November 19, 2024

Beth Stimatz
NorthWestern Energy
Station W/Cobb Storage Field Station 17
242 Hay Lake Road
Cut Bank, Montana 59427

Sent via email: beth.stimatz@northwestern.com

RE: Final Permit Issuance for MAQP #2783-13

Dear Beth Stimatz:

Montana Air Quality Permit (MAQP) #2783-13 is deemed final as of November 19, 2024, by DEQ. This permit is for NorthWestern Energy – Station W/Cobb Storage field Station 17, a compressor station. All conditions of the Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For DEQ,

Eric Merchant
Permitting Services Section Supervisor
Air Quality Bureau
(406) 444-3626

Emily Hultin
Air Quality Engineering Scientist
Air Quality Bureau
(406) 444-204

Montana Department of Environmental Quality
Air, Energy & Mining Division
Air Quality Bureau

Montana Air Quality Permit #2783-13

NorthWestern Energy
Cobb Storage Field Station 17/Station W
Section 15, Township 35 North, Range 5 West
40 East Broadway
Butte, MT 59701

November 19, 2024

MONTANA AIR QUALITY PERMIT

Issued To: NorthWestern Energy
Cobb Storage Field, Station 017
40 East Broadway
Butte, MT 59701

MAQP: #2783-13
Application Complete: 09/05/2024
Preliminary Decision: 10/04/2024
Department Decision: 11/01/2024
Permit Final: 11/19/2024
AFS #: 035-0009

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to NorthWestern Energy (NWE) 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. Plant Location

NWE owns and operates a natural gas compressor station and associated equipment located in the Northwest ¼ of the Northwest ¼ of Section 15, Township 35 North, Range 5 West in Glacier County, Montana. The facility is known as the Cobb Storage Field, Station 017 (or Station W). A complete list of the permitted equipment can be found in Section I.A of the Permit Analysis.

B. Current Permit Action

On August 8, 2024, the Department of Environmental Quality (DEQ) received a request from NWE to replace the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station. NWE provided a fully updated Emissions Inventory.

DEQ also updated permit references of the "Department" to "DEQ", and references of "NorthWestern" to "NWE." Further, DEQ included limits previously taken by NWE, but not stated within the permit.

Section II: Conditions and Limitations

A. Emission Limitations

1. Emissions from each of the five 1,600 hp Solar Saturn turbines shall not exceed the following (ARM 17.8.752):

Oxides of Nitrogen (NO_x)[1]	6.32 pounds per hour (lb/hr)
Carbon Monoxide (CO)	7.69 lb/hr

[1] NO_x reported as NO_2.

Volatile Organic Compounds (VOC) 0.55 lb/hr

2. Emissions from the 1,100-hp White Superior compressor engine shall not exceed the following (ARM 17.8.749):

NO_x[1]	36.46 lb/hr
CO	7.28 lb/hr
VOC	1.21 lb/hr

3. Emissions from two 1,340-hp lean burn engines shall be controlled with an oxidation catalyst and an air-to-fuel (AFR) controller capable of maintaining the required emission limits in Sections II.A.4 and II.A.5 through all load and speed changes at which the engine may be operated (ARM 17.8.752).

4. The following gram per brake horsepower-hour (g/bhp-hr) emissions limit for the two 1,340-hp lean burn engines shall be met at all operating load conditions. (ARM 17.8.752):

Emission Factors (lean-burn engine)

NO_x	2.0 g/bhp-hr
CO	0.15 g/bhp-hr
VOC	0.12 g/bhp-hr

5. The pound per hour (lb/hr) emission limits for the two 1,340-hp lean burn engines shall be determined using the following equation and pollutant specific g/bhp-hr emission factors from Sections II.A.4 (ARM 17.8.749):

Equation

Emission Limit (lb/hr) = Emission Factor (g/bhp-hr) * maximum rated design capacity of engine (bhp) * 0.002205 lb/g

NO_x[1]	5.91 lb/hr
CO	0.44 lb/hr
VOC	0.35 lb/hr

6. The total annual NO_x emissions from the 1,100 hp White Superior Engine, the two 1,400 hp Solar Saturn Turbines, the five 1,600 hp Solar Saturn Turbines, and the two 1,340-hp lean burn engines shall not exceed 95 TPY based on a rolling 12-calendar-month total (ARM 17.8.749 and ARM 17.8.1204).

7. NWE shall operate and maintain the condenser on the Glycol Dehydrator unit to minimize VOC and Hazardous Air Pollutant (HAP) emissions (ARM 17.8.749).

8. NWE shall only compress and combust pipeline quality natural gas (ARM 17.8.749).

9. NWE shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

10. NWE 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).

11. NWE shall not cause or authorize emissions to be discharged into the atmosphere from haul roads, access roads, parking lots, or the general plant property without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

12. NWE shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant, as necessary, to maintain compliance with the reasonable precautions limitation in Section II.A.11 (ARM 17.8.749).

13. NWE shall comply with any applicable standards, limitations, reporting, recordkeeping, and notification requirements contained in Title 40, Code of Federal Regulations 40 CFR 63, Subpart ZZZZ, 40 CFR 60, Subpart KKKK, and 40 CFR 60, Subpart OOOOb (ARM 17.8.342, 40 CFR 60, Subpart KKKK, 40 CFR 60 Subpart OOOOb, and 40 CFR 63, Subpart ZZZZ).

14. NWE shall limit the hours of operation for the five new 1,600 hp turbines to operate for up to 12,000 hours per calendar year total, which equates to 2,400 hours per year, per engine. (ARM 17.8.752 and 40 CFR 60, Subpart KKKK).

15. NWE shall limit the operating hours of the BS & R Reboiler (IEU11) to 500 hours per calendar year. (ARM 17.8.749)

16. NWE shall limit the operating hours of the 1,100 hp White Superior 4-Stroke Lean-Burn Compressor engine (EU5) to 2,000 hours per calendar year (ARM 17.8.749).

17. NWE shall limit the operating hours of the 158 hp Onan Cummings Emergency Backup Generator (IEU17) to 500 hours per calendar year (ARM 17.8.749).

18. NWE shall limit the operating hours of the 4 MMBtu/hr Line Heater (IEU19) to 4,000 hours per calendar year (ARM 17.8.749).

B. Testing Requirements

1. Each 1,340-hp lean-burn engine shall be initially tested for nitrogen oxides (NO_x) and carbon monoxide (CO), concurrently, and then every 4 years thereafter (or according to another testing/monitoring schedule as may be approved by DEQ), to demonstrate compliance with emissions limits in Section II.A.4 and II.A.5. The initial source test shall be conducted within 180 days of the initial startup date of each unit (ARM 17.8.105 and ARM 17.8.749).

2. The existing 1,100 hp White Superior Engine, the two 1,400 hp Solar Saturn Turbines, and the five 1600 hp Solar Saturn Turbines shall be initially tested for nitrogen oxides (NO_x) and carbon monoxide (CO), concurrently, to demonstrate compliance with emissions limits in Section II.A.1, II.A.2 and II.A.4, II.A5, and then every 4 years thereafter (or according to another testing/monitoring schedule as may be approved by DEQ). If NWE has tested any of these eight engines within the two years prior to issuance of MAQP #2783-10, those test results may be substituted for the initial test. Otherwise, NWE shall test these engines within two years of permit issuance of MAQP #2783-10.

3. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

4. DEQ may require testing (ARM 17.8.105).

C. Operational Reporting Requirements

1. NWE shall supply DEQ with annual production information for all emission points, as required by DEQ 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. For reporting purposes, the sources shall be identified using the source numbers contained in Section I.A of the Permit Analysis.

   Production information shall be gathered on a calendar-year basis and submitted to DEQ by the date required in the emission inventory request. Information shall be in the units required by DEQ. 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. NWE shall notify DEQ of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include a 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 or the addition of a new emission unit. The notice must be submitted to DEQ, in writing, 10 days prior to start up 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(1)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by NWE 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 DEQ, and must be submitted to DEQ upon request (ARM 17.8.749).

4. NWE shall document, by month, the total hours of operation of the five Solar Saturn turbines (five 1,600 hp turbines). By the 25th day of each month, NWE shall total the total hours of operation of the five Solar Saturn turbines (five 1,600 hp turbines) for the previous month. The monthly information will be used to verify

compliance with the rolling 12-month limitation in Section II.A.6. Emissions shall be totaled by multiplying the run hours by the average NO_x emission rate achieved during the most recent emissions compliance test. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. NWE shall document, by month, the hours of operation of the 1,100-hp White Superior engine. By the 25th day of each month, NWE shall total the hours of operation of the 1,100-hp White Superior engine for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.6.

   Emissions shall be totaled by multiplying the run hours by the average NO_x emission rate achieved during the most recent emissions compliance test. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. NWE shall document, by month, the hours of operation of each new 1,340-hp lean burn engine. By the 25th day of each month, NWE shall total the hours of operation of each 1,340-hp lean burn engine for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.6. Emissions shall be totaled by multiplying the run hours by the average NO_x emission rate achieved during the most recent emissions compliance test. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

7. NWE shall annually certify that its emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204(3)(b). The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emissions inventory information (ARM 17.8.749 and ARM 17.8.1204).

D. Notification

NWE shall provide DEQ with written notification of the actual start-up date of each of the five new 1,600 hp natural gas combustion turbines within 15 days after the actual start-up date. The notification shall include the engine model and maximum rated design capacity (ARM 17.8.749).

Section III: General Conditions

A. Inspection – NWE shall allow DEQ'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 NWE fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving NWE 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.

E. Appeals – Any person or persons jointly or severally adversely affected by DEQ's decision may request, within 15 days after DEQ 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 DEQ'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 DEQ'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, DEQ's decision on the application is final 16 days after DEQ'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 DEQ at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by NWE 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).

Montana Air Quality Permit (MAQP) Analysis
NorthWestern Energy
MAQP #2783-13

I. Introduction/Process Description

A. Permitted Equipment

NorthWestern Energy (NWE) owns and operates a natural gas compressor station and associated equipment located in the Northwest ¼ of the Northwest ¼ of Section 15, Township 35 North, Range 5 West in Glacier County, Montana. The facility is known as the Cobb Storage Field, Station 017 (or Station W). The facility includes, but is not limited to, the following equipment:

Source #	Title V I.D. #	NorthWestern Internal I.D.	Year Installed	Make	Model	Size
03	EU03	Engine #03	2024	Solar	Saturn	1,600-hp
04	EU04	Engine #04	2024	Solar	Saturn	1,600-hp
05	EU05	Engine #05	1979	White Superior	8GTL/MW62	1,100-hp
06	EU06	Engine #06	2024	Solar	Saturn	1,600-hp
07	EU07	Engine #07	2024	Solar	Saturn	1,600-hp
08	EU08	Engine #08	2024	Solar	Saturn	1,600-hp
09	IEU01	Standby Reboiler	----------	BS & B	----------	0.5 MMBtu/hr
10	IEU02	Boiler	----------	Teledyne-Laars	----------	0.85 MMBtu/hr
11	IEU03	Reboiler	1994	Enertek	3486	0.6 MMBtu/hr
12	IEU04	Building Heaters	----------	----------	----------	< 1 MMBtu/hr
13	IEU05	Process Valves	----------	----------	----------	----------
14	IEU06	In Plant Traffic	----------	----------	----------	----------
15	IEU07	Emergency Generator	2001	Onan Cummins	100GGHD	158-hp
16	IEU08	Methanol Tank	----------	----------	----------	1,000-gallon
17	EU09	Dehydrator Tanks (2)	----------	----------	----------	1,000/500 gallon
18	EU10	Dehydrator Vent	----------	----------	----------	----------
Source #	Title V I.D. #	NorthWestern Internal I.D.	Year Installed	Make	Model	Size
19	EU11	Engine 1	2015	Caterpillar		1,340 hp
20	EU12	Engine 2	2015	Caterpillar		1,340 hp
21	IEU09	Line Heater	2015			4 MMBtu/hr

- Horsepower – hp
- Million British thermal unit per hour – MMBtu/hr

B. Source Description

The complex has two primary purposes. The first is to pump the field gas up to the required pressure in the natural gas transmission system. Compression of the gas is accomplished using the compressor engines and the turbines described above. Three engine heaters provide heat to the various station facilities.

The second purpose of the complex is to "dry" the gas as it is being processed. The gas contains some moisture, which must be removed from the system prior to being sent into the transmission system. This is accomplished with a dehydrator, also commonly called a reboiler or glycol unit.

Pipeline quality natural gas is injected into the Cobb Storage Field during low use periods, primarily the summer. The gas is retrieved from storage during high use periods, primarily the winter. During storage, the gas takes in some moisture and other material from the geologic formation. When the gas is retrieved, moisture and impurities are removed and the gas is brought up to pipeline pressure before being pumped into the main line for market.

In preparation for storage, natural gas is piped from NWE's Main Line #1 Station to the Cobb Storage Field Station where it is sent through a "scrubber." In the scrubber, water and other liquid constituents (e.g. heavy ends, butane, C5+) drop out of the gas stream. The scrubbed gas is then injected into the formation for storage.

When consumer demand is great enough, natural gas is retrieved from storage. From the formation, the gas is routed through a scrubber to remove water and other liquid constituents that have been taken up during storage. The gas is then compressed to a pressure ranging from 550 to 650 pounds per square inch (psi) using natural gas fired engine or turbine driven compressors. The Cobb Storage Field Station uses both reciprocating internal combustion engines (RICE) and combustion turbines (CT) for compression activities. After the gas has been compressed, it is dehydrated by a triethylene glycol (TEG) dehydrator. In the dehydrator, wet gas flows through two contactor towers where it bubbles through a "lean" TEG solution that absorbs moisture. The wet or "rich" TEG flows from the towers to either a 0.5-million British thermal unit per hour (MMBtu/hr) reboiler or a 0.6-MMBtu/hr reboiler. Typically, the 0.5-MMBtu/hr reboiler is used as a backup to the 0.6-MMBtu/hr reboiler.

Whichever reboiler is in use, the TEG is heated to approximately 300 to 350 degrees Fahrenheit (°F), driving off the water and making the glycol "lean" again. Each reboiler is associated with a condenser/storage tank that receives vapors from the reboiler, or still vent. As these vapors leave the reboiler, they condense in the piping and tank and produce a mixture of water and natural gas liquids. This process mitigates potential atmospheric emissions.

C. Permit History

On July 21, 1993, the Department of Environmental Quality (Department) issued **Permit #2783-00** to Montana Power Company (MPC) for the operation of their compressor station and associated equipment located in the Northwest ¼ of the Northwest ¼ of Section 15, Township 35 North, Range 5 West in Glacier County, near Cut Bank, Montana. The station was identified as the Cobb Storage Field, Station 017-1 through 6.

On February 9, 1994, the Department issued **Permit #2783-01** to MPC. This modification revised the emission limitations from a gram per brake horsepower-hour (g/bhp-hr) limit to a pound per hour (lb/hr) limit. In addition, to clarify nitrogen oxides (NO_x) mass emission calculations, NO_x emission limitations were identified as nitrogen dioxide (NO_2). Furthermore, a 90-day testing extension was granted to MPC. Permit #2783-01 replaced Permit #2783-00.

On September 16, 1994, the Department issued **Permit #2783-02** to MPC. This permit action increased the capacity on two of the Solar Saturn turbines (units #3 and #4) from 1,100-Horsepower (hp) to 1,400-hp and added a third 1,400-hp Solar Saturn turbine (unit #6). In addition, the 1,100-hp White Superior carbon monoxide (CO) mass emission rates were increased to 7.28 lb/hr. The increase was necessary because the previous CO limits were based on manufacturer data under specific, ideal conditions that are not consistently present at the Cobb Storage Field. The Cobb Storage Field operations were also limited to 6,132 hours per year (hr/yr) in order to limit the facility's potential emissions below the Prevention of Significant Deterioration (PSD) thresholds. Also, the Rite Leating 0.76-MMBtu/hr boiler was replaced with a Teledyne-Laars 0.85-MMBtu/hr boiler. Permit #2783-02 replaced Permit #2783-01.

On July 24, 1997, the Department issued **Permit #2783-03** to MPC. This permit action included 40 CFR 60, Subpart GG as a condition of the permit because it was determined to be applicable to the facility. The modification contained exemptions from the monitoring requirements of 40 CFR 60, Subpart GG based on the requirement of MPC to compress and combust only pipeline quality natural gas at the Cobb Storage station. The modification also updated the rule references in the permit. Permit #2783-03 replaced Permit #2783-02.

On August 28, 1997, the Department issued **Permit #2783-04** to MPC. MPC requested that the permit be modified to correctly identify the two 240-hp Ingersoll Rand engines as 300-hp Ingersoll Rand engines. The original application and permit had identified the engines as 240-hp engines. MPC discovered the mistake and requested that the permit be modified to reflect the correct engine size. Permit #2783-04 replaced Permit #2783-03.

On July 23, 2000, the Department issued **Permit #2783-05** to MPC. MPC had requested an alteration to Permit #2783-04 that included the installation of two new 1,400-hp Solar Saturn turbine compressors. MPC requested a limitation on all of the compressors at the site to stay below the threshold that would require a PSD permit.

Separate limitations were assigned to each of the three different types of compressors. Also, the Department reviewed the applicability of 40 CFR 60, Subpart GG and determined that Subpart GG is not applicable to this facility. As a result of the determination, the limitation of 150 part per million (ppm) on the 1,400-hp compressors and the monitoring requirements were removed from the permit. Permit #2783-05 replaced Permit #2783-04.

On November 23, 2002, the Department issued **Permit #2783-06** to NorthWestern. The Department received a letter on October 18, 2002, dated October 15, 2002, from NorthWestern informing the Department that the name change from MPC to NorthWestern was complete. NorthWestern requested that the Department modify the permit to reflect the name change. In addition, NorthWestern requested that the Department modify the permit analysis to be consistent with the equipment, equipment size, and equipment descriptions for the operating permit. In addition, NorthWestern requested that the Department modify the permit to correctly identify the two Solar Saturn turbines that were permitted in July 2000, as 1,450-hp. Permit Application #2783-05 and Permit #2783-05 incorrectly identified the two Solar Saturn turbines as 1,400-hp. Permit #2783-06 incorporated NorthWestern's requests into the permit. Permit #2783-06 replaced Permit #2783-05.

On October 30, 2003, the Department received an administrative amendment request from NorthWestern for Permit #2783-06. NorthWestern requested that the every 4-year testing requirements for each of the two 1,450-hp Solar Saturn turbines and each of the three 1,400-hp Solar Saturn turbines be removed from the permit because NorthWestern's Title V Operating Permit #OP2783-02, as issued as final on September 16, 2003, requires at least annual testing on each of the five turbines.

On December 23, 2003, the Department issued **Permit #2783-07** to NorthWestern. On October 30, 2003, the Department received an administrative amendment request from NorthWestern to remove the every 4-year testing requirements for each of the five turbines from the MAQP because Operating Permit #OP2783-02 required at least annual testing on each of the five turbines. In addition, the permit format, language, and rule references were updated to reflect the Department's current permit format, language, and rule references. Permit #2783-07 replaced Permit #2783-06.

On April 17, 2008, the Department issued **Permit #2783-08**. On February 7, 2008, the Department received a request from NorthWestern to change the name on Permit #2783-07 from NorthWestern Corporation to NorthWestern. The permit action incorporated the requested name change as well as updated the permit format and language to reflect the Department's current permit format and language. Permit #2783-08 replaced Permit #2783-07.

On November 12, 2013, the Department received a request from NorthWestern to remove emitting units, reduce hours of operation limits and include an enforceable permit condition to require a condenser as control equipment on the glycol dehydrator.

These changes reduced the potential to emit (PTE) for the facility to below Title V levels and allowed NorthWestern to request that Operating Permit #OP2783-05 be revoked. This permit action incorporated the requested changes as well as updated the permit format and language to reflect the Department's current permit format and language. **MAQP #2783-09** replaced MAQP #2783-08.

