-P2).” The correct description is “6th Stage Peroxide Reactor Blow Tube.” Added footnote indicating that Domtar will be replacing Nos. 3 and 4 Green Liquor Clarifiers and No. 3 Green Liquor Storage Tank (ID Nos. ES-14-10-

Table 1. Summary of Changes to Permit No. 04291T44

Pages	Section	Description of Changes
		<p>0050, ES-14-10-0400, ES-14-10-0750) with No. 5 Green Liquor Clarifier (ID No. ES-14-10-1000). Added No. 5 Green Liquor Clarifier to table.</p> <ul style="list-style-type: none"> Added footnote indicating that Domtar will be replacing No. 3 White Liquor Clarifier (ID No. ES-14-25-0450) with No. 5 White Liquor Clarifier (ID No. ES-14-25-0350). Added No. 5 White Liquor Clarifier to table. Removed No. 6 fuel oil from lime kiln as a permitted fuel. Removed Broke Pulper Dust Collection System (ID No. ES-49-70-0180) and associated Rotoclone (ID No. CD-49-70-2180) from permit. Removed Sludge Press Feed Tanks A and B (ID Nos. ES-73-20-1080 and ES-73-20-1120) from permit. Removed Building Fugitives (Sludge Dewatering) (ID No. FS-019) from permit. Updated control device description for Carbonator Tower (ID No. ES-09-27-1400) to clarify that it is a white liquor scrubber. Added footnote to table to identify the sources being added or modified with this permit modification and to identify the requirement to submit a Title V Permit Application within 12 months. Identified the new/modified/affected sources under the Mill Optimization Project that are subject to the Section 2.2 G .0530(u) condition.
15 – 36	Section 2.1 A	<ul style="list-style-type: none"> Updated condition header to remove No. 6 fuel oil as a permitted fuel; Identified the current No. 2 Hog Fuel Boiler control system, the multicyclone with three electroscrubbers, as the POS. Identified the modified control system, the multicyclone with an electrostatic precipitator, as the AOS. Added Boiler MACT (40 CFR Part 63, Subpart DDDDD) to the summary of limits and standards for the hog fuel boilers. Added condition A.1 to define the primary and alternate operating scenarios for the No. 2 Hog Fuel Boiler. Renumbered remaining conditions. Updated condition A.4 (NSPS, Subpart D) to: <ul style="list-style-type: none"> remove No. 6 fuel oil requirements Add a requirement to conduct a performance test on the No. 2 Hog Fuel Boiler within 180 days of operation of the electrostatic precipitator. add AOS and POS requirements update inspection requirements for electrostatic precipitator Updated conditions A.5 (PSD) and A.7 (CAM) to add POS and AOS requirements. Updated condition A.8 [112(j)] to remove No. 6 fuel oil requirements and equations for calculating emission limits when No. 6 fuel oil is fired. Added condition A.9 for Boiler MACT, Subpart DDDDD.
49 – 53	Section 2.1 F	<ul style="list-style-type: none"> Removed Broke Pulper Dust Collection System and all associated permit requirements from condition. Changed emission source ID No. ES-64-60-0180 for the No. 1 Hog Fuel Boiler Ash Silo to the correct ID No. ES-64-50-0180. Changed emission source ID No. ES-65-60-0190 for the No. 2 Hog Fuel Boiler Ash Silo to the correct ID No. ES-65-50-0190. Changed emission source ID No. ES-65-60-0150 for the No. 2 Hog Fuel Boiler North De-entrainment Vessel to the correct ID No. ES-65-60-0140. Removed redundant listing of the reburned lime bin in condition header and combined reburned lime conveyor with bucket elevator and bin.
61 – 62	Section 2.1 J	<ul style="list-style-type: none"> Added Thermal Oxidizer as backup control device for HVLC sources associated with the Nos. 6 and 7 Fiberlines. Added NSPS Subpart BB requirements for thermal oxidizers.

Table 1. Summary of Changes to Permit No. 04291T44

Pages	Section	Description of Changes
65 – 66	Section 2.1 M	<ul style="list-style-type: none"> Revised condition header to be consistent with the Section 1 table equipment descriptions.
74	Section 2.1 Q	<ul style="list-style-type: none"> Revised condition header to be consistent with the Section 1 table equipment descriptions.
78 – 85	Section 2.2 A	<ul style="list-style-type: none"> Added Thermal Oxidizer as backup control device for HVLC sources associated with the Nos. 6 and 7 Fiberlines. For the bleach plant and oxygen delignification sources not required to be controlled per Clean Condensate Alternative under 40 CFR 63.447, clarified the control device description to identify how the Domtar mill offsets methanol emissions. Added NESHAP Subpart S requirements for thermal oxidizers.
86 – 90	Section 2.2 B	<ul style="list-style-type: none"> Corrected a typographical error on the PM emissions limit associated with the South Smelt Tank. The correct PM emissions limit is 0.190 lb/TBLS. Revised smelt tank equipment names in the summary of limits and standards table to be consistent with Section 1.
93 – 100	Section 2.2 E	<ul style="list-style-type: none"> Revised condition E.2 in Tables 2.2 E.2.a and E.2.b to reflect current approved modeling. Revised condition E.3 to only include TAP in the TPER Limitations Table that were not modeled.
101	Section 2.2 F.2	<ul style="list-style-type: none"> Added section “Permit Application Submittal Requirement” and added conditions requiring that, within 12 months of the beginning of operation, a permit application be submitted for the sources being added under 02Q .0501(c)(2).
102 – 104	Section G	<ul style="list-style-type: none"> Added 02D .0530(u) condition for PSD avoidance using Projected Actual Emissions.
105 – 114	Section 3	<ul style="list-style-type: none"> Updated General Conditions to current Version 5.2, dated 04/03/2018.

V. Regulatory Review

This permit modification potentially impacts several regulations applicable to the new and modified sources: the No. 2 Hog Fuel Boiler; the new Thermal Oxidizer; the NC-5 Fluff Pulp Machine; and the North and South Smelt Tanks. The following discussion summarizes the regulatory review and necessary permit modifications on a source-specific basis.

A. No. 2 Hog Fuel Boiler

The No. 2 Hog Fuel Boiler is subject to the following State and federal regulations:

- 15A NCAC 02D .0504: Particulates from Wood Burning Indirect Heat Exchangers;
- 15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources;
- 15A NCAC 02D .0524: New Source Performance Standards (40 CFR Part 60, Subpart D);
- 15A NCAC 02D .0530: Prevention of Significant Deterioration (Best Available Control Technology Limits);
- 15A NCAC 02D .0317: Avoidance Conditions for 15A NCAC 02D .0530: Prevention of Significant Deterioration (NO_x Emissions);
- 15A NCAC 02D .0614: Compliance Assurance Monitoring; and
- 15A NCAC 02D .1109: CAA §112(j): Case-by-Case MACT for Boilers and Process Heaters.

To optimize biomass combustion, minimize ash and char carryover, improve waste heat recovery and reduce excess air usage with respect to the No. 2 Hog Fuel Boiler, Domtar is proposing to replace portions of the: generating bank tubes; superheater (single metallurgy & improved support); nose arch tubes; and economizer. According to the permit application, the generating bank and nose arch tubes are experiencing wear and will be replaced with no increase in boiler steam generating capacity. The new superheater will be a change in design to a single metallurgy and improved support for easier maintenance, and also will not increase steam generating capacity. The economizer size will be increased by

75 percent to improve waste heat recovery without increasing steam generating capacity. Domtar stated that the upper and lower economizer sections are unreliable and by installing additional heat transfer surface area in the existing economizer and directing boiler feed water to run first through the spray water condenser and then the economizer, steam consumption can be reduced by approximately 60,000 pounds per hour.

