



October 13, 2015

Erin Fox Dukart  
Basin Electric Power Cooperative  
1717 East Interstate Ave.  
Bismarck, ND 58503-0564

Dear Dukart:

Montana Air Quality Permit #4256-01 is deemed final as of September 29, 2015, by the Department of Environmental Quality (Department). This permit is for an electrical power generation station. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

A handwritten signature in black ink that reads "Julie A. Merkel".

Julie A. Merkel  
Air Permitting Supervisor  
Air Quality Bureau  
(406) 444-3626

A handwritten signature in black ink that reads "John P. Proulx".

John P. Proulx  
Environmental Science Specialist  
Air Quality Bureau  
(406) 444-1277

JM:JP  
Enclosure

Montana Department of Environmental Quality  
Permitting and Compliance Division

Montana Air Quality Permit #4256-01

Basin Electric Power Cooperative  
1717 East Interstate Ave.  
Bismarck, ND 58503-0564

September 29, 2015



## MONTANA AIR QUALITY PERMIT

Issued To: Basin Electric Power Cooperative  
1717 East Interstate Ave. Bismarck, ND  
58503-0564

Permit: #4256-01  
Administrative Amendment (AA) Request  
Received: 09/08/2015  
Departments Decision on AA: 09/11/2015  
Permit Final: 9/29/2015  
AFS #: 085-0061

An air quality permit, with conditions, is hereby granted to Basin Electric Power Cooperative – Culbertson Generation Station (Basin Electric), pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq.*, as amended, for the following:

### SECTION I: Permitted Facilities

#### A. Permitted Equipment

Basin Electric operates a stationary electric power generation station to provide power to the electric power grid during daily and seasonal periods of peak demand. This station consists of a single, simple-cycle, combustion turbine generator (General Electric Model LMS100) powered by natural gas with a nominal power output capacity of 100 megawatts (MW). A complete list of permitted equipment is contained in Section I.A of the permit analysis.

#### B. Current Permit Action

On September 8, 2015, the Department received a letter from Basin Electric Power Cooperative (BEPC) requesting an amendment to Montana Air Quality Permit (MAQP) #4256-00. BEPC requested that the permit language be changed to reflect the correct averaging period of the Title 40 Code of Federal Regulations (CFR) Part 60, Subpart KKKK emission limit for Oxides of Nitrogen applicable during start-up, operation, and shut-down of the power generating unit. The permit was also updated to reflect the current language used by the Department.

### SECTION II: Conditions and Limitations

#### A. Emission Limitations

1. Emissions of nitrogen oxides (NO<sub>x</sub>) 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 (ARM 17.8.752).
2. Emissions of NO<sub>x</sub> from the turbine generator shall not exceed 25 parts per million dry volume (ppmvd) at 15% oxygen (O<sub>2</sub>), based on a 1-hour average calculated over 4 continuous hours of operation, effective during all periods of operation, including startup and shutdown (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

3. Emissions of carbon monoxide (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 (ARM 17.8.752).
4. Emissions of volatile organic compounds (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 (ARM 17.8.752).
5. The combined sum of filterable and condensable emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) 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 (ARM 17.8.752).
6. Operation of the turbine generator, including startup and shutdown, shall not exceed 3,400 hours per rolling 12-month time period (ARM 17.8.749).
7. Basin Electric shall operate and maintain a water-injection system to control NO<sub>x</sub> emissions during the combustion process. Water-injection shall commence within 10 minutes of turbine startup and shall continue until 10 minutes or less prior to shutdown (ARM 17.8.752).
8. Basin Electric shall install, operate, and maintain a catalytic oxidizer to control emissions of CO and VOCs (ARM 17.8.752).
9. Basin Electric shall combust only pipeline quality natural gas in the turbine generator (ARM 17.8.752).
10. The turbine shall exhaust into a stack that is at least 85.6-feet tall from grade (ARM 17.8.749).
11. 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).
12. Basin Electric shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
13. Basin Electric shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.12 (ARM 17.8.749).
14. Basin Electric shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart KKKK (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

## B. Testing Requirements

1. Basin Electric shall test the turbine generator, using natural gas as a fuel, for NO<sub>x</sub> and CO, concurrently, within 180 days of initial startup of the turbine generator, or according to another testing/monitoring schedule as may be approved by the Montana Department of Environmental Quality (Department), to demonstrate compliance with the NO<sub>x</sub> and CO emission limits contained in Sections II.A.1, II.A.2, and II.A.3. The testing shall continue on an every 2-year basis, or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).
2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).
3. The Department may require further testing (ARM 17.8.105).

## C. Operational Reporting Requirements

1. Basin Electric shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. Basin Electric shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit***, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).
3. All records compiled in accordance with this permit must be maintained by Basin Electric as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).
4. Basin Electric shall document, by month, the hours of operation for the turbine generator, including startup and shutdown. By the 25th day of each month, Basin Electric shall total the hours of operation for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.6. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

#### E. Continuous Emissions Monitoring Systems

1. Basin Electric shall install, certify, maintain, and operate a continuous emission monitoring system (CEMS) consisting of a NO<sub>x</sub> monitor and a diluent gas (oxygen (O<sub>2</sub>) or carbon dioxide (CO<sub>2</sub>)) monitor, to determine the hourly NO<sub>x</sub> emission rate in ppm (ARM 17.8.749, ARM 17.8.340, and 40 CFR 60, Subpart KKKK).
2. Basin Electric shall comply with all applicable requirements of 40 CFR 60, Subpart KKKK, including requirements for CEMS installation, certification, quality assurance, and relative accuracy and performance testing (ARM 17.8.340 and 40 CFR 60, Subpart KKKK).

#### SECTION III: General Conditions

- A. Inspection – Basin Electric shall allow the Department’s representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.
- B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Basin Electric fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Basin Electric of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA, and ARM 17.763.
- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

- G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Basin Electric may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

## INSTRUCTIONS FOR COMPLETING EXCESS EMISSION REPORTS (EER)

PART 1 Complete as shown. Report total time during the reporting period in hours. The determination of plant operating time (in hours) includes time during unit startup, shutdown, malfunctions, or whenever pollutants of any magnitude are generated, regardless of unit condition or operating load.

Excess emissions include all time periods when emissions, as measured by the CEMS, exceed any applicable emission standard for any applicable time period.

Percent of time in compliance is to be determined as:  $(1 - (\text{total hours of excess emissions during reporting period} / \text{total hours of CEMS availability during reporting period})) \times 100$

PART 2 Complete as shown. Report total time the point source operated during the reporting period in hours. The determination of point source operating time includes time during unit startup, shutdown, malfunctions, or whenever pollutants (of any magnitude) are generated, regardless of unit condition or operating load.

Percent of time CEMS was available during point source operation is to be determined as:  $(1 - (\text{CEMS downtime in hours during the reporting period}^* / \text{total hours of point source operation during reporting period})) \times 100$

\* All time required for calibration and to perform preventative maintenance must be included in the CEMS downtime.

PART 3 Complete a separate sheet for each pollutant control device. Be specific when identifying control equipment operating parameters. For example: number of TR units, energizers for electrostatic precipitators (ESP); pressure drop and effluent temperature for baghouses; and bypass flows and pH levels for scrubbers. For the initial EER, include a diagram or schematic for each piece of control equipment.

PART 4 Use Table I as a guideline to report all excess emissions. Complete a separate sheet for each monitor. Sequential numbering of each excess emission is recommended. For each excess emission, indicate: 1) time and duration, 2) nature and cause, and 3) action taken to correct the condition of excess emissions. Do not use computer reason codes for corrective actions or nature and cause; rather, be specific in the explanation. If no excess emissions occur during the quarter, it must be so stated.

PART 5 Use Table II as a guideline to report all CEM system upsets or malfunctions. Complete a separate sheet for each monitor. List the time, duration, nature and extent of problems, as well as the action taken to return the CEM system to proper operation. Do not use reason codes for nature, extent or corrective actions. Include normal calibrations and maintenance as prescribed by the monitor manufacturer. Do not include zero and span checks.

- PART 6 Complete a separate sheet for each pollutant control device. Use Table III as a guideline to report operating status of control equipment during the excess emission. Follow the number sequence as recommended for excess emissions reporting. Report operating parameters consistent with Part 3, Subpart e.
- PART 7 Complete a separate sheet for each monitor. Use Table IV as a guideline to summarize excess emissions and monitor availability.
- PART 8 Have the person in charge of the overall system and reporting certify the validity of the report by signing in Part 8.

# EXCESS EMISSIONS REPORT

## PART 1

- a. Emission Reporting Period \_\_\_\_\_
- b. Report Date \_\_\_\_\_
- c. Person Completing Report \_\_\_\_\_
- d. Plant Name \_\_\_\_\_
- e. Plant Location \_\_\_\_\_
- f. Person Responsible for Review and Integrity of Report \_\_\_\_\_
- g. Mailing Address for 1.f. \_\_\_\_\_
- h. Phone Number of 1.f. \_\_\_\_\_
- i. Total Time in Reporting Period \_\_\_\_\_
- j. Total Time Plant Operated During Quarter \_\_\_\_\_
- k. Permitted Allowable Emission Rates: Opacity \_\_\_\_\_  
SO<sub>2</sub> \_\_\_\_\_ NO<sub>x</sub> \_\_\_\_\_  
TRS \_\_\_\_\_
- l. Percent of Time Out of Compliance: Opacity \_\_\_\_\_  
SO<sub>2</sub> \_\_\_\_\_ NO<sub>x</sub> \_\_\_\_\_ TRS \_\_\_\_\_
- m. Amount of Product Produced During Reporting Period \_\_\_\_\_  
\_\_\_\_\_
- n. Amount of Fuel Used During Reporting Period \_\_\_\_\_

## PART 2 – Monitor Information (Complete for each monitor).

- a. Monitor Type (circle one): Opacity                      SO<sub>2</sub>                      NO<sub>x</sub>                      O<sub>2</sub>  
CO<sub>2</sub>                      TRS Flow
- b. Manufacturer \_\_\_\_\_
- c. Model No. \_\_\_\_\_
- d. Serial No. \_\_\_\_\_



**PART 5 – Continuous Monitoring System Operation Failures**

Use Table II: Complete table as per instructions. Complete one sheet for each monitor.

**PART 6 – Control Equipment Operation During Excess Emissions**

Use Table III: Complete as per instructions. Complete one sheet for each pollutant control device.

**PART 7 – Excess Emissions and CEMS performance Summary Report**

Use Table IV: Complete one sheet for each monitor.

**PART 8 – Certification for Report Integrity, by person in 1.f.**

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THE INFORMATION PROVIDED IN THE ABOVE REPORT IS COMPLETE AND ACCURATE.

SIGNATURE \_\_\_\_\_

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

DATE \_\_\_\_\_







**TABLE IV**

**EXCESS EMISSIONS AND CEMS PERFORMANCE SUMMARY REPORT**

Pollutant (circle one): SO<sub>2</sub>    NO<sub>x</sub>                    TRS    H<sub>2</sub>S    CO                    Opacity

Monitor ID \_\_\_\_\_

Emission data summary <sup>1</sup>	CEMS performance summary <sup>1</sup>
1. Duration of excess emissions in reporting period due to: a. Startup/shutdown b. Control equipment problems c. Process problems d. Other known causes e. Unknown causes  2. Total duration of excess emissions  3. $\frac{\text{Total duration of excess emissions}}{\text{Total time CEM operated}} \times 100 =$	1. CEMS <sup>2</sup> downtime in reporting due to: a. Monitor equipment malfunctions b. Non-monitor equipment malfunctions c. Quality assurance calibration d. Other known causes e. Unknown causes  2. Total CEMS downtime  3. $\frac{\text{Total CEMS downtime}}{\text{Total time source emitted}} \times 100 =$

1. For opacity, record all times in minutes. For gases, record all times in hours. Fractions are acceptable (e.g., 4.06 hours)
2. CEMS downtime shall be regarded as any time CEMS is not measuring emissions.

Montana Air Quality Permit (MAQP) Analysis  
Basin Electric Power Cooperative – Culbertson Generation Station  
MAQP #4256-01

I. Introduction/Process Description

Basin Electric Power Cooperative (Basin Electric) operates a stationary electric power generation station to provide power to the electric power grid during daily and seasonal periods of peak power demand. The facility is located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border. The legal description is Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana. The facility is known as the Culbertson Generation Station.

A. Permitted Equipment

The facility consists of a single General Electric LMS100 turbine generator. This turbine generator is a nominal 100-megawatt (MW), simple-cycle, combustion turbine generator that runs solely off natural gas. The GE LMS100 was chosen for its generation capacity, startup response time, and thermal efficiency not available in other power generation turbines of comparable capacity.

B. Source Description

The generation plant consists of 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 only combusts natural gas which is supplied by an existing pipeline running through the Basin Electric property.

Emissions are limited by permit conditions that restrict operation of the turbine to no more than 3,400 hours per year. Oxides of nitrogen (NOx) emissions are controlled by the combustion of pipeline quality natural gas and water injection during combustion. The facility does not incorporate add-on controls for emissions of sulfur dioxide (SO<sub>2</sub>), particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>), or particulate matter with an aerodynamic diameter of 2.5 microns or less (PM<sub>2.5</sub>). Basin Electric is required by permit to combust only pipeline quality natural gas, which results in minimal SO<sub>2</sub> and PM<sub>10</sub> emissions. A catalytic oxidizer treats post-combustion exhaust emissions to reduce carbon monoxide (CO) and volatile organic compounds (VOC).

C. Permit History

**MAQP #4256-00** was issued final on January 21, 2009 for the construction and operation of one simple-cycle, combustion turbine generator (General Electric Model LMS 100) powered by natural gas with a nominal power output capacity of 100 megawatts (MW).

## D. Current Permit Action

On September 8, 2015, the Department received a letter from Basin Electric Power Cooperative (BEPC) requesting an amendment to MAQP #4256-00. BEPC of Federal Regulations (CFR) Part 60, Subpart KKKK emissions limit for Oxides of Nitrogen applicable during start-up, operation, and shut-down of the power generating unit. The permit was also updated to reflect the current language used by the Department. **MAQP #4256-01** replaces MAQP #4256-00

## II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department of Environmental Quality (Department). Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

### A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

Based on the emissions from the turbine, the Department determined that initial testing for NO<sub>x</sub> and CO is necessary. Furthermore, based on the emissions from the turbine, the Department determined that additional testing every 2 years is necessary to demonstrate compliance with the NO<sub>x</sub> and CO emission limit.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

Basin Electric shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM<sub>10</sub>

Basin Electric must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Basin Electric shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.
3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.
4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.
6. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.
7. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.

8. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). The turbine generator is considered an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts.
    - a. 40 CFR 60, Subpart A – General Provisions. This subpart applies to all equipment or facilities subject to an NSPS Subpart as listed below:
    - b. 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.
  9. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This source shall comply with the standards and provisions of 40 CFR Part 61, as appropriate.
  10. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:
    - a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an NESHAP Subpart as may be listed below:
    - b. 40 CFR 63, Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines: This subpart applies to stationary combustion turbines located at a major sources of hazardous air pollutant (HAP) emissions which emits any single HAP at a rate of at least 10 tons per year (TPY), or a combination of HAPs of at least 25 TPY. This subpart does not apply to the Basin Electric combustion turbine generator because emissions of no single HAP meet or exceed 10 TPY, and any combination of HAPs do not meet or exceed 25 TPY.
- D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:
1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.
  2. ARM 17.8.402 Requirements. Basin Electric must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or altered stack for the turbine generator is below the allowable 65-meter GEP stack height.
- E. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:
1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. A permit fee is not required for the current permit action because the permit action is considered an administrative permit change.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

F. ARM 17.8, Subchapter 7 – Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. The Basin Electric facility has a PTE greater than 25 TPY for NOx and CO; therefore, an air quality permit is required.
3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements.
  - (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. A permit application was not required for the current permit action because the permit change is considered an administrative permit change.
  - (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. An affidavit of publication of public notice was not required for the current permit action because the permit change is considered an administrative permit change.
6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT (Best Available Control Technology) shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Basin Electric of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.
12. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
13. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

G. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

This facility is not a major stationary source because this facility is not a listed source and the facility's PTE is below 250 tons per year of any pollutant (excluding fugitive emissions).

H. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:
  - a. PTE > 100 TPY of any pollutant;
  - b. PTE > 10 TPY of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
  - c. PTE > 70 TPY of PM<sub>10</sub> in a serious PM<sub>10</sub> nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #4256-00 for Basin Electric, the following conclusions were made:
  - a. The facility's PTE is greater than 100 TPY for NO<sub>x</sub>.
  - b. The facility's PTE is less than 10 TPY for any one HAP and less than 25 TPY for all HAPs.
  - c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
  - d. This facility is subject to a current NSPS (40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines).
  - e. This facility is not subject to any current NESHAP standards.
  - f. This source is a Title IV affected source; however, it is not a solid waste combustion unit.
  - g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that Basin Electric is subject to the Title V operating permit program. Basin Electric applied for and was issued an initial Title V Operating Permit on December 14, 2010 and submitted a timely and complete renewal application on June 1, 2015.

### III. BACT Determination

A BACT determination is required for each new or modified source. Basin Electric shall install on the new or modified source the maximum air pollution control capability which is technically practicable and economically feasible, except that BACT shall be utilized.

A BACT determination was not required for the current permit action because the permit change is considered an administrative permit change.

### IV. Emission Inventory

Emission Source	Tons per Year <sup>1</sup>						
	PM <sup>2</sup>	PM <sub>10</sub> <sup>3</sup>	PM <sub>2.5</sub> <sup>3</sup>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>
Natural Gas Turbine	2.9	10.2	10.2	133.5	36.5	2.3	1.9
Haul Roads	2.5	0.7	--	--	--	--	--
<b>Total Emissions</b>	<b>5.4</b>	<b>10.9</b>	<b>10.2</b>	<b>133.5</b>	<b>36.5</b>	<b>2.3</b>	<b>1.9</b>

1. Inventory based on permit conditions that limit turbine operation to 3,400 hours per year and a maximum rated design capacity of 738.1 MMBtu/hr.
2. Filterable particulate matter only.
3. Combined sum of filterable and condensable particulates. It is assumed that all particulates are less than 2.5 microns due to combustion properties of natural gas; thus PM<sub>10</sub>=PM<sub>2.5</sub>.

#### **GE LMS100 Turbine Generator**

##### PM Emissions (Filterable only)

Note: "Filterable PM" emissions in this inventory refers to the particulate matter collected in the "front-half" of the U.S. EPA Method 5 reference test (40 CFR Part 60, Appendix A), which collects PM from the probe and filter. This does not include the material that condenses in the impinger. The filterable PM emission factor was derived from the GE-reported worst-case uncontrolled emissions for PM<sub>10</sub> and PM<sub>2.5</sub> (assumed equivalent since most particulates will be less than 2.5 microns). However, because the GE value for PM<sub>10/2.5</sub> represents the sum of condensable and filterable particulate matter (i.e., Total PM) the component of filterable PM was determined using a ratio of filterable-to-total PM based on AP-42 emission factors for gas-fired turbine generators (AP-42, Table 3.1-2a, 4/00). Detailed calculations are provided below.

Total PM<sub>10/2.5</sub> (filterable + condensable) = 6.0 lb/hr (uncontrolled, GE data)

Turbine Maximum Heat Input = 738.1 MMBtu/hr

Total PM<sub>10/2.5</sub> Emission Factor for the GE LMS100 = 6.0 lb/hr ÷ 738.1 MMBtu/hr = 0.0081 lb/MMBtu.

Calculations for ratio of filterable-to-total PM based on AP-42 emission factors for stationary gas turbines:

Condensable PM = 0.0047 lb/MMBtu (water-steam injection per footnote 1, AP-42, Table 3.1-2a, 4/00)

Filterable PM = 0.0019 lb/MMBtu (water-steam injection per footnote 1, AP-42, Table 3.1-2a, 4/00)

Total PM = 0.0066 lb/MMBtu (water-steam injection per footnote 1, AP-42, Table 3.1-2a, 4/00)

Ratio of filterable-to-total PM = 0.0019 lb/MMBtu ÷ 0.0066 lb/MMBtu = 0.288

Apply ratio to GE factor for total PM to obtain filterable PM emission factor:  
Filterable PM emission factor =  $0.288 * 0.0081 \text{ lb/MMBtu} = 0.0023 \text{ lb/MMBtu}$

Inventory calculation:  
 $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.0023 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) = 2.94 \text{ tons}$

#### PM<sub>10</sub> Emissions (Filterable and condensable)

Emission factor derived based on the GE-reported worst-case uncontrolled PM of 6.0 lb/hr:  
 $6.0 \text{ lb/hr} \div 738.1 \text{ MMBtu/hr} = 0.0081 \text{ lb/MMBtu}$   
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.008129 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) = 10.20 \text{ tons}$

#### PM<sub>2.5</sub> Emissions (Filterable and condensable)

Emission factor derived based on the GE-reported worst-case uncontrolled PM of 6.0 lb/hr:  
 $6.0 \text{ lb/hr} \div 738.1 \text{ MMBtu/hr} = 0.008129 \text{ lb/MMBtu}$   
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.008129 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) = 10.20 \text{ tons}$

#### NO<sub>x</sub> Emissions

Emission factor derived based on the GE-reported worst-case NO<sub>x</sub> of 78.53 lb/hr with water injection:  
 $78.53 \text{ lb/hr} \div 738.1 \text{ MMBtu/hr} = 0.1064 \text{ lb/MMBtu}$   
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.1064 \text{ lbs/MMBtu}) * (0.0005 \text{ tons/lb}) = 133.51 \text{ tons}$

#### CO Emissions

Emission factor derived based on the GE-reported worst-case uncontrolled CO of 215.26 lb/hr:  
 $215.26 \text{ lb/hr} \div 738.1 \text{ MMBtu/hr} = 0.291 \text{ lb/MMBtu}$   
Control Efficiency = 90% (catalytic oxidizer)  
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.291 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) * (1-90/100) = 36.51 \text{ tons}$

#### VOC Emissions

Emission factor derived based on the GE-reported worst-case uncontrolled VOC of 13.28 lb/hr:  
 $13.28 \text{ lb/hr} \div 738.1 \text{ MMBtu/hr} = 0.018 \text{ lb/MMBtu}$   
Control Efficiency = 90% (catalytic oxidizer)  
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.018 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) * (1-90/100) = 2.26 \text{ tons}$

#### SO<sub>2</sub> Emissions

Note: Potential maximum SO<sub>2</sub> emissions for the turbine were calculated using a mass balance approach that assumed maximum allowable amount of sulfur in pipeline quality natural gas and complete transformation and emission as SO<sub>2</sub>.

Assumptions/Constants:  
0.5 gr sulfur / 100 scf (40 CFR 72.2 definition for “pipeline quality natural gas”).  
738.1 MMBtu/hr, LHV, design basis fuel flow per GE.  
959 Btu/scf, LHV, natural gas content per GE.  
32 lb/lb-mol S  
64 lb/lb-mol SO<sub>2</sub>

Emission rate using mass balance:  $(738.1 \text{ MMBtu/hr}) * (10^6 \text{ Btu / MMBtu}) * (1/959 \text{ Btu/scf}) * (0.5 \text{ gr S} / 100 \text{ scf}) * (\text{lb} / 7000 \text{ gr}) * (64 \text{ lb/lb-mol SO}_2 / 32 \text{ lb/lb-mol S}) = 1.10 \text{ lb SO}_2 / \text{hr}$   
Emission Factor:  $(1.10 \text{ lb SO}_2 / \text{hr}) * (1 / 738.1 \text{ MMBtu/hr}) = 0.00149 \text{ lb SO}_2/\text{MMBtu}$   
Calculation:  $(3400 \text{ hrs}) * (738.1 \text{ MMBtu/hr}) * (0.00149 \text{ lb/MMBtu}) * (0.0005 \text{ tons/lb}) = 1.87 \text{ tons}$

## Haul Roads

Vehicle Miles Traveled (VMT) per Day = 5 VMT/day (Estimate)

VMT per hour = (5 VMT/day) \* (day/24 hr) = 0.21 VMT/hr

Hours of Operation = 3,400 hours

### PM Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites per AP 42, Ch. 13.2.2, 11/06.

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 14.13 \text{ lb/VMT}$

Where: k = constant = 4.9 lb/VMT (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 8.5 % (Mean value for construction sites, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)

a = constant = 0.7 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>30</sub>/TSP, AP 42, Table 13.2.2-2, 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (3400 hours) \* (0.21 VMT/hr) \* (14.13 lb/VMT) \* (ton/2000 lb) \* (1-50/100) = 2.50 tons

### PM10 Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites per AP 42, Ch. 13.2.2, 11/06.

Emission Factor =  $k * (s / 12)^a * (W / 3)^b = 4.04 \text{ lb/VMT}$

Where: k = constant = 1.5 lb/VMT (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

s = surface silt content = 8.5 % (Mean value for construction sites, AP 42, Table 13.2.2-1, 11/06)

W = mean vehicle weight = 54 tons (1994 average loaded/unloaded or a 40 ton truck)

a = constant = 0.9 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

b = constant = 0.45 (Value for PM<sub>10</sub>, AP 42, Table 13.2.2-2, 11/06)

Control Efficiency = 50% (Water spray or chemical dust suppressant)

Calculation: (3400 hours) \* (0.21 VMT/hr) \* (4.04 lb/VMT) \* (ton/2000 lb) \* (1-50/100) = 0.72 tons

## V. Existing Air Quality

The turbine generator facility is located approximately 7.2 miles northeast of Culbertson, Montana, about 16 miles due west of the Montana-North Dakota border. The legal description is Section 5, Township 28 North, Range 57 East, Roosevelt County, Montana. The air quality of this area is classified as either “better than national standards” or unclassifiable/attainment with respect to National Ambient Air Quality Standards (NAAQS) for all criteria pollutants. The closest Prevention of Significant Deterioration (PSD) Class I areas are the Fort Peck Indian Reservation (FPIR) at approximately 10.8 miles away minimum distance, and the Medicine Lake Wilderness Area (MLWA) at approximately 14.5 miles away minimum distance. The next closest Class I area is the UL Bend Wilderness Area at approximately 88 miles to the southwest.

## VI. Air Quality Impacts

The Department determined that there will be no impacts from this permitting action because this permitting action is considered an administrative action. Therefore, the Department believes this action will not cause or contribute to a violation of any ambient air quality standard.

## VII. Ambient Air Impact Analysis

The current permit action is an administrative permit action with no changes to maximum allowable emission levels. Therefore, no ambient air impact analysis was performed. An Ambient Air Impact Analysis from the initial facility permitting effort is on file with the Department.

## VIII. Taking or Damaging Implication Analysis

As required by 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? (e.g., 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)].
		5a. Is there a reasonable, specific connection between the government requirement and legitimate state interests?
		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.

## VIII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an environmental assessment is not required.

Analysis Prepared By: John P. Proulx

Date: September 9, 2015