

**AIR QUALITY EFFECTS ANALYSIS
FOR
PERMIT TO CONSTRUCT
ACP-18197 v1.0**

Applicant:

American Crystal Sugar Company
101 N. Third Street
Moorhead, MN 56560-1990

Facility Location:

Drayton Plant
County Highway 44
Drayton, Pembina County, ND
NE ¼, SE ¼, T159N, R51W

Introduction (and Background):

American Crystal Sugar Company (ACS) – Drayton Plant (Drayton) submitted a permit to construct (PTC) application to the North Dakota Department of Environmental Quality – Division of Air Quality (Department) on August 18, 2022. The August 2022 application requested an amendment to PTC No. ACP-17815 v1.0 (a.k.a. PTC17001) as a result of as-built changes which occurred during construction of the project. The changes resulted in a decrease of potential emissions from all species except for PM_{2.5}, see Table 6. Since changes to equipment and emissions units were undertaken, an updated PTC is necessary. The major as-built changes are summarized as follows (also see Table 2):

- Modification of the existing Pulp Dryer No. 1 (Emission Unit (EU) 4) instead of removal and installation of a new pulp dryer;
- Installation of a natural gas-fired vertical lime kiln instead of an anthracite/coke fired vertical lime kiln;
- Upgrade of the lime slaker to match new kiln production parameters; and
- Installation of three new pellet mills and associated cooler to replace all existing pellet mills and cooler instead of adding one new pellet mill.

As the Department was processing the August 2022 application, ACS Drayton submitted an application for a new PTC to the Department on December 28, 2022. The December 2022 application requested a PTC to support an expansion of Drayton’s sugar beet slice rate from approximately 9,000 tons per day (tpd) to 11,000 tpd. New units are required to support this proposed project and various existing units, which are no longer needed are being removed. The new units consist of a natural gas fired boiler and pulp dryer, see Table 1.

ACS Drayton currently operates under Title V Permit to Operate (PTO) AOP-28454 v5.0 (a.k.a T5-X73015) which expires on May 12, 2025. AOP-28454 v5.0 will be required to be updated as a result of this permitting action.

Due to the overlapping timing of these applications, the Department has chosen to address both actions (i.e., August 2022 request for amendment and December 2022 new PTC application) with one permit action. All changes associated with this permit action will be referred to as the “Project”.

Table 1 lists the new emissions units associated with the ACS Drayton Project.

Table 2 lists the emissions units being modified with the Project.

Table 3 lists the emissions units that are being removed with the Project.

Table 4 lists all emissions units associated with ACS Drayton upon Project completion.

Table 1 – New Emissions Units for the Project

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Package boiler with a nominal heat input capacity of 359×10^6 Btu/hr fired on natural gas (NSPS Db, MACT 5D)	35	32	Ultra Low NO _x Burner (ULNB) and Good Combustion Practice
Pulp dryer No. 2, Promill direct-fired triple-pass rotary dryer with a nominal process rate of approximately 65 tons/hr pressed pulp, primarily coal-fired (8.6 tons/hr) with natural gas as a supplemental fuel (40×10^6 Btu/hr)	36	33	Cyclone, Wet Scrubber, Good Combustion Practice

Table 2 – Modified Emissions Units for the Project

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Babcock and Wilcox coal-fired spreader stoker boiler with a nominal heat input capacity of 392×10^6 Btu/hr and a nominal steam load capacity of 300,000 lbs/hr ^B	1	1	Multiclone and Electrostatic Precipitator

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Pulp dryer No. 1, Stearns-Roger 12'0" x 56' rotary, direct-fired, traveling grate pulp dryer, with a nominal process rate of approximately 65 tons/hr. The Combustion Engineering coal-fired Inseco furnace has a nominal heat input capacity of 125 x 10 ⁶ Btu/hr.	4	4	Multiclone
Dry pulp belt conveyors with a nominal capacity of 16.8 tons/hr and pellet mill area	9	9	Bagfilter
Dry pulp bucket elevator with a nominal capacity of 16.8 tons/hr which is part of the pulp conveyors	11		
Vertical shaft lime kiln with a nominal capacity of 500 tons/day of lime and a maximum heat input capacity of 84.7 x 10 ⁶ Btu/hr fired on natural gas	28	27a ^A (balance vent)	Inherent process controls / good combustion practices
		27b ^A (combined carbonation vent)	
		27c ^A (CO ₂ pressure vent)	
		27d (startup/emergency vent)	
Sugar dryer/granulator with a maximum rated capacity of 100 tons/hr	29	28	Baghouse
Eberhardt lime slaker with a capacity of 500 tons/day of calcined lime	30	29	Good engineering practices
Pellet Mill/Cooler System: Pulp Pellet Mill Nos. 1, 2 and 3 each with a nominal capacity of 16 tons/hr and Pellet Cooler with a nominal capacity of 30 ton/hr	31	30	Cyclone
	33		
	34		

^A Emissions from EU 28 are vented to a packed tower scrubber gas conditioning system as an inherent part of the process. The exhaust gases are then vented to carbonation tanks in the carbonation process. A portion of the exhaust gases are vented to a balance vent and a CO₂ pressure relief vent prior to the carbonation process.

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
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^B The boiler (EU 1) is not being modified as part of this project; however, the emission limits established by 40 CFR 63, Subpart DDDDD are incorporated into this permit.