The No. 2 Hog Fuel Boiler is equipped with a mechanical dust collector (i.e., multicyclones) followed by electrified filter beds (i.e., electroscrubber) for PM control. Domtar is proposing to replace the existing No. 2 Hog Fuel Boiler electroscrubber with a new electrostatic precipitator. Domtar has requested that the ESP be permitted as an alternate control device for the electroscrubber until it is removed from service. A new condition Section 2.1 A.1 was added to define the primary operating scenario (POS) as the current No. 2 Hog Fuel Boiler control system, the multicyclone with three electroscrubbers. The alternate operating scenario (AOS) was also defined as the boiler with the modified control system, the multicyclone with an electrostatic precipitator.

The proposed No. 2 Hog Fuel Boiler modifications will not require any changes to the permit conditions associated with the following regulations: 02D .0504, 02D .0516., 02Q .0317 (PSD Avoidance with a NO_x emission limits). The following discussion is a summary of the regulations impacted by this project.

1. 15A NCAC 02D .0524: New Source Performance Standards (40 CFR Part 60, Subparts D and Db)

In the current permit, the No. 2 Hog Fuel Power Boiler is subject to particulate, SO₂, NO_x, and visible emissions standards under the new source performance standards (NSPS) for Fossil-Fuel-Fired Steam Generators under 40 CFR Part 60, Subpart D. A modification or reconstruction of the No. 2 Hog Fuel Boiler could potentially change the applicability status of this boiler, making it subject to Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units under 40 CFR Part 60, Subpart Db. A modification is defined in 40 CFR 60.2 as

“...any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.”

As stated above, the modifications being made to the No. 2 Hog Fuel Boiler are not expected to increase steam generating capacity of the boiler and no change is being made to fuel sulfur content. The project is expected to increase boiler efficiency and decrease PM emissions. Therefore, as stated in their permit application, the project is not expected to increase hourly emissions from the boiler and DAQ agrees that the boiler changes would not be considered a modification under NSPS.

Reconstruction under the NSPS General Provisions (40 CFR Part 60, Subpart A) is defined “...the replacement of components of an existing facility to such an extent that: (1) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and (2) It is technologically and economically feasible to meet the applicable standards set forth in this part.” [40 CFR 60.15(b)] NSPS Subpart A also defines “fixed capital cost” as “...the capital needed to provide all the depreciable components.”

In an Applicability Determination, EPA has addressed which components are to be considered in determining fixed capital costs for reconstruction pursuant to 40 CFR 60.15.⁴⁷ EPA stated that depreciable components to be included in the determination of fixed capital costs are: costs of engineering, purchase and installation of major process components, contractor fees, instrumentation, auxiliary facilities, and buildings and structures.

The following cost comparison information was provided by Domtar for the boiler modification and new biomass boiler (See Attachment A):

⁴⁷ US EPA Applicability Determination Index Control Number 9800085. “Reconstruction Costs.” Neeley, R. Douglas, US EPA Region 4, to Cain, Jerry, Mississippi DEQ. May 11, 1998.

Actual Cost of Boiler Equipment = \$10,000,000⁴⁸
Actual Cost of Other Equipment +10,000,000⁴⁹
Total Cost of Boiler Modification = \$20,000,000
New Boiler Cost (equipment only) = \$40,703,000⁵⁰
Percentage of actual cost to new boiler cost = 49 percent

DAQ considers this estimate to be conservative because the provided costs appear to only represent equipment costs and do not appear to include items such as labor, building and structures, auxiliary facilities, etc. Furthermore, the actual costs included in the calculation represent the top end of the provided equipment range and, as it is unclear whether the cost information provided by Domtar represents only equipment or the entire cost of the modifications, it was assumed that the actual costs represent only equipment. Considering the conservativeness of the estimate, the cost of the new components does not exceed 50 percent of the cost of a new boiler. Therefore, DAQ agrees that this project is not considered a modification or reconstruction as defined in Part 60 and will not change the applicability of the NSPS to the No. 2 Hog Fuel Boiler.

No major changes to the existing Subpart D permit conditions were necessary as a result of the proposed boiler modifications. However, new conditions were added to require that Domtar conduct a performance test on the new ESP to demonstrate compliance with the emission limits. The current permit (T44) requires continuous parameter monitoring of the secondary electroscrubber voltage. The NSPS requires visible emissions monitoring using a continuous opacity monitoring system (COMS). There are no NSPS requirements for monitoring voltage and these will not be carried over to the new permit condition for the ESP. Finally, all references to the use of No. 6 fuel oil were removed from the NSPS permit condition.

2. 15A NCAC 02D .0530: Prevention of Significant Deterioration (Best Available Control Technology Limits)

The current permit (T44) contains prevention of significant deterioration (PSD) best available control technology (BACT) limits for CO, PM₁₀, SO₂, H₂SO₄ mist, and TRS emissions from the No. 2 Hog Fuel Boiler. The proposed project does not have any impact on the CO, SO₂, H₂SO₄ mist, and TRS emissions limits. However, the proposed project includes a replacement of the currently installed PM₁₀ control technology (i.e., the electroscrubber system) with an electrostatic precipitator. In the original BACT analysis, an electrostatic precipitator was considered, but it was rejected because of the extensive and costly retrofitting of the boiler and the additional energy consumption burden that would be associated with requiring an ESP rather than the existing PM₁₀ control technology. Because Domtar is now voluntarily installing the ESP and the numerical BACT limit will not be changing, no additional BACT analysis is necessary. As a result, the only change to the PSD condition in the permit was to specify the ESP as the control technology under an alternate operating scenario (AOS).

3. 15A NCAC 02D .0614: Compliance Assurance Monitoring

The CAM rule requires owners and operators to conduct monitoring to provide a reasonable assurance of compliance with applicable requirements under the act. Monitoring focuses on emissions units that rely on pollution control device equipment to achieve compliance with applicable standards. An emission unit is subject to CAM, under 40 CFR Part 64, if all of the following three conditions are met:

- The unit is subject to any (non-exempt, e.g., pre-November 15, 1990, Section 111 or 112 standard) emission limitation or standard for the applicable regulated pollutant.
- The unit uses any control device to achieve compliance with any such emission limitation or standard.

⁴⁸ The cost range provided (See Attachment A) for the economizer, generating bank, nose arch, and superheaters was between \$7 and \$10 million. According to their documentation, the generating bank, nose arch and superheaters modifications have been pushed off and may not be included in this project. However, to be conservative the maximum end of the range for all components was used.

⁴⁹ According to the permit application, the total cost of the boiler modification was the equipment cost (see Reference 48), \$10 million, plus the cost of other combustion air and process control system improvements, less than \$10 million.

⁵⁰ NOTE: The Total Installed Cost quote provided by Domtar for a new biomass boiler included a “factor from Jacobs Estimating Group” of 3.24 which was applied to the total equipment costs, bringing the total installed cost to approximately \$132 million. An explanation of what was included in this factor was not provided. Therefore, this additional cost was not included in the comparison.

- The unit's pre-control potential emission rate exceeds 100 percent of the amount required for a source to be classified as a major source; i.e., either 100 tpy (for criteria pollutants) or 10 tpy of any individual/25 tpy of any combination of HAP.

The No. 2 Hog Fuel Boiler has been determined to be subject to CAM and the current permit (T44) contains a condition for CAM for PM emissions. The current monitoring approach is to use a COMS for visible emissions as an indicator of PM emissions. The replacement of the electroscrubbers with the ESP does not impact the COMS approach. Therefore, the proposed project does not require any major changes to this permit condition. The condition was revised to incorporate the AOS for the use of the ESP once it is operational.

4. 15A NCAC 02D .1109: CAA §112(j): Case-by-Case MACT for Boilers and Process Heaters

Domtar is permitted to operate the No. 2 Hog Fuel Boiler, which is currently subject to Case-by-Case MACT under 112(j). The 112(j) requirements expire on May 19, 2019, at which time the Boiler MACT standards under 40 CFR Part 63, Subpart DDDDD will apply. Domtar has indicated that the ESP is likely to be installed after the Boiler MACT compliance date. As a result, the 112(j) condition in the permit was not revised to include a requirement for performance testing and a revised monitoring plan once the ESP is operational.

Domtar has requested that No. 6 fuel oil be removed as a permitted fuel for the Nos. 1 and 2 Hog Fuel Boilers, the No. 5 Lime Kiln and the No. 5 Recovery Boiler. The condition was revised to remove requirements associated with No. 6 fuel oil. The condition in Section 2.1 A.8.b was also updated to remove the equations that calculated PM and CO emission limits on prorated bases depending on the mix of biomass and No. 6 fuel oil combustion in the hog fuel boilers.

5. 15A NCAC 02D .1111: Maximum Achievable Control Technology (40 CFR Part 63, Subpart DDDDD)

As discussed above, the No. 2 Hog Fuel Boiler is currently subject to Case-by-Case MACT under 112(j). The 112(j) requirements expire on May 19, 2019, at which time the Boiler MACT standards under 40 CFR Part 63, Subpart DDDDD will apply. Since the renewal permit application (Permit Application No. 5900069.16B) is currently being processed by DAQ, the Boiler MACT requirements are being added to the permit prior to renewal. As of this permit issuance, the Boiler MACT is undergoing a reconsideration process. Once the amendments are finalized, it is recommended that the permit conditions be reviewed and revised as needed during the next significant modification. These Boiler MACT requirements apply to the No. 1 Hog Fuel Boiler and the remaining discussion of Boiler MACT applies to both boilers.

The hog fuel boilers are biomass boilers and DAQ previously approved the determination that the design and operation meets the definition of a hybrid suspension grate boiler.⁵¹ Domtar has requested that the hog fuel boilers be permitted as hybrid suspension grate boilers under Subpart DDDDD, which is defined as follows:

Hybrid suspension grate boiler means a boiler designed with air distributors to spread the fuel material over the entire width and depth of the boiler combustion zone. The biomass fuel combusted in these units exceeds a moisture content of 40 percent on an as-fired annual heat input basis as demonstrated by monthly fuel analysis. The drying and much of the combustion of the fuel takes place in suspension, and the combustion is completed on the grate or floor of the boiler. Fluidized bed, dutch oven, and pile burner designs are not part of the hybrid suspension grate boiler design category.

Subpart DDDDD applies to new and existing boilers. A boiler is considered new if it was constructed or reconstructed after June 4, 2010. Both the Nos. 1 and 2 Hog Fuel Boilers were constructed prior to this date. The Part 63 General Provisions (40 CFR Part 63, Subpart A) define reconstruction using the same parameters as the NSPS General Provisions (see discussion above). That is, a source is considered to be a reconstructed source if the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to build a comparable new source and it is technologically feasible for the reconstructed source to meet the relevant standards. As discussed above, Domtar has demonstrated that the fixed capital costs of the replacement parts for the No. 2 Hog Fuel Boiler are less than 50 percent of

⁵¹ Letter from van der Vaart, D.R., DENR/DAQ, to D. Askew, Vice President/Mill Manager, Domtar Paper Company, LLC. Permit Applicability Determination No. 1935. "Case-By-Case MACT Boiler Classification." February 21, 2012.

a new boiler. As a result, both the Nos. 1 and 2 Hog Fuel Boilers are considered existing sources under Subpart DDDDD. The following discussion summarizes the applicable requirements for existing hybrid suspension grate boilers.

Emission Standards. The hog fuel boilers are subject to emission standards for hydrogen chloride (HCl), mercury (Hg), CO, and Filterable PM (or total suspended metals, TSM). Subpart DDDDD includes compliance options for boilers:

- Comply with an alternative TSM limit instead of the PM limit;
- Comply with an output-based limit instead of an input-based limit;
- Comply with alternate CO CEMS-based limit instead of CO stack-based limit;
- Comply with Hg, HCl, and/or TSM limits by fuel analysis instead of performance stack tests;
- Comply by emissions averaging; and
- Earn efficiency credits from implementation of energy conservation measures to comply with output based-limits.

The Boiler MACT condition provides an option for complying with the Hg, HCl, and TSM limits by fuel analysis instead of performance testing. Domtar has indicated that while they would like to have the option to demonstrate compliance with the emission standards using performance testing with operating parameter limits or fuel analysis in the permit. Domtar also stated in their permit application what they will not be installing a CO CEMS, so they will comply with the CO stack-based limit. The boiler was also permitted to be subject to the emission limits on a heat input basis with an option to comply using emissions averaging and efficiency credit options provided by Subpart DDDDD. Operating parameters for electroscrubbers are the same as electrostatic precipitators, so no distinction between the operating parameter requirements associated with the control device was necessary in the permit conditions.

Work Practice Standards. The hog fuel boilers are also subject to work practice standards under Subpart DDDDD. The boilers will be required to conduct periodic boiler tune-ups. Boilers without oxygen trim systems will have to be tuned-up every year (not more than 13 months after the previous tune-up). The No. 2 Hog Fuel Boiler will be equipped with an oxygen trim system and will have to conduct tune-ups once every five years. The first tune-ups for the hog fuel boilers will be required on or before the compliance date of May 20, 2019. Domtar will also be required to perform a one-time energy assessment on the hog fuel boilers no later than the compliance date of May 20, 2019. Compliance with the work practice standards will be demonstrated by records documenting the boiler tune-ups and the energy assessment.

Subpart DDDDD also requires work practice standards during startups and shutdowns. Startup work practice requirements include the use of clean fuels during startup periods and provide options dependent on which definition of “startup” the mill chooses. During shutdowns, Subpart DDDDD requires the use of all continuous monitoring systems and specifies how emissions are to be controlled and which supplemental fuels, if necessary, can be used to support the shutdown process. Monitoring data must be collected during periods of startup and shutdown. Domtar is required to keep records during periods of startup and shutdown and submit reports concerning activities and periods of startup.

Notification, Recordkeeping and Reporting Requirements: Domtar will be required to submit notifications of performance tests and performance evaluations. Domtar will be required to maintain records of fuel usage and records associated with demonstration of compliance with the work practice standards. Recordkeeping and reporting are also required for boilers in this subcategory.

B. Thermal Oxidizer

The Thermal Oxidizer is being installed as a backup control device for the high volume low concentration (HVLC) system sources, most of which are subject to the NSPS under 40 CFR Part 60, Subpart BB and the MACT under 40 CFR Part 63, Subpart S. Several sources in the LSRP are also vented to the HVLC system. The following discussion is a summary of changes to the permit conditions that were made to incorporate the backup control device.

1. 15A NCAC 02D .0524: New Source Performance Standards (40 CFR Part 60, Subpart BB and BBa)

Domtar is subject to the Standards of Performance for Kraft Pulp Mills under 40 CFR Part 60, Subpart BB (Kraft Pulp Mill NSPS). The Kraft Pulp Mill NSPS applies to the following affected facilities: each digester system, each brownstock washer system, each multiple-effect evaporator system, and each recovery furnace, smelt dissolving tank, lime kiln, and

condensate stripper system constructed, reconstructed, or modified after September 24, 1976. The HVLC system sources subject to Subpart BB are related to the fiberline digester systems and include the chip bin relief condensers, pressure diffuser filtrate tanks and digester blow tanks for each fiberline. Domtar is not proposing to make modifications to any of the Subpart BB-affected facilities (except as discussed below for the smelt dissolving tanks), so there is no change in applicability to Subpart BB and Subpart BBa does not apply. However, the Thermal Oxidizer is being installed as the backup control device for the HVLC system. Therefore, the permit conditions related to the control of HVLC sources were updated to incorporate Thermal Oxidizer requirements under 40 CFR 60.283(a)(1)(iii).

2. 15A NCAC 02D .1111: Maximum Achievable Control Technology (40 CFR Part 63, Subpart S)

The Plymouth mill is subject to the NESHAP from the Pulp and Paper Industry under 40 CFR Part 63, Subpart S (Pulp and Paper NESHAP). The Pulp and Paper NESHAP applies to the pulping and bleaching systems at chemical pulp mills. Affected sources are required to reduce HAP emissions, in general, by collecting and controlling emissions. As previously discussed, Domtar is not proposing to modify Subpart S-affected sources. The Thermal Oxidizer is being installed as a backup control device for sources that currently are vented through the mill's HVLC system. The HVLC system is currently being controlled in the No. 2 Hog Fuel Boiler with the No. 1 Hog Fuel Boiler and the No. 5 Recovery Boiler as backups. As allowed under Subpart S [40 CFR 63.443(d)(3)], HAP emissions from pulping sources may also be controlled using a thermal oxidizer designed and operated at a minimum temperature of 871°C (1600°F) and a minimum residence time of 0.75 seconds. Therefore, the permit was modified to include these requirements for the Thermal Oxidizer, including a requirement to install a CMS to measure temperature in the firebox or ductwork downstream from the firebox of the oxidizer [40 CFR 63.453(b)].

C. NC-5 Fluff Pulp Machine

The NC-5 line, consisting of the Fluff Pulp Machine fugitives, high density (HD) and low density (LD) stock tanks, inside/outside vacuum pumps, and dryer hoods do not have any applicable requirements, except for the limits associated with toxic air pollutants (TAP) under 15A NCAC 02D .1100 (see Section VI, below for additional discussion on the toxics limits in the permit). The proposed modifications to the fluff pulp machine do not change any regulatory applicability and therefore no changes to the permit were necessary.

D. Additional Mill Optimization Items and Other Concurrent Work

In addition to the modifications identified above, the following recent projects are also being incorporated as effectively being a part of the mill optimization:

- Replacement of three green liquor tanks (No. 4 Green Liquor Clarifier, No. 3 Green Liquor Clarifier, and No. 3 Green Liquor Storage Tank) with the new No. 5 Green Liquor Clarifier. And replacing the existing No. 3 White Liquor Clarifier with a new No. 5 White Liquor Clarifier.
- Rebuild of the North and South Smelt Tanks.

1. Green Liquor Clarifier/Tank and White Liquor Clarifier Replacement

On August 24, 2017, Domtar submitted a 502(b)(10) change notification for the replacement of the existing Nos. 3 and 4 Green Liquor Clarifiers and the existing No. 3 Green Liquor Storage Tank with a new No. 5 Green Liquor Clarifier. Domtar also replaced the existing No. 3 White Liquor Clarifier with an almost identical, new No. 5 White Liquor Clarifier. These sources have no applicable requirements under the North Carolina SIP, but their emissions (VOC) are greater than the 5-tpy insignificant activity thresholds under 15A NCAC 02Q .0503(8); therefore, they are included on the permit.

Recovery furnace smelt from the smelt tanks is reacted with weak liquor (i.e., weak wash) to form green liquor. The solids dissolved in the green liquor are allowed to settle in a green liquor clarifier and clarified green liquor is reacted with lime (both reburned lime from the lime kiln and fresh lime) to form white liquor. By switching to a one-tank configuration, Domtar will be able to more efficiently process the green liquor and produce white liquor, decrease the need for purchasing fresh lime, and improve green and white liquor quality. They will not be increasing the black, green or white

liquor processing capacity as a result of this tank replacement and as a result, there is no increase in emissions from the tank replacement. It should be noted that the emission factors for green liquor tanks are in terms of pound per ton of lime produced. Domtar has described the process by which they will transition from the existing tanks to the new tank. Domtar expects the construction of the No. 5 Green Liquor Clarifier to be completed by the end of 2018. Once the new clarifier is constructed, they will begin filling that clarifier from the smelt tanks and begin emptying the existing Nos. 3 and 4 Green Liquor Clarifiers. Once they are emptied, the Nos. 3 and 4 Green Liquor Clarifiers and the No. 3 Green Liquor Storage Tank will be removed.

White liquor is also allowed to settle in a clarifier to remove lime mud solids. Domtar currently operates the Nos. 3 and 4 White Liquor Clarifiers. Domtar is replacing the No. 3 White Liquor Clarifier with the No. 5 White Liquor Clarifier. The new clarifier will be constructed on the foundation of the former No. 4 Green Liquor Clarifier (discussed above). To transition to the new clarifier, Domtar will fill the No. 5 White Liquor Clarifier while emptying the existing No. 3 White Liquor Clarifier, before placing it into service. This project is expected to occur in the 3rd or 4th quarter of 2019. No change in emissions is expected by replacing the existing clarifier because there will be no increase in the production of white liquor.

In the current permit (T44), the existing green liquor clarifiers and the green liquor storage tank are grouped as the “GL Process Area” and have source-specific TAP limits in Table 2.2 E.2.b for benzene and methyl mercaptan. The existing white liquor clarifiers are grouped as the “#3 and #4 WL Clarifiers” and have a source-specific TAP limit in Table 2.2 E.2.b for benzene. Changes to the toxics limits will be addressed in Section VI, below.

2. Rebuild of North and South Smelt Tanks

Domtar is permitted to operate two smelt tanks associated with the No. 5 Recovery Boiler. Due to integrity issues, both the North and South Smelt Tanks are being replaced with identical tanks. The smelt tanks are subject to the following regulations:

- 15A NCAC 02D .0508: Particulates from Pulp and Paper Mills;
- 15A NCAC 02D .0521: Control of Visible Emissions;
- 15A NCAC 02D .0528: Total Reduced Sulfur from Kraft Pulp Mills;
- 15A NCAC 02D .1111: Maximum Achievable Control Technology (40 CFR Part 63, Subpart MM); and
- 15A NCAC 02D .1109: CAA 112(j) - Case-by-Case MACT for Startup, Shutdown, or Malfunction Conditions in 40 CFR Part 63, Subpart MM Requirements.

The replacement of the smelt tanks does not impact the permit conditions for 02D .0508, 02D .0521, and 02D .0528 (Note: 02D .0528 applicability is not impacted based on the discussion below). The smelt tanks are currently not subject to 15A NCAC 02D .0524 and NSPS Subpart BBa. The following discussion evaluates potential changes in applicability to Subpart BBa and whether the smelt tanks should be considered new sources under the NESHAP for Chemical Recovery Combustion Sources at Kraft, Soda, Sulfite, and Stand-Alone Semichemical Pulp Mills under 40 CFR Part 63, Subpart MM.

New Source Performance Standards, Subpart BBa

As previously stated, the smelt tanks are not subject to the Kraft NSPS under Part 60, Subpart BB. However, the replacement of these tanks does have the potential to impact NSPS applicability. Therefore, Domtar submitted a request for DAQ to evaluate whether the replacement projects would cause the smelt tanks to be considered reconstructed sources under the NSPS for Kraft Pulp Mill Affected Sources for Which Construction, Reconstruction, or Modification Commenced After May 23, 2013,” under 40 CFR Part 60, Subpart BBa (Subpart BBa). Under Subpart BBa, a smelt dissolving tank is considered an affected facility if it was constructed, reconstructed, or modified after May 23, 2013. The replacement project was not considered a modification because it did not include a “...physical or operational change to an existing facility which results in an increase in the emission rate...” [40 CFR 60.14(a)]. Therefore, an evaluation was necessary to determine whether the smelt tank replacements would meet the definition of reconstruction (see Section V.A.1, above for the definition of reconstruction).

Domtar submitted detailed cost information showing the actual cost of smelt tank replacement and proposed costs for a new smelt tank. DAQ evaluated this information and based on the cost information provided by Domtar, DAQ responded with a letter agreeing that the smelt tank replacement did not trigger Subpart BBa applicability.⁵² As part of the response, DAQ stated that Domtar would need to provide additional information to determine whether the project was a significant modification under PSD. In their permit application for the mill optimization project, Domtar included emission increase calculations for the North and South Smelt Tanks (see Section V.E, below, for additional discussion).

National Emission Standards for Hazardous Air Pollutants, Subpart MM

The North and South Smelt Tanks are subject to existing source standards under Subpart MM. Similar to the NSPS, the tank replacement has the potential to change the applicability of new source standards for the smelt tanks. The NESHAP General Provisions under 40 CFR Part 63, Subpart A definition of reconstruction is the same as for NSPS (see Section V.A.5, above for the definition under Part 63). Because Domtar's demonstration that the rebuild of the smelt tanks is not considered reconstruction under NSPS, the smelt tanks rebuild is also not considered reconstruction under Part 63 and the smelt tanks will not be considered new sources under Subpart MM.

E. All Sources - Prevention of Significant Deterioration

The prevention of significant deterioration (PSD) regulations apply to new major stationary sources or existing major sources that propose a major modification. Kraft paper mills are listed as one of the 28 source categories under federal PSD regulation as being subject to regulation with potential emissions greater than 100 tpy of any PSD-regulated pollutant. As such, the Domtar mill is a major source under PSD.

A project is considered a major modification if there is a physical change in or a change in the method of operation of a major stationary source that would result in both a significant emissions increase and a significant net emissions increase. In order to determine whether a project results in a significant increase, the NC regulations under 15A NCAC 02D .0530 allow for project netting. Under project netting, emission increases and decreases from all emission units at the source that are defined as the project are used and compared to the significant emission rates.

A significant increase in emissions of a regulated PSD pollutant is projected to have occurred if the difference between the emission after the project and the emissions before the project are greater than the significant emission rate for that pollutant. When a new emissions unit at a major source is being installed, the emissions after the project are based on the potential to emit (PTE) of the new unit.

Under 40 CFR 51.166(r)(6) and 15A NCAC 02D .0530(u), for projects involving existing emissions units at a major stationary source, the owner or operator may elect to use projected actual emissions (PAE) to represent the emissions after the project. Projected actual emissions mean the maximum annual rate, in tons per year, at which an existing emissions unit is projected to emit a regulated pollutant in any one of the 5 years (12-month period) following the date the unit resumes regular operation after the project, or in any one of the 10 years following that date, if the project involves increasing the emissions unit's design capacity or its potential to emit that regulated NSR pollutant.

The emissions prior to the project are baseline actual emissions (BAE). As required by 15A NCAC 02D .0530, baseline actual emissions are calculated as the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the five-year period immediately preceding the date that a complete permit application is received.

The mill optimization project includes new units, modified units and sources affected by the project due to increases or decreases in throughput or efficiency. As a result, this project represents a change in the method of operation of an existing source and Domtar is required to evaluate whether this project is a significant modification under (PSD).

⁵² Letter from Willets, W., Section Chief, DEQ/DAQ/Permitting to A. Bohn, Vice President/Mill Manager, Domtar Paper Company, LLC. Permit Applicability Determination, Applicability Determination Application No. 3221. March 20, 2018.

In their permit application, Domtar provided an assessment of the applicability of PSD by comparing BAE to PAE for existing units; and PTE was compared to BAE for the new units (cooling tower and thermal oxidizer). The PSD applicability analysis is presented in Table 2. The source-specific BAE and PAE/PTE emissions are included in

Table 2. Prevention of Significant Deterioration Analysis[illegible]

Attachment B. Domtar has selected the 24-hour period from August 2015 through July 2017 as the baseline period for which BAE will be calculated. The production rates used for BAE and PAE/PTE are also presented in Attachment B.

As stated in Section II, above, the NC-2 Pulp Machine was permanently shut down in February 2018, and Domtar anticipates shutting down the No. 1 Hog Fuel Boiler. However, to be conservative, Domtar included PAE emissions from the No. 1 Hog Fuel Boiler and the NC-2 Pulp Machine at reduced production rates. As shown in Table 2, the project results in a net decrease for all pollutants except for sulfuric acid mist (H_2SO_4 mist), H_2S , TRS, and VOC. For H_2SO_4 mist, H_2S , and TRS, the emissions increase was less than 50 percent of the PSD significant emission rate (SER); the VOC emissions increase was 99 percent of the SER (i.e., 39.7 tpy). DAQ conducted a review of all emissions from all sources, with a focus on the VOC emissions, and agrees with Domtar that this project is not a significant modification under PSD.

Because PAE was used in project netting, a recordkeeping and reporting requirement was added to the permit as a 15A NCAC 02D .0530(u) condition using the total PAE/PTE in Table 2. Under this condition, Domtar will be required to monitor and record annual emissions from the new/modified/affected sources (identified in the table in Section 1.0 of the permit) for the previous 14 months. Annual reports of the emissions calculations and comparisons to the proposed limits in Table 2 will also be required. Since the mill optimization will not result in an increase in capacity and will not increase potential to emit of the affected/modified sources, the reports will need to be submitted for five years.

VI. Facility Wide Air Toxics

Domtar previously triggered a toxics analysis and compliance with the acceptable ambient levels (AALs) was demonstrated for the 31 toxic air pollutants (TAP) with emissions greater than the TAP permitted emission rate (TPER). Compliance was demonstrated on a source-by-source basis for the facility and the current permit contains both facility wide and source-by-source TAP limits. To allow for operational flexibility, the permitted emission rates were developed for each source by optimizing the emissions such that the peak modeled concentration would be no higher than 98 percent of the applicable AAL. The permitted emission rates were based on an optimization factor developed by dividing 98 percent of the AAL by the maximum modeled baseline concentration. Because compliance was demonstrated on a source-by-source basis, permit limits are normally established on source-by-source bases; in this case however, where the optimization factor is greater than 10 (meaning that the facility wide maximum modeled concentration was 9.8 percent or less of the AAL), the compliance margin was considered to be sufficiently high to ensure compliance with the AAL on a facility wide basis. Therefore, facility wide emission limits were established for TAP for which the maximum modeled concentration was 9.8 percent or less of the AAL.

As a part of this permit application, Domtar conducted a complete facility wide analysis to determine which TAP were emitted in amounts greater than the TPER for each averaging period after the proposed mill optimization modifications. Table 3 presents this analysis. As shown in Table 3, 29 compounds exceed the associated TPER (shaded rows); therefore, Domtar submitted a modeling analysis for these 29 TAP. The baseline modeling was conducted to represent current emission factors and equipment throughputs. Twenty-nine TAP were modeled from point, area, and volume sources. Revised optimization factors for each TAP were developed as described above to increase the baseline emissions such that the maximum modeled output is 98 percent of the AAL. DAQ has reviewed the provided modeling analysis and determined that the results demonstrate compliance assuming the source parameters and pollutant emissions rates are correct. The modeling was approved on April 30, 2018.⁵³

As discussed, Table 2.2 E.2.a of the current permit (T44) has facility-wide emission limits for the TAP with baseline concentration 9.8 percent of the AAL or less and the source-by-source emission limits are presented in Table 2.2 E.2.b. In the revised modeling, the baseline concentration of seven TAP (ammonia, benzene, chloroform, cresol, formaldehyde, hydrogen sulfide, and methyl mercaptan) was greater than 9.8 percent of the AAL. These TAP are shown in bold in Table 3. In their permit application, Domtar provided revised TAP limits and requested that Section 2.2 E.2 be updated to reflect the current modeling analysis. DAQ has reviewed the proposed TAP limits and updated the tables in this permitting action. Changes to the TAP emissions from sources at Domtar were due to the following:

- Limits for TAP emitted from only MACT sources were removed (this includes fluorides and hydrogen fluoride);

⁵³ Memorandum from Zarnowski, A., AQAB, to H. Sands, RCO, and Permit Coordinator, WaRO. Air Dispersion Modeling Review for Domtar Paper Company, LLC. Plymouth, NC, Martin County. April 30, 2018.

Table 3. Summary of TPER Analysis and Baseline Modeling Results

TAP	Averaging Period	Total Potential Emissions (lb/averaging period)	TPER (lb/averaging period)	Modeling Required (Y/N)?	Baseline Concentration (µg/m³)	Percent of AAL
Acetaldehyde	1-Hour	11.00	6.8	Y	849.70	3.15%
Acrolein	1-Hour	0.50	0.02	Y	5.77	7.21%
Ammonia	1-Hour	24.23	0.68	Y	701.85	25.99%
Arsenic (& compounds)	Annual	67.35	0.053	Y	2.01E-05	0.96%
Benzene	Annual	6153	8.1	Y	4.05E-02	33.74%
Benzo(a)pyrene	Annual	0.73	2.2	N		
Beryllium	Annual	62.28	0.28	Y	7.59E-06	0.19%
Butadiene, 1,3-	Annual	264.10	11	Y	1.61E-02	3.66%
Cadmium	Annual	92.18	0.37	Y	2.11E-05	0.38%
Carbon disulfide	24-Hour	64.52	3.90	Y	16.75	9.01%
Carbon tetrachloride	Annual	991	460	Y	0.13	1.94%
Chlorine	1-Hour	0.05	0.23	N		
	24-Hour	1	0.79	Y	2.28	6.08%
Chlorobenzene	24-Hour	1.43	46	N		
Chloroform	Annual	8,366	290	Y	1.11	25.81%
Chromium VI (soluble chromate compounds)	24-Hour	0.39	0.013	Y	6.20E-04	0.10%
Cresol	1-Hour	6.254	0.56	Y	433.43	19.70%
Di(2-ethylhexyl)phthalate	24-Hour	0.04	0.63	N		
1,2 Dichloroethane (Ethylene Dichloride)	Annual	637	260	Y	5.28E-02	1.39%
1,4 Dichlorobenzene	1-Hour	0.004	16.8	N		
Fluoride	24-Hour	22.3	0.34	Y	0.11	0.04%
	1-Hour	0.93	0.064	Y	1.80E-02	0.11%
Formaldehyde	1-Hour	2.98	0.04	Y	18.49	12.33%
n-Hexane	24-Hour	147.29	23	Y	0.17	0.02%
Hexachlorodebenzo-p-dioxin	Annual	1.94E-05	5.10E-03	N		
Hydrogen Chloride	1-Hour	11.45	0.18	Y	10.46	1.49%
Hydrogen Fluoride	24-Hour	3.65	0.63	Y	0.02	0.01%
	1-Hour	0.15	0.064	Y	3.19E-03	0.01%
Hydrogen Sulfide	24-Hour	701.7	1.7	Y	100.77	83.98%
Manganese (& compounds)	24-Hour	10.33	0.63	Y	9.11E-03	0.03%
Mercury	24-Hour	0.21	0.013	Y	3.40E-04	0.06%
Methyl Ethyl Ketone	24-Hour	45	78	N		
	1-Hour	1.9	22.4	N		
Methyl Isobutyl Ketone	24-Hour	35.43	52.00	N		
	1-Hour	1.48	7.6	N		
Methyl Chloroform	24-Hour	2.13	250.0	N		
	1-Hour	0.09	64.0	N		
Methyl Mercaptan	1-Hour	6.28	0.013	Y	43.64	87.28%
Methylene Chloride	Annual	4,166	1600	Y	27.58	1.62%
	1-Hour	0.48	0.39	Y	0.66	2.75%

Table 3. Summary of TPER Analysis and Baseline Modeling Results

TAP	Averaging Period	Total Potential Emissions (lb/averaging period)	TPER (lb/averaging period)	Modeling Required (Y/N)?	Baseline Concentration (µg/m³)	Percent of AAL
Nickel (metal)	24-Hour	0.41	0.13	Y	3.90E-04	0.01%
Nitric Acid	1-Hour	0.25	0.256	N		
Phenol	1-Hour	3.51	0.24	Y	23.71	2.50%
Styrene	1-Hour	1.57	2.7	N		
Sulfuric Acid	24-Hour	67	0.25	Y	0.25	0.25%
	1-Hour	2.81	0.025	Y	4.80E-02	0.40%
1,1,2,2-Tetrachloroethane	Annual	3.63	430	N		
Tetrachloroethylene (Perchloroethylene)	Annual	1437.47	13000	N		
Toluene	24-Hour	50.59	98.0	N		
	1-Hour	2.11	14.4	N		
Trichloroethylene	Annual	1,659	4000	N		
Trichlorofluoromethane	1-Hour	3.86E-02	140	N		
Vinyl Chloride	Annual	333.34	26	Y	2.30E-04	0.06%
Vinylidene Chloride	24-Hour	2.08E-01	2.5	N		
Xylene	24-Hour	47.25	57	N		
	1-Hour	1.96	16.4	N		

- Removed TAP only associated with coal combustion;
- Updated emission factors from old stack test data to newer data from NCASI; and
- Some sources were previously modeled together with a MACT source from a common stack. The non-MACT sources are now modeled separately.
- Some sources were modeled in the past, but inadvertently omitted from the permit table.

VII. Facility Emissions Review

The table on the first page of this permit review presents the criteria pollutant (plus total HAP) from the latest available reviewed facility emissions inventory (2016).

VIII. Facility Compliance Status

DAQ has reviewed the compliance status of this facility. Due to the size and complexity of the paper mill, the inspections at Domtar are conducted in phases. The most recent inspections covering the Power Area, Lime Kiln and Causticizing, No. 6 & No. 7 Fiberline, Turpentine, Woodyard/Storage and Handling, NC-5, Wastewater Treatment, Maintenance, HVLC and LVHC collection systems, No. 6 & No. 7 Bleach Plants (and common facilities), Evaporator Operations and Pulping Process Condensate occurred between March 2, 2018, and May 3, 2018, by Betsy Huddleston of the Washington Regional Office (WaRO). No problems were discovered during the physical inspection of the sources and during records review at the mill. During the onsite inspection, the facility was operating in compliance. Domtar is currently operating under a Special Order by Consent (SOC) for PSD violations, but is currently in compliance with the interim deliverables of the SOC.

IX. Draft Permit Review Summary

The Permittee was sent a preliminary draft of the permit on July 23, 2018 and copies of the draft permit and permit review on August 1, 2018. Editorial comments from the Permittee were incorporated where possible. With their comments, the Permittee also requested the following changes to the permit that were clarifications to current permit language or corrections. DAQ agreed that these permit modifications could be processed with this permitting action and incorporated the changes.

- For the bleach plant and oxygen delignification sources not required to be controlled per the Clean Condensate Alternative under 40 CFR 63.447, Domtar clarified the control device description to identify how the Domtar mill offsets methanol emissions.
- The 0.191-pound per ton of black liquor solids (lb/TBLS) PM emissions limit for the South Smelt Tank associated with the Pulp and Paper Combustion Source NESHA (40 CFR Part 63, Subpart MM) was a typographical error. The correct limit is 0.190 lb/TBLS.

Copies of the draft permit and permit review were sent to the WaRO August 1, 2018. Comments from the WaRO were received on August 2, 2018 and incorporated.

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

Public notice not required at this time. This permit action is for the first step of a two-step process as per 15A NCAC 02Q .0501(c)(2).

XI. Conclusions, Comments and Recommendations

PE Seal

Pursuant to 15A NCAC 02Q .0112 "Application requiring a Professional Engineering Seal," a professional engineer's seal (PE Seal) is required to seal technical portions of air permit applications for new sources and modifications of existing sources as defined in Rule .0103 of this Section that involve:

- (1) design;

- (2) determination of applicability and appropriateness; or
- (3) determination and interpretation of performance; of air pollution capture and control systems.

A professional engineer's seal (PE Seal) was required for this modification and was provided on Form D5.

Zoning

Domtar is located in an area without zoning. Therefore, a Zoning Consistency Determination per 15A NCAC 02Q .0304(b) was required for this modification. Before submitting a permit application for a new or expanded facility in an area without zoning, the Permittee is required to provide public notification by publishing a legal notice and to post a sign on their property where the new or expanded source is located.

The legal notice is required to be published in a newspaper of general circulation in the area where the source is or will be located at least two weeks before submitting the permit application for the source. The notice must include: the name of the affected facility; the name and address of the permit applicant; and the activity or activities involved in the permit action.

The sign must meet the following as specified by 15A NCAC 02Q .0113:

1. The sign shall be at least six square feet in area;
2. It shall be set off the road right-of-way, but no more than 10 feet from the road right-of-way.
3. The bottom of the sign shall be at least six feet above the ground;
4. It shall contain the following information: the name of the affected facility; the name and address of the permit applicant; and the activity or activities involved in the permit action;
5. Lettering shall be a size that the sign can be read by a person with 20/20 vision standing in the center of the road; and
6. The side with the lettering shall face the road, and sign shall be parallel to the road.

In Appendix C of the March 2018, permit application, Domtar provided an affidavit and proof of publication that the legal notice required under this rule was published in the Williamston Enterprise on December 15, 2017, and the Roanoke Beacon on December 20, 2017. Domtar also provided a picture of the posted sign meeting the requirements specified above and Domtar stated that the sign was posted on January 15, 2018.

Recommendations

This permit modification application has been reviewed by NC DAQ to determine compliance with all procedures and requirements. NC DAQ has determined that this facility appears to be complying with all applicable requirements.

Recommend Issuance of Permit No.04291T45. WaRO has received a copy of this permit and submitted comments that were incorporated as described in Section IX.

ATTACHMENT A

No. 2 Hog Fuel Boiler Cost Information

Diane,

As James Chivers referenced in his email, below is the biomass boiler estimate from work done for another client in 2011. Also attached is the excel file.

Major Equipment	Process Equipment Cost
Biomass Boiler System	\$37,500,000
Additional Items Not Included w/ Boiler Price:	
Free Standing Carbon Steel Stack and Ductwork	\$830,000
Continuous Emissions Monitoring System	\$270,000
Bottom Ash Hopper	\$11,000
Fly Ash Handling System	\$2,000,000
Freight	\$92,000
Total Equipment	\$40,703,000
Total Installed Cost (Total Equipment X 3.24*)	\$131,877,720
*Factor from Jacobs Estimating Group	

If any questions, please let us know. Thank you,
James

James Cantrell | JACOBS | Process Engineering
864-676-6273 | james.cantrell@jacobs.com 1041 E. Butler Rd. |
Greenville, SC | 29615

From: Chivers, James
Sent: Thursday, February 01, 2018 8:51 AM
To: Hardison, Diane <Diane.Hardison@domtar.com>; Hardison, Ken <Ken.Hardison@domtar.com>
Cc: Bickerstaff, Bracky <Bracky.Bickerstaff@domtar.com>; Shaw, Wynne <Wynne.Shaw@domtar.com>; Kimball, Bob (ABC Family Consulting) <Bob.Kimball@domtar.com>; Cantrell, James <James.Cantrell@jacobs.com>
Subject: RE: Estimate for a New Power Boiler Diane,

I just left James Cantrell, we discussed the pricing and he is compiling the cost estimate for you. WHe will have a number to you before lunch. This will be an estimate based on a fairly recent (2011) estimate that was done for a very similar boiler for another client.

Subject: FW: HFB2 work question

From: Shaw, Wynne [mailto:Wynne.Shaw@domtar.com]
Sent: Wednesday, January 31, 2018 1:56 PM
To: Marshall, Amy; Hardison, Diane; Galie, Claire
Cc: Kimball, Bob (ABC Family Consulting); Hardison, Ken
Subject: RE: HFB2 work question

Ken thinks he already gave Diane the installed cost for a new hog fuel boiler, and he's remembering it as \$120MM.

We're planning to replace the economizer in 2018. The generating bank, nose arch and superheats have been pushed out, maybe indefinitely. How many years are you looking at for this comparison?

The economizer, generating bank, nose arch and superheats will cost between \$7 and 10MM.

Wynne Shaw
Senior Project Engineer
P 252-793-8912 | F 252-793-7138 | M 252-940-9510

This email is for the exclusive use of the addressee and is subject to [Domtar Confidentiality Notice](#).

ATTACHMENT B

Mill Optimization Project Baseline Actual and Projected Actual Emissions

Table 3 (from email received 07/27/2018)
Domtar Plymouth Mill
Mill Optimization Project
BAE Summary

[illegible]

Area	Emission Source Description	Baseline Actual Emissions (TPY)													
		CO	Pb	NO _x	PM	PM ₁₀	PM _{2.5}	SO ₂	SAM	H ₂ S	TRS (TOC)	TRS as H ₂ S	VOC	F	CO ₂ e
	Lime Mud Filter Vacuum Systems (2)									0.01	0.26	1.61	20.46		
	No. 5 Lime Kiln and Lime Crusher	0.14	0.00	52.17	88.69	75.30	68.29	0.78		1.88	2.09	2.02	5.46		4.87E-02
	Lime Dust Baghouse				14.91	14.91									
	NC-2 Line				2.32	5.03	4.38				0.58	0.41	6.21		
Pulp Operations	NC-2 Stock Tanks												0.30		
	NC-5 Line				8.81	19.08	16.61				2.18	1.54	23.54		
	NC-5 Stock Tanks												1.25		
	North, South, and Emergency Chip Piles				0.13	0.06	0.01						0.16		
Woodyard Operations	Screen House				5.80	5.80									
	Hogged Bark Fuel Storage Pile				0.04	0.02	0.00								
	Two Bark Hogs				0.94	0.94									
	Hog Fuel Handling and Transfer in Woodyard				0.21	0.10	0.02								
	Chip Conveying to Pulping				0.13	0.06	0.01								
	Chip Handling & Transfer in Woodyard				11.77	11.77									
	Hog Fuel Handling and Transfer to Boiler Area				0.17	0.08	0.01								
Wastewater Operations	WWTP Total Operations										13.09	13.09	58.89		
	Total	8516.49	0.06	1839.33	610.08	533.22	410.37	725.23	8.08	21.64	78.36	69.33	652.52	0.26	2,042,817

Table 4 (from email received 07/27/2018)
Domtar Plymouth Mill
Mill Optimization Project
PAE Summary

Area	Emission Source Description	Projected Actual/Future Potential to Emit Emissions (TPY)													
		CO	Pb	NOX	PM	PM10	PM2.5	SO2	SAM	H2S	TRS (TOC)	TRS as H2S	VOC	F	CO2e
Power Operations	No. 1 Hog Fuel Boiler	448.32	0.00	75.47	16.93	23.55	23.55	35.65					1.67	0.02	65,949
	No. 1 HF Ash Transport Steam Exhauster				0.27	0.23									
	No. 1 HF Ash Silo				0.27	0.23									
	No. 1 HF Boiler De-Entrainment Vessels				0.83	0.71									
	No. 1 HF Scrubber Ash Silo				0.01	0.01									
	No. 2 Hog Fuel Boiler	842.39	0.05	457.35	72.93	101.36	79.29	564.67	0.44	6.52	32.67	25.25	82.48	0.14	401,997
	New Thermal Oxidizer	15.71	0.00	18.70		1.42	1.42	0.11					1.03		23,080
	No. 2 HF Ash Transport Steam Exhauster				1.29	0.97									
	No. 2 HF Ash Silo				1.29	0.97									
	No. 2 HF Boiler De-Entrainment Vessels				0.00	0.00									
	No. 2 HF Scrubber Ash Silo				0.01	0.01									
	No. 2 Hog Fuel Conveying				2.64	2.64									
Fiberline Operations	Hogged Fuel Storage Pile at Boilers				0.01	0.01	0.00								
	Nos. 6 and 7 Chip Silos				11.21	11.21							0.03		
	Nos. 6 and 7 BP Scrubber	229.51								9.25	10.61	10.12	45.26		
	Nos. 6 and 7 O2 Delignification System	6.19									0.56	0.39	138.74		
	Bleach Plants EOP and Peroxide Stage										0.19	0.13	104.78		
	Chlorine Dioxide Generator Scrubber										4.45E-04	1.61E-07	2.16E-03		
	No. 5 Hot Water Tank/Evap. Condensate										5.16	3.46	11.14		
	No. 32 High Density Pulp Tank										2.99	1.78	27.73		
Evaporator Operations	Nos. 7 Spill Collection Tank and White Liquor Surge Tank	0.24		0.00				0.16			0.40	0.40	4.48		
	South Weak Black Liquor Storage Tank	0.01									0.00	0.00	0.08		
	Turpentine Railcar Loading												0.32		
	New Cooling Tower					0.24	0.24								
Recovery Boiler Operations	Salt Cake Mix Tank	0.02											0.77		
	No. 5 Recovery Boiler	5520.35	0.00	989.99	286.90	143.97	116.18	6.89	8.13	2.13	3.74	3.30	73.38		1,389,829
	No. 5 Precipitator Mix Tank										0.09	0.06	0.85		
Smelt Dissolving/Green Liquor Clarification Operations	North & South Smelt Tanks	1.28		19.52	17.19	16.93	15.33	6.40		3.26	6.61	5.54	26.39		
	No. 5 Green Liquor Clarifier									0.00	0.05	0.18	11.68		
	Dregs Sources									0.01	0.02	0.03	3.51		
Slaking/Causticizing Operations	East/West Slaker Wet Scrubbers				3.73	3.73					0.07	0.05	9.17		

Area	Emission Source Description	Projected Actual/Future Potential to Emit Emissions (TPY)													
		CO	Pb	NOX	PM	PM10	PM2.5	SO2	SAM	H2S	TRS (TOC)	TRS as H2S	VOC	F	CO2e
	Nos. 3 and 4 White Liquor Clarifiers												4.41		
Lime Mud Filters and Lime Kiln Operations	Lime Mud Mix Tank									0.02	0.18	3.01	8.77		
	Lime Mud Storage Tank												0.16		
	No. 3 Lime Mud Wash Tank												0.80		
	East/West Lime Mud Filter Scrubber												2.11		
	Scrubber Water Clarifier and Standpipe												8.38		
	Lime Mud Filter Vacuum Systems (2)									0.01	0.29	1.83	23.30		
	No. 5 Lime Kiln and Lime Crusher	0.16	0.00	59.40	100.99	85.74	77.76	0.89		2.14	2.38	2.29	6.22		5.55E-02
	Lime Dust Baghouse				16.98	16.98									
Pulp Operations	NC-2 Line				1.16	2.52	2.19				0.29	0.20	3.10		
	NC-2 Stock Tanks												0.15		
	NC-5 Line				11.26	24.38	21.23				2.79	1.97	30.09		
	NC-5 Stock Tanks												1.60		
Woodyard Operations	North, South, and Emergency Chip Piles				0.13	0.06	0.01						0.16		
	Screen House				5.90	5.90									
	Hogged Bark Fuel Storage Pile				0.02	0.01	0.00								
	Two Bark Hogs				0.42	0.42									
	Hog Fuel Handling and Transfer in Woodyard				0.10	0.05	0.01								
	Chip Conveying to Pulping				0.13	0.06	0.01								
	Chip Handling & Transfer in Woodyard				11.98	11.98									
	Hog Fuel Handling and Transfer to Boiler Area				0.08	0.04	0.01								
Wastewater Operations	WWTP Total Operations										13.09	13.09	59.46		
	Total	7064.18	0.06	1620.44	564.66	456.32	337.23	614.76	8.57	23.34	82.21	73.11	692.20	0.17	1,880,854
	Projected Actual (Modified/Affected)	7048.47	0.06	1601.74	564.66	454.66	335.56	614.65	8.57	23.34	82.21	73.11	691.17	0.17	1,857,774
	Future Potential Emissions (New TO and Cooling Tower)	15.71	0.00	18.70	0.00	1.67	1.67	0.11	0.00	0.00	0.00	0.00	1.03	0.00	23,080

ATTACHMENT B
NON-HAZARDOUS SECONDARY MATERIALS

See IBEAM for Attachment B to this Permit Review

Attachment C

Memorandum from Gary Saunders, NC DAQ

See IBEAM for Attachment C to this Permit Review

ATTACHMENT D

Excerpt from 1992 Air Permit Application

See IBEAM for Attachment D to this permit

ATTACHMENT E

September 2, 2020, Email from Don Wynne, re: No. 2 HFB NO_x Emissions

See IBEAM for Attachment E to this permit

ATTACHMENT F

PTE Calculations Supporting CAM Analysis
Received via email from Claire Corta, Project Manager, All4
February 5, 2021

Emission Source ID No.	Emission Source Description	Control Device	Regulated Pollutant	Uncontrolled Emissions (TPY)	Reference
ES-64-60-0960	No. 1 Hog Fuel Boiler Scrubber Ash Silo	Bagfilters	PM	12	Based on 1,021 MMBtu/hr (maximum rate), 9.12E-02 lb/MMBtu (total PM from site specific test data) the PTE emission rate is 408 TPY from the boiler stack. The hog fuel boiler control system has a total efficiency of 99% for the control of particulate emissions. The mechanical cyclones have a 96% efficiency for the control of particulates, thus the maximum annual amount of particulate sent to the Electroscrubbers is 1,631 TPY [0.0912/(1-.99)*1021*8760/2,000*(1-.96)]. Therefore, 1,224 TPY of particulate is sent to the dentrainment vessels (1,631 - 408 TPY). 100% of the particulate sent to the dentrainment vessel is collected and routed though a baghouse with a 99% control efficiency, thus 99% of the particulate from the dentrainment vessel is sent to the scrubber ash silo (1,211 TPY). It is assumed that 1% of the total ash that enters the silo can be emitted as particulate pre-control. All assumptions and emissions factors are consistent with 2019 AEI.
ES-65-60-0860	No. 2 Hog Fuel Boiler Scrubber Ash Silo	Bagfilters	PM	4	Based on 889 MMBtu/hr (maximum rate), 3.84E-02 lb/MMBtu (total PM based on site specific test data) the PTE emission rate is 150 TPY from the boiler stack. The hog fuel boiler control system has a total efficiency of 99% for the control of particulate emissions. The mechanical cyclones have a 96% efficiency for the control of particulates, thus the maximum annual amount of particulate sent to the ESP is 598 TPY [0.0384/(1- 0.99)*889* 8760/2,000*(1-.96)]. Therefore, 449 TPY of particulate is sent to the scrubber ash silo (598-150 TPY). It is assumed that 1% of the total ash that enters the silo can be emitted as particulate. All assumptions and emissions factors are consistent with 2019 AEI.
ES-14-20-2020	East Lime Slaker	Scrubber	PM	15	500 TCaO/day, 2.93E-02 lb/TCaO - National Council of the Paper Industry for Air and Stream Improvement (NCASI) Technical Bulletin No. 1020, October 2014 Compilation of Criteria Air Pollutant Emissions Data for Sources at Pulp and Paper Mills Including Boilers, Table 4.14, the median lb/ton CaO for slaker scrubber vent. Based on a 91% scrubber control efficiency per NCASI TB No. 884, Table A-14b. Emissions split equally between east and west systems.
ES-14-20-2040	No. 1 East Causticizing Line				
ES-14-20-2050	No. 2 East Causticizing Line				
ES-14-20-2060	No. 3 East Causticizing Line				
ES-14-20-2085	West Lime Slaker	Scrubber	PM	15	
ES-14-20-2105	No. 1 West Causticizing Line				
ES-14-20-2115	No. 2 West Causticizing Line				
ES-14-20-2125	No. 3 West Causticizing Line				
ES-94-15	Carpentry Woodworking Operations	Cyclone	PM	5	Emissions before control are 20.9 lb/hr per Table 13-10 of the 2019 AEI. The carpenter shop operates 10 hrs a week, 52 weeks/yr = 520 hr/yr. Even if emissions are calculated using 8,760 hr/yr, uncontrolled emissions are still below 100 tpy.