North Dakota State University (NDSU), Heating Plant
Title V Permit to Operate No. AOP-28364 v6.1
(Previously T5-F73019)
Statement of Basis
(05/16/25)

Facility Background: The NDSU central heating plant has six steam generating boilers (EU 2, 3, 4, 9, 14 and 15) that provide heat for various buildings on the campus. EU 3, 9, 14 and 15 are fired by natural gas (with distillate oil backup) and EU 2 and 4 combust coal. Heat input ratings range from 32 to 140 million Btu/hr. Particulate emissions from EU 2 and 4 are controlled by multiclone and baghouse. Approximately 36 diesel engine-driven emergency (some with peak shaving ability) generator sets ranging from 40 bhp to 2,941 bhp are located at various buildings on the campus.

Chronology of significant events (not all-inclusive):

- June 1, 1973: NDSU was issued a conditional air pollution control Permit to Operate (PTO) No. 730019. This PTO permitted the operation of five boilers, only one of which (EU 4) remains on-site.
- March 15, 1983: PTO 730019 was first renewed, and it was subsequently renewed at approximately three-year intervals.
- January 28, 1988: A solid waste incinerator rated at 800 lb/hr and located in Van Es Hall was first permitted by PTO I85003.
- January 5, 1992: An unnamed PTC was issued and permitted the previously constructed Cleaver Brooks 75.8 x 10^6 Btu/hr gas/oil-fired boiler (EU 3).
- April 2, 1998: Title V PTO No. T5-F73019 was first issued to NDSU, and included boilers EU 1 through 5, four emergency electrical generators, and an 800 lb/hr incinerator at Van Es Hall in the veterinary diagnosis laboratory.
- July 25, 2000: PTC00007 was issued and replaced the 800 lb/hr incinerator with a new pathological waste incinerator/animal crematorium rated at 400 lb/hr or 1,600 lb/batch.
- February 8, 2002: Administrative Amendment No. 1 was issued to T5-F73019 to revise the expiration date to reflect a five-year permit period.
- June 11, 2003: Renewal No. 1 to T5-F73019 (AOP-28364 v2.0) was issued and was the first to include a CAM Plan for the Zurn Industries and Erie City boilers.
- May 7, 2008: Renewal No. 2 of the Title V PTO (AOP-28364 v3.0) was issued.
- June 22, 2009: PTC09020 (ACP-17220 v1.0) was issued and added a new pathological waste incinerator/animal crematorium rated at 600 lb/hr or 2,400 lb/batch.
- October 27, 2009: PTC09040 (ACP-17240 v1.0) was issued and added a diesel engine-driven emergency generator at the NDSU greenhouse and research center.
- August 2, 2010: Renewal No. 2 Revision No. 1 (AOP-28364 v3.1) was issued to incorporate the provisions of ACP-17220 v1.0, ACP-17240 v1.0 and remaining provisions of PTC00007.
- December 6, 2010: PTC10045 (ACP-17289 v1.0) was issued and permitted the installation and operation of a diesel engine-driven generator (EU 122).
- June 3, 2013: Renewal No. 3 of the Title V PTO (AOP-28364 v4.0) was issued and included administrative changes and the engine from ACP-17289 v1.0.

- January 14, 2015: PTC15004 (ACP-17699 v1.0) was issued to permit the construction of the English Boiler and Tube natural gas/oil-fired boiler (EU 9).
- August 29, 2016: Revision No. 1 to Renewal No. 3 (AOP-28364 v4.1) incorporating ACP-17699 v1.0 was issued.
- January 3, 2017: PTC16042 (ACP-17814 v1.0) was issued for the construction and initial operation of the second animal crematorium at the veterinary diagnostic laboratory.
- March 24, 2017: PTC17010 (ACP-17824 v1.0) was issued for two diesel engine-driven generator sets (EU 130 & 131/EP 130 & 131).
- May 21, 2018: The fourth renewal of the Title V PTO (AOP-28364 v5.0) was issued and incorporated ACP-17814 v1.0 and ACP-17824 v1.0.
- June 25, 2018: A revision to the Title V PTO (AOP-28364 v5.1) was issued to remove EU 8 (pathological waste incinerator/animal crematorium).
- July 12, 2022: ACP-18153 v1.0 was issued to revise the NO_x limits for the natural gas-fired (distillate oil backup) boiler EU 9.
- June 6, 2023: AOP-28364 v6.0 was issued and incorporates ACP-18153 v1.0 for EU 9 NO_x emission limits and revisions regarding the emergency engines.

Current Action: On July 10, 2024, the Department received a timely significant modification application through CERIS-ND from NDSU for a revised Title V permit for the Heating Plant. The draft permit removes the crematorium (EU 10) and three Cleaver Brooks boilers (EU 11 through 13), that are now permitted on Air Quality Permit to Operate No. AOP-28569 as it was determined these emission units are located at a separate facility. The Burnham boiler (EU 5) and two Aldrich Co. boilers (EU 7A and 7B) were removed from the permit and ACP-18255 v1.0 was incorporated for two Johnston boilers (EU 14 and 15).

The Department proposes to issue Title V Permit to Operate No. AOP-28364 v6.1 after the required 30-day public comment period and subsequent 45-day EPA review period. This statement of basis summarizes the relevant information considered during this revision of the Title V permit. The legal basis for each permit condition is stated in the draft permit under the heading of "Applicable Requirement."

Applicable Programs/As-Needed Topics:

1. **Title V.** The facility holds a Title V permit to operate due to the potential to emit more than 100 tons per year of a criteria pollutant (SO_2, NO_x and CO). NDSU is a minor/area source of Hazardous Air Pollutant (HAP) emissions because individual and combined potential annual HAP emissions are below 10 tpy and 25 tpy, respectively. The predominant HAP emitted is hydrogen chloride with potential emissions of less than one ton per year.

2. **New Source Performance Standards (NSPS).** The following NDAC 33.1-15-12-02 and 40 CFR 60 subparts apply to the facility:

   Subpart A - General Provisions, applies to each source unit to which another NSPS subpart applies.

Subpart Db - Standards of Performance for Industrial Commercial-Institutional Steam Generating Units [EU 9 because its design heat input capacity is greater than 100 million Btu per hour and it was constructed after June 19, 1984 (actual 2015)].

Subpart Dc - Standards of Performance for Small Industrial Commercial-Institutional Steam Generating Units [EU 3, 14 and 15 because their design heat input capacity is between 10 and 100 million Btu per hour and were constructed after June 9, 1989 (actual 1990, 2023 and 2023, respectively)].

Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (affected diesel engines manufactured after April 1, 2006).

Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (affected natural gas engines manufactured after June 12, 2006).

3. **National Emission Standards for Hazardous Air Pollutants (NESHAP).** No NDAC 33.1-15-13 and 40 CFR 61 subparts apply to the facility, with the possible exception of NDAC 33.1-15-13-02 (40 CFR 61, Subpart M, National Emission Standard for Asbestos) which may apply during facility modifications involving asbestos.

4. **Maximum Achievable Control Technology (MACT).** The following NDAC 33.1-15-22-03 and 40 CFR 63 subparts apply to the facility, which is an area source of HAP emissions:

   Subpart A - General Provisions, applies to each source unit to which another MACT subpart applies.

   Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (EU 101, 105 to 108, 110 to 114 & 116 to 141, as applicable). Since this facility is an area source of HAP emissions, compliance with Subpart ZZZZ is achieved by complying with the applicable NSPS engine rule (NSPS Subpart IIII or JJJJ) where appropriate. North Dakota has not adopted the area source provisions of this subpart; all required reports and documentation are to be sent to EPA Region 8.

   Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers (EU 2 & 4). This rule does not apply to the natural gas (distillate oil backup) boilers (EU 3, 14, and 15) as long as the permittee maintains documentation demonstrating that the boilers are considered gas boilers under the rule.

5. **Acid Rain Program.** NDAC 33.1-15-21 (40 CFR 72, 73, 75 and 76) does not apply since the facility is not an existing electric utility steam generating plant.

6. **Prevention of Significant Deterioration (PSD).** Since the total heat input for the boilers is greater than 250 x 10^6 Btu/hr, the facility is a major stationary source under 40 CFR 52 because it has the potential to emit more than 100 tons of a regulated air contaminant (CO) during normal operations.

7. **Best Available Control Technology (BACT).** Although this facility is a major source under PSD, a BACT is not required because none of the changes incorporated in this draft permit increase potential emissions by a PSD-significant amount.

8. **Gap Filling.** The draft permit contains gap filling changes for testing, monitoring or recordkeeping not otherwise required by rule for EU 14 and 15. The gap filling conditions are generally identified by the applicable requirement NDAC 33.1-15-14-06.5.a(3)(a).

9. **Streamlining Decisions.** The NDAC 33.1-15-06-01.2 Restrictions applicable to fuel burning installations emission limit for sulfur (3.0 lb sulfur per million Btu) was streamlined because the standard ND natural gas fuel restriction for sulfur (2 grains/100 scf) is more stringent for several natural gas/distillate oil-fired units.

10. **Compliance Assurance Monitoring (CAM).** CAM applies because the coal-fired boilers (EUs 2 and 4) have add-on air pollution control equipment installed that is required to achieve compliance. However, the draft permit contains no changes to the CAM Plan.

11. **Permit Shield.** Permit shield does not apply because the draft permit does not contain a permit shield.

12. **New Conditions/Limits.** The draft permit includes new emission limits and conditions associated with the incorporation of ACP-18255 v1.0 for EU 14 and 15. Emission units 5, 7A, 7B, 10 and 11 through 13 and associated limits and conditions were removed. Specific modifications are identified in the "Permit Changes by Section" below.

13. **40 CFR 98 - Mandatory Greenhouse Gas Reporting.** This rule requires sources above certain emission thresholds or in certain supplier thresholds to calculate, monitor, and report greenhouse gas emissions. According to the definition of "applicable requirement" in 40 CFR 70.2, neither Subpart 98, nor Clean Air Act Section 307(d)(1)(V), the CAA authority under which Subpart 98 was promulgated, are listed as applicable requirements for the purpose of Title V permitting. Although the rule is not an applicable requirement under 40 CFR 70, the source is not relieved from the requirement to comply with the rule separately from compliance with their Part 70 operating permit. It is the responsibility of each source to determine applicability to the subpart and to comply, if necessary.

Permit Changes by Section:

Note: Administrative changes were made to some sections of the permit to update to the current North Dakota (ND) format and to correct errors. These changes may not be specifically addressed below.

Cover: Permit number.

Table of Contents: Page numbers were updated.

1. **Emission Unit Identification**: Emission units and their air pollution control equipment from ACP-18255 v1.0 were incorporated into the emission unit tables. The crematorium (EU 10) and three Cleaver Brooks boilers (EU 11 through 13) were removed as they are now permitted on Air Quality Permit to Operate No. AOP-28569. The Burnham boiler (EU 5) and two Aldrich Co. boilers (EU 7A and 7B) were removed from this section and all subsequent sections since the facility has decommissioned/completely discontinued use.

2. **Applicable Standards, Restrictions and Miscellaneous Conditions**: Updated the fuel use and restrictions, NSPS and MACT to remove/add emission units as appropriate. Added stack height condition for EU 14 and 15 as required by ACP-18255 v1.0.

3. **Emission Unit Limits**: Updated the table to remove/add emission units and footnotes as appropriate. Changed the nomenclature from MMBtu to 10^6 Btu where applicable. The SO_2 limit for EU 3 was removed as the fuel restrictions requirement is more stringent. Opacity limits for EU 9, 14, and 15 were added/clarified for the applicable NSPS requirements. Added footnote to clarify NO_X limits.

4. **Monitoring Requirements and Conditions**: Updated the table to remove/add emission units and condition number references as appropriate. Updated condition numbers and revised condition language to current format. The SO_2 monitoring limit for EU 3 was removed as the fuel restrictions requirement is more stringent. Removed Condition 4.B.9 as it only applied to the crematorium (EU 10) that is now permitted on AOP-28569. The equations for calculating NO_X previously listed in Conditions 2.A.1 and 2.A.2 were moved to Condition 4.B.11.

5. **Recordkeeping Requirements**: Updated the table to remove/add emission units as appropriate. Updated Condition 5.B.3 to include EU 14 and 15.

6. **Reporting**: Updated Condition 6.A.3 and 6.D to include EU 14 and 15

7. **Facility Wide Operating Conditions**: The Noncompliance Due to an Emergency condition (7.H) was removed per EPA's Affirmative Defense Provision Rule effective 8/21/23.

8. **General Conditions**: No change.

9. **State Enforceable Only Conditions (not Federally enforceable)**: No change.

Attachment A, CAM Plan: No change.

Comments/Recommendations: It is recommended that Title V Permit to Operate No. AOP-28364 v6.1 be processed and considered for issuance following a 30-day public comment period and a subsequent 45-day EPA review period.