Table 3 – Removed Emissions Units for the Project

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Pulp dryer No. 2, Stearns-Roger 10'6" x 48' rotary, direct-fired, traveling grate pulp dryer, with a nominal process rate of approximately 33.8 tons/hr. The Combustion Engineering coal-fired Inseco furnace has a nominal heat input capacity of 100 x 10 ⁶ Btu/hr.	3	3	Multiclone
Lime mixing tank	5	5	Wet scrubber
Lime mixing tank	24		
Pellet mill no. 1	6	6	Cyclone
Two California pellet mills (CPM) with two CPM pellet coolers, Model 2GA3, with a nominal 5 tons/hr capacity each	7	7	One cyclone for each cooler
	8	8	
Sugar dryer/Link Belt Roto-Louvre sugar granulator	12	12	Roto-clone
Belgian lime kiln with a nominal 15.7 tons/hr capacity of limestone, coke & anthracite coal	13	13a-f	Cyclone
Pulp pellet mill/pellet cooler	22	22	Cyclone
Lime slaker with a nominal process rate of 8.1 tons of lime per hour	26	25	None
Direct-fired pulp dryer with a nominal process rate of approximately 110 tons/hour of pressed pulp. The coal-fired furnace has a rated heat input of approximately 230 x 10 ⁶ Btu/hr	27	26	Cyclone and wet scrubber

Table 4 – ACS Drayton Emissions Units Upon Project Completion

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Babcock and Wilcox coal-fired spreader stoker boiler with a nominal heat input capacity of 392 x 10 ⁶ Btu/hr and a nominal steam load capacity of 300,000 lbs/hr	1	1	Multiclone and electrostatic precipitator
Coal handling equipment for boiler house	1a ^A	1a	Bagfilter
Pulp dryer No. 1, Stearns-Roger 12'0" x 56' rotary, direct-fired, traveling grate pulp dryer, with a nominal process rate of approximately 65 tons/hr. The Combustion Engineering coal-fired Inseco furnace has a nominal heat input capacity of 125 x 10 ⁶ Btu/hr.	4	4	Multiclone
		4a (bypass stack)	None
Dry pulp belt conveyors with a nominal capacity of 16.8 tons/hr and pellet mill area	9	9	Bagfilter
Dry pulp bucket elevator with a nominal capacity of 16.8 tons/hr which is part of the pulp conveyors	11		
Dry pulp reclaim system with a nominal capacity of 16.8 tons/hr which is part of the pulp conveyors	10	10	Bagfilter
MAC 2 flow headhouse (a)	14a	14a	None ^B
Old hummer room Pulsaire (b)	14b	14b	None ^B
Hummer room MAC (c)	14c ^C		
Pulp pellet bin no. 1	15 ^A	15	None
Pulp pellet bin no. 2	16 ^A	16	None
Pulp pellet bin no. 3	17 ^A	17	None
Sugar warehouse (Hi-vac)	18 ^{A, C}	18	None ^B
Bulk loading pulsaire	19a ^A	19a	None ^B
North bulk sugar loadout 12,000 cfm	19b ^C	19b	None ^B
South bulk sugar loadout 10,000 cfm	19c ^C	19c	None ^B
Main sugar warehouse pulsaire	20 ^A	20	None ^B
Diesel fire suppression pump engine (137 hp, manf. 1985)	21 ^{A, D}	21	None
Pulp dryer coal hopper	23	23	Baghouse

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Vertical shaft lime kiln with a nominal capacity of 500 tons/day of lime and a maximum heat input capacity of 84.7×10^6 Btu/hr fired on natural gas	28	27a ^E (balance vent)	Inherent process controls / good combustion practices
		27b ^E (combined carbonation vent)	
		27c ^E (CO ₂ pressure vent)	
		27d (startup/emergency vent)	
Sugar dryer/granulator with a maximum rated capacity of 100 tons/hr	29	28	Baghouse
Eberhardt lime slaker with a capacity of 500 tons/day of calcined lime	30	29	Good engineering practice
Pellet Mill/Cooler System: Pulp Pellet Mill Nos. 1, 2 and 3 each with a nominal capacity of 16 tons/hr and Pellet Cooler with a nominal capacity of 30 ton/hr	31	30	Cyclone
	33		
	34		
Pellet loadout	32	31	Baghouse
Package boiler with a nominal heat input capacity of 359×10^6 Btu/hr fired on natural gas (NSPS Db, MACT 5D)	35	32	Ultra low NO _x burner (ULNB) and good combustion practices
Pulp dryer No. 2, Promill direct-fired triple-pass rotary dryer with a nominal process rate of approximately 65 tons/hr pressed pulp, primarily coal-fired (8.6 tons/hr) with natural gas as a supplemental fuel (40×10^6 Btu/hr)	36	33	Cyclone, wet scrubber, good combustion practices
Coal handling emissions	FUG2 ^A	FUG2	None
Coal handling wind erosion	FUG2a ^A	FUG2a	None
Limerock handling emissions	FUG3 ^A	FUG3	None
Spent lime wind erosion	FUG4 ^A	FUG4	None

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Unpaved roads	RD ^A	RD	None

^A Insignificant or fugitive emission sources (no specific emission limit).

^B Although these emission points exhaust through baghouses, the owner has documented that the baghouses are inherent process equipment providing product recovery by collecting and returning sugar to the process. Inherent process equipment is not considered a control device under the CAM program.

^C This unit vents inside the building and does not have an external stack.

^D The potential to emit for an emergency stationary reciprocating internal combustion engine (RICE) is based on operating no more hours per year than is allowed by the subpart (40 CFR 63, Subpart ZZZZ) for other than emergency situations. For engines to be considered emergency stationary RICE under the RICE rules, engine operations must comply with the operating hour limits as specified in the applicable subpart. There is no time limit on the use of emergency stationary RICE in emergency situations [40 CFR 63, Subpart ZZZZ, §63.6640(f)].

^E Emissions from EU 28 are vented to a packed tower scrubber gas conditioning system as an inherent part of the process. The exhaust gases are then vented to carbonation tanks in the carbonation process. A portion of the exhaust gases are vented to a balance vent and a CO₂ pressure relief vent prior to the carbonation process.

Facility Wide Emissions Profile
Potential to Emit (PTE)

Table 5 – Criteria Pollutant PTE (tons per year)^A

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	CO	NO_x	SO₂	VOCs	PM	PM₁₀	PM_{2.5}
B&W boiler	1	1	228.3	869.4	1598.2	4.6	68.5	130.3	110.5
Coal handling dust collector	1a	1a	--	--	--	--	1.3	1.3	0.3
Pulp dryer no. 1	4	4/4a	1992.9	238.0	203.9	341.7	210.2	388.9	357.4
Dry pulp belt conveyors & elevator	9/11	9	--	--	--	--	1.1	1.1	0.3
Dry pulp reclaim system	10	10	--	--	--	--	2.7	2.7	0.6
Mac 2 flow headhouse	14a	14a	--	--	--	--	15.0	15.0	3.5
Hummer pulsaire and mac	14b/14c	14b	--	--	--	--	14.3	14.3	3.3
Pulp pellet bin no. 1	15	15	--	--	--	--	1.6	1.6	0.2
Pulp pellet bin no. 2	16	16	--	--	--	--	1.6	1.6	0.2
Pulp pellet bin no. 3	17	17	--	--	--	--	1.6	1.6	0.2
Bulk loading pulsaire	19a	19a	--	--	--	--	0.5	0.5	0.1
North bulk sugar loadout	19b	19b	--	--	--	--	2.3	2.3	0.5
South bulk sugar loadout	19c	19c	--	--	--	--	1.9	1.9	0.4
Main sugar warehouse pulsaire	20	20	--	--	--	--	2.0	2.0	0.5
Diesel fire suppression pump engine	21	21	--	--	--	--	--	--	--
Pulp dryer coal hopper	23	23	--	--	--	--	3.9	3.9	0.9
Natural gas-fired lime kiln	28	27a-d	2295.9	118.2	17.7	12.0	52.4	52.4	31.7
Sugar dryer granulator	29	28	--	--	--	--	9.7	9.7	2.0
Lime slaker	30	29	--	--	--	--	14.6	14.6	5.4
Pulp pellet mills & cooler	31,33,34	30	--	--	--	--	6.6	6.6	1.5
Pellet loadout	32	31	--	--	--	--	0.2	0.2	0.0
Natural gas-fired package boiler	35	32	58.1	31.5	0.9	8.5	11.7	11.7	11.7

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	CO	NO_x	SO₂	VOCs	PM	PM₁₀	PM_{2.5}
Pulp dryer no. 2	36	33	2007.3	205.1	264.2	342.6	139.7	258.5	160.7
Coal handling emissions	FUG2	FUG2	--	--	--	--	0.2	0.2	0.0
Coal handling wind erosion	FUG2a	FUG2a	--	--	--	--	2.7	2.7	0.4
Limerock handling emissions	FUG3	FUG3	--	--	--	--	0.4	0.4	0.0
Spent lime wind erosion	FUG4	FUG4	--	--	--	--	1.1	1.1	0.2
Unpaved roads	RD	RD	--	--	--	--	261.0	66.5	6.7
Total (with Fugitives):			6582.5	1462.2	2084.9	709.3	828.7	993.5	699.2

^A Abbreviations:

PM: filterable particulate matter only

PM_{2.5}: filterable and condensable particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($\leq 2.5 \mu\text{m}$)

PM₁₀: filterable and condensable particulate matter with an aerodynamic diameter less than or equal to 10 microns ($\leq 10 \mu\text{m}$) including PM_{2.5}

SO₂: sulfur dioxide

NO_x: oxides of nitrogen

CO: carbon monoxide

VOCs: volatile organic compounds

Facility Potential To Emit Changes since Pre-PTC17001*Table 6 – PTE (in tons per year) Evolution Since PTC17001 (ACP-17815 v1.0)*

Facility-Wide Emissions	CO	NO _x	SO ₂	VOCs	PM(f)	PM ₁₀ (f+c)	PM _{2.5} (f+c)
Pre PTC17001 (Baseline)	2,770	660	432	63	421	606	324
PTC17001 Planned	8,389	1,524	2,164	772	705	1,115	652
<i>Baseline to 17001Planned</i>	<i>5,619</i>	<i>864</i>	<i>1,732</i>	<i>709</i>	<i>284</i>	<i>509</i>	<i>328</i>
<i>PSD SER^A</i>	<i>100</i>	<i>40</i>	<i>40</i>	<i>40</i>	<i>25</i>	<i>15</i>	<i>10</i>
	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
PTC17001 As-Built^B	5,557	1,324	1,983	536	644	1,037	731
Post Expansion Potential	6,582	1,462	2,085	709	829	994	699
<i>17001As-Built' to PostExpansion^C</i>	<i>1,025</i>	<i>138</i>	<i>102</i>	<i>173</i>	<i>185</i>	<i>(43)</i>	<i>(32)</i>
<i>PSD SER^D</i>	<i>100</i>	<i>40</i>	<i>40</i>	<i>40</i>	<i>25</i>	<i>15</i>	<i>10</i>
	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>No</i>	<i>No</i>

^A A BACT analysis and air quality modeling analysis was completed for PTC17001 (*Shown for informational purposes only*).

^B An updated BACT analysis and air quality modeling analysis was completed for the PTC17001 As-Built update package received in Aug. 2022.

^C Change in emissions does not reflect information provided in the Project's application received in Dec. 2022. Project application compared actual average emissions from 2017-2018 to Project PTE while this table compares PTC17001 As-Built PTE to Project PTE (*Shown for informational purposes only*).

^D A BACT analysis and air quality modeling analysis was completed for this Project.

Since the planned expansion permitted under PTC17001 (from 6,850 to 9,000 tpd sugar beet slice rate) to this proposed Project (from 9,000 tpd to 11,000 tpd), the potential emissions have evolved and changed significantly. Potential CO emissions were projected to increase to 8,389 tpy with PTC17001 and are now expected to be 6,582 tpy with this Project, meaning Potential CO emissions increased by 1,807 tpy less than originally planned in 2017 (8,389 - 6,582 = 1,807). The other emission increases that were less than PTC17001 were NO_x at 62 tpy, SO₂ at 79 tpy, VOCs at 63 tpy, and PM₁₀(f+c) at 121 tpy. Potential PM(f) emissions were projected to increase to 705 tpy with PTC17001 and are now expected to be 829 tpy with this Project, meaning Potential PM(f) emissions increased by 124 tpy more than originally planned in 2017 (705 - 829 = -124). The other emission increases that were more than PTC17001 was PM_{2.5}(f+c) at 47 tpy. Air quality dispersion modeling was completed at each stage of the facility's emissions evolution to demonstrate compliance with the ambient air quality standards (AAQS).

Rules Analysis

Potentially Applicable Rules and Expected Compliance Status

A. NDAC 33.1-15-01 - General Provisions:

Multiple topics are included in the General Provisions chapter, these include: entry onto premises - authority, variances, circumvention, severability, land use plans and zoning regulations (only to provide air quality information), measurement of air contaminants, shutdown and malfunction of an installation - requirements for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications.

Applicability and Expected Compliance

Based on the review of the information provided, the Project will comply with all applicable sections of this rule.

B. NDAC 33.1-15-02 - Ambient Air Quality Standards:

The facility must comply with the North Dakota and Federal Ambient Air Quality Standards (AAQS). In addition to these standards, compliance with the “Criteria Pollutant Modeling Requirements for a Permit to Construct” guidelines¹ and the “Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota (Air Toxics Policy)”² is required.

Applicability and Expected Compliance

The Project is considered a major modification at an existing major source due to emissions increase greater than the significant thresholds. Therefore, the Project is subject to prevention of significant deterioration (PSD) and preconstruction modeling was required to demonstrate compliance with the AAQS. See NDAC 33.1-15-15-Prevention of Significant Deterioration of Air Quality [40 CFR 52.21] for discussion on PSD. Preconstruction permit modeling was completed for nitrogen dioxide (NO₂), SO₂, PM₁₀, PM_{2.5}, and CO.

The facility performed a Tier 2 procedural analysis to determine compliance with the Department’s Air Toxics Policy. The analysis of air toxics emissions included with the application demonstrates that air toxics concentrations from the Project in the ambient air are expected to be below the applicable guideline concentrations and that the maximum individual carcinogenic risk (MICR) associated with emissions from the facility is expected to be less than the acceptable value of 1 in 100,000 established by the Department’s Air Toxics Policy. The calculated MICR is 8.0×10^{-7} (lower than the applicable value of 1×10^{-5}) and the Hazard Index (HI) is 0.1, less than the maximum allowable HI of 1.0.

¹ See October 6, 2014, Criteria Pollutant Modeling Requirements for a Permit to Construct. Available at: https://www.deq.nd.gov/publications/AQ/policy/Modeling/Criteria_Modeling_Memo.pdf

² See August 25, 2010, Policy for the Control of Hazardous Air Pollutant (HAP) Emissions in North Dakota. Available at: https://www.deq.nd.gov/publications/AQ/policy/Modeling/Air_Toxics_Policy.pdf

The results of the preconstruction modeling demonstrate the potential emissions from the Project are not expected to cause or contribute to an exceedance of the AAQS. Details regarding the preconstruction permit modeling analysis and results are discussed in the Air Quality Impacts Analysis (AQIA) associated with this permitting action. See “ACP-18197 v1.0_AQIA” for details.

C. NDAC 33.1-15-03 - Restriction of Emission of Visible Air Contaminants:

This chapter requires all non-flare sources from new facilities to comply with an opacity limit of 20% except for one six-minute period per hour when 40% opacity is permissible. This chapter also requires facility flares to comply with an opacity limit of 20% except for one six-minute period per hour when 60% opacity is permissible. Lastly, this chapter restricts opacity of fugitive emissions transported off property to 40% except for one six-minute period per hour when 60% opacity is permissible. This chapter also contains exceptions under certain circumstances and provides the method of measurement to determine compliance with the referenced limits.

Applicability and Expected Compliance

The Project triggered a best available control technology (BACT) analysis for PM, PM₁₀, and PM_{2.5}. Based on the implementation of PM, PM₁₀, and PM_{2.5} BACT controls on the applicable emissions units associated with the Project, the Department expects the Project will comply with the non-flare source and fugitive emissions opacity requirements.

D. NDAC 33.1-15-04 - Open Burning:

No person may dispose of refuse and other combustible material by open burning, or cause, allow, or permit open burning of refuse and other combustible material, except as provided for in Section 33.1-15-04-02 or 33.1-15-10-02, and no person may conduct, cause, or permit the conduct of a salvage operation by open burning.

Applicability and Expected Compliance

The Project is subject to this chapter and will comply with all open burning regulations.

E. NDAC 33.1-15-05 - Emissions of Particulates Matter Restricted:

This chapter establishes particulate matter emission limits for industrial process equipment and fuel burning equipment used for indirect heating.

Applicability and Expected Compliance

The pulp dryer #1 (EU 4; EP 4/4a), dry pulp belt conveyor and elevator (EU 9/11; EP9), lime kiln (EU 28; EP 27a), sugar dryer granulator (EU 29; EP 28), lime slaker (EU30; EP 29), pulp pellet mills & cooler (EU 31, 33, 34; EP 30), package boiler (EU 35; EP 32) and pulp dryer #2 (EU 36; EP 33) are considered industrial process equipment or fuel burning equipment used for indirect heating. These units triggered a BACT analysis for PM, PM₁₀, and PM_{2.5}. Based on the implementation of PM, PM₁₀, and PM_{2.5} BACT controls on the

emissions units referenced above, the Department expects the Project will comply with the allowable emission rate(s) set forth in this chapter.

F. NDAC 33.1-15-06 - Emissions of Sulfur Compounds Restricted:

This chapter applies to any installation in which fuel is burned and the SO₂ emissions are substantially due to the sulfur content of the fuel; and in which the fuel is burned primarily to produce heat. This chapter is not applicable to installations which are subject to an SO₂ emission limit under Chapter 33.1-15-12, Standards for Performance for New Stationary Sources, or installations which burn pipeline quality natural gas.

Applicability and Expected Compliance

The Project pulp dryer #1 (EU 4; EP4/4a) and pulp dryer #2 (EU 36; EP 33) burn fuel (coal) containing sulfur that results in SO₂ emissions which must comply with this chapter. The Project lime kiln (EU 28; EP 27a-b) and package boiler (EU 35; EP 32) are fired on pipeline quality natural gas and are therefore exempt from this chapter.

Pulp dryer #1 and pulp dryer #2 are required to comply with a 3.0 lb SO₂ per MMBtu limit. Representations made in the permit application indicate a maximum potential lb SO₂ per MMBtu from these units of less than 0.4, therefore, compliance with chapter is expected. SO₂ limits are provided in ACP-18197v1.0 Condition II.A to ensure compliance with representation made in the permit application.

G. NDAC 33.1-15-07 - Control of Organic Compounds Emissions:

This chapter establishes requirements for organic compound facilities and the disposal of organic compounds.

Applicability and Expected Compliance

The Project is not considered an organic compound facility, but the Project will emit significant organic compounds from the pulp dryer #1 (EU 4; EP4/4a) and pulp dryer #2 (EU 36; EP 33). Pulp dryer #1 and pulp dryer #2 triggered a BACT analysis for VOCs. Based on the implementation of BACT controls on the emissions units referenced above, the Project is expected to comply with the requirements of this chapter.

H. NDAC 33.1-15-08 - Control of Air Pollution from Vehicles and Other Internal Combustion Engines:

This chapter restricts the operation of internal combustion engines which emit from any source unreasonable and excessive smoke, obnoxious or noxious gas, fumes or vapor. This chapter also prohibits the removal or disabling of motor vehicle pollution control devices.

Applicability and Expected Compliance

No additional engines are being added and there are no engine modifications associated with this Project.

I. NDAC 33.1-15-09 - [repealed]

J. NDAC 33.1-15-10 - Control of Pesticides:

This chapter provides restrictions on pesticide use and restrictions on the disposal of surplus pesticides and empty pesticide containers.

Applicability and Expected Compliance

The Project is subject to this chapter and is expected to comply with all applicable requirements should pesticides be used.

K. NDAC 33.1-15-11 - Prevention of Air Pollution Emergency Episodes:

When an air pollution emergency episode is declared by the Department, the facility shall comply with the requirements in Chapter 33.1-15-11 of the North Dakota Air Pollution Control (NDAPC) rules.

L. NDAC 33.1-15-12 - Standards of Performance for New Stationary Sources [40 Code of Federal Regulations Part 60 (40 CFR Part 60)]:

This chapter adopts most of the Standards of Performance for New Stationary Sources (NSPS) under 40 CFR Part 60. The Project subject to the following subparts under 40 CFR Part 60 which have been adopted by North Dakota:

Subpart A – General Provisions

Subpart A contains general requirements for plan reviews, notification, recordkeeping, performance tests, reporting, monitoring and general control device requirements.

Applicability and Expected Compliance

The Project will comply with the general provisions of Subpart A through submission of timely notifications, performance testing, reporting, and following the general control device and work practice requirements under Subpart A. In addition, any changes to the Project after it is built will be evaluated with respect to this subpart as well as others.

Subpart Db – Standards of Performance for Industrial – Commercial – Institutional Steam Generating Units

This subpart applies to each steam generating unit that commences construction, modification, or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)).

Applicability and Expected Compliance

The new package boiler (EU 36; EP 33) will become subject to NSPS Subpart Db upon start-up of this Project. Subpart Db nitrogen oxides emission limit for natural gas high heat release rate boilers is 0.20 lb/MMBtu on a 30-day rolling average. The new package boiler was subject to BACT for NO_x emissions. As a result of what was determined for BACT, the package boiler will be limited to 0.02 lb/MMBtu on a 3-hour rolling average basis.

Compliance will be demonstrated through installation and operation of a NO_x continuous emissions monitoring system (CEMS) on the boiler and following the monitoring, reporting, and recordkeeping requirements as defined in Subpart Db.

- M. NDAC 33.1-15-13-Emission Standards for Hazardous Air Pollutants [40 Code of Federal Regulations Part 61 (40 CFR Part 61)]

This chapter adopts most the National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61.

Applicability and Expected Compliance

The facility does not appear to have any applicable requirements under this chapter.

- N. NDAC 33.1-15-14-Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate

This chapter requires the facility to obtain a Permit to Construct and a Permit to Operate.

Applicability and Expected Compliance

The facility has submitted an application for a permit to construct amendment and an application for a new permit to construct. Both applications are being processed with this action. The facility has met all requirements necessary to obtain a permit to construct.

The facility is an existing major stationary source for NO_x, CO, SO₂, VOC, PM, PM₁₀, and PM_{2.5}, see Table 6. The Project is considered a major modification to an existing major source, see NDAC 33.1-15-15 for discussion on PSD. The permit must undergo public comment per NDAC 33.1-15-14-02.6.c.

Once the Project completes construction and meets the permit to construct requirements, an inspection will be performed by the Department. The facility will be required to submit a timely Title V Permit to Operate update package upon Project start-up.

- O. NDAC 33.1-15-15-Prevention of Significant Deterioration of Air Quality [40 CFR 52.21]

This chapter adopts the federal provisions of the prevention of significant deterioration of air quality (PSD) program. A facility is subject to PSD review if it is classified as a “major stationary source” under Chapter 33.1-15-15.

Applicability and Expected Compliance

PSD contains source obligation requirements to ensure Project construction or modification is done in accordance with the application submitted or with the terms of any approval to construct (i.e., this permit action). Any deviations from the Project without applying for and receiving prior approval from the Department shall be subject to appropriate enforcement action (i.e., the Project must be constructed in accordance with this permit action).³

This facility is classified as an existing “major stationary source” under 40 CFR 52.21(b)(1)(i)(a)⁴. The Project will increase emissions from the facility above the significance thresholds listed under 40 CFR 52.21(b)(23)(i)⁵ and therefore triggers the major modification definition under 40 CFR 52.21(b)(2)(i)⁶. Since the Project is a major modification, it is subject to PSD review, see Table 6 for details. PSD requires the installation of Best Available Control Technology (BACT); an air quality analysis (i.e., air dispersion modeling); an additional impacts analysis, and public involvement.

BACT for August 2022 application

A revised BACT analysis was included with the August 2022 amendment application for the modified pulp dryer #1 (EU 4; EP 4/4a), lime kiln (EU 28; EP 27a-d), lime slaker (EU 30; EP 29), and pellet mills/cooler (EUs 31, 33, 34; EP 30).

The pulp dryer #1 (EU 4) was permitted for removal with PTC17001, however, during engineering design review for the PTC17001 project it was determined that EU4 could be modified to increase the pulp drying capacity and eliminating the need for a replacement unit. As a result, a BACT analysis for EU4 was completed for PM/PM₁₀/PM_{2.5}, SO₂, NO_x, CO, and VOC. The Department has reviewed the BACT analysis and confirms the selection of BACT for each of the species. PM/PM₁₀/PM_{2.5} BACT is determined to be an upgraded multiclone. SO₂ BACT is determined to be inherent controls (i.e., low sulfur coal and good combustion practices). NO_x, CO, and VOC BACT were all determined to be good combustion practices.

The lime kiln (EU 28) was permitted to be fired on coal/anthracite with PTC17001, however, during engineering design review for the PTC17001 project it was determined that a sufficient supply of natural gas was available, and the lime kiln could be fired on natural gas. As a result, the BACT analysis for EU 28 was revised for PM/PM₁₀/PM_{2.5}, SO₂, NO_x, CO, and VOC. The Department has reviewed the revised BACT analysis and confirms the selection of BACT for each of the species. PM/PM₁₀/PM_{2.5} BACT is determined to be inherent process controls (i.e., integral gas washer). SO₂ BACT is determined to be inherently low sulfur fuels (i.e., natural gas). NO_x, CO, and VOC BACT were all determined to be good combustion practices.

The slime slaker (EU 30) was permitted at a capacity of 307 tons per day of calcined lime with PTC17001. EU 30 capacity was increased to 500 tons per day to support the increase in lime kiln process throughout. As a result, the BACT analysis for EU 30 was revised for PM/PM₁₀/PM_{2.5}. The Department has reviewed the revised BACT analysis and confirms

³ See 40 CFR 52.21(r). Available at [https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21\(r\)](https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21(r))

⁴ See [https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21\(b\)\(1\)\(i\)\(a\)](https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21(b)(1)(i)(a))

⁵ See [https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21\(b\)\(23\)\(i\)](https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21(b)(23)(i))

⁶ See [https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21\(b\)\(2\)\(i\)](https://www.ecfr.gov/current/title-40/part-52/section-52.21#p-52.21(b)(2)(i))

the selection of BACT for PM/PM₁₀/PM_{2.5}. PM/PM₁₀/PM_{2.5} BACT is determined to be good engineering practices.

PTC17001 permitted for a new pellet mill/cooler system to be installed with a maximum rated capacity of 15 tons per hour. Engineering design review indicated that significant redesign of the existing pellet mill/cooler system was necessary to support the project. A new pellet mill/cooler system was constructed comprising of three pellet mills with a capacity of 16 tons per hour each and a pellet cooler with a capacity of 30 tons per hour, with all three pellet mills routed to the cooler. As a result, the BACT analysis for the as-built pellet mill/cooler (EU 31, 33, 34) was revised for PM/PM₁₀/PM_{2.5}. The Department has reviewed the revised BACT analysis and confirms the selection of BACT for PM/PM₁₀/PM_{2.5}. PM/PM₁₀/PM_{2.5} BACT is determined to be a fabric filter baghouse.

Emissions limits resulting from the revised BACT analysis for the modified pulp dryer (EU 4; EP 4/4a), lime kiln (EU 28; EP 27a-d), lime slaker (EU 30; EP 29), and pellet mills/cooler (EUs 31, 33, 34; EP 30) are included in Condition II.A of ACP-18197v1.0.

BACT for December 2022 application

A new BACT analysis was included with the December 2022 application for the new pulp dryer #2 (EU 36; EP 33) and the new natural gas fired package boiler (EU 35; EP 32).

A BACT analysis for pulp dryer #2 (EU 36) was completed for PM/PM₁₀/PM_{2.5}, SO₂, NO_x, CO, VOC, and greenhouse gases (GHGs). The Department has reviewed the BACT analysis and confirms the selection of BACT for each of the species. PM/PM₁₀/PM_{2.5} BACT is determined to be a cyclone (i.e., mechanical separator) and a wet scrubber. SO₂ BACT is determined to be inherent controls (i.e., low sulfur coal and good combustion practices). NO_x, CO, VOC, and GHG BACT were all determined to be good combustion practices.

A BACT analysis for the natural gas fired boiler was completed for PM/PM₁₀/PM_{2.5}, SO₂, NO_x, CO, VOC, and greenhouse gases (GHGs). The Department has reviewed the BACT analysis and confirms the selection of BACT for each of the species. PM/PM₁₀/PM_{2.5} BACT is determined to be pipeline quality natural gas and good combustion practices. SO₂ BACT is determined to be inherently low sulfur fuel (i.e., natural gas). NO_x BACT is determined to ultra-low NO_x burners and good combustion practices. CO, VOC, and GHG BACT were all determined to be good combustion practices.

Emissions limits resulting from the new BACT analysis for the new pulp dryer #2 (EU 36; EP 33) and the new natural gas fired package boiler (EU 35; EP 32) are included in Condition II.A of ACP-18197v1.0

Ambient Air Analysis

An air quality analysis was completed to demonstrate that the Project's potential emissions will not cause or contribute to a violation of any applicable NAAQS or PSD increment. The Department has reviewed the air quality analysis and completed an independent analysis to verify the results. See [NDAC 33.1-15-02](#) and "ACP-18197v1.0_AQIA" for details.

Additional Impacts Analysis

An additional impacts analysis was completed to assess the impacts of air, ground and water pollution on soils, vegetation, and visibility caused by any increase in emissions of any regulated pollutant from the Project, and from associated growth. Associated growth is industrial, commercial, and residential growth that will occur in the area due to the source. The Department has reviewed the additional impacts analysis included in the December 2022 application and believes it accurately assesses the Project impacts.

Public Participation

The permit must undergo public comment per NDAC 33.1-15-14-02.6.c and NDAC 33.1-15-15. See “Summary:” section for details on the public comment period.

P. NDAC 33.1-15-16 - Restriction of Odorous Air Contaminants

This chapter restricts the discharge of objectionable odorous air contaminants which measures seven odor concentration units or greater outside the property boundary.

Applicability and Expected Compliance

Based on Department experience with sources having similar emission units, processes, and low hydrogen sulfide concentrations, the facility is expected to comply with this chapter.

Q. NDAC 33.1-15-17 - Restriction of Fugitive Emissions

This Chapter restricts fugitive emissions from particulate matter or other visible air contaminants and gaseous emissions that would violate Chapter 2 (ambient air quality standards), Chapter 15 (PSD), Chapter 16 (odor), or Chapter 19 (visibility).

Applicability and Expected Compliance

The facility will be required to take reasonable precautions to prevent fugitive emissions in violation of the above referenced NDAC chapters.

R. NDAC 33.1-15-18 - Stack Heights

This chapter restricts the use of stack heights above good engineering practices (GEP). This chapter also restricts the use of dispersion techniques to affect the concentration of a pollutant in the ambient air.

Applicability and Expected Compliance

The proposed stacks at the facility do not exceed GEP and will not use dispersion techniques to affect the pollutant concentration in the ambient air.

The stack heights for the new and modified units associated with the Project are listed in the following table:

Emission Unit	Emission Point (EP)	Stack Height (Feet)
4	4	180
9 & 11	9	22
28	27a	175
30	29	80
31, 33, 34	30	23
35	32	180
36	33	120

S. NDAC 33.1-15-19 - Visibility Protection

This chapter applies to major stationary sources as defined in Section 33.1-15-15-01.

Applicability and Expected Compliance

The facility is an existing major stationary source, and the Project is a major modification to the source. The nearest Class I areas to the facility are the Voyageurs National Park and the Boundary Waters Canoe Area National Wilderness, both of which are located in Minnesota and are greater than 250 kilometers away. All other Class I areas in North Dakota and South Dakota are greater than 500 kilometers from the facility. Due to the relatively large distances from the facility to the Class I areas, impacts to the Class I areas visibility from the proposed Project are anticipated to be negligible.

T. NDAC 33.1-15-20 - Control of Emissions from Oil and Gas Well Production Facilities

The facility is not an oil or gas well facility and is therefore not subject to the requirements of this chapter.

U. NDAC 33.1-15-21 - Acid Rain Program

This chapter adopts the acid rain provisions of the Clean Air Act specified under 40 CFR Parts 72-78. The facility is not subject to the acid rain provision as they are not an electric utility.

V. NDAC 33.1-15-22 - Emissions Standards for Hazardous Air Pollutants for Source Categories [40 Code of Federal Regulations Part 60 (40 CFR Part 63)]

This chapter adopts the 40 CFR Part 63 regulations which regulates hazardous air pollutants (HAPs) from regulated source categories. Typically, these standards apply to major sources of air pollution that are a regulated source category. In addition to the major source requirements, some of the regulations have “area source” standards (for non-major sources). Some of the area source standards have not been adopted by the Department and compliance will be determined by the United States Environmental Protection Agency (USEPA) (i.e., 40 CFR 63, Subpart ZZZZ area source provisions have not been adopted by the Department).

Applicability

The facility's potential HAP emissions are greater than 10 tons per year for any single HAP, so the facility is major source of HAPs. Hydrochloric acid is the single largest HAP with the potential to emit greater than 10 tons per year.

Subpart A – General Provisions

Subpart A contains general requirements for prohibited activities and circumvention, preconstruction review and notification, standards and maintenance requirements, performance tests, monitoring, recordkeeping, reporting, and control device work practice requirements.

Applicability and Expected Compliance

The facility will comply with the general provisions of Subpart A through submission of timely notifications, performance testing, monitoring, recordkeeping, reporting, and following the control device work practice requirements under Subpart A.

Subpart DDDDD – National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

Subpart DDDDD (a.k.a. MACT 5D) applies to industrial, commercial, or institutional boiler or process heaters located at major sources of HAPs and establishes national emission limitations, work practice standards, and requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards.

Applicability and Expected Compliance

The new package boiler (EU 36; EP 33) will become subject to MACT 5D upon start-up and will be subject to the periodic tune-up requirements under 40 CFR 63.7500. MACT 5D limits from EU1 are also incorporated with this permit action.

W. NDAC 33.1-15-23 - Fees

This chapter requires a filing fee of \$325 for permit to construct applications, plus any additional fees based on actual processing costs. The additional fees based on processing costs will be assessed upon issuance of the draft permit to construct. The annual operating permit fee is also applicable.

The applicant has paid the \$325 filing fee and may be required to pay the additional fees associated with the permit processing.

X. NDAC 33.1-15-24 - Standards for Lead-Based Paint Activities

The facility will not perform any lead-based painting and is therefore not subject to this chapter.

Y. NDAC 33.1-15-25 - Regional Haze Requirements

This chapter is specific to existing stationary sources or groups of sources which have the potential to “contribute to visibility impairment” as defined in Section 33.1-15-25-01.2. Existing stationary sources or groups of sources determined to contribute to visibility impairment may be required to implement emissions reduction measures to help the Department make reasonable progress toward North Dakota’s reasonable progress goals established in accordance with 40 CFR 51.308.

Applicability and Expected Compliance

The facility is an existing major stationary source, and the Project is a major modification to the source. Due to the relatively large distances from the facility to the Class I areas, impacts to the Class I areas visibility from the proposed Project are anticipated to be negligible and are not expected to interfere with North Dakota’s reasonable progress goals.

Summary:

A complete review of the August 2022 and December 2022 applications indicate that the Project is expected to comply with the applicable federal and state air pollution rules and regulations. The Department will make a final recommendation on the issuance of a Permit to Construct for ACS Drayton following completion of a 30-day public comment period. The public comment period will run from January 11, 2024, through February 10, 2024.

Update post comment period:
[Reserved]

Date of Draft Analysis: January 3, 2023

Date of Final Analysis: [Reserved]

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DES: