

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OPERATING PERMIT TECHNICAL REVIEW DOCUMENT**

**Permitting and Compliance Division
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**Basin Electric Power Cooperative
Culbertson Generating Station
Section 5, Township 28 North, Range 57 East, Roosevelt County
1717 East Interstate Avenue
Bismarck, North Dakota**

The following table summarizes the air quality programs testing, monitoring, and reporting requirements applicable to this facility.

| Facility Compliance Requirements | Yes | No | Comments |
|---|-----|----|---|
| Source Tests Required | X | | Including Methods 7, 10 and 18/25 |
| Ambient Monitoring Required | | X | |
| COMS Required | | X | |
| CEMS Required | X | | NO _x |
| Schedule of Compliance Required | | X | |
| Annual Compliance Certification and Semiannual Reporting Required | X | | As Applicable |
| Monthly Reporting Required | | X | |
| Quarterly Reporting Required | | X | |
| Applicable Air Quality Programs | | | |
| ARM Subchapter 7 – Montana Air Quality Permit (MAQP) | X | | MAQP #4256-00 |
| New Source Performance Standards (NSPS) | X | | 40 CFR 60, Subpart A and Subpart KKKK |
| National Emission Standards for Hazardous Air Pollutants (NESHAPS) | | X | |
| Maximum Achievable Control Technology (MACT) | | X | |
| Major New Source Review (NSR) – includes Prevention of Significant Deterioration (PSD) and/or Non-attainment Area (NAA) NSR | | X | |
| Risk Management Plan Required (RMP) | | X | |
| Acid Rain Title IV | X | | 40 CFR Part 72-78 |
| Compliance Assurance Monitoring (CAM) | X | | CO and VOC Permit Renewal Applicability |
| State Implementation Plan (SIP) | X | | General State SIP |

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SECTION I. GENERAL INFORMATION

A. Purpose

This document establishes the basis for the decisions made regarding the applicable requirements, monitoring plan, and compliance status of emissions units affected by the operating permit proposed for this facility. The document is intended for reference during review of the proposed permit by the Environmental Protection Agency (EPA) and the public. It is also intended to provide background information not included in the operating permit and to document issues that may become important during modifications or renewals of the permit. Conclusions in this document are based on information provided in the original application submitted by Basin Electric Power Cooperative (Basin Electric) on September 4, 2008, and additional submittals on November 6, 2008, and December 11, 2008; and administrative requests received on September 5, 2014, and October 20, 2014.

B. Facility Location

The station is located 7 miles northeast of Culbertson, Montana within Section 5, Township 28 North, Range 57 East, Roosevelt County.

C. Facility Background Information

Basin Electric owns and operates a combustion turbine power generation facility approximately 7 miles northeast of Culbertson, Montana. The generation plant houses a single, simple-cycle, General Electric (GE) LMS100 aeroderivative combustion turbine and an electric generator driven by the turbine. Gross generation capacity of the turbine is 100 megawatts (MW) The turbine combusts natural gas which will be supplied by an existing pipeline running through the Basin Electric property.

Montana Air Quality Permit History

On January 1, 2009, the Department of Environmental Quality (Department) issued **Montana Air Quality Permit (MAQP) #4256-00** to Basin Electric to construct the previously described 100 MW natural gas combustion turbine electrical power generation facility. The proposed facility would consist of a single, simple-cycle, General Electric (GE) LMS100 aeroderivative combustion turbine.

Title V Operating Permit

The initial Title V **Operating Permit #OP4256-00** was issued on December 14, 2010, for the operation of the Culbertson Generating Station.

D. Current Permit Action

On October 20, 2014 the Department received an Administrative Amendment (AA) request from Basin Electric proposing a change in the designated responsible official for the Culbertson Generating Station. The current permit action is an administrative action updating the responsible official. **Operating Permit #OP4256-01** replaces Operating Permit #OP4256-00.

E. Taking and Damaging Analysis

HB 311, the Montana Private Property Assessment Act, requires analysis of every proposed state agency administrative rule, policy, permit condition or permit denial, pertaining to an environmental matter, to determine whether the state action constitutes a taking or damaging of private real property that requires compensation under the Montana or U.S. Constitution. As part of issuing an operating permit, the Department is required to complete a Taking and Damaging Checklist. As required by 2-10-101 through 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

| YES | NO | |
|-----|----|---|
| X | | 1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights? |
| | X | 2. Does the action result in either a permanent or indefinite physical occupation of private property? |
| | X | 3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property) |
| | X | 4. Does the action deprive the owner of all economically viable uses of the property? |
| | X | 5. Does the action require a property owner to dedicate a portion of property or to grant an easement? [If no, go to (6)]. |
| NA | | 5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests? |
| NA | | 5b. Is the government requirement roughly proportional to the impact of the proposed use of the property? |
| | X | 6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action) |
| | X | 7. Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public generally? |
| | X | 7a. Is the impact of government action direct, peculiar, and significant? |
| | X | 7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded? |
| | X | 7c. Has government action lowered property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question? |
| | X | Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas) |

Based on this analysis, the Department determined there are no taking or damaging implications associated with this permit action.

F. Compliance Designation

As of the date of issuance of the Draft #OP4256-01, the Basin Electric facility has commenced construction and scheduled initial testing as prescribed in the permit; therefore, the Department believes the facility is in compliance with all applicable requirements.

SECTION II. SUMMARY OF EMISSIONS UNITS

A. Facility Process Description

The generation plant will house a single, simple-cycle, aeroderivative combustion turbine and an electric generator driven by the turbine. The turbine draws in combustion air which is compressed and mixed with natural gas. The fuel-air mixture is ignited to produce compressed hot combustion gases which expand and rotate a shaft which turns a generator to produce electricity. The turbine combusts only natural gas which will be supplied by an existing pipeline running through the Basin Electric property.

Emissions will be limited by permit conditions that restrict operation of the turbine to no more than 3,400 hours per year. Oxides of nitrogen (NO_x) emissions will be controlled by the combustion of pipeline quality natural gas and water injection during combustion. The facility will not incorporate add-on controls for emissions of sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀), or particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}). Basin Electric is required by permit to combust only pipeline quality natural gas, which will result in reduced SO₂ and PM₁₀ emissions. A catalytic oxidizer will treat post-combustion exhaust emissions to reduce carbon monoxide (CO) and volatile organic compounds (VOC).

B. Emissions Units and Pollution Control Device Identification

Emissions from the turbine will be limited by permit conditions that restrict operation of the turbine to no more than 3,400 hours per year. Oxides of nitrogen (NO_x) emissions will be controlled by the combustion of pipeline quality natural gas and water injection during combustion. The facility will not incorporate add-on controls for emissions of sulfur dioxide (SO₂), particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀), or particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}). Basin Electric is required by permit to combust only pipeline quality natural gas, which will result in reduced SO₂ and PM₁₀ emissions. A catalytic oxidizer will treat post-combustion exhaust emissions to reduce carbon monoxide (CO) and volatile organic compounds (VOC).

| Emissions Unit ID | Emission Unit Description | Pollution Control Device/Practice |
|-------------------|---|--|
| EU001 | General Electric (GE) LMS100 aeroderivative combustion turbine. | NO _x – water/steam injection; SO ₂ , PM/PM ₁₀ /PM _{2.5} and Opacity– pipeline quality gas; CO and VOC – catalytic oxidation. |

C. Categorically Insignificant Sources/Activities

Pursuant to ARM 17.8.1201(22)(a), an insignificant emission unit means any activity or emissions unit located within a source that: (i) has a potential to emit (PTE) less than 5 tons per year (TPY) of any regulated pollutant; (ii) has a PTE less than 500 pounds per year of lead; (iii) has a PTE less than 500 pounds per year of hazardous air pollutants listed pursuant to Section 7412 (b) of the FCAA; and (iv) is not regulated by an applicable requirement, other than a generally applicable requirement that applies to all emission units subject to Subchapter 12.

Basin Electric proposed one insignificant sources and/or activities, fugitive emissions from haul roads. Because there are no requirements to update such a list, the status of such emission units and/or activities may change.

SECTION III. PERMIT CONDITIONS

A. Emission Limits and Standards

The following emission limits and standards are applicable to Basin Electric facility operations:

The Department determined that the emission limits that apply to EU001 – simple-cycle, General Electric (GE) LMS100 aeroderivative combustion turbine are as follows:

- Emissions limits for NO_x were established through the Best Available Control Technology (BACT) analysis required by Administrative Rules of Montana (ARM) 17.8.752. NO_x emissions from the turbine generator shall not exceed 78.50 pounds per hour (lb/hr) based on a 1-hour average, effective during all periods of operation, including startup and shutdown; and shall be controlled by water/steam injection into the turbine within 10 minutes of turbine startup and shall continue until 10 minutes or less prior to shutdown.
- This facility is an affected facility under 40 CFR 60, Subpart KKKK, which is applicable via ARM 17.8.340. Accordingly, Basin Electric shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart KKKK; and, emissions of NO_x from the turbine generator shall not exceed 25 parts per million dry volume (ppmvd) at 15% oxygen (O₂), based on a 1-hour average, effective during all periods of operation, including startup and shutdown.
- Emissions limits for CO were established through the BACT analysis required by ARM 17.8.752. Emissions of CO from the turbine generator shall not exceed 21.50 lb/hr based on a 3-hour average, effective during all periods of operation, including startup and shutdown; and CO emissions shall be controlled through proper installation, operation, and maintenance of a catalytic oxidation emissions control system.
- Emissions limits for VOC were established through the BACT analysis required by ARM 17.8.752. Emissions of VOCs from the turbine generator shall not exceed 1.33 lb/hr based on a 1-hour average, effective during all periods of operation, including startup and shutdown; and VOC emissions shall be controlled through proper installation, operation, and maintenance of a catalytic oxidation emissions control system.
- Emissions limits for particulate matter (PM\PM₁₀\PM_{2.5}) were established through the BACT analysis required by ARM 17.8.752. The combined sum of filterable and condensable emissions of PM₁₀ from the turbine generator shall not exceed 6.00 lb/hr based on a 1-hour average, effective during all periods of operation, including startup and shutdown; and, particulate emission shall be controlled through combustion of pipeline quality natural gas only.
- Work practice emissions limits for SO_x were established through the BACT analysis required by ARM 17.8.752. SO_x emissions shall be controlled through combustion of pipeline quality natural gas only.
- Limits in hours of operation were proposed by Basin Electric. Accordingly operation of the turbine generator, including startup and shutdown, shall not exceed 3,400 hours per rolling 12-month time period.

- In order to maintain good dispersion to maintain compliance with the Montana and Federal Clean Air Act(s), the turbine shall exhaust into a stack that is at least 85.6-feet tall from grade.
- Pursuant to the general emission standards at ARM 17.8.304 Basin Electric shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
- The Basin Electric facility is an affected facility under Title IV of the Federal Clean Air Act (Acid Rain Program) as defined at 40 CFR Parts 72-78; therefore pursuant to ARM 17.8.1234 Basin Electric shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements of the Acid Rain Program contained in 40 CFR Parts 72-78.

B. Monitoring Requirements

ARM 17.8.1212(1) requires that all monitoring and analysis procedures or test methods required under applicable requirements are contained in operating permits. In addition, when the applicable requirement does not require periodic testing or monitoring, periodic monitoring must be prescribed that is sufficient to yield reliable data from the relevant time period that is representative of the source's compliance with the permit.

The requirements for testing, monitoring, recordkeeping, reporting, and compliance certification sufficient to assure compliance do not require the permit to impose the same level of rigor for all emissions units. Furthermore, they do not require extensive testing or monitoring to assure compliance with the applicable requirements for emissions units that do not have significant potential to violate emission limitations or other requirements under normal operating conditions. When compliance with the underlying applicable requirement for an insignificant emissions unit is not threatened by lack of regular monitoring and when periodic testing or monitoring is not otherwise required by the applicable requirement, the status quo (**i.e., no monitoring**) will meet the requirements of ARM 17.8.1212(1). Therefore, the permit does not include monitoring for insignificant emissions units.

The permit includes periodic monitoring or recordkeeping for each applicable requirement. The information obtained from the monitoring and recordkeeping will be used by the permittee to periodically certify compliance with the emission limits and standards. However, the Department may request additional testing to determine compliance with the emission limits and standards.

C. Test Methods and Procedures

The operating permit may not require testing for all sources if routine monitoring is used to determine compliance, but the Department has the authority to require testing if deemed necessary to determine compliance with an emission limit or standard. In addition, the permittee may elect to voluntarily conduct compliance testing to confirm its compliance status.

D. Recordkeeping Requirements

The permittee is required to keep all records listed in the operating permit as a permanent business record for at least five years following the date of the generation of the record.

E. Reporting Requirements

Reporting requirements are included in the permit for each emissions unit and Section V of the operating permit "General Conditions" explains the reporting requirements. However, the permittee is required to submit semi-annual and annual monitoring reports to the Department and to annually certify compliance with the applicable requirements contained in the permit. The reports must include a list of all emission limit and monitoring deviations, the reason for any deviation, and the corrective action taken as a result of any deviation.

SECTION IV. NON-APPLICABLE REQUIREMENT ANALYSIS

The permit application for Basin Electric's Title V Operating Permit #OP4256-01 identified applicable requirements: non-applicable requirements for individual or specific emission units and facility-wide operations were not listed.

SECTION V. FUTURE PERMIT CONSIDERATIONS

A. MACT Standards

As of the date of the AA the emission of hazardous air pollutants (HAPs) from the Basin Electric Culbertson Generating Station facility is less than 10 tons per year for any individual HAP and less than 25 tons per year for all HAPs combined; therefore, the Basin Electric facility is not a major source of HAPs and not subject to the requirements of 40 CFR 63, Subpart YYYY.

B. NESHAP Standards

As of the date of this AA Basin Electric is not subject to any standards listed under 40 CFR Part 61, with the possible exception of Subpart M – Asbestos, as applicable.

C. NSPS Standards

40 CFR 60, Subpart A – General Provisions. This subpart applies to all equipment or facilities subject to an NSPS Subpart as listed below:

40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines. This subpart applies to the proposed facility because Basin Electric proposes to install and operate a stationary combustion turbine with a heat input greater than 10 million British thermal units (MMBtu) per hour, which commenced construction, modification, or reconstruction after February 18, 2005.

D. Risk Management Plan

As of this date (08/19/10), this facility does not exceed the minimum threshold quantities for any regulated substance listed in 40 CFR 68.115 for any facility process. Consequently, this facility is not required to submit a Risk Management Plan.

If a facility has more than a threshold quantity of a regulated substance in a process, the facility must comply with 40 CFR 68 requirements no later than June 21, 1999; three years after the date on which a regulated substance is first listed under 40 CFR 68.130; or the date on which a regulated substance is first present in more than a threshold quantity in a process, whichever is later.

E. CAM Applicability

In accordance with the ARM Title 17, Chapter 8, Subchapter 15, a Compliance Assurance Monitoring (CAM) Plan applies to each pollutant-specific emitting unit at a major stationary source (Title V) if the affected unit is subject to a pollutant specific emission limitation or standard; the unit uses a control device to achieve compliance with the applicable limitation or standard; and the unit has a pre-control PTE of the regulated pollutant in an amount that exceeds 100% of the Title V major source threshold.

ARM 17.8.1501(5) defines ‘control device’ and excludes inherent combustion controls such as water injection. Because the Culbertson Generating Station turbine will use water injection to intrinsically limit NO_x formation, NO_x emission limits for the combustion turbine are not subject to CAM rules.

The turbine meets the CAM applicability criteria for CO and VOC. However because the controlled emission of CO and VOCs are under 100 TPY, Basin Electric is not required to submit a CAM Plan until the first Title V permit renewal application.

F. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule

On May 7, 2010, EPA published the “light duty vehicle rule” (Docket # EPA-HQ-OAR- 2009-0472, 75 FR 25324) controlling greenhouse gas (GHG) emissions from mobile sources, whereby GHG became a pollutant subject to regulation under the Federal and Montana Clean Air Act(s). On June 3, 2010, EPA promulgated the GHG “Tailoring Rule” (Docket # EPA-HQ-OAR-2009-0517, 75 FR 31514) which modified 40 CFR Parts 51, 52, 70, and 71 to specify which facilities are subject to GHG permitting requirements and when such facilities become subject to regulation for GHG under the PSD and Title V programs.

Under the Tailoring Rule, any PSD action (either a new major stationary source or a major modification at a major stationary source) taken for a pollutant or pollutants other than GHG that was not final prior to January 2, 2011, would be subject to PSD permitting requirements for GHG if the GHG increases associated with that action were at or above 75,000 TPY of carbon dioxide equivalent (CO_{2e}) emissions. Similarly, if such action were taken, any resulting requirements would be subject to inclusion in the Title V Operating Permit. Starting on July 1, 2011, PSD permitting requirements would be triggered for modifications that were determined to be major under PSD based on GHG emissions alone, even if no other pollutant triggered a major modification. In addition, sources that exceed the 100,000 TPY CO_{2e} threshold under Title V would be required to obtain a Title V Operating Permit if they were not already subject.

Based on information provided by Basin Electric, Basin Electric’s potential emissions exceed the GHG major source threshold of 100,000 TPY of CO_{2e} for both Title V and PSD under the Tailoring Rule. Therefore, Basin Electric may be subject to GHG permitting requirements in the future.