On April 9, 2015, the Department received a request from NorthWestern to add two Caterpillar 1340-hp lean burn engines, the addition of a natural gas line heater up to 4 MMBtu/hr and implementation of a combined NO_x annual emission limit (95 tons per year) for the existing six engines plus the two new lean burn engines. The annual NO_x limit would apply to the 1,100 hp White Superior Engine, the two 1,400 hp Solar Saturn Turbines, the three 1,450 hp Solar Saturn Turbines and the two new 1,340 hp lean burn engines. Implementing an annual NO_x limit for these engines kept the permit below 100 tons per year and below Title V permitting thresholds. **MAQP #2783-10** replaced MAQP #2783-09.

On May 10, 2016, the Department received a request from NorthWestern Energy for a permit modification to change the current carbon monoxide (CO) emission rate of 0.04 grams per brake horse power hour (g/bhp-hr) to the manufacturer guaranteed emission rate of 0.15 g/bhp-hr. While the 0.04 g/bhp-hr emission rate was initially guaranteed by the emission control system vendor, it was determined upon final design and verified by emissions testing that the aggressive emission reduction originally proposed as BACT would not be consistently attainable over the life of the catalyst. By working with the catalyst and engine manufacturers, NWE was able to successfully demonstrate compliance with that emission level. However, there was no compliance margin and the catalyst could not be expected to perform at that level consistently during the life of the catalyst. The permit modification requested that the emissions limitations for CO be adjusted to the manufacturer's re-evaluated guarantee of 0.15 g/bhp-hr, which continued to fulfill the BACT requirement of achieving a 90% or greater reduction for carbon monoxide (CO) emissions. Under the new emissions rate, emission reduction for CO had been calculated through source testing to be 91.7%. **MAQP #2783-11** replaced MAQP #2783-10.

During an internal review of MAQP #2783-11, DEQ noted typographical mistakes regarding emission rate units in the Permit Analysis. DEQ contacted NorthWestern and reported the errors. On August 1, 2016, DEQ received a written request via email, asking DEQ to fix the errors with an administrative amendment. **MAQP #2783-12** replaced MAQP #2783-11.

D. Current Permit Action

On August 8, 2024, the Department of Environmental Quality (DEQ) received a request from NorthWestern Energy (NWE) to replace the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines, with five 1,600 hp natural gas combustion turbines at the NWE Station W/Station 17 Compressor Station.

DEQ also updated references of the Department to DEQ, and references of NorthWestern to NWE. **MAQP #2783-13** replaces MAQP #2783-12.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

F. Response to Public Comments

No public comments were received.

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 DEQ. Upon request, DEQ will provide references for the location of complete copies of all applicable rules or 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 DEQ, 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 DEQ.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by DEQ, 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).

   NWE shall comply with 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 DEQ upon request.

4. ARM 17.8.110 Malfunctions. (2) DEQ 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 which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

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

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_{10}
11. ARM 17.8.230 Fluoride in Forage

NWE 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. (1) This rule requires that no person may cause or authorize emissions to be discharged to an outdoor atmosphere from any source installed on or before November 23, 1968, that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes. (2) This rule requires that no person may cause or authorize emissions to be discharged to an 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. Under this rule, NWE 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.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1971, no person shall burn liquid or solid fuels containing sulfur in excess of 1

pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel calculated as hydrogen sulfide at standard conditions. NWE will burn natural gas in the fuel burning equipment, which will meet this limitation.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. The owner and operator of any stationary source or modification, as defined and applied in 40 CFR Part 60, shall comply with the standards and provisions of 40 CFR Part 60. NWE is subject to the following subparts:

   a. Subpart KKKK: Standards of Performance for Stationary Combustion Turbines.

      The replacement of the existing natural gas turbines includes stationary combustion turbines with a heat input at peak load equal to or great than 10MMBtu/hr and constructed after February 18, 2005. The new gas turbines have an equivalent heat input capacity of 16.6 MMBtu/hr and have been or will be manufactured after 2005, making this subpart applicable.

   b. Subpart OOOOb: Standards of Performance for Crude Oil and Natural Gas Facilities for Which Construction, Modification, or Reconstruction Commenced After December 6, 2022.

      The replacement of the existing natural gas combustion turbines will take place after the December 6, 2022, deadline, making this subpart applicable.

   NWE is not subject to the following subparts:

   a. Subpart GG: Standards of Performance for Stationary Gas Turbines
      This does not apply to the turbines at this facility because the turbines are less than 10.7 GJ/hr.

   b. Subpart KKK: Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants
      This is not applicable to this facility.

7. ARM 17.8.342 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 applicable, including the following subparts:

   a. Subpart A: General Provisions
      This subpart applies to all equipment or facilities subject to a specific Part 63 subpart.

   b. Subpart HH: National Emission Standards for Hazardous Air Pollutants from Oil and Natural Gas Production Facilities.

This subpart applies to listed sources and/or facilities that are a major source of HAPs or non-listed sources and/or facilities that are an area source for HAPs and that include a triethylene glycol (TEG) dehydrator. Station W is an area source of HAPs. Station W's glycol dehydration unit emits less than 1 ton per year of benzene, making it exempt from the control requirements listed in Subpart HH. Records of the determinations applicable to this exemption must be maintained as required in 40 CFR 63.774(d)(1).

c. Subpart HHH: National Emission Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage Facilities
This facility is not a major source of HAPs and is not affected under this subpart.

d. Subpart YYYY: National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines
This facility is a minor source of HAPs, so this subpart does not apply.

e. Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants from Reciprocating Internal Combustion Engines.
Station W is an area source of HAPs and the engines are considered to be an existing stationary RICE under this subpart. Engines at Station W are considered to be remote engines as defined under this subpart.

D. 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 DEQ. NWE submitted the appropriate permit application fee for the current permit action.

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 DEQ by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by DEQ. This operation fee is based on the actual or estimated 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. DEQ 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 which pro-rate the required fee amount.

E. 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 alteration to construct, alter or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tons per year of any pollutant. NWE has a PTE greater than 25 tons per year of NO_x, CO, and VOC; 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, alteration or use of a source. NWE submitted the required permit application for the current permit action. (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. NWE submitted an affidavit of publication of public notice for the August 12, 2024, issue of *The Great Falls Tribune*, a newspaper of general circulation in Cascade County, Montana, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by DEQ 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 shall be utilized. The BACT analysis is discussed 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 DEQ 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 NWE 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 DEQ'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 17.8.762 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 altered 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.

12. 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).

13. 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.

14. 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 DEQ.

F. 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 FCAA that it would emit, except as this subchapter would otherwise allow.

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

G. 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 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one HAP, PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as DEQ may establish by rule;

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} 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 #2783-13 for NWE, the following conclusions were made:

   a. The facility's PTE is less than 100 tons/year for any pollutant.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons per year of all HAPs.

   c. This source is not located in a serious PM_{10} nonattainment area.

   d. This facility is subject to the current NSPS standards, 40 CFR 60, Subpart KKKK and Subpart OOOOb.

   e. This facility is subject to a current NESHAP (considered an area source subject to 40 CFR 63, Subpart A, Subpart HH, and Subpart ZZZZ).

   f. This source is not a Title IV affected source, nor a solid waste combustion unit.

   g. This source is not an EPA designated Title V source.

   h. As allowed by ARM 17.8.1204(3), DEQ may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's potential to emit.

      NWE has taken federally enforceable permit limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source, thus a Title V operating permit is not required. DEQ

determined that the annual reporting requirements contained in the permit are sufficient to satisfy this requirement.

i. ARM 17.8.1204(3). DEQ may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations which limit that source's PTE.

i. In applying for an exemption under this section the owner or operator of the facility shall certify to DEQ that the source's PTE does not require the source to obtain an air quality operating permit.

ii. Any source that obtains a federally enforceable limit on PTE shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit

3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness.

NWE shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit as required by ARM 17.8.1204 (3)(b).

The annual certification shall comply with requirements of ARM 17.8.1207. The annual certification shall be submitted along with the annual emission inventory information.

III. BACT Determination

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

BACT Analysis – NO_x

NO_x control technologies available for natural gas combustion turbines are generally divided into two categories: combustion controls and post-combustion controls. Combustion controls reduce the amount of NO_x generated in the turbine combustion process include dry low NO_x (DLN) systems, catalytic combustion, and water/steam injection. The only viable post-combustion control to remove NO_x from the exhaust gas is selective catalytic reduction (SCR).

Step 1 – Identify All Available NO_x Control Technologies

The NO_x control technologies evaluated in this study include:

- Lean premix combustion, as proposed
- Addition of "dry low NO_x" (DLN) technology
- Addition of catalytic combustion
- Water/steam injection
- Selective catalytic reduction (SCR)

Step 2 - Eliminate Technically Infeasible NO_x Control Options

Water/steam injection for NO_x control will not be considered for the facility because of the remote location and the lack of water infrastructure on site. Catalytic combustion is not commercialized, and the durability of the catalyst is unproved (U.S. DOE, 1999)[1]. Therefore, this technology is considered infeasible and will be eliminated from the NO_x control technology list. The remaining control options are considered technically feasible and will be evaluated further.

Note: 1 U.S. Department of Energy, Cost Analysis of NO_x Control Alternatives for Stationary Gas Turbines, November 5, 1999

Step 3 - Rank Control Technologies by NO_x Control Effectiveness

Table 1 lists the NO_x control technologies and emission rates for the various NO_x control options. The control values are all based on the exhaust NO_x concentration in units of parts per million (ppm) at 15% oxygen (O_2) in the exhaust gas.

Table 1. Ranked NO_x Control Technology Effectiveness

Control Technology	NO_x Reduction (% Control)	NO_x Emission Rate (lb/hr)
Turbine with lean premix, as proposed (100ppm @ 15% O_2)	0%	6.32
Dry Low NO_x – DNL (25 ppm @ 15% O_2)	75%	1.58
Selective Catalytic Reduction – SCR (9ppm @ 15% O_2)	91%	0.569

Step 4 - Evaluate Most Effective NO_x Controls and Document Results

Emissions control depends on economic feasibility as well as technical feasibility. The estimated cost of each technology per ton of NO_x removed is calculated to assist in the BACT analysis. The proposed turbines without additional NO_x control serve as the base case. The cost analysis is based on a single solar Saturn 1,600 hp turbine – all the proposed turbines will be the same model.

Information regarding the cost per ton of NO_x control using DLN, catalytic combustion and water/steam injection has been taken from a U.S. Department of Energy document titled "Cost Analysis of NO_x Control Alternatives for Stationary Gas Turbines, published November 5, 1999 (U.S. DOE, 1999). The trade name for the DLN technology used on Solar Saturn turbines is SoLoNOx.

Information regarding the cost of SCR controls has been taken from the EPA-CICA Air Pollution Control Technology Fact Sheet for SCR (Appendix D of NWE's permit application).

The cost per ton of NO_x removed is based on the tons per year, accounting for the proposed hours of operation in this permit application. NWE is proposing that the five new turbines operate for up to 12,000 hours per year total, which equates to 2,400 hours per year per engine. The total proposed NO_x emissions for a single turbine are calculated as follows:

6.32 lb/hr * 2,400 hrs/yr ÷ 2,000 lb/ton = 7.58 tpy

The U.S. DOE NO_x control study evaluated NO_x control technologies for a number of turbines of varying sizes (U.S. DOE, 1999, Table 3-2). The most similar unit evaluated was the Solar Centaur 50, 4.0 MW turbine. The capital cost for the SoLoNOx DNL addition was $190,000 in 1999 dollars. Using the US CPI Inflation Calculator[2] provided online by the Bureau of Labor Statistics, the conversion rate between 1999 dollars and 2024 dollars is an increase of 89%. Therefore, the unit cost for the SoLoNox unit is assumed to be $190,000 * 1.89 = $359,100. The annualized costs for the equipment are included in Table A-2 (U.S. DOE, 1999) which is included in Appendix D of the application materials.

During the DOE study, Solar declined to provide operating costs for the SoLoNOx technology, stating that it was proprietary. For this BACT analysis, the annual O&M costs have been assumed to equal those for another small turbine, at $32,000 per year in 1999 dollars. The annualized cost for the 2024 analysis is $60,480/yr.

If SCR were used on the solar turbines, the turbines would first be fitted with DNL to reduce the load on the SCR. Therefore, the cost of the SCR is an incremental cost based on installation of SCR downstream of DNL.

Cost information for installation of SCR on the proposed small gas turbines has been obtained from the EPA-CICA Fact Sheet for SCR, Table 1a (Appendix D of NWE's permit application).
The values presented are based on 1999 dollars and have been advanced to 2024-dollar values using an inflation multiplier of 1.89. The EPA fact sheet values were based on a 5 MW unit for the Small Gas Turbine category, so the lower end of the capital cost range has been used. The capital cost is calculated as follows: $17,000/MMBtu * 1.89 * 16.6 MMBtu = $533,358. O&M and Annual Costs for the small gas turbine total $8,505/MMBtu. All the values are shown in Table 2.

Table 2. NO_x BACT Analysis - Turbine

Emissions Reduction Technology	% Reduction	Incremental Emissions Reduction (TPY)	Calculations
Traditional Combustion Technology	Base Case	---	6.32 lb/hr 2,400 hours/yr = 7.58 TPY
Dry Low-NO_x Burner	75% reduction, from 100ppm to 25ppm	5.68	7.58 * 0.75 = 5.68 TPY
Selective Catalytic Reduction	64% reduction, from 25ppm to 9ppm	1.22	1.90 * 0.64 = 1.22TPY

DLN Parameter	**DLN Calculations**		
DLN Capital and Installation Cost	$359,100 total installed cost[1]		
Capital Recovery Cost 20 Years at 5%	$359,100 * (0.05/(1-(1.05)$^{-20}$) = $28,815/yr		
O&M Control Costs	$60,480/yr		
SCR Parameter	**SCR Calculations**		
SCR Capital and Installation Cost	$533,358 total installed cost[2]		
Capital Recovery Cost 20 Years at 4%	$533,358 * (0.5/(1-(1.05)$^{-20}$) = $42,798/yr		
O&M Control Costs	$8,505/MMBtu * 16.6 MMBtu = $144,183/yr[2]		

Control Alternative	Incremental NO_x Reduction (TPY)	Annualized Capital Cost	Annual O&M Costs	Incremental Control Cost ($/ton)
Traditional Combustion	0	0	0	0
Dry Low – NO_x	5.68	$28,815	$60,480	$15,721/ton
Add SCR	1.22	$42,798	$141,183	$150,804/ton

Notes:
1 DOE 1999.
2 Cost Information from EPA-CICA Air Pollution Control Technology Fact Sheet for SCR.

As shown in Table 2, the estimated cost of adding DLN to the proposed Solar Saturn turbines is $15,721 per ton of NO_x removed. This cost per ton is high compared to current Montana cost-effectiveness values that would trigger required installation of additional controls. Therefore, replacement of the proposed turbines with DLN combustion units is not economically feasible for reducing NO_x emissions.

The cost of installing and operating SCR on the proposed Solar Saturn turbines is far above the cost effectiveness level of any jurisdiction and is likely the reason that SCR is not used on small turbines.

Step 5 – Select NO_x BACT

The analysis above shows that the proposed Solar Saturn turbines, using conventional combustion technology, meet the required of BACT for NO_x emissions control. The manufacturer specified NO_x emission rate is 100 ppm @ 15% O_2, which meets the requirements of NSPS 40 CFR 60 Subpart KKKK.

The proposed turbines will have limited hours of operation which keeps the potential NO_x emissions low on an annual basis.

BACT Analysis – CO and VOC

A top-down BACT analysis for the combustion turbines has been performed to determine the CO and VOC emission limits and appropriate control devices. CO and VOC emissions both result from incomplete combustion and are controlled using the same methodology. The proposed turbines will use combustion optimization to minimize formation of CO/ VOC as products of incomplete combustion. The proposed emission units without controls will be considered the base case.

Step 1 - Identify All Control Technologies

Two types of oxidation processes are considered for reduction of CO/VOC emissions from the natural gas combustion turbines. The following post-combustion technologies for CO and VOC emissions control are considered:

- Thermal oxidation
- Catalytic oxidation

Step 2 - Eliminate Technically Infeasible Control Options

Thermal oxidizers are supplementary combustion chambers that complete the conversion of CO/VOC to carbon dioxide (CO_2) and water (H_2O) by creating a high temperature environment with optimal oxygen concentration, mixing, and residence time. Thermal oxidation requires temperatures of approximately 1,800°F to 2,000°F. The manufacturer provided exhaust temperatures for the natural gas combustion turbines are 924°F. Use of thermal oxidation would require the combustion of supplemental fuel to reach the target temperatures. This technology is considered infeasible due to the low concentrations of CO and VOC in the exhaust gas and the need for supplemental heat to drive the reaction.

Step 3 - Rank Control Technologies by CO/VOC Control Effectiveness

Catalytic oxidizers employ the same principles as thermal oxidizers, but they use catalysts to lower the temperature required to effect complete oxidation. The optimum temperature range for catalytic oxidizers is generally 600°F to 900°F.

CO catalysts can also be used to reduce VOC and organic HAPs emissions. The CO catalyst promotes the oxidation of CO and hydrocarbon compounds to CO_2 and H_2O as the emission stream passes through the catalyst bed. The oxidation process takes place spontaneously, without the requirement for introducing reactants. The performance of these oxidation catalyst systems on combustion turbines results in 90-plus percent control of CO and about 85 to 90 percent control of formaldehyde. Similar emission reductions are expected on other HAP pollutants.

For the BACT analysis, a potential control efficiency of 90% is used for both CO and VOC.

Table 3. Ranked CO/VOC Control Technology Effectiveness

Control Technology	CO/VOC Reduction (% Control)	CO/VOC Emission Rate (lb/hr)
Turbine as Proposed	0%	CO: 7.69 VOC: 0.55
Catalytic Oxidation, 90% Control	90%	CO: 0.77 VOC: 0.055

Step 4 - Evaluate Most Effective CO/VOC Controls and Document Results

Emissions control depends on economic feasibility as well as technical feasibility. The estimated cost of each technology per ton of CO and VOC removed is calculated to assist in the BACT analysis. The proposed turbines without additional CO/VOC control serve as the base case. The cost analysis is based on a single solar Saturn 1,600 hp turbine – all the proposed turbines will be the same model.

Information regarding the costs of catalytic oxidation has been taken from the EPA-CICA Air Pollution Control Technology Fact Sheet for catalytic incineration (Appendix D of NWE's application).

The values presented are based on 2002 dollars and have been advanced to 2024-dollar values using an inflation multiplier of 1.75. Because of the small size of the units and the low concentrations of pollutants, the higher end of the cost range has been used.

Costs for catalytic incineration are based on the exhaust flow rate in units of dollars ($) per standard cubic meter per second (sm^3/s). The exhaust air flow for the turbines is 10,970 scfm which is equal to 5.177 m^3/s. The estimated cost is calculated as follows:

$$\$191{,}000 \text{ per } sm^3/s * 1.75 * 5.177\ m^3/s = \$1{,}730{,}412$$

O&M and annual costs are calculated based on the lower end of the ranges in the EPA Fact Sheet to be $77,008 per year and $154,016 per year, respectively in 2024 dollars. All the values are shown in Table 4.

Table 4. CO/VOC BACT Analysis – Turbine

Emission Reduction Technology	% Reduction	Emission Reduction (TPY)	Calculations
Traditional Combustion Technology	Base Case	---	CO: 9.24 TPY VOC: 066 TPY
Catalytic Oxidation	90% Reduction	CO: 8.31 VOC: 0.59 Total: 8.9	CO: 9.3 * 0.9 = 8.31 TPY VOC: 0.66 * 0.9= 0.59TPY

Catalytic Oxidation Parameters	**Catalytic Oxidation Calculations**
Capital and Installation Cost	$1,730,412 total installed cost[1]
Capital Recovery Cost 20 Years at 5%	$1,730,412 * (0.05/(1-(1.05)-20) = $138,853/yr
O&M and Annual Costs	$231,024/yr[1]

Control Alternative	CO/VOC Reduction (TPY)	Annualized Capital Cost	Annual O&M Costs	Control Cost ($/ton)
Traditional Combustion	0	0	0	0
Catalytic Oxidation	8.90	$138,853	$231,024	$41,559/ton

Notes: 1. Cost information from EPA-CICA Air Pollution Control Technology Fact Sheet for Catalytic Oxidation.

Step 5 – Select CO/VOC BACT

As shown in Table 4, the estimated cost of adding catalytic oxidation to the proposed solar Saturn turbines is $41,559 per ton of CO/VOC removed. This cost per ton is high compared to current Montana cost-effectiveness values that would trigger required installation of additional controls. Therefore, addition of catalytic oxidation to the proposed turbines is not economically feasible for reducing CO/VOC emissions.

Therefore, BACT for CO/VOC constitutes no additional control.

BACT Analysis – SO_2

Step 1 – Identify All Control Technologies

- Low sulfur (pipeline quality) natural gas with no add-on controls

Step 2 – Eliminate Technically Infeasible Control Options

Table 5. Technically Feasible Options

Control Technology	SO_2 Reduction (% Control)	Technically Feasible
Turbine as Proposed	0%	Yes

Step 3 - Rank Control Technologies by SO_2 Control Effectiveness

Table 6. Ranking Control Technologies

Technology Ranking	Control Technology	Control Option
1	Turbine as Proposed	Low sulfur (pipeline quality) natural gas with no add-on controls

Step 4 - Evaluate Most Effective SO_2 Controls and Document Results

Emissions control depends on economic feasibility as well as technical feasibility.
The control for SO_2, given the low level of potential emissions, makes the only economic and technically feasibly option, to be to utilize low sulfur (pipeline quality) natural gas with no add-on controls.

Step 5 – Select SO_2 BACT

ARM 17.8.752 requires a BACT analysis for SO_2 emissions. Annual uncontrolled SO_2 emissions from natural gas combustion are very low, and any add-on control would be cost-prohibitive and unreasonable on a cost per ton of SO_2 removed basis.
The proposed SO2 BACT is low sulfur (pipeline quality) natural gas with no add-on controls. The proposed SO_2 BACT conforms to previous BACT determinations made by Montana DEQ for similar compressor engines.

BACT Analysis - $PM_{10}/PM_{2.5}$

Step 1 - Identify All Control Technologies

- Combustion of low-ash (pipeline quality) natural gas with no add-on controls

Step 2 - Eliminate Technically Infeasible Control Options

Table 7. Technically Feasible Options

Control Technology	$PM_{10}/PM_{2.5}$ Reduction (% Control)	Technically Feasible
Turbine as Proposed	0%	Yes

Step 3 - Rank Control Technologies by $PM_{10}/PM_{2.5}$ Control Effectiveness

Table 8. Ranking Control Technologies

Technology Ranking	Control Technology	Control Option
1	Turbine as Proposed	Combustion of low-ash (pipeline quality) natural gas with no add-on controls

Due to the low level of potential emissions for PM10/PM2.5, with total PM emissions for all five new turbines being 1.3 TPY, any add-on control would be cost-prohibitive and unreasonable on a cost per ton of PM10 removed basis. Therefore, the only option

Step 4 - Evaluate Most Effective $PM_{10}/PM_{2.5}$Controls and Document Results

Due to the low level of potential emissions for $PM_{10}/PM_{2.5}$, with total PM emissions for all five new turbines being 1.3 TPY, any add-on control would be cost-prohibitive and unreasonable on a cost per ton of PM_{10} removed basis.

Step 5 – Select $PM_{10}/PM_{2.5}$BACT

ARM 17.8.752 requires a BACT analysis for PM_{10} emissions. Annual uncontrolled PM_{10} emissions are predicted to be very low, and any add-on control would be cost-prohibitive and unreasonable on a cost per ton of PM_{10} removed basis.
NWE proposes BACT as combustion of low-ash (pipeline quality) natural gas with no add-on controls.

The proposed PM_{10} BACT conforms to previous BACT determinations made by the Montana DEQ for similar compressor engines.

IV. Emissions Inventory

Table 1. Total Updated Site Emissions Inventory

Emitting Unit ID	Description	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_x (TPY)	NO_x (TPY)	VOC (TPY)	CO (TPY)	HAPs (TPY)
EU01	1340 hp 4-Stroke Lean Burn Compressor Engine[1]	0.49	0.49	0.03	95	1.51	0.5	1.04
EU02	1340 hp 4-Stroke Lean Burn Compressor Engine[1]	0.49	0.49	0.03		1.51	0.5	1.04
EU03	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU04	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU05	1100 hp Whie Superior Compressor[1]	0.09	0.09	0.01		1.21	7.28	0.67
EU06	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU07	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU08	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU09	1,000/5,000 Gallon Dehydrator Tanks (2)	--	--	--	--	19.88	--	0.36
EU10	Dehydrator Still Vent	--	--	--	--	9.14	--	4.23
IEU11	0.5 MMBtu/hr BS & B Reboiler (Standby Reboiler)	0	0	0	0.01	0	0.01	2.30E-04
IEU12	0.85 MMBtu/hr Teledryne-Laars Boiler	0.03	0.03	0	0.37	0.02	0.31	6.90E-03

IEU13	0.6 MMBtu/hr Enertek Dehy Reboiler	0.02	0.02	0	0.26	0.01	0.22	4.90E-03
IEU14	<1 MMBtu Building Heaters	0.03	0.03	0	0.43	0.02	0.36	8.10E-03
IEU15	Fugitive emissions from Process Valves, etc.	--	--	--	--	1.97	--	0.07
IEU16	In-plant Vehicle Traffic	2.3	2.3	--	--	--	--	--
IEU17	158 hp Onana Cummings Emergency Backup Generator	0	0	0	0.6	0.08	1.7	0.1
IEU18	Methanol Storage Tank	0	0	0	0	0.002	0	0
IEU19	4 MMBtu/hr Line Heater	0.06	0.06	0	0.8	0.04	0.67	0.02
	Total	**4.16**	**4.16**	**0.42**	**97.47**	**38.692**	**57.7**	**7.65013**

Notes:

1. NWE is maintaining the annual combined emission limit of 95 TPY for EU01-08
2. The three engines and five turbines have been limited to a 95 TPY 12-month rolling NO_x limit combined.
3. The proposed replacement of turbines will not increase the 95 TPY 12-month rolling NO_x limit.

Table 2. Turbine Replacement Emissions Inventory

Emitting Unit ID	**Description**	**PM_{10} (TPY)**	**$PM_{2.5}$ (TPY)**	**SO_x (TPY)**	**NO_x (TPY)**	**VOC (TPY)**	**CO (TPY)**	**HAPs (TPY)**
EU03	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07	Included in 95 TPY limit	0.66	9.23	0.02
EU04	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU06	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU07	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
EU08	1600 hp Solar Saturn Combustion Turbine[1,2]	0.13	0.13	0.07		0.66	9.23	0.02
	Total	**0.65**	**0.65**	**0.35**	**NA**	**3.3**	**46.15**	**0.1**

Notes:

1. NWE is maintaining the annual combined emission limit of 95 TPY for EU01-08
2. The three engines and five turbines have been limited to a 95 TPY 12-month rolling NO_x limit combined.

Full Emissions Inventory:

EU01: 1,340 hp 4-Stroke Lean Burn Compressor Engine Emissions

	Value	Units	Notes
Heat Input	11.20776	MMBtu/hr	Calculated
Max Heat Capacity	0.008364	MMBtu/hr	Manufacturer Specs
Horsepower	1340	hp	Manufacturer Specs
Fuel Usage	0.011	MMscf/hr	
Hours	8760	hrs/yr	
Conversions	2000	lb/ton	
	2.2046	lbs/kg	
	453.592	g/lb	

Pollutant	**Emission Factor (EF)**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	9.99E-03	lbs/MMBtu	AP-42 3.2-2	0.11	0.4904
NO_x	1.5	g/hp-hr	Manufacturer Data	4.43	19.4091
CO	0.04	g/hp-hr	Manufacturer Data	0.12	0.5176
VOC	0.12	g/hp-hr	Manufacturer Data	0.35	1.5527
SO_x	5.88E-04	lbs/MMBtu	AP-42 3.2-2	0.01	0.0289

Sample Calculation:
Emissions (lbs/hr)= (Emission Factor, lbs/MMBtu)x(Heat Input, MMBtu/hr)
PM Emissions (lbs/hr)= (0.01 lbs/MMBtu) x (11.20776 MMBtu/hr)
PM Emissions (lbs/hr)= 0.112 lb/hr

Emissions (ton/yr)= (Emissions, lb/hr) x (Hours of Operation) / (2000 lbs/ton)
PM Emissions (ton/yr)= (0.112 lb/hr) x (8760 hrs) / (2000 lb/ton)
PM Emissions (ton/yr)= 0.49 ton/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor	Units	Emission Factor Reference	Potential Emissions (tons/yr)
Formaldehyde	50-00-0	1.10E-02	g/bhp-hr	Manufacturer Data	0.14
Acetaldehyde	75-07-0	8.36E-03	lb/MMBtu		0.41
Acrolein	107-02-8	5.14E-03	lb/MMBtu		0.25
Benzene	71-43-2	4.40E-04	lb/MMBtu		0.02
Biphenyl	92-52-4	2.12E-04	lb/MMBtu		0.01
1,3-Butadiene	106-99-0	2.67E-04	lb/MMBtu		0.01
Carbon Tetrachloride	56-23-5	3.67E-05	lb/MMBtu		0.00
Chlorobenzene	108-90-7	3.04E-05	lb/MMBtu		0.00
Chloroform	67-66-3	2.85E-05	lb/MMBtu		0.00
1,3-Dichloropropene	542-75-6	2.64E-05	lb/MMBtu		0.00
Ethylbenzene	100-41-4	3.97E-05	lb/MMBtu		0.00
Chloroethane	75-00-3	1.87E-06	lb/MMBtu		0.00
Ethylene Dibromide	106-93-4	4.43E-05	lb/MMBtu		0.00
1,2-Dichloroethane	107-06-2	2.36E-05	lb/MMBtu		0.00
1,1-Dichloroethane	75-34-3	2.36E-05	lb/MMBtu		0.00
Methanol	67-56-1	2.50E-03	lb/MMBtu		0.12
Methylene Chloride	75-09-2	2.00E-05	lb/MMBtu	AP-42	0.00
Naphthalene	91-20-3	7.44E-05	lb/MMBtu	Table 3.2-2	0.00
Phenol	684-93-5	2.40E-05	lb/MMBtu	(07/00)	0.00
Toluene	87-86-5	4.08E-04	lb/MMBtu		0.02
Vinyl Chloride	108-95-2	1.49E-05	lb/MMBtu		0.00
Xylene	106-50-3	1.84E-04	lb/MMBtu		0.01
1,2-Dichloropropane	78-87-5	2.69E-05	lb/MMBtu		0.00
Styrene	100-42-5	2.36E-05	lb/MMBtu		0.00
1,1,2,2-Tetrachloroethane	79-34-5	4.00E-05	lb/MMBtu		0.00
1,1,2-Trichloroethane	79-00-5	3.18E-05	lb/MMBtu		0.00
2,2,4-Trimethylpentane	540-84-1	2.50E-04	lb/MMBtu		0.01
PAH	---	2.69E-05	lb/MMBtu		0.00
Benzo(b)fluoranthene	205-99-2	1.66E-07	lb/MMBtu		0.00
Chrysene	218-01-9	6.93E-07	lb/MMBtu		0.00
Acenaphthene	83-32-9	1.25E-06	lb/MMBtu		0.00
Acenaphthylene	208-96-8	5.53E-06	lb/MMBtu		0.00
Benzo(g,h,i)perylene	191-24-2	4.14E-07	lb/MMBtu		0.00
Fluoranthene	206-44-0	1.11E-06	lb/MMBtu		0.00
Fluorene	86-73-7	5.67E-06	lb/MMBtu		0.00
Phenanthrene	85-01-8	1.04E-05	lb/MMBtu		0.00
Pyrene	129-00-0	1.36E-06	lb/MMBtu		0.00
Arsenic	7440-38-2	2.0E-04	lb/MMscf		9.63E-06
Beryllium	7440-41-7	1.2E-05	lb/MMscf		5.78E-07
Cadmium	7440-43-9	1.1E-03	lb/MMscf		5.29E-05
Chromium	7440-47-3	1.4E-03	lb/MMscf	AP-42	6.74E-05
Cobalt	7440-48-4	8.4E-05	lb/MMscf	Table 1.4-4	4.04E-06
Manganese	7439-96-5	3.8E-04	lb/MMscf	(07/98)	1.83E-05
Mercury	7439-97-6	2.6E-04	lb/MMscf		1.25E-05
Nickel	7440-02-0	2.1E-03	lb/MMscf		1.01E-04
Selenium	7782-49-2	2.4E-05	lb/MMscf		1.16E-06
				Total HAPs:	**1.04**

EU 2: 1,340 hp 4-Stroke Lean Burn Compressor Engine Emissions

	Value	Units	Notes
Heat Input	11.20776	MMBtu/hr	Calculated
Max Heat Capacity	0.008364	MMBtu/hr	Manufacturer Specs
Horsepower	1340	hp	Manufacturer Specs
Fuel Usage	0.011	MMscf/hr	
Hours	8760	hrs/yr	

Conversions	2000	lb/ton	
	2.2046	lbs/kg	
	453.592	g/lb	

Pollutant	**Emission Factor (EF)**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	9.99E-03	lbs/MMBtu	AP-42 3.2-2	0.11	0.4904
NO_x	1.5	g/hp-hr	Manufacturer Data	4.43	19.4091
CO	0.04	g/hp-hr	Manufacturer Data	0.12	0.5176
VOC	0.12	g/hp-hr	Manufacturer Data	0.35	1.5527
SO_x	5.88E-04	lbs/MMBtu	AP-42 3.2-2	0.01	0.0289

Sample Calculation:

Emissions (lbs/hr)= (Emission Factor, lbs/MMBtu)x(Heat Input, MMBtu/hr)
PM Emissions (lbs/hr)= (0.01 lbs/MMBtu) x (11.20776 MMBtu/hr)
PM Emissions (lbs/hr)= 0.112 lb/hr

Emissions (ton/yr)= (Emissions, lb/hr) x (Hours of Operation) / (2000 lbs/ton)
PM Emissions (ton/yr)= (0.112 lb/hr) x (8760 hrs) / (2000 lb/ton)
PM Emissions (ton/yr)= 0.49 ton/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor	Units	Emission Factor Reference	Potential Emissions (tons/yr)
Formaldehyde	50-00-0	1.10E-02	g/bhp-hr	Manufacturer Data	0.14
Acetaldehyde	75-07-0	8.36E-03	lb/MMBtu		0.41
Acrolein	107-02-8	5.14E-03	lb/MMBtu		0.25
Benzene	71-43-2	4.40E-04	lb/MMBtu		0.02
Biphenyl	92-52-4	2.12E-04	lb/MMBtu		0.01
1,3-Butadiene	106-99-0	2.67E-04	lb/MMBtu		0.01
Carbon Tetrachloride	56-23-5	3.67E-05	lb/MMBtu		0.00
Chlorobenzene	108-90-7	3.04E-05	lb/MMBtu		0.00
Chloroform	67-66-3	2.85E-05	lb/MMBtu		0.00
1,3-Dichloropropene	542-75-6	2.64E-05	lb/MMBtu		0.00
Ethylbenzene	100-41-4	3.97E-05	lb/MMBtu		0.00
Chloroethane	75-00-3	1.87E-06	lb/MMBtu		0.00
Ethylene Dibromide	106-93-4	4.43E-05	lb/MMBtu		0.00
1,2-Dichloroethane	107-06-2	2.36E-05	lb/MMBtu		0.00
1,1-Dichloroethane	75-34-3	2.36E-05	lb/MMBtu		0.00
Methanol	67-56-1	2.50E-03	lb/MMBtu		0.12
Methylene Chloride	75-09-2	2.00E-05	lb/MMBtu	AP-42	0.00
Naphthalene	91-20-3	7.44E-05	lb/MMBtu	Table 3.2-2	0.00
Phenol	684-93-5	2.40E-05	lb/MMBtu	(07/00)	0.00
Toluene	87-86-5	4.08E-04	lb/MMBtu		0.02
Vinyl Chloride	108-95-2	1.49E-05	lb/MMBtu		0.00
Xylene	106-50-3	1.84E-04	lb/MMBtu		0.01
1,2-Dichloropropane	78-87-5	2.69E-05	lb/MMBtu		0.00
Styrene	100-42-5	2.36E-05	lb/MMBtu		0.00
1,1,2,2-Tetrachloroethane	79-34-5	4.00E-05	lb/MMBtu		0.00
1,1,2-Trichloroethane	79-00-5	3.18E-05	lb/MMBtu		0.00
2,2,4-Trimethylpentane	540-84-1	2.50E-04	lb/MMBtu		0.01
PAH	---	2.69E-05	lb/MMBtu		0.00
Benzo(b)fluoranthene	205-99-2	1.66E-07	lb/MMBtu		0.00
Chrysene	218-01-9	6.93E-07	lb/MMBtu		0.00
Acenaphthene	83-32-9	1.25E-06	lb/MMBtu		0.00
Acenaphthylene	208-96-8	5.53E-06	lb/MMBtu		0.00
Benzo(g,h,i)perylene	191-24-2	4.14E-07	lb/MMBtu		0.00
Fluoranthene	206-44-0	1.11E-06	lb/MMBtu		0.00
Fluorene	86-73-7	5.67E-06	lb/MMBtu		0.00
Phenanthrene	85-01-8	1.04E-05	lb/MMBtu		0.00
Pyrene	129-00-0	1.36E-06	lb/MMBtu		0.00
Arsenic	7440-38-2	2.0E-04	lb/MMscf		9.63E-06
Beryllium	7440-41-7	1.2E-05	lb/MMscf		5.78E-07
Cadmium	7440-43-9	1.1E-03	lb/MMscf		5.29E-05
Chromium	7440-47-3	1.4E-03	lb/MMscf	AP-42	6.74E-05
Cobalt	7440-48-4	8.4E-05	lb/MMscf	Table 1.4-4	4.04E-06
Manganese	7439-96-5	3.8E-04	lb/MMscf	(07/98)	1.83E-05
Mercury	7439-97-6	2.6E-04	lb/MMscf		1.25E-05
Nickel	7440-02-0	2.1E-03	lb/MMscf		1.01E-04
Selenium	7782-49-2	2.4E-05	lb/MMscf		1.16E-06
				Total HAPs:	**1.04**

EU5: 1,100 hp White Superior 4-Stroke Lean-Burn Compressor Engine Emissions

	Value	**Unit**	**Notes**
Heat Input	9.35	MMBtu/hr	Manufacturer Specs
Max Heat Capacity	0.0085	MMBtu/BHp-hr	
Horsepower	1100	bhp	Manufacturer Specs
Fuel Usage	0.0092	MMscf/hr	
Hours	2000	hrs/yr	

Conversions	2000	lb/ton	
	2.2046	lbs/kg	
	453.592	g/lb	

Pollutant	Emissions Factor	Units	EF Reference	Emissions (lb/hr)	Emissions (TPY)
PM (includes PM_{10} and $PM_{2.5}$)	9.99E-03	lbs/MMBtu	AP-42 3.2-2	0.09	0.0934
NO_X	36.46	lb/hr	MAQP#2783-02 limit	36.46	36.4600
CO	7.28	lb/hr	MAQP#2783-02 limit	7.28	7.2800
VOC	1.21	lb/hr	MAQP#2783-02 limit	1.21	1.2100
SO_X	5.88E-04	lbs/MMBtu	AP-42 3.2-2	5.50E-03	0.0055

Sample Calculation:

Emissions (lbs/hr)= (Emission Factor, lbs/MMBtu)x(Heat Input, MMBtu/hr)
PM Emissions (lbs/hr)= (0.01 lbs/MMBtu) x (9.35 MMBtu/hr)
PM Emissions (lbs/hr)= 0.093 lb/hr

Emissions (ton/yr)= (Emissions, lb/hr) x (Hours of Operation) / (2000 lbs/ton)
PM Emissions (ton/yr)= (0.093 lb/hr) x (2000 hrs) / (2000 lb/ton)
PM Emissions (ton/yr)= 0.093 ton/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor (lb/MMBtu)	Units	Emission Factor Reference	Potential Emissions (tons/yr)
Acetaldehyde	75-07-0	8.36E-03	lb/MMBtu		7.82E-02
Acrolein	107-02-8	5.14E-03	lb/MMBtu		4.81E-02
Benzene	71-43-2	4.40E-04	lb/MMBtu		4.11E-03
Biphenyl	92-52-4	2.12E-04	lb/MMBtu		1.98E-03
1,3-Butadiene	106-99-0	2.67E-04	lb/MMBtu		2.50E-03
Carbon Tetrachloride	56-23-5	3.67E-05	lb/MMBtu		3.43E-04
Chlorobenzene	108-90-7	3.04E-05	lb/MMBtu		2.84E-04
Chloroform	67-66-3	2.85E-05	lb/MMBtu		2.66E-04
1,3-Dichloropropene	542-75-6	2.64E-05	lb/MMBtu		2.47E-04
Ethylbenzene	100-41-4	3.97E-05	lb/MMBtu		3.71E-04
Chloroethane	75-00-3	1.87E-06	lb/MMBtu		1.75E-05
Ethylene Dibromide	106-93-4	4.43E-05	lb/MMBtu		4.14E-04
1,2-Dichloroethane	107-06-2	2.36E-05	lb/MMBtu		2.21E-04
1,1-Dichloroethane	75-34-3	2.36E-05	lb/MMBtu		2.21E-04
Formaldehyde	50-00-0	5.28E-02	lb/MMBtu		4.94E-01
Methanol	67-56-1	2.50E-03	lb/MMBtu		2.34E-02
Methylene Chloride	75-09-2	2.00E-05	lb/MMBtu	AP-42	1.87E-04
Naphthalene	91-20-3	7.44E-05	lb/MMBtu	Table 3.2-2	6.96E-04
Phenol	684-93-5	2.40E-05	lb/MMBtu	(07/00)	2.24E-04
Toluene	87-86-5	4.08E-04	lb/MMBtu		3.81E-03
Vinyl Chloride	108-95-2	1.49E-05	lb/MMBtu		1.39E-04
Xylene	106-50-3	1.84E-04	lb/MMBtu		1.72E-03
1,2-Dichloropropane	78-87-5	2.69E-05	lb/MMBtu		2.52E-04
Styrene	100-42-5	2.36E-05	lb/MMBtu		2.21E-04
1,1,2,2-Tetrachloroethane	79-34-5	4.00E-05	lb/MMBtu		3.74E-04
1,1,2-Trichloroethane	79-00-5	3.18E-05	lb/MMBtu		2.97E-04
2,2,4-Trimethylpentane	540-84-1	2.50E-04	lb/MMBtu		2.34E-03
PAH	---	2.69E-05	lb/MMBtu		2.52E-04
Benzo(b)fluoranthene	205-99-2	1.66E-07	lb/MMBtu		1.55E-06
Chrysene	218-01-9	6.93E-07	lb/MMBtu		6.48E-06
Acenaphthene	83-32-9	1.25E-06	lb/MMBtu		1.17E-05
Acenaphthylene	208-96-8	5.53E-06	lb/MMBtu		5.17E-05
Benzo(g,h,i)perylene	191-24-2	4.14E-07	lb/MMBtu		3.87E-06
Fluoranthene	206-44-0	1.11E-06	lb/MMBtu		1.04E-05
Fluorene	86-73-7	5.67E-06	lb/MMBtu		5.30E-05
Phenanthrene	85-01-8	1.04E-05	lb/MMBtu		9.72E-05
Pyrene	129-00-0	1.36E-06	lb/MMBtu		1.27E-05
Arsenic	7440-38-2	2.0E-04	lb/MMscf		1.83E-06
Beryllium	7440-41-7	1.2E-05	lb/MMscf		1.10E-07
Cadmium	7440-43-9	1.1E-03	lb/MMscf		1.01E-05
Chromium	7440-47-3	1.4E-03	lb/MMscf	AP-42	1.28E-05
Cobalt	7440-48-4	8.4E-05	lb/MMscf	Table 1.4-4	7.70E-07
Manganese	7439-96-5	3.8E-04	lb/MMscf	(07/98)	3.48E-06
Mercury	7439-97-6	2.6E-04	lb/MMscf		2.38E-06
Nickel	7440-02-0	2.1E-03	lb/MMscf		1.93E-05
Selenium	7782-49-2	2.4E-05	lb/MMscf		2.20E-07
				Total HAPs:	0.67

EU3, 4, 6, 7, 8 – 1,600 hp Solar Saturn Combustion Turbines Emissions

	Value	Units	Notes
Heat Input	16.592	MMBtu/hr	Calculated
Max Heat Capacity	0.01037	MMBtu/hr	Manufacturer Specs
Horsepower	1600	hp	Manufacturer Specs
Fuel Usage	0.0163	MMscf/hr	
Hours	12000	hrs/yr	All turbines
Flow Rate	16,267	scf/hr	
Conversions	2000	lb/ton	
	2.2046	lbs/kg	
	453.592	g/lb	
	1194	kW	

Pollutant	**Emissions Factor**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	6.60E-03	lbs/MMBtu	AP-42 3.2-2	0.11	0.66
NO_X	6.32	lb/hr	Max based on 100ppm at 15% O_2	6.32	37.92
CO	7.69	lb/hr	Manufacturer Spec	7.69	46.14
VOC	0.55	lb/hr	Manufacturer Spec	0.55	3.30
SO_X	3.40E-03	lbs/MMBtu	AP-42 3.1-2a	5.64E-02	0.34

Sample Calculation:

Emissions (lb/hr)= (Emission Factor, lbs/MMBtu)x(Heat Input, MMBtu/hr)
PM Emissions (lb/hr)= (0.0066 lbs/MMBtu) x (16.592 MMBtu/hr)
PM Emissions (lb/hr)= 0.11 lb/hr

Emissions (ton/yr)= (Emissions, lb/hr) x (Hours of Operation) / (2000 lb/ton)
PM Emissions (ton/yr)= (0.11 lb/hr) x (12000 hrs/yr) / (2000 lb/ton)
PM Emissions (ton/yr)= 0.66 ton/yr

Hazardous Air Pollutants (HAPs)

Pollutant	Emission Factor	Units	Emission Factor Reference	Potential Emissions Each Turbine (ton/yr)
1,1,2,2-Tetracholoethane		lb/MMBtu	AP-42, Table 3.1-3	0.00E+00
1,1,2-Trichloroethane		lb/MMBtu		0.00E+00
1,3-Butadiene	4.30E-07	lb/MMBtu		4.28E-05
1,3-Dichloropropene		lb/MMBtu		0.00E+00
Acetaldehyde	4.00E-05	lb/MMBtu		3.98E-03
Acrolein	6.40E-06	lb/MMBtu		6.37E-04
Benzene	1.20E-05	lb/MMBtu		1.19E-03
Carbon Tetrachloride		lb/MMBtu		0.00E+00
Chlorobenzene		lb/MMBtu		0.00E+00
Chloroform		lb/MMBtu		0.00E+00
Ethylbenzene	3.20E-05	lb/MMBtu		3.19E-03
Ethylene Dibromide		lb/MMBtu		0.00E+00
Formaldehyde	7.10E-04	lb/MMBtu		7.07E-02
Methanol		lb/MMBtu		0.00E+00
Methylene Chloride		lb/MMBtu		0.00E+00
Naphthalene	1.30E-06	lb/MMBtu		1.29E-04
PAH	2.20E-06	lb/MMBtu		2.19E-04
Styrene		lb/MMBtu		0.00E+00
Toluene	1.30E-04	lb/MMBtu		1.29E-02
Vinyl Cloride		lb/MMBtu		0.00E+00
Xylene	6.40E-05	lb/MMBtu		6.37E-03
Arsenic	2.0E-04	lb/MMscf	AP-42, Table 1.4-4 (7-98)	1.95E-05
Beryllium	1.2E-05	lb/MMscf		1.17E-06
Cadmium	1.1E-03	lb/MMscf		1.07E-04
Chromium	1.4E-03	lb/MMscf		1.37E-04
Cobalt	8.4E-05	lb/MMscf		8.20E-06
Manganese	3.8E-04	lb/MMscf		3.71E-05
Mercury	2.6E-04	lb/MMscf		2.54E-05
Nickel	2.1E-03	lb/MMscf		2.05E-04
Selenium	2.4E-05	lb/MMscf		2.34E-06
			Total HAPs:	**9.99E-02**

EU9: 1000/500 Gallong Dehydrator Tanks (2)
EU10: Glycol Dehydrator Unit

Category	Make	Enertek
	Glycol Type	TEG
	Hours of Operation	8760
Wet Gas Inputs	Wet Gas Temperature (°F)	60
	Wet Gas Pressure (psig)	500
	Wet Gas Saturated? (yes or no)	yes
Dry Gas Inputs	Max Annual Dry Gas Thruput (BBscf/yr)	10
	Dry Gas Flow Rate (MMscf/day) (max/min/nominal)	27.4
	Dry Gas H_2O Content (lbs H_2O/MMscf)[2]	2
	Absorber Stages[1]	5
Lean Glycol Inputs	Lean Glycol H_2O Content (wt % H_2O)	1.0%
	Lean Glycol Flowrate (gpm)	2%
	Recirculation Ratio (gal/lb H_2O)[3]	3.00
Pump Inputs	Pump Type? (electric or gas)	Electric
	Gas Pump Volume Ratio (aacfm gas/gpm glycol)[4]	N/A
Flash Tank Inputs	Flash tank? (yes or no)	yes
	Flash Tank Temperature (°F)	80
	Flash Tank Pressure (psig)	50
Stripping Gas Inputs	Stripping Gas Option (none, dry gas, flash gas, nitrogen)	Dry Gas
	Stripping Gas Flow Rate (scfm)	0.8
Control Device Inputs	Control Device Option (none, condenser, incinerator, condenser/incinerator)	Condenser
	Condenser Temperature (°F)	100
	Condenser Pressure (psia)	12.5
	Incinerator Excess O_2 (%)	N/A
	Incinerator Destruction Efficiency (%)	N/A

EU9 - 1000/5000 Gallon Dehydrator Tanks (2)

Pollutant	Emissions Reference	Potential Emissions (ton/yr)
Total VOC	GlyCalc 4.0, Flash Tank Off-gas	9.1395
Total HAP	GlyCalc 4.0, Flash Tank Off-gas	0.3632
CO2e	GlyCalc 4.0, Flash Tank Off-gas	96.18
Methane	GlyCalc 4.0, Flash Tank Off-gas	4.58
n-Hexane	GlyCalc 4.0, Flash Tank Off-gas	0.2302
2,2,4-Trimethylpentane	GlyCalc 4.0, Flash Tank Off-gas	0.0546
Benzene	GlyCalc 4.0, Flash Tank Off-gas	0.0157
Toluene	GlyCalc 4.0, Flash Tank Off-gas	0.0365
Ethylbenzene	GlyCalc 4.0, Flash Tank Off-gas	0.0063
Xylenes	GlyCalc 4.0, Flash Tank Off-gas	0.0199

ND=Non Detectable (see attached gas analyses)

EU10 - Glycol Dehydrator Unit

Pollutant	Emissions Reference	Potential Emissions (ton/yr)
Total VOC	GlyCalc 4.0, Condenser Emissions	19.8756
Total HAP	GlyCalc 4.0, Condenser Emissions	4.23
CO2e	GlyCalc 4.0, Condenser Emissions	152.88
Methane	GlyCalc 4.0, Condenser Emissions	7.28
n-Hexane	GlyCalc 4.0, Condenser Emissions	0.6042
2,2,4-Trimethylpentane	GlyCalc 4.0, Condenser Emissions	0.0618
Benzene	GlyCalc 4.0, Condenser Emissions	0.9775
Toluene	GlyCalc 4.0, Condenser Emissions	1.6009
Ethylbenzene	GlyCalc 4.0, Condenser Emissions	0.197
Xylenes	GlyCalc 4.0, Condenser Emissions	0.7911

ND=Non Detectable (see attached gas analyses)

IEU11: 0.5 MMBtu/hr BS & B Reboiler (Standby Reboiler) Emissions

	Value	Units	Notes
Fuel Usage	0.25	MMscf/yr	
Horsepower	NA	hp	
Hours	500	hours	Limited Hours
Max fuel Comb. Rate	0.5	MMBtuhr	Manufacturer Specs
Fuel Heating Value	1020	MMBtu/MMscf	
Conversions	2.2046	lbs/kg	
	453.592	g/lb	

Pollutant	Emissions Factor	Units	EF Reference	Emissions (lb/hr)	Emissions (TPY)
PM (includes PM_{10} and $PM_{2.5}$)	7.60	lb/MMscf	AP-42 Table 1.4-2	3.73E-03	0.001
NO_X	100	lb/MMscf	AP-42 Table 1.4-1	4.90E-02	0.012
CO	84	lb/MMscf	AP-42 Table 1.4-1	4.12E-02	0.010
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	2.70E-03	0.001
SO_X	6.00E-01	lb/MMscf	AP-42 Table 1.4-2	2.94E-04	7.35E-05

Sample Calculation:

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)

PM Emissions (lb/hr) = (7.6 lb/MMscf) / (1020 MMBtu/MMscf) x (0.5 MMBtu/hr) = 0.0037 lbs/hr

PM Emissions (tons/yr) = (0.0037 lbs/hr) x (500 hrs/yr) / (2000 lbs/ton) = 0.001 tons/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor (lb/MMscf)	Emission Factor Reference	Potential Emissions (ton/yr)
2-Methylnaphthalene	91-57-6	2.4E-05	AP-42 Table 1.4-3 (07/98)	2.9E-09
3-Methylchloranthrene	56-49-5	1.8E-06		2.2E-10
7,12-Dimethylbenz(a)anthracene		1.6E-05		2.0E-09
Acenaphthene	83-32-9	1.8E-06		2.2E-10
Acenaphthylene	203-96-8	1.8E-06		2.2E-10
Anthracene	120-12-7	2.4E-06		2.9E-10
Benz(a)anthracene	56-55-3	1.8E-06		2.2E-10
Benzene	71-43-2	2.1E-03		2.6E-07
Benzo(a)pyrene	50-32-8	1.2E-06		1.5E-10
Benzo(b)fluoranthene	205-99-2	1.8E-06		2.2E-10
Benzo(g,h,i)perylene	191-24-2	1.2E-06		1.5E-10
Benzo(k)fluoranthene	205-82-3	1.8E-06		2.2E-10
Chrysene	218-01-9	1.8E-06		2.2E-10
Dibenzo(a,h)anthracene	53-70-3	1.2E-06		1.5E-10
Dichlorobenzene	25321-22-6	1.2E-03		1.5E-07
Fluoranthene	206-44-0	3.0E-06		3.7E-10
Fluorene	86-73-7	2.8E-06		3.4E-10
Formaldehyde	50-00-0	7.5E-02		9.2E-06
Hexane	110-54-3	1.8E+00		2.2E-04
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06		2.2E-10
Naphthalene	91-20-3	6.1E-04		7.5E-08
Phenanathrene	85-01-8	1.7E-05		2.1E-09
Pyrene	129-00-0	5.0E-06		6.1E-10
Toluene	108-88-3	3.4E-03		4.2E-07
Arsenic	7440-38-2	2.0E-04	AP-42 Table 1.4-4 (07/98)	2.5E-08
Beryllium	7440-41-7	1.2E-05		1.5E-09
Cadmium	7440-43-9	1.1E-03		1.3E-07
Chromium	7440-47-3	1.4E-03		1.7E-07
Cobalt	7440-48-4	8.4E-05		1.0E-08
Manganese	7439-96-5	3.8E-04		4.7E-08
Mercury	7439-97-6	2.6E-04		3.2E-08
Nickel	7440-02-0	2.1E-03		2.6E-07
Selenium	7782-49-2	2.4E-05		2.9E-09
			Totals	**2.31E-04**

IEU12: 0.85 MMBtu/hr Teledyne-Laars Boiler Emissions

	Value	**Units**	**Notes**
Fuel Usage	7.3	MMscf/yr	
Horsepower	NA	hp	
Hours	8760	hours	
Max fuel Comb. Rate	0.85	MMBtuhr	Manufacturer Specs
Fuel Heating Value	1020	MMBtu/MMscf	
Conversions	2.2046	lbs/kg	
	453.592	g/lb	
	2000	lb/ton	

Pollutant	Emissions Factor	Units	EF Reference	Emissions (lb/hr)	Emissions (TPY)
PM (includes PM_{10} and $PM_{2.5}$)	7.60E+00	lb/MMscf	AP-42 Table 1.4-2	6.33E-03	0.028
NO_X	100	lb/MMscf	AP-42 Table 1.4-1	8.33E-02	0.365
CO	84	lb/MMscf	AP-42 Table 1.4-1	7.00E-02	0.307
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	4.58E-03	0.020
SO_X	6.00E-01	lb/MMscf	AP-42 Table 1.4-2	5.00E-04	0.002

Sample Calculation:

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)

PM Emissions (lb/hr) = (7.6 lb/MMscf) / (1020 MMBtu/MMscf) x (0.85 MMBtu/hr) = 0.0063 lbs/hr

PM Emissions (tons/yr) = (0.0063 lbs/hr) x (8760 hrs/yr) / (2000 lbs/ton) = 0.028 tons/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor (lb/MMscf)	Emission Factor Reference	Potential Emissions (ton/yr)
2-Methylnaphthalene	91-57-6	2.4E-05	AP-42 Table 1.4-3 (07/98)	8.8E-08
3-Methylchloranthrene	56-49-5	1.8E-06		6.6E-09
7,12-Dimethylbenz(a)anthracene		1.6E-05		5.8E-08
Acenaphthene	83-32-9	1.8E-06		6.6E-09
Acenaphthylene	203-96-8	1.8E-06		6.6E-09
Anthracene	120-12-7	2.4E-06		8.8E-09
Benz(a)anthracene	56-55-3	1.8E-06		6.6E-09
Benzene	71-43-2	2.1E-03		7.7E-06
Benzo(a)pyrene	50-32-8	1.2E-06		4.4E-09
Benzo(b)fluoranthene	205-99-2	1.8E-06		6.6E-09
Benzo(g,h,i)perylene	191-24-2	1.2E-06		4.4E-09
Benzo(k)fluoranthene	205-82-3	1.8E-06		6.6E-09
Chrysene	218-01-9	1.8E-06		6.6E-09
Dibenzo(a,h)anthracene	53-70-3	1.2E-06		4.4E-09
Dichlorobenzene	25321-22-6	1.2E-03		4.4E-06
Fluoranthene	206-44-0	3.0E-06		1.1E-08
Fluorene	86-73-7	2.8E-06		1.0E-08
Formaldehyde	50-00-0	7.5E-02		2.7E-04
Hexane	110-54-3	1.8E+00		6.6E-03
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06		6.6E-09
Naphthalene	91-20-3	6.1E-04		2.2E-06
Phenanathrene	85-01-8	1.7E-05		6.2E-08
Pyrene	129-00-0	5.0E-06		1.8E-08
Toluene	108-88-3	3.4E-03		1.2E-05
Arsenic	7440-38-2	2.0E-04	AP-42 Table 1.4-4 (07/98)	7.3E-07
Beryllium	7440-41-7	1.2E-05		4.4E-08
Cadmium	7440-43-9	1.1E-03		4.0E-06
Chromium	7440-47-3	1.4E-03		5.1E-06
Cobalt	7440-48-4	8.4E-05		3.1E-07
Manganese	7439-96-5	3.8E-04		1.4E-06
Mercury	7439-97-6	2.6E-04		9.5E-07
Nickel	7440-02-0	2.1E-03		7.7E-06
Selenium	7782-49-2	2.4E-05		8.8E-08
			Totals	6.89E-03

IEU13: 0.6 MMBtu/hr Enertek Dehy Reboiler Emissions:

	Value	Units
Fuel Usage	5.15	MMscf/yr
Horsepower	NA	hp
Hours	8760	hours
Max Fuel Combustion Rate	0.6	MMBtuhr
Fuel Heating Value	1020	MMBtu/MMscf
Conversions	2.2046	lbs/kg
	453.592	g/lb
	2000	lb/ton

Pollutant	**Emission Factor**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	7.60E+00	lb/MMscf	AP-42 Table 1.4-2	4.47E-03	0.020
NO_X	100	lb/MMscf	AP-42 Table 1.4-1	5.88E-02	0.258
CO	84	lb/MMscf	AP-42 Table 1.4-1	4.94E-02	0.216
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	3.24E-03	0.014
SO_X	6.00E-01	lb/MMscf	AP-42 Table 1.4-2	3.53E-04	0.002

Sample Calculation:

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)
PM Emissions (lb/hr) = (7.6 lb/MMscf) / (1020 MMBtu/MMscf) x (0.6 MMBtu/hr) = 0.0045 lbs/hr
PM Emissions (tons/yr) = (0.0045 lbs/hr) x (8760 hrs/yr) / (2000 lbs/ton) = 0.02 tons/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor (lb/MMscf)	Emission Factor Reference	Potential Emissions (ton/yr)
2-Methylnaphthalene	91-57-6	2.4E-05	AP-42 Table 1.4-3 (07/98)	6.2E-08
3-Methylchloranthrene	56-49-5	1.8E-06		4.6E-09
7,12-Dimethylbenz(a)anthracene		1.6E-05		4.1E-08
Acenaphthene	83-32-9	1.8E-06		4.6E-09
Acenaphthylene	203-96-8	1.8E-06		4.6E-09
Anthracene	120-12-7	2.4E-06		6.2E-09
Benz(a)anthracene	56-55-3	1.8E-06		4.6E-09
Benzene	71-43-2	2.1E-03		5.4E-06
Benzo(a)pyrene	50-32-8	1.2E-06		3.1E-09
Benzo(b)fluoranthene	205-99-2	1.8E-06		4.6E-09
Benzo(g,h,i)perylene	191-24-2	1.2E-06		3.1E-09
Benzo(k)fluoranthene	205-82-3	1.8E-06		4.6E-09
Chrysene	218-01-9	1.8E-06		4.6E-09
Dibenzo(a,h)anthracene	53-70-3	1.2E-06		3.1E-09
Dichlorobenzene	25321-22-6	1.2E-03		3.1E-06
Fluoranthene	206-44-0	3.0E-06		7.7E-09
Fluorene	86-73-7	2.8E-06		7.2E-09
Formaldehyde	50-00-0	7.5E-02		1.9E-04
Hexane	110-54-3	1.8E+00		4.6E-03
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06		4.6E-09
Naphthalene	91-20-3	6.1E-04		1.6E-06
Phenanathrene	85-01-8	1.7E-05		4.4E-08
Pyrene	129-00-0	5.0E-06		1.3E-08
Toluene	108-88-3	3.4E-03		8.8E-06
Arsenic	7440-38-2	2.0E-04	AP-42 Table 1.4-4 (07/98)	5.2E-07
Beryllium	7440-41-7	1.2E-05		3.1E-08
Cadmium	7440-43-9	1.1E-03		2.8E-06
Chromium	7440-47-3	1.4E-03		3.6E-06
Cobalt	7440-48-4	8.4E-05		2.2E-07
Manganese	7439-96-5	3.8E-04		9.8E-07
Mercury	7439-97-6	2.6E-04		6.7E-07
Nickel	7440-02-0	2.1E-03		5.4E-06
Selenium	7782-49-2	2.4E-05		6.2E-08
			Totals	**4.86E-03**

IEU14: <1 MMBtu/hr Building Heaters

	Value	Units	Notes
Fuel Usage	8.59	MMscf/yr	
Horsepower	NA	hp	
Hours	8760	hours	
Max fuel Comb. Rate	1	MMBtuhr	Manufacturer Specs
Fuel Heating Value	1020	MMBtu/MMscf	
Conversions	2.2046	lbs/kg	
	453.592	g/lb	
	2000	lb/ton	

Pollutant	**Emissions Factor**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	7.60E+00	lb/MMscf	AP-42 Table 1.4-2	7.45E-03	0.033

NO_X	100	lb/MMscf	AP-42 Table 1.4-1	9.80E-02	0.429
CO	84	lb/MMscf	AP-42 Table 1.4-1	8.24E-02	0.361
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	5.39E-03	0.024
SO_X	6.00E-01	lb/MMscf	AP-42 Table 1.4-2	5.88E-04	0.003

Sample Calculation:

PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr)
PM Emissions (lb/hr) = (7.6 lb/MMscf) / (1020 MMBtu/MMscf) x (1 MMBtu/hr) = 0.0075 lbs/hr
PM Emissions (tons/yr) = (0.0075 lbs/hr) x (8760 hrs/yr) / (2000 lbs/ton) = 0.033 tons/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor	Units	Emission Factor Reference	Potential Heater Emissions (ton/yr)
Benzene	71-43-2	2.10E-03	lb/MMscf	AP-42, Table 1.4-3	9.02E-06
Formaldehyde	50-00-0	7.50E-02	lb/MMscf	AP-42, Table 1.4-3	3.22E-04
Naphthalene	91-20-3	6.10E-04	lb/MMscf	AP-42, Table 1.4-3	2.62E-06
Toluene	87-86-5	3.40E-03	lb/MMscf	AP-42, Table 1.4-3	1.46E-05
Hexane	110-54-3	1.80E+00	lb/MMscf	AP-42, Table 1.4-3	7.73E-03
Dichlorobenzene	106-46-7	1.20E-03	lb/MMscf	AP-42, Table 1.4-3	5.15E-06
Arsenic	7440-38-2	2.0E-04	lb/MMscf	AP-42, Table 1.4-4	8.59E-07
Beryllium	7440-41-7	1.2E-05	lb/MMscf	AP-42, Table 1.4-4	5.15E-08
Cadmium	7440-43-9	1.1E-03	lb/MMscf	AP-42, Table 1.4-4	4.72E-06
Chromium	7440-47-3	1.4E-03	lb/MMscf	AP-42, Table 1.4-4	6.01E-06
Cobalt	7440-48-4	8.4E-05	lb/MMscf	AP-42, Table 1.4-4	3.61E-07
Manganese	7439-96-5	3.8E-04	lb/MMscf	AP-42, Table 1.4-4	1.63E-06
Mercury	7439-97-6	2.6E-04	lb/MMscf	AP-42, Table 1.4-4	1.12E-06
Nickel	7440-02-0	2.1E-03	lb/MMscf	AP-42, Table 1.4-4	9.02E-06
Selenium	7782-49-2	2.4E-05	lb/MMscf	AP-42, Table 1.4-4	1.03E-07
				Totals	8.11E-03

VOC Content[3] =	22% % VOC
CH_4 Content[3] =	78% % CH4
Hours of Operation =	8,760 hr
Conversions:	2000 lbs/ton
	2.20 lbs/kg

Hours per year 8760

Table B-3: Itemized Process Equipment Component Count for

Gas Component[3]	Service	Count	TOC EF[1] (kg/hr/source)	TOC EF (lb/hr/source)	TOC Emiss (lb/hr)	TOC Emiss (ton/yr)	Gas Molecular Weight[2] (lb/lb-mole)	Emiss (MMscf/yr)
Valves	Gas	145	4.50E-03	9.92E-03	1.44E+00	6.30E+00	16.043	0.3024
Pump seals	Gas	0	2.40E-03	5.29E-03	0.00E+00	0.00E+00	16.043	0.0000
Other	Gas	8	8.80E-03	1.94E-02	1.55E-01	6.80E-01	16.043	0.0326
Connectors	Gas	320	2.00E-04	4.41E-04	1.41E-01	6.18E-01	16.043	0.0297
Flanges	Gas	200	3.90E-04	8.60E-04	1.72E-01	7.53E-01	16.043	0.0361
Open-ended lines	Gas	12	2.00E-03	4.41E-03	5.29E-02	2.32E-01	16.043	0.0111
Valves	Heavy Liquid	0	8.40E-06	1.85E-05	-	-	N/A	-
Pump seals	Heavy Liquid	0	-	0.00E+00	-	-	N/A	-
Other	Heavy Liquid	0	3.20E-05	7.05E-05	-	-	N/A	-
Connectors	Heavy Liquid	0	7.50E-06	1.65E-05	-	-	N/A	-
Flanges	Heavy Liquid	0	3.90E-07	8.60E-07	-	-	N/A	-
Open-ended lines	Heavy Liquid	0	1.40E-04	3.09E-04	-	-	N/A	-
Valves	Light Liquid	12	2.50E-03	5.51E-03	6.61E-02	2.90E-01	44.097	0.0051
Pump seals	Light Liquid	0	1.30E-02	2.87E-02	-	-	44.097	-
Other	Light Liquid	0	7.50E-03	1.65E-02	-	-	44.097	-
Connectors	Light Liquid	36	2.10E-04	4.63E-04	1.67E-02	7.30E-02	44.097	0.0013
Flanges	Light Liquid	12	1.10E-04	2.43E-04	2.91E-03	1.27E-02	44.097	0.0002
Open-ended lines	Light Liquid	0	1.40E-03	3.09E-03	-	-	44.097	-
Valves	H_20 & Liquid	0	9.80E-05	2.16E-04	-	-	N/A	-
Pump seals	H_20 & Liquid	0	2.40E-05	5.29E-05	-	-	N/A	-
Other	H_20 & Liquid	0	1.40E-02	3.09E-02	-	-	N/A	-
Connectors	H_20 & Liquid	0	1.10E-04	2.43E-04	-	-	N/A	-
Flanges	H_20 & Liquid	0	2.90E-06	6.39E-06	-	-	N/A	-
Open-ended lines	H_20 & Liquid	0	2.50E-04	5.51E-04	-	-	N/A	-
				Total Fugitive TOC Emissions =	**2.05**	**8.96**		**0.42**
				Total Fugitve VOC Emissions = (1-78%)* TOC[4]=	**0.45**	**1.97**		**0.09**

1. From Table 2-4 of Protocol for Equipment Leak Emissions Estimates (EPA-453/R-95-017), November, 1995.
2. Molecular weight of methane (CH_4)is used as a surrogate for molecular weight of gas. Molecular weight of propane (C_3H_8) is used as a surrogate for molecular weight of the light liquid.
3. The "other" equipment factor is for compressors, diaphragms, drains, dump arms, hatches, instruments, meters, PRVs, polished rods, relief valves and vents.
4. From GRI GLYCalc Version 4.0 Calculations Report (August 2007) and Energy Laboratories wet gas analysis (October 2001), 78% of natural gas is methane.

Summary of Gas Analyses

Gas Constituent	Wet Gas Conc. (Vol%)[1]	Dry Gas Conc. (Vol%)[2]	HAP ?
Water	NG	9.72E-04	no
Carbon Dioxide	3.99E+00	3.99E+00	no
Nitrogen	3.07E+00	3.07E+00	no
Methane	7.81E+01	7.80E+01	no
Ethane	7.07E+00	7.07E+00	no
Propane	3.90E+00	3.90E+00	no
Isobutane	7.00E-01	7.00E-01	no
n-Butane	1.40E+00	1.40E+00	no
Isopentane	4.20E-01	4.20E-01	no
n-Pentane	3.30E-01	3.30E-01	no
n-Hexane	1.10E-01	1.10E-01	yes
Other Hexanes	1.50E-01	1.50E-01	no
Heptanes	8.10E-01	8.07E-01	no
2,2,4-Trimethylpentane	2.41E-02	2.41E-02	yes
Benzene	5.40E-03	5.03E-03	yes
Toluene	1.12E-02	9.90E-03	yes
Ethylbenzene	2.00E-03	1.61E-03	yes
Xylenes	6.50E-03	4.54E-03	yes

1. From Energy Laboratories wet gas analysis dated October 2001 (on file with MDEQ).
2. From GRI GLYCalc Version 4.0 Calculations Report, August 2007.

NG = Data not given.

Potential Fugitive HAPs Emissions from Process Valves, etc. (EU15)

HAP Compound	Dry Gas HAP Conc. (vol %)	Molecular Wt. (lb/lb-mole)	TOC Emission Rate Valves, etc. (MMscf/yr)	TOC Emission Rate Total (scf/yr)	HAP Emission Rate (scf/yr)	HAP Emission Rate (tpy)
n-Hexane	1.10E-01	86.2	0.42	418,522	460	4.44E-02
2,2,4-Trimethylpentane	2.41E-02	114.2	0.42	418,522	101	1.29E-02
Benzene	5.03E-03	78.1	0.42	418,522	21	1.84E-03
Toluene	9.90E-03	92.1	0.42	418,522	41	4.27E-03
Ethylbenzene	1.61E-03	106.2	0.42	418,522	7	8.01E-04
Xylenes	4.54E-03	106.2	0.42	418,522	19	2.26E-03
					Total (tpy) =	6.65E-02

IEU16: In-Plant Vehicle Traffic

Estimated trips per day =	12	
Plant Road Distance =	1	
Vehicle miles traveled =	4380	VMT/year
Silt =	13.5	%, AP-42 13.2.2-3
Estimated Average Speed =	30	mph
Estimated Average Vehicle Weight =	5	tons
Days precipitation > 0.01 =	120	days per year
Control Efficiency =	50.0%	Reasonable Precautions
Conversions:	453.592	grams/lb
	2000	lbs/ton

Pollutant	a	b	k lb/VMT	Emission Factor lb/VMT
TSP	0.7	0.45	4.9	6.70
PM-10	0.9	0.45	1.5	2.10

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (ton/yr)
TSP	6.70	lb/VMT	AP-42 13.2.2; eqn 1a	1.67	7.33
PM-10	2.10	lb/VMT	AP-42 13.2.2; eqn 1a	0.52	2.30

Sample Calculation:

PM Emissions (tpy) = (Emission Factor, lbs/VMT) x (VMT/year)/(2,000 lb/ton)*(Control Efficiency)
PM Emissions (tpy) = (6.7 lb/VMT) x (4380 VMT/year) /(2,000 lb/ton) x (0.5) = 7.33 tpy

IEU17: 158 hp Onana Cummins Emergency Backup Generator

	Values	Units	Notes
Heat Input	1.343	MMBtu/hr	Calculated
Max Heat Capacity	0.0085	MMBtu/hr	Manufacturer Specs
Horsepower	158	hp	Manufacturer Specs
Fuel Usage	0.0013	MMscf/hr	
Rating	100	kW	Manufacturer Specs
Hours	500	hrs/yr	
Conversions	2000	lb/ton	
	2.2046	lbs/kg	
	453.592	g/lb	

Pollutant	**Emissions Factor**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	1.94E-02	lbs/MMBtu	AP-42 3.2-2	0.03	0.0065
NO_X	11	g/kW-hr	Manufacturer Specs (06/18/2002)	2.43	0.6075
CO	31.4	g/kW-hr	Manufacturer Specs (06/18/2002)	6.92	1.7300
VOC	1.50E+00	g/kW-hr	Manufacturer Specs (06/18/2002)	0.33	0.0825
SO_X	5.88E-04	lbs/MMBtu	AP-42 3.2-3	7.90E-04	0.0002

Sample Calculation:

Emissions (lb/hr)= (Emission Factor, lb/MMBtu)x(Heat Input, MMBtu/hr)
PM Emissions (lb/hr)= (0.0194 lbs/MMBtu) x (1.343 MMBtu/hr)
PM Emissions (lb/hr)= 0.03 lb/hr

Emissions (ton/yr)= (Emissions, lb/hr) x (Hours of Operation) / (2000 lb/ton)
PM Emissions (ton/yr)= (0.03 lb/hr) x (500 hrs/yr) / (2000 lb/ton)
PM Emissions (ton/yr)= 0.01 ton/yr

Hazardous Air Pollutants (HAPs)

Pollutant	Emission Factor	Units	Emission Factor Reference	Potential Emissions (ton/yr)
1,1,2,2-Tetracholoethane	2.53E-05	lb/MMBtu	AP-42 Table 3.2-3	8.49E-06
1,1,2-Trichloroethane	1.53E-05	lb/MMBtu		5.14E-06
1,3-Butadiene	6.63E-04	lb/MMBtu		2.23E-04
1,3-Dichloropropene	1.27E-05	lb/MMBtu		4.26E-06
Acetaldehyde	2.79E-03	lb/MMBtu		9.37E-04
Acrolein	2.63E-03	lb/MMBtu		8.83E-04
Benzene	1.58E-03	lb/MMBtu		5.30E-04
Carbon Tetrachloride	1.77E-05	lb/MMBtu		5.94E-06
Chlorobenzene	1.29E-05	lb/MMBtu		4.33E-06
Chloroform	1.37E-05	lb/MMBtu		4.60E-06
Ethylbenzene	2.48E-05	lb/MMBtu		8.33E-06
Ethylene Dibromide	2.13E-05	lb/MMBtu		7.15E-06
Formaldehyde	2.05E-02	lb/MMBtu		6.88E-03
Methanol	3.06E-03	lb/MMBtu		1.03E-03
Methylene Chloride	4.12E-05	lb/MMBtu		1.38E-05
Naphthalene	9.71E-05	lb/MMBtu		3.26E-05
PAH	1.41E-04	lb/MMBtu		4.73E-05
Styrene	1.19E-05	lb/MMBtu		4.00E-06
Toluene	5.58E-04	lb/MMBtu		1.87E-04
Vinyl Cloride	7.18E-06	lb/MMBtu		2.41E-06
Xylene	1.95E-04	lb/MMBtu		6.55E-05
Arsenic	2.0E-04	lb/MMscf	AP-42 Table 1.4-4 (7-98)	6.58E-08
Beryllium	1.2E-05	lb/MMscf		3.95E-09
Cadmium	1.1E-03	lb/MMscf		3.62E-07
Chromium	1.4E-03	lb/MMscf		4.61E-07
Cobalt	8.4E-05	lb/MMscf		2.77E-08
Manganese	3.8E-04	lb/MMscf		1.25E-07
Mercury	2.6E-04	lb/MMscf		8.56E-08
Nickel	2.1E-03	lb/MMscf		6.91E-07
Selenium	2.4E-05	lb/MMscf		7.90E-09
			Total HAPs:	**0.01**

IEU18: Methanol Storage Tank

Pollutant	Emission Factor	Units	Emission Factor Reference	Emissions (lbs/hr)	Emissions (ton/yr)
VOC	N/A	N/A	Tanks 4.09d	4.57E-04	0.0020

IEU19: 4MMBtu/hr Line Heater

	Value	Units	Notes
Fuel Usage	16.01	MMscf/yr	
Horsepower	NA	hp	
Hours	4000	Hours	
Max Heat Output Rate	2.8	MMBtuhr	Manufacturer Specs
Heating Efficiency	70	%	Manufacturer Specs
Max Heat Input Rate	4	MMbtu/hr	Manufacturer Specs
Fuel Heating Value	1000	Mmbtu/MMScf	
Conversions	2.2046	lbs/kg	
	453.592	g/lb	
	2000	lb/ton	

Pollutant	**Emissions Factor**	**Units**	**EF Reference**	**Emissions (lb/hr)**	**Emissions (TPY)**
PM (includes PM_{10} and $PM_{2.5}$)	7.60E+00	lb/MMscf	AP-42 Table 1.4-2	3.04E-02	0.061
NO_X	100	lb/MMscf	AP-42 Table 1.4-1	4.00E-01	0.800
CO	84	lb/MMscf	AP-42 Table 1.4-1	3.36E-01	0.672
VOC	5.5	lb/MMscf	AP-42 Table 1.4-2	2.20E-02	0.044
SO_X	6.00E-01	lb/MMscf	AP-42 Table 1.4-2	2.40E-03	0.005

Sample Calculation:
PM Emissions = (Emission Factor, lbs/MMscf) / (Fuel Heating Value, MMBtu/MMscf) x (Fuel Combustion Rate MMBtu/hr) / (Heating Efficiency)
PM Emissions (lb/hr) = (7.6 lb/MMscf) / (1000 MMBtu/MMscf) x (2.802 MMBtu/hr) / (0.7) = 0.0304 lbs/hr
PM Emissions (tons/yr) = (0.0304 lbs/hr) x (4000 hrs/yr) / (2000 lbs/ton) = 0.061 tons/yr

Hazardous Air Pollutants (HAPs)

Pollutant	CAS No.	Emission Factor (lb/MMscf)	Emission Factor Reference	Potential Emissions (ton/yr)
2-Methylnaphthalene	91-57-6	2.4E-05		1.9E-07
3-Methylchloranthrene	56-49-5	1.8E-06		1.4E-08
7,12-Dimethylbenz(a)anthracene		1.6E-05		3.2E-05
Acenaphthene	83-32-9	1.8E-06		1.4E-08
Acenaphthylene	203-96-8	1.8E-06		1.4E-08
Anthracene	120-12-7	2.4E-06		1.9E-08
Benz(a)anthracene	56-55-3	1.8E-06		1.4E-08
Benzene	71-43-2	2.1E-03		1.7E-05
Benzo(a)pyrene	50-32-8	1.2E-06		9.6E-09
Benzo(b)fluoranthene	205-99-2	1.8E-06		1.4E-08
Benzo(g,h,i)perylene	191-24-2	1.2E-06	AP-42 Table 1.4-3 (07/98)	9.6E-09
Benzo(k)fluoranthene	205-82-3	1.8E-06		1.4E-08
Chrysene	218-01-9	1.8E-06		1.4E-08
Dibenzo(a,h)anthracene	53-70-3	1.2E-06		9.6E-09
Dichlorobenzene	25321-22-6	1.2E-03		9.6E-06
Fluoranthene	206-44-0	3.0E-06		2.4E-08
Fluorene	86-73-7	2.8E-06		2.2E-08
Formaldehyde	50-00-0	7.5E-02		6.0E-04
Hexane	110-54-3	1.8E+00		1.4E-02
Indeno(1,2,3-cd)pyrene	193-39-5	1.8E-06		1.4E-08
Naphthalene	91-20-3	6.1E-04		4.9E-06
Phenanathrene	85-01-8	1.7E-05		1.4E-07
Pyrene	129-00-0	5.0E-06		4.0E-08
Toluene	108-88-3	3.4E-03		2.7E-05
Arsenic	7440-38-2	2.0E-04		1.6E-06
Beryllium	7440-41-7	1.2E-05		9.6E-08
Cadmium	7440-43-9	1.1E-03		8.8E-06
Chromium	7440-47-3	1.4E-03		1.1E-05
Cobalt	7440-48-4	8.4E-05	AP-42 Table 1.4-4 (07/98)	6.7E-07
Manganese	7439-96-5	3.8E-04		3.0E-06
Mercury	7439-97-6	2.6E-04		2.1E-06
Nickel	7440-02-0	2.1E-03		1.7E-05
Selenium	7782-49-2	2.4E-05		1.9E-07
			Totals	**1.51E-02**

V. Existing Air Quality

DEQ determined that there will be minor air quality impacts from this permitting action. Glacier County is classified as, "Attainment/Unclassifiable" as of August 19, 2024. Therefore, DEQ believes this action will not cause or contribute to a violation of any ambient air quality standard.

VI. Ambient Air Impact Analysis

Based on the information provided and the conditions established in MAQP #2783-13, DEQ determined that there will be minor air quality impacts from this permitting action. Therefore, DEQ did not conduct an ambient air impact analysis. DEQ believes it will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, DEQ 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)].
		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, DEQ determined there are no taking or damaging implications associated with this permit action.

VIII. Environmental Assessment

This permitting action will result in an increase of emissions from the facility therefore, an environmental assessment is required.

FINAL ENVIRONMENTAL ASSESSMENT

November 19, 2024

Air Quality Bureau
Montana Department of Environmental Quality

PROJECT/SITE NAME: Station W/Station 17 Compressor Station	
APPLICANT/COMPANY NAME: NorthWestern Energy	
PROPOSED PERMIT/LICENSE NUMBER: 2783-13	
LOCATION: Township 35N, Range 5W, Section 15	**COUNTY: Glacier**
PROPERTY OWNERSHIP: FEDERAL ____ STATE ____ PRIVATE _X___	

Table of Contents

Project Overview

COMPANY NAME:	NorthWestern Energy
EA DATE:	November 1, 2024
SITE NAME:	Cobb Field Station W/Station 17 Compressor Station
MAQP#:	2783
Version #:	13
Application Received Date:	August 8, 2024

Location

Township 35 North, Range 5 West, Section 15
County: Glacier
PROPERTY OWNERSHIP: FEDERAL STATE PRIVATE X

Compliance with the Montana Environmental Policy Act

Under the Montana Environmental Policy Act (MEPA), Montana agencies are required to prepare an environmental review for state actions that may have an impact on the human environment. The proposed action is considered to be a state action that may have an impact on the human environment and, therefore, the Department of Environmental Quality (DEQ) must prepare an environmental review. This Environmental Assessment (EA) will examine the proposed action and alternatives to the proposed action and disclose potential impacts that may result from the proposed and alternative actions. DEQ will determine the need for additional environmental review based on consideration of the criteria set forth in Administrative Rules of Montana (ARM) 17.4.608. DEQ may not withhold, deny, or impose conditions on the Permit based on the information contained in this EA (§ 75-1- 201(4), MCA).

Proposed Action

NorthWestern Energy (NWE) has applied for a Montana Air Quality permit modification under the Clean Air Act of Montana to construct and operate this facility. The state law that regulates air quality permitting in Montana is the Clean Air Act of Montana, §§ 75-2-101, et seq., (CAA) Montana Code Annotated (MCA). DEQ may not approve a proposed project contained in an application for an air quality permit unless the project complies with the requirements set forth in the CAA of Montana and the administrative rules adopted thereunder, ARMs 17.8.101 et. seq. The proposed action would be located on privately owned land, in Glacier County, Montana. All information included in this EA is derived from the permit application, discussions with the applicant, analysis of aerial photography, topographic maps, and other research tools.

Purpose and Need

Under MEPA, Montana agencies are required to prepare an environmental review for state actions that may have an impact on the human environment. The Proposed Action is a state action that may have an impact on the human environment; therefore, DEQ must prepare an environmental review pursuant to MEPA. This EA will examine the proposed action and alternatives to the proposed action and disclose potential impacts that may result from the proposed and alternative actions. DEQ will determine the need for additional environmental review based on consideration of the criteria set forth in ARM 17.4.608, Determining the Significance of Impacts.

Table 1: Summary of Proposed Action

Proposed Action	
General Overview	NWE will replace the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station.
Duration & Hours of Operation	**Construction:** The construction is estimated to start in September 2024 and finish in October 2024. **Operation:** The facility will operate on a continual basis, 8760 hours per year.
Estimated Disturbance	No land disturbance will occur from this permitting action, of replacing the existing turbines with larger horsepower turbines.
Construction Equipment	No construction equipment will be utilized for the installation of the new turbines. The turbines will arrive via truck to the facility and then installed.
Personnel Onsite	**Construction:** Approximately 2-3 personnel will be onsite during the construction timeframe for approximately two weeks. **Operation:** Two onsite employees
Location and Analysis Area	**Location**: 242 Hay Lake Road, Cut Bank, MT, 59427 **Analysis Area:** The area being analyzed as part of this environmental review includes the immediate project area (Figure 1), as well as neighboring lands surrounding the analysis area, as reasonably appropriate for the impacts being considered.
The applicant is required to comply with all applicable local, county, state, and federal requirements pertaining to the following resource areas.	
Air Quality	The applicant proposes to modify the existing MAQP #2783-12, for replacing the three existing 1,400hp natural gas combustion turbines and the two existing 1,450hp natural gas combustion turbines with 1,600hp natural gas combustion turbines at the NWE Station W Compressor Station.
Water Quality	This permitting action would not affect water quality. NWE is required to comply with the applicable local, county, state and federal requirements pertaining to water quality.
Erosion Control and Sediment Transport	This permitting action would not affect erosion control and sediment transport. NWE is required to comply with the applicable local, county, state and federal requirements pertaining to erosion control and sediment transport.
Solid Waste	This permitting action would not affect solid waste in the area. NWE is required to comply with the applicable local, county, state and federal requirements pertaining to solid waste.
Cultural Resources	This permitting action would not affect cultural resources. NWE is required to comply with the applicable local, county, state and federal requirements pertaining to cultural resources.

Hazardous Substances	This permitting action would not contribute to any hazardous substances. NWE is required to comply with the applicable local, county, state and federal requirements pertaining to hazardous substances.
Reclamation	This permitting action would not require any reclamation.

Cumulative Impact Considerations	
Past Actions	See Section 1.C. Permit History, for all previous permitting actions for this permitted facility.
Present Actions	NWE will replace the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station.
Related Future Actions	DEQ is not currently aware of any future projects from NWE. Any future projects would be subject to a new permit application.

See Figures 1, 2 and 3 below for the project location of the NWE site.

Figure 1: Site Location Map

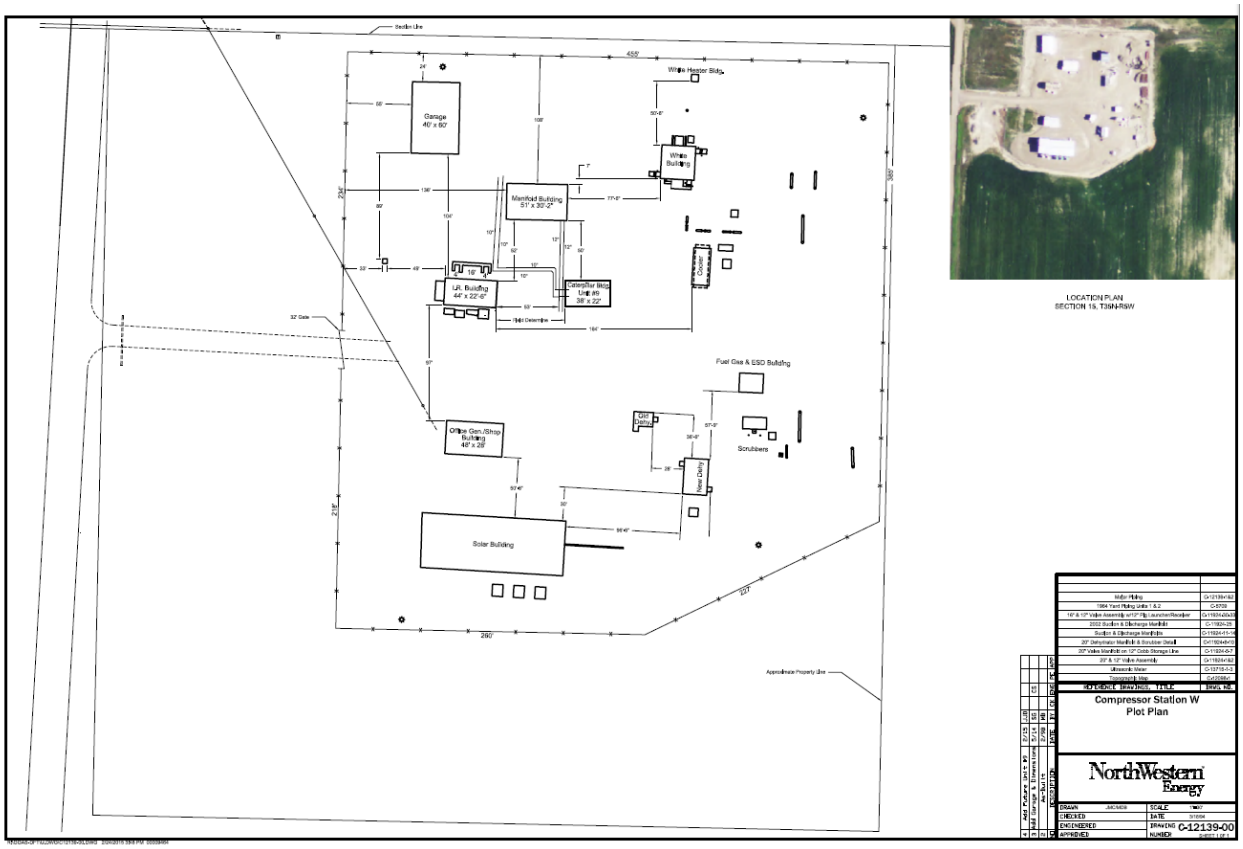
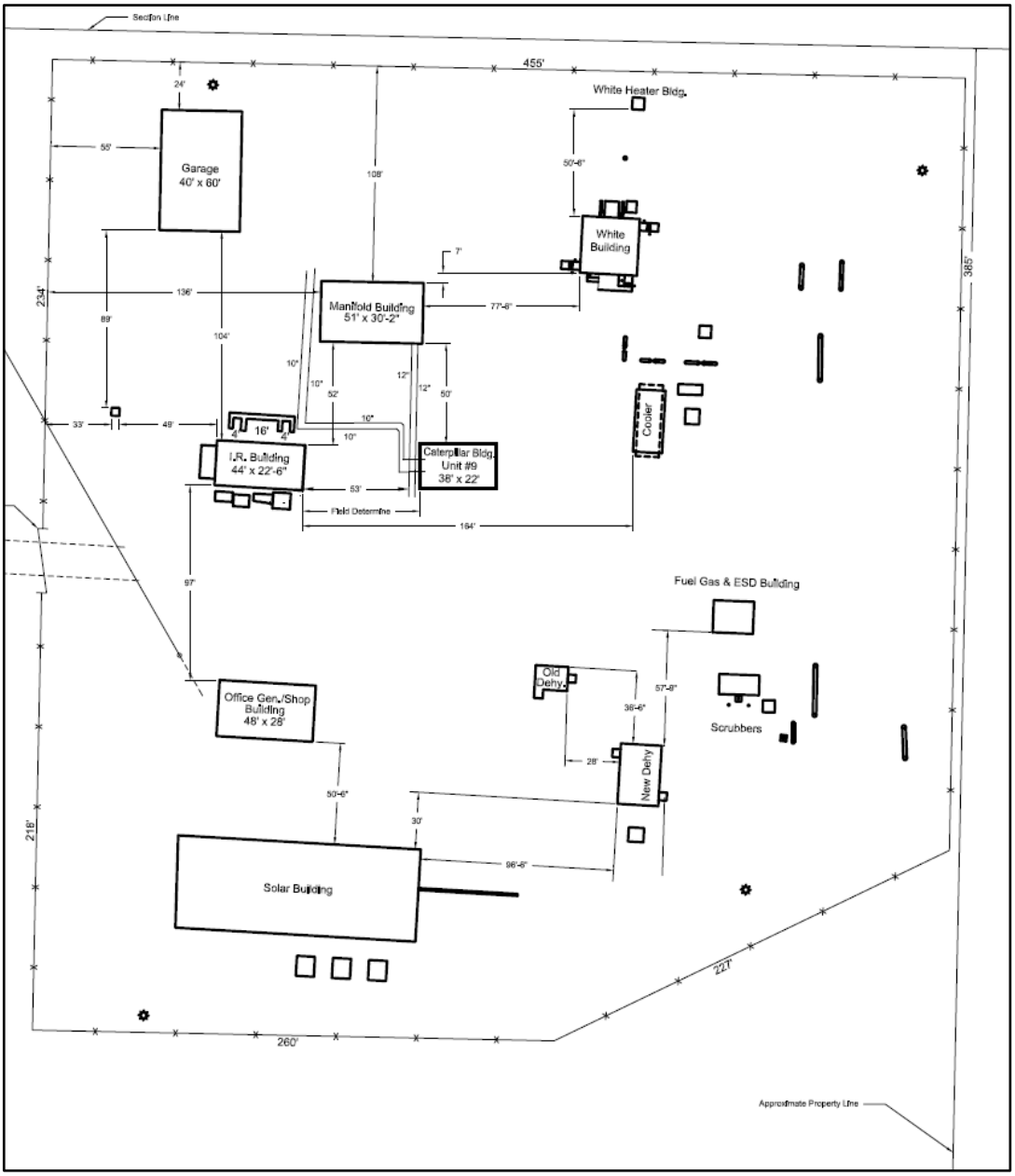


Figure 2. Location Plan

Figure 3. Detailed View



EVALUATION OF AFFECTED ENVIRONMENT AND IMPACT BY RESOURCE:

The impact analysis will identify and evaluate whether the impacts are direct or secondary impacts to the physical environment and human population in the area to be affected by the proposed project. Direct impacts occur at the same time and place as the action that causes the impact. Secondary impacts are a further impact to the human environment that may be stimulated, or induced by, or otherwise result from a direct impact of the action (ARM 17.4.603(18)). Where impacts would occur, the impacts will be described.

Cumulative impacts are the collective impacts on the human environment within the borders of Montana that could result from the Proposed Action when considered in conjunction with other past and present actions related to the Proposed Action by location and generic type. Related future impacts must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures. The activities identified in Table 1 were analyzed as part of the cumulative impacts assessment for each resource.

The duration is quantified as follows:

- Construction Impacts (short-term): These are impacts to the environment during the construction period. When analyzing duration, please include a specific range of time.

- Operation Impacts (long-term): These are impacts to the environment during the operational period. When analyzing duration, please include a specific range of time.

The intensity of the impacts is measured using the following:

++No impact: There would be no change from current conditions.

- Negligible: An adverse or beneficial effect would occur but would be at the lowest levels of detection.

- Minor: The effect would be noticeable but would be relatively small and would not affect the function or integrity of the resource.

- Moderate: The effect would be easily identifiable and would change the function or integrity of the resource.

- Major: The effect would alter the resource.

1. Geology and Soil Quality, Stability, and Moisture

The geological formation of this area is the Two Medicine Formation (Geological Map).
This permitting action is not considered first time disturbance and this facility uses this land for industrial purposes. No disturbance to soil will occur with this permitting action.

Direct Impacts:

The permit application included additional information like analysis of aerial photography, topographic maps, information provided by NWE and other research tools. No impacts to geology and soil quality, stability, and moisture are anticipated from this permitting action.

Secondary Impacts:

No secondary impacts to geology, stability, and moisture would be expected because the replacement turbines would be located within the existing NWE property boundary.

Cumulative Impacts:

No cumulative impacts to geology and soil quality, stability, and moisture are anticipated from this permitting action.

2. Water Quality, Quantity, and Distribution

Approximately one mile to the East of the facility is Hay Lake. Old Maids Coulee and Snake Coulee are located in the area as well.

Direct Impacts:

NWE has not submitted any other permit applications that DEQ is aware of related to this permitting action. The construction phase of the proposed project would not require ground disturbance thus no water resources would be required for the control of fugitive dust from construction activities or operation of new turbines. Since there is not any new water usage from construction or operation of the turbines, no discharge to nearby water resources would occur.
No fragile or unique water resources or values are present in the area affected by the proposed project. No direct impacts to water quality and quantity, which are resources of significant statewide and societal importance, would be expected from this permitting action.

Secondary Impacts:

During operations, discharges would not be released to ground or surface water because of the proposed project. Further, as permitted, the proposed project would not be expected to cause or contribute to a violation of the applicable primary or secondary NAAQS. See permit analysis for more detailed information regarding air quality impacts. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, no secondary impacts to water quality would be expected because of the proposed project. No new water resources would be required for normal operations of the affected new equipment. No secondary impacts to water quantity, quantity, and distribution would be expected from this permitting action.

Cumulative Impacts:

No major cumulative impacts to water quality, quantity, and distribution are anticipated from this permitting action. NWE has not submitted any other permit applications that DEQ is aware of. Further, DEQ is unaware of any related actions under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures.

3. Air Quality

Existing sources of air pollution in the area are limited and generally include fugitive dust associated with high wind events and exposed ground, vehicle travel on unpaved roads (fugitive dust), vehicle exhaust emissions, various agricultural practices (vehicle exhaust emissions and fugitive dust) and emissions from dispersed oil and gas facilities in the affected area (fugitive dust, natural gas flaring, engine exhaust emissions). No significant point-sources of air pollution exist in the area affected by the proposed project. As of August 19, 2024, Glacier County is designated as an Unclassifiable/Attainment area for all criteria pollutants according to 40 CFR 81.327. Applicants are required to comply with all laws relating to air, such as the Federal Clean Air Act, National Ambient Air Quality Standards set by the Environmental Protection Agency (EPA), and the Clean Air Act of Montana.

Direct Impacts:

The construction phase of the proposed project would not require ground disturbance thus no water resources would be required for the control of fugitive dust from construction activities associated with the proposed project. Expected emissions from the construction and operation of the facility are shown in the Permit Analysis Section within the Emission Inventory. An assessment of greenhouse gases (GHGs) is described in Section 23 of this EA. Any direct impacts would be short-term and negligible.

Air quality standards, set by the federal government and DEQ are enforced by the AQB and allow for pollutants at the levels permitted within the MAQP. The NWE emissions include particulate matter (PM) species, oxides of nitrogen (NOX), carbon monoxide (CO), sulfur dioxide (SO2), volatile organic compounds (VOCs), Hazardous Air Pollutants (HAPs), and GHG emissions.

Air pollution control equipment must be operated at the maximum design for which it is intended ARM 17.8.752(2). Limitations would be placed on the allowable emissions for the new emission sources. As part of the air quality permit application, NWE submitted a Best Available Control Technology (BACT) analysis for each emitting unit. These proposed limits were reviewed by DEQ and incorporated into MAQP #2783-13 as federally enforceable conditions. These permit limits cover NO_X, CO, SO_2, VOCs, PM, and HAPs with associated ongoing compliance demonstrations, as determined by DEQ.

Air quality standards are regulated by the federal Clean Air Act, 42 U.S.C. 7401 et seq. and CAA, § 50-40-101 et seq. MCA, and are implemented and enforced by DEQ's AQB. As stated above, NWE is required to comply with all applicable state and federal laws. Minor air quality impacts would be anticipated for the proposed action.

Secondary Impacts:

Impacts to air quality from the operation of the NWE facility are to be restricted by an MAQP and therefore should have minor secondary air quality impacts.

The ongoing use of unpaved roads to access the proposed facility would occur and would be expected to generate fugitive dust. However, NWE would be subject to reasonable precautions requirements for the control of fugitive dust from vehicle travel on unpaved roads. Further, operation of the permitted equipment would result in the emission of regulated airborne pollutants. As permitted, the proposed project would not be expected to cause or contribute to a violation of the applicable primary or secondary NAAQS. See permit analysis for more detailed information regarding air quality impacts. Primary NAAQS provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any secondary impacts would be long-term, consistent with existing impacts in the affected area, and minor.

Cumulative Impacts:

Cumulative impacts to air quality from the operation of the NWE facility are to be restricted by an MAQP and therefore should have minor air quality impacts. The nearby area also has other stationary sources, the Cut Bank Crude Oil Tank Farm MAQP #2757-06, the Cut Bank Field Station 001 MAQP #2768-10, NorthWestern Energy Mainline #1 MAQP #2428-15, Mainline #1 Facility, Unit #3 MAQP #5215-02, Cut Bank Field Station 015 MAQP #2737-09, Cut Bank Field Station 018 MAQP #2738-08, and Ferdig Oil Co MAQP #2810-01, that all contribute to the air quality of this area. DEQ is unaware of any related future actions that are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures.

4. Vegetation Cover, Quantity, and Quality

The proposed project would occur on land already in industrial use. The predominant type of existing vegetation in the affected area is sagebrush and range grass (NWE permit application). The information provided above is based on the information that DEQ had available to it at the time of completing this EA and provided by the applicant. The permit application provided an analysis of aerial photography, topographic maps, geologic maps, soil maps, and other research tools.

DEQ conducted research using the Montana Natural Heritage Program (MTNHP) website and ran the query titled “Environmental Summary Report” dated August 21, 2024, that produced the following Species of Concern (SOC) for the following plants: Long-sheath Waterweed and Bractless Hedge-hyssop. The polygon area analyzed using the MTNHP website produces an area inherently larger than the specific disturbance area, so some additional species may be reported that are not necessarily present in this exact area, but nearby.

No unique or important plant areas are present in this area. No rare plants, or cover types, are present in this area.

Direct Impacts:

No vegetative communities will be impacted from this permitting action as it is occurring on land already in industrial use and no ground disturbing activities will occur because of the proposed project. Therefore, no direct impacts would be expected because of the proposed project.

Secondary Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any direct impacts would be short-term and negligible to minor.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible.

5. Terrestrial, Avian, and Aquatic Life and Habitats

As described earlier in Section 4. Vegetation Cover, Quantity, and Quality, the area is represented by agricultural and industrial operations. There is no known wildlife in the area, and no known migration or intentional movement, across the property (NWE application). DEQ conducted research using the MTNHP website and ran the query titled "Environmental Summary Report" dated August 21, 2024, which produced the following species of concern (SOC): Hoary Bat, Baird's Sparrow, Burrowing Owl, Sage Thrasher, Long-eared Myotis, Long-legged Myotis, Silver-haired Bat, American Bittern, Bald Eagle, Greater Short-horned Lizard, Eastern Red Bat, Caspian Tern, Great Blue Heron, Black-tailed Prairie Dog, Preble's Shrew, Townsend's Big-eared Bat, Northern Leopard Frog, Common Poorwill, and the Grizzly Bear.
The polygon area analyzed using the MTNHP website produces an area inherently larger than the specific disturbance area, so some additional species may be reported that are not necessarily present in this exact area, but nearby.

No important bird areas are present in the area. This area is in the BCR 10 – Northern Rockies, Bird Conservation Region. Approximately one mile to the East of the facility is Hay Lake.

This project would not be in core, general or connectivity sage grouse habitat, as designated by the Sage Grouse Habitat Conservation Program (Program Map).

Direct Impacts:

There would be no new land disturbance, meaning no species will be displaced by this permitting action. Therefore, any direct impacts would be short-term, similar to existing impacts, and negligible. The potential impact to terrestrial, avian and aquatic life and habitats would be negligible, due to the long-term industrial nature of the site

Secondary Impacts:

The affected area consists primarily of agricultural and grazing lands with nearby oil and gas operations. Since this permitting action is not considered first time disturbance, any species displaced

by facility operations would be unlikely. Emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any secondary impacts would be long-term and negligible to minor. No secondary impacts to aquatic life and habitats would be expected because of the proposed project. No secondary impacts to terrestrial, avian and aquatic life and habitats stimulated or induced by the direct impacts analyzed above would be expected.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible.

6. Unique, Endangered, Fragile, or Limited Environmental Resources

According to review of the Montana Natural Heritage Program's online resource for such purposes, the following species of concern may be present within or use the affected area for part of their life cycle: Hoary Bat, Baird's Sparrow, Burrowing Owl, Sage Thrasher, Long-eared Myotis, Long-legged Myotis, Silver-haired Bat, American Bittern, Bald Eagle, Greater Short-horned Lizard, Eastern Red Bat, Caspian Tern, Great Blue Heron, Black-tailed Prairie Dog, Preble's Shrew, Townsend's Big-eared Bat, Northern Leopard Frog, Common Poorwill, and Grizzly Bear. The Montana Natural Heritage Program search used a polygon that overlapped the site and produced the list of species of concern identified in Section 5 above. The project would not be in core, general or connectivity sage grouse habitat, as designated by the Sage Grouse Habitat Conservation Program (Program) at: http://sagegrouse.mt.gov.

Direct Impacts:

Construction of the proposed project would not involve any new ground disturbing activities and the affected site is an existing industrial site. Therefore, none of the identified species of concern would be expected to locate within or use the affected site for part of their life cycle and no impacts would be expected because of the proposed project.

Secondary Impacts:

Operation of the proposed facility would not require new land disturbance. Further, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any secondary impacts would be long-term and negligible to minor.

The proposed action at the NWE facility would have no secondary impacts to endangered species because the permit conditions are protective of human and animal health and all lands involved in the proposed action are currently used for industrial operations and would not change the effect to the environment.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible.

The proposed action and the development and operation of the NWE facility would have minor cumulative impacts to endangered species because the permit conditions are protective of human and animal health and all lands involved in the proposed action are currently used for industrial operations and would not change the effect to the environment outside of the original construction of the facility.

7. Historical and Archaeological Sites

The Montana State Historic Preservation Office (SHPO) was contacted to conduct a file search for historical and archaeological sites within Section 15 Township 35 North, Range 5 West, in Glacier, County, Montana. SHPO provided a letter dated August 14, 2024, that indicated there have been no previously recorded sites within the designated search location. It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are within the Area of Potential Effect, and are over fifty years old, SHPO recommends that they be recorded, and a determination of their eligibility be made prior to any disturbance taking place. It is SHPO's position that the absence of cultural properties in the area does not mean that they do not exist, but rather may reflect the absence of any previous cultural resource inventory in the area, as the records indicated none.

However, should structures need to be altered, or if cultural materials are inadvertently discovered during this proposed action, SHPO requests their office be contacted for further investigation. It is/is not anticipated that this project would cause a shift in any unique quality of the area.

Direct Impacts:

No previously recorded historical or archaeological sites have been identified within the project area. Therefore, no direct impacts would be expected because of the proposed project.

Secondary Impacts:

No previously recorded historical or archaeological sites have been identified within the project area. Therefore, no secondary impacts would be expected because of the proposed project.

Cumulative Impacts:

No previously recorded historical or archaeological sites have been identified within the project area. Therefore, no cumulative impacts would be expected because of the proposed project.

8. Aesthetics

The site is located in an area mostly surrounded by sagebrush and grass. The closest structure, including residential homes, is approximately 0.6 miles away from the facility. The proposed action would occur on private land.

Direct Impacts:

The affected area consists primarily of sagebrush and grass, with oil and gas operations in the area. Further, construction of the proposed facility would not require new land disturbance. During construction, a minor increase in noise level would be anticipated from this permitting action, but would be temporary, as it would return to normal noise levels following the completion of the installation of the new turbines. The compressor station will operate continuously, 24 hours a day. The NWE profile would not change with this permitting action as the new turbines are going into already existing structures on the NWE property. Therefore, any direct impacts would be short-term, consistent with existing impacts, and negligible to minor.

Secondary Impacts:

Operation of the proposed facility would not require new land disturbance. Further, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any secondary impacts would be long-term, consistent with existing impacts in the affected area, and negligible to minor.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible. While in the construction phase, the proposed project may cause minor, short-term impacts to area aesthetics, but long-term impacts would remain the same for this facility, from this permitting action.

9. Demands on Environmental Resources of Land, Water, Air, or Energy

The site is located on land owned by NWE with industrial activities. The affected area generally supports existing industrial operations See Sections 1, 2, and 3 of this EA for details on land, water and air.

Direct Impacts:

Once the replacement of the turbines is complete, energy and electric demands would continue for the duration of the facility's lifetime at or near current levels. Some direct impacts to land, water and air would be expected because of the proposed project, as identified by the corresponding impacts analyses above. Further, no ground disturbing activities would occur during the construction phase of the proposed project; therefore, the operation of heavy equipment and the combustion of fossil fuels necessary to operate such equipment would not occur because of the proposed project. No direct impacts to energy resources would be expected because of the proposed project.

Secondary Impacts:

No secondary impacts to demands on land, water, air, and energy are anticipated as a result of this permitting action.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible.

10. Impacts on Other Environmental Resources

The site currently is an existing compressor station. This facility is already used for industrial purposes.

Direct Impacts:

No other environmental resources are known to have been identified in the area beyond those discussed above. Therefore, there is no impact to other environmental resources.

Secondary Impacts:

Proposed operations would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. See permit analysis for more detailed information regarding air quality impacts. Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Therefore, any secondary impacts to other environmental resources would be long-term and minor.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Therefore, any cumulative impacts because of the proposed project would be long-term and negligible.

11. Human Health and Safety

The applicant would be required to adhere to all applicable state and federal safety laws. The Occupational Safety and Health Administration (OSHA) has developed rules and guidelines to reduce the risks associated with this type of labor. Few, if any, members of the public would be in immediate proximity to the project during construction or operations.
The access to the public would continue to be restricted to this property.

Direct Impacts:

Negligible changes in impacts to human health and safety are anticipated as a result of this permitting action. Therefore, any direct impacts would be negligible. Upon initial startup of the turbine replacement, there would be additional traffic in and out of this area, but these activities, however, are regulated by other state and federal laws to ensure they are operated safely.

Secondary Impacts:

Operation of the proposed engines would emit regulated air pollutants. However, emissions from the proposed project would use best available control technology or BACT and would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. See permit analysis for more information regarding air quality impacts. Primary NAAQS provide public health

protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Any secondary impacts to human health and safety would be long-term and negligible to minor.

Cumulative Impacts:

As permitted, emissions from the proposed project would not be expected to cause or contribute to a violation of the health and welfare-based NAAQS. Any cumulative impacts because of the proposed project would be long-term and negligible.

12. Industrial, Commercial, and Agricultural Activities and Production

This site is currently used for industrial use by NWE, with the nearest home/structure being approximately 0.6 miles away. The area is primarily sagebrush and range grass, with no agriculture activities.

Direct Impacts:

The replacement of the turbines would not change the purpose of the property as it is currently being used for industrial purposes. Once the replacement is completed, impacts on the industrial, commercial, and agricultural activities and production in the area would be negligible. The proposed project would not displace any land currently used for agricultural purposes. Therefore, no impacts to agricultural activities or production would be expected because of the proposed project.

Industrial activities, and potentially commercial activities (contracted construction), in the affected area would increase during the construction phase of the proposed project. NWE would use existing staff or contracted services to complete the construction phase of the proposed project. Therefore, any direct impacts to industrial and commercial activities or production during the construction phase would be short-term and negligible.

Secondary Impacts:

Operation of the proposed new equipment would not displace current agricultural and grazing operations. Therefore, no impacts to agricultural activities and production would occur because of the proposed project. No secondary impacts to industrial, commercial, and agricultural activities and production are anticipated as a result of the proposed permitting action.

Cumulative Impacts:

The replacement of the turbines would not change the purpose of the property as it is currently being used for industrial purposes. Construction and operation of the proposed new equipment would not displace current agricultural and grazing operations. Therefore, no cumulative impacts to agricultural activities and production would occur because of the proposed project. Once operational, the cumulative impacts are negligible as the facility is still used for industrial purposes on land that was already used for industrial purposes.

13. Quantity and Distribution of Employment

There currently are 2 permanent jobs at the NWE site. During the construction phase of the project,

there would be approximately 2-3 NWE employees onsite to complete the turbine replacement. No new full-time jobs would result from this permitting action. The project would occur on privately owned land by NWE. The city of Cut Bank, MT has a population of approximately 3,056 (U.S. Census Bureau).

Direct Impacts:

The construction phase of the proposed project would take approximately one month to complete. Therefore, any direct impacts during the construction phase would be short-term. Direct impacts would be minor impacts on the population as it is occurring on privately owned land by NWE. The project area would be subject to any plans or rules set forth by Glacier County and the city of Cut Bank, Montana. The proposed action would be expected to have no impact on the overall distribution of employment as the facility no new additional employment is resulting from this permitting action, apart from the temporary construction personnel during the turbine replacement.

Secondary Impacts:

NWE would continue to use existing staff to operate the facility following construction. Therefore, no secondary impacts would be expected because of the proposed project.

Cumulative Impacts:

No new full-time jobs would result from construction or operation of the proposed project. Minor impacts are anticipated with the temporary employment of the construction personnel. Once the turbine replacement was completed, there would be no impacts on employment for this permitting action. No new employees would be added as a result of this permitting action.

14. Local and State Tax Base and Tax Revenues

Local, state, and federal governments would be responsible for appraising the property, setting tax rates, collecting taxes, from the companies, employees, or landowners benefiting from this operation. A minor impact is expected on the tax base and revenue with the proposed action.

Direct Impacts:

The construction phase of the project may result in an increase in local sales of goods and services. However, it would be expected the construction phase would be completed in approximately one month and would be accommodated by just two additional employees or contractors. Since the amount of time and resources necessary to accommodate construction of the proposed facility would be relatively limited, any direct impacts to the local and state tax base and tax revenues would be short-term and negligible to minor.

Secondary Impacts:

NWE would continue to be responsible for accommodation of any increased taxes associated with operation of the modified facility. Therefore, any secondary impacts would be negligible to minor, consistent with existing impacts in the affected area.

Cumulative Impacts:

Local, state and federal governments would be responsible for appraising the property, setting tax rates, and collecting taxes from the companies, employees, or landowners benefitting from the proposed operation. NWE would continue to be responsible for accommodation of any increased taxes associated with operation of the modified facility. Therefore, any cumulative impacts would be negligible to minor, consistent with existing impacts in the affected area.

15. Demand for Government Services

The area surrounding the NWE site consists of general coniferous forest wildlife species, with no known migration or intentional movement across the existing facility plant. No wilderness areas are located nearby or accessed through this land owned by NWE. Hays Lake is located approximately one mile from this facility, but this permitting action will not inhibit access to the lake, or nearby recreation areas (NHP Mapviewer).

Direct Impacts:

The air quality permit has been prepared by state government employees as part of their day-to-day, regular responsibilities. Therefore, any direct impacts to demands for government services would be short-term, consistent with existing impacts, and negligible. Compliance review and permitting assistance oversight by DEQ AQB would be conducted in concert with other area activity when in the vicinity. The proposed action would have only minor impacts on demand for government services, mainly through oversight by DEQ AQB.

Secondary Impacts:

Following the construction phase of this project, initial and ongoing compliance inspections of facility operations would be accomplished by state government employees as part of their typical, regular duties and required to ensure the facility is operating within the limits and conditions listed in the air quality permit. Therefore, any secondary impacts to demands for government services would be long-term, consistent with existing impacts, and negligible. No secondary impacts are anticipated on government services with the proposed action and a minimal increase in impact would occur from the permitting and compliance needs associated with this newly permitted facility.

Cumulative Impacts:

The air quality permit has been prepared by state government employees as part of their day-to-day, regular responsibilities. Following construction of the proposed facility, initial and ongoing compliance inspections of facility operations would be accomplished by state government employees as part of their typical, regular duties and required to ensure the facility is operating within the limits and conditions listed in the air quality permit. Therefore, any cumulative impacts to demands for government services would be short- and long-term, consistent with existing impacts, and negligible. Minor cumulative impacts are anticipated on government services with the proposed action and a minimal increase in impact would occur from the permitting and compliance needs associated with this permitted facility.

16. Locally-Adopted Environmental Plans and Goals

This existing facility is located approximately 15 miles from the Blackfeet Indian Reservation, but this permitting action would not disrupt any native or traditional lifestyles or communicates (Montana DEQ GIS Layer).

A search was conducted on the City of Cutbank Website (Home Page) on August 21, 2024, and no growth policies were found. In a City Hall meeting on June 3, 2024, the Meeting Minutes state that, "May Winchell stated that we will begin getting bills for the growth policy updates (Cut Bank City Council)."
No growth policy was found on the city website (Home Page).

Direct Impacts:

A search was conducted on the City of Cutbank Website (Home Page) on August 21, 2024, and no environmental plans or goals related to construction of the proposed project were identified. Construction of the proposed project would not be expected to impact any locally adopted environmental plans and goals. NWE's facility is on property already owned by NWE. No impacts from the proposed action would be expected relative to any locally adopted community planning goals.

Secondary Impacts:

No secondary impacts to the locally adopted environmental plans and goals are anticipated as a result of the proposed permitting action.
DEQ conducted a search on the City of Cutbank Website (Home Page) on August 21, 2024, and no growth policies or related environmental plans or goals were found. In a City Hall meeting on June 3, 2024, the Meeting Minutes state that, "May Winchell stated that we will begin getting bills for the growth policy updates (Cut Bank City Council)." No growth policy was found on the city website (Home Page). DEQ is unaware of any other locally adopted environmental plans and goals in the area affected by the proposed action; therefore, no secondary impacts would be expected because of the proposed project.

Cumulative Impacts:

DEQ conducted a search on the City of Cutbank Website (Home Page) on August 21, 2024, and no growth policies or related environmental plans or goals were found. In a City Hall meeting on June 3, 2024, the Meeting Minutes state that, "May Winchell stated that we will begin getting bills for the growth policy updates (Cut Bank City Council)." No growth policy was found on the city website (Home Page). DEQ is unaware of any other locally adopted environmental plans and goals in the area affected by the proposed action. No cumulative impacts to the locally adopted environmental plans and goals are anticipated as a result of the proposed permitting action.

17. Access to and Quality of Recreational and Wilderness Activities

No wilderness areas are located nearby or accessed through this land owned by NWE. Hays Lake is located approximately one mile from this facility, but this permitting action will not inhabit access to the lake, or nearby recreation areas (NHP Mapviewer).

Direct Impacts:

The nearest congressionally designated wilderness area is The Great Bear Wilderness, which is approximately 80 miles from the affected site. Therefore, no direct impacts to access to and quality of wilderness activities would be expected because of the proposed project. The affected area is industrial by nature with little to no recreational opportunities exist in the area affected by the proposed project and no direct impacts would be expected. Recreationalists in the nearby area could potentially have an increase in noise levels while the turbine replacement was occurring but would be temporary. The replacement of the turbines would have no impact on the surrounding wilderness areas. Access to the wilderness areas would not change.

Secondary Impacts:

No wilderness areas are located nearby or accessed through this land owned by NWE. The nearest congressionally designated wilderness area is the Great Bear Wilderness, located approximately 80 miles from the affected site. Therefore, no secondary impacts to access to and quality of wilderness activities would be expected because of the proposed project. No secondary impacts to access and quality of recreational and wilderness activities are anticipated as a result of the proposed permitting action which is wholly contained within the boundary of the NWE property, within already existing structures.

Cumulative Impacts:

No wilderness areas are located nearby or accessed through this land owned by NWE. The nearest congressionally designated wilderness area is the Great Bear Wilderness, which is approximately 80 miles from the affected site. Therefore, no cumulative impacts to access to and quality of wilderness activities would be expected because of the proposed project.

No cumulative impacts to access and quality of recreational and wilderness activities are anticipated as a result of the proposed permitting action which is wholly contained within the boundary of the NWE property. Even upon startup of construction of the replacement of the turbines could have a temporary increase in noise but would only last until the turbine replacement was completed. The replacement of the turbines would not change the aesthetics of the location.

18. Density and Distribution of Population and Housing

The proximity of the proposed action to the City of Cut Bank would accommodate housing needs for workers.

Direct Impacts:

NWE would employ 2 existing staff and/or contracted services for construction of the proposed project and the proposed project would not be expected to otherwise result in an increase or decrease in the local population. Therefore, no direct impacts would be expected because of the proposed project. This permitting action would not add to the population or require additional housing, therefore, no impacts to density and distribution of population and housing are anticipated.

Secondary Impacts:

NWE would employ existing staff to operate the facility and the proposed project would not be expected to otherwise result in an increase or decrease in the local population. No secondary impacts to density and distribution of population and housing are anticipated as a result of the proposed permitting action.

Cumulative Impacts:

NWE would employ existing staff and/or contractors to construct the proposed project and existing NWE employees would operate the facility following construction of the proposed project. Therefore, the proposed project would not be expected to result in an increase or decrease in the local population. No cumulative impacts to density and distribution of population and housing are anticipated as a result of the proposed permitting action as no new employees would be added as result of this permitting action. A minor increase would be seen during the construction phase, as construction personnel would be needed, but once the construction is over, those employees would no longer be on-site.

19. Social Structures and Mores

Based on the required information provided by NWE DEQ is not aware of any native cultural concerns that would be affected by the proposed action on this existing facility. This facility is located approximately 15 miles from the Blackfeet Indian Reservation, but this permitting action would not disrupt any native or traditional lifestyles or communicates (Montana DEQ GIS Layer).

Direct Impacts:

The proposed project is located on an existing industrial site, no disruption of native or traditional lifestyles would be expected from this permitting action. Construction of the facility, nor continued operation of the facility, would not be expected to affect existing customs and values of the affected population. No direct impacts to existing social structures and mores of the affected population would be expected because of the proposed project.

Secondary Impacts:

The proposed project is located on an existing industrial site, no disruption of native or traditional lifestyles would be expected. Continued operations would not be expected to affect existing customs and values of the affected population. Therefore, no secondary impacts to existing social structures and mores of the affected population would be expected because of the proposed project.

Cumulative Impacts:

The proposed project is located on an existing industrial site, no disruption of native or traditional lifestyles would be expected because of operational changes following construction of the proposed project. Proposed operations would not be expected to affect existing customs and values of the affected population; therefore, no cumulative impacts to existing social structures and mores of the affected population would be expected because of the proposed project.

20. Cultural Uniqueness and Diversity

Based on the required information provided by NWE, DEQ is not aware of any unique qualities of the area that would be affected by the proposed action at this existing facility.

Direct Impacts:

The existing nature of the area affected by the proposed project is industrial. Further, NWE would employ existing staff and/or contracted services to complete the turbine replacements. Therefore, the proposed project would not be expected to result in an increase or decrease in the local population or population demographics. Therefore, no direct impacts would be expected because of the proposed project.

Secondary Impacts:

The existing nature of the area affected by the proposed project is industrial. Further, NWE would employ existing staff to operate the facility following construction of the proposed project. Therefore, the proposed project would not be expected to result in an increase or decrease in the local population or population demographics. No secondary impacts to cultural uniqueness and diversity are anticipated as a result of the proposed permitting action or from the operation of the NWE facility on existing industrial property.

Cumulative Impacts:

The existing nature of the area affected by the proposed project is industrial. Further, NWE would employ existing staff and/or contractors to construct the proposed project and existing NWE employees would operate the facility following construction of the proposed project. Therefore, the proposed project would not be expected to result in an increase or decrease in the local population or population demographics. No cumulative impacts to cultural uniqueness and diversity are anticipated as a result of the proposed permitting action or from the operation of the NWE facility on what is now existing industrial property.

21. Private Property Impacts

The proposed project would take place on private land owned by the applicant. DEQ's approval of NWE's permit would affect the applicant's real property. DEQ has determined, however, that the permit conditions are reasonably necessary to ensure compliance with applicable requirements under the Clean Air Act. Therefore, DEQ's approval of NWE's permit would not have private property-taking or damaging implications.

The proposed action would take place on privately-owned land. The analysis below in response to the Private Property Assessment Act indicates no impact. DEQ does not plan to deny the application or impose conditions that would restrict the regulated person's use of private property so as to constitute a taking. Further, if the application is complete, DEQ must take action on the permit pursuant to § 75-2-218(2), MCA. Therefore, DEQ does not have discretion to take the action in another way that would have less impact on private property—its action is bound by a statute.

There are private residences in the area of the proposed action. The closest residence, including

homes or structures, is located approximately 0.6 miles away.

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)].
		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 DEQ determined there are no taking or damaging implications associated with this permit action.

22. Other Appropriate Social and Economic Circumstances

Due to the nature of the proposed action, no further direct or secondary impacts are anticipated from this project.

23. Greenhouse Gas Assessment

Issuance of this permit would authorize use of various equipment and vehicles to replace the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station

The analysis area for this resource is limited to the activities regulated by the issuance of MAQP #2783-13, which is to replace the three existing 1,400 hp and two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station and operation of these five new turbines. The amount of natural gas fuel utilized at this site may be impacted by a number of factors including seasonal weather impediments and equipment malfunctions. To account for these factors DEQ has calculated the range of emissions using the maximum hours per year, combined with the max heat input, in MMBtu/hr, of the Applicant's estimate.

For the purpose of this analysis, DEQ has defined greenhouse gas emissions as the following gas species: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and many species of fluorinated compounds. The range of fluorinated compounds includes numerous chemicals which are used in many household and industrial products. Other pollutants can have some properties that also are similar to those mentioned above, but the EPA has clearly identified the species above as the primary GHGs. Water vapor is also technically a greenhouse gas, but its properties are controlled by the temperature and pressure within the atmosphere, and it is not considered an anthropogenic species.

The combustion of diesel fuel at the site would release GHGs primarily being carbon dioxide (CO_2), nitrous oxide (N_2O) and much smaller concentrations of uncombusted fuel components including methane (CH_4) and other volatile organic compounds (VOCs).

DEQ has calculated GHG emissions using the EPA Simplified GHG Calculator version May 2023, for the purpose of totaling GHG emissions. This tool totals carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) and reports the total as CO_2 equivalent (CO_2e) in metric tons CO_2e. The calculations in this tool are widely accepted to represent reliable calculation approaches for developing a GHG inventory. DEQ has determined EPA's Scope 1 GHG impacts as defined in the Inventory Guidance for Greenhouse Gas Emissions are appropriate under MEPA for this Proposed Action. Scope 1 emissions are defined as direct GHG emissions that occur from sources that are controlled or owned by the organization (EPA Center for Corporate Climate Leadership). DEQ's review of Scope 1 emissions is consistent with the agency not evaluating downstream effects of other types of impacts.

This review does not include an assessment of GHG impacts in quantitative economic terms, otherwise known as evaluating the social cost of carbon. DEQ instead calculates potential GHG emissions and provides a narrative description of GHG impacts. This approach is consistent with Montana Supreme Court caselaw and the agency's discussion of other impacts in this EA. *See Belk v. Mont. DEQ*, 2022 MT 38, ¶ 29.

Operation of gasoline or diesel fueled vehicles throughout the life of the proposed project would produce exhaust fumes containing GHGs.

To account for variability due to the factors described above, DEQ has calculated the maximum amount of emissions using the Environmental Protection Agency's (EPA) simplified GHG Emissions Calculator for mobile sources, and approximately 10,575 metric tons of CO_2e would be produced per year. The construction phase of this project would contribute approximately 5 metric tons of CO2e.

Direct Impacts:

Operation of the NWE facility throughout the life of the facility would produce exhaust fumes containing GHGs.

DEQ estimates that approximately 10,575 metric tons of CO2e would be produced per year. To account for variability due to the factors described above, DEQ has calculated the maximum amount of emissions using a factor of 8760 hours per year for operation. Using the Environmental Protection Agency's (EPA) simplified GHG Emissions Calculator for mobile sources, approximately 10,595 metric tons of CO_2e would be produced per year.

The construction portion of the NWE permitting action would result in temporary GHG emissions. The total construction would result in approximately 5 metric tons of CO2e. Once construction was completed, no future emissions would occur from this action.

Secondary Impacts:

GHG emissions contribute to changes in atmospheric radiative forcing, resulting in climate change impacts. GHGs act to contain solar energy loss by trapping longer wave radiation emitted from the Earth's surface and act as a positive radiative forcing component (BLM 2021).

Per EPA's website "Climate Change Indicators", the lifetime of carbon dioxide cannot be represented with a single value because the gas is not destroyed over time. The gas instead moves between air, ocean, and land mediums with atmospheric carbon dioxide remaining in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments. Methane remains in the atmosphere for approximately 12 years. Nitrous oxide has the potential to remain in the atmosphere for about 109 years (EPA, Climate Change Indictors). The impacts of climate change throughout the northwestern area of Montana include changes in flooding and drought, rising temperatures, and the spread of invasive species (BLM 2021).

Cumulative Impacts:

Montana recently used the EPA State Inventory Tool (SIT) to develop a greenhouse gas inventory in conjunction with preparation of a possible grant application for the Community Planning Reduction Grant (CPRG) program. This tool was developed by EPA to help states develop their own greenhouse gas inventories, and this relies upon data already collected by the federal government through various agencies. The inventory specifically deals with carbon dioxide, methane, and nitrous oxide and reports the total as CO_2e. The SIT consists of eleven Excel based modules with pre-populated data that can be used with default settings or in some cases, allows states to input their own data when the state believes their own data provides a higher level of quality and accuracy. Once each of the eleven modules is filled out, the data from each module is exported into a final "synthesis" module which summarizes all of the data into a single file. Within the synthesis file, several worksheets display the output data in a number of formats such as GHG emissions by sector and GHG emissions by type of greenhouse gas.

DEQ has determined the use of the default data provides a reasonable representation of the greenhouse gas inventory for the various sectors of the state, and the estimated total annual greenhouse gas inventory by year. The SIT data from EPA is currently only updated through the year 2021, as it takes several years to validate and make new data available within revised modules. DEQ

maintains a copy of the output results of the SIT.

DEQ has determined that the use of the default data provides a reasonable representation of the GHG inventory for all of the state sectors, and an estimated total annual GHG inventory by year. At present, Montana accounts for 47.77 million metric tons of CO_2e based on the EPA SIT for the year 2021. This project may contribute up to 10,575 metric tons per year of CO2e. The construction phase of this project would contribute approximately 5 metric tons of CO2e. The estimated emission of 10,580 metric tons of CO2e from this project would contribute 0.2% of Montana's annual CO2e emissions.

GHG emissions that would be emitted as a result of the proposed activities would add to GHG emissions from other sources. The No Action Alternative would contribute approximately the same amount of GHG emissions, as the same number of turbines would still be on-site if they were not replaced with the new turbines, as the Proposed Action Alternative of GHG emissions. The current land use of the area is industrial.

Reference

Bureau of Land Management (BLM) 2021. Specialist Report on Annual Greenhouse Gas Emissions and Climate Trends from Coal, Oil, and Gas Exploration and Development on the Federal Mineral Estate. Available at: https://www.blm.gov/content/ghg/2021/. Accessed February 28, 2024.

PROPOSED ACTION ALTERNATIVES:

No Action Alternative: In addition to the proposed action, DEQ must also considered a "no action" alternative. The "no action" alternative would deny the approval of replace the three existing 1,400 hp and two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station. The applicant would lack the authority to conduct the proposed activity. Any potential impacts that would result from the proposed action would not occur. The no action alternative forms the baseline from which the impacts of the proposed action can be measured.

If the applicant demonstrates compliance with all applicable rules and regulations required for approval, the "no action" alternative would not be appropriate.

Other Reasonable Alternative(s): No other alternatives were considered outside of the "no action" alternative.

CONSULTATION

DEQ engaged in internal and external efforts to identify substantive issues and/or concerns related to the proposed project. Internal scoping consisted of internal review of the environmental assessment document by DEQ staff. External scoping efforts also included queries to the following websites/databases/personnel: MAQP #2783-13 Application, EPA State Inventory Tool, the EPA GHG Calculator Tool, the Montana Natural Heritage Program Website, the Montana Cadastral Mapping Program, the City of Cut Bank Website, and the State Historical Preservation Office.

PUBLIC INVOLVEMENT:

A public comment period was provided for this permit from October 4, 2024, to October 21, 2024. No public comments were received.

OTHER GOVERNMENTAL AGENCIES WITH JURSIDICTION:

The proposed project would be located on private land. All applicable state and federal rules must be adhered to, which, at some level, may also include other state, or federal agency jurisdiction.

This environmental review analyzes the proposed project submitted by the Applicant. The project would be negligible and would be fully reclaimed to the permitted postmining land uses at the conclusion of the project and thus would not contribute to the long-term cumulative effects of mining in the area.

NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS

When determining whether the preparation of an environmental impact statement is needed, DEQ is required to consider the seven significance criteria set forth in ARM 17.4.608, which are as follows:

- The severity, duration, geographic extent, and frequency of the occurrence of the impact;
- The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur;
- Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts – identify the parameters of the proposed action;
- The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values;
- The importance to the state and to society of each environmental resource or value that would be affected.
- Any precedent that would be set as a result of an impact of the proposed action that would commit the department to future actions with significant impacts or a decision in principle about such future actions; and
- Potential conflict with local, state, or federal laws, requirements, or formal plans.

CONCLUSIONS AND FINDINGS

DEQ finds that this action results in negligible impacts to air quality and GHG emissions in Glacier County, Montana.

The severity, duration, geographic extent and frequency of the occurrence of the impacts associated with the proposed air quality project would be limited. The proposed action would result in no new disturbance with the replacement of the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station.

As discussed in this EA, DEQ has not identified any significant impacts associated with the proposed actions for any environmental resource. DEQ does not believe that the proposed activities by the Applicant would have any growth-inducing or growth-inhibiting aspects, or

contribution to cumulative impacts. The proposed site does not appear to contain known unique or fragile resources.

There are no unique or known endangered fragile resources in the project area. No underground disturbance would be required for this project.

There would be major impacts to view-shed aesthetics as the facility would be constructed where there previously was not one.

Demands on the environmental resources of land, water, air, or energy would not be significant, as it is already an operational facility.

Impacts to human health and safety would not be significant as access roads would be closed to the public and because the site is on Privately Owned Land. The public is not allowed on the NWE the three existing 1,400 hp natural gas combustion turbines and the two existing 1,450 hp natural gas combustion turbines with 1,600 hp natural gas combustion turbines at the NWE Station W Compressor Station site.

As discussed in this EA, DEQ has not identified any significant impacts associated with the proposed activities on any environmental resource.

Issuance of a Montana Air Quality Permit to the Applicant does not set any precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions If the Applicant submits another modification or amendment, DEQ is not committed to issuing those revisions. DEQ would conduct an environmental review for any subsequent permit modifications sought by the Applicant that require environmental review. DEQ would make permitting decisions based on the criteria set forth in the Clean Air Act of Montana.

Issuance of the Permit to the Applicant does not set a precedent for DEQ's review of other applications for Permits, including the level of environmental review. The level of environmental review decision is made based on case-specific consideration of the criteria set forth in ARM 17.4.608.

Finally, DEQ does not believe that the proposed air quality permitting action by the Applicant would have any growth-inducing or growth inhibiting impacts that would conflict with any local, state, or federal laws, requirements, or formal plans.

Based on a consideration of the criteria set forth in ARM 17.4.608, the proposed operation is not predicted to significantly impact the quality of the human environment. Therefore, preparation of an EA is the appropriate level of environmental review for MEPA.

Environmental Assessment and Significance Determination Prepared By:

Emily Hultin
Air Quality Engineering Scientist

Environmental Assessment Reviewed By:

M. Eric Merchant, Supervisor, Air Quality Permitting Services Section

Approved By:

SIGNATURE *November 1, 2024*

Eric Merchant, Supervisor, Air Quality Permitting Section Date
Department of Environmental Quality

REFERENCES

1. NorthWestern Energy (NWE) application for the modification of MAQP#2783-13 received August 8, 2024
2. Cut Bank Crude Oil Tank Farm MAQP #2757-06
3. Cut Bank Field Station 001 MAQP #2768-10
4. NorthWestern Energy Mainline #1 MAQP #2428-15
5. Mainline #1 Facility, Unit #3 MAQP #5215-02
6. Cut Bank Field Station 015 MAQP #2737-09
7. Cut Bank Field Station 018 MAQP #2738-08
8. Ferdig Oil Co MAQP #2810-01
9. **Montana DEQ GIS Layer – Through-Out Project Up Until Decision Issuance** (2014). Mtdeq.us. https://gis.mtdeq.us/portal/home/webmap/viewer.html?webmap=bb443b5b50d74f1d83f040497010882e

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18. (n.d.). ***Geologic Map**, Cut Bank 30' x 60' Quadrangle* [Review of *Geologic Map, Cut Bank 30' x 60' Quadrangle*]. Montana Bureau of Mines and Geology. Retrieved August 21, 2024, from https://www.mbmg.mtech.edu/pdf_100k/cutbank.pdf
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ABBREVIATIONS and ACRONYMS

AQB – Air Quality Bureau
ARM - Administrative Rules of Montana
BACT – Best Available Control Technology
BMP - Best Management Practices
CAA – Clean Air Act of Montana
CFR - Code of Federal Regulations
CO - carbon monoxide
DEQ – Department of Environmental Quality
DNRC – Department of Natural Recourses and Conservation
EA – Environmental Assessment
EIS – Environmental Impact Statement
EPA - U.S. Environmental Protection Agency
FCAA- Federal Clean Air Act
MAQP – Montana Air Quality Permit
MCA – Montana Code Annotated
MEPA – Montana Environmental Policy Act
MTNHP - Montana Natural Heritage Program
NO_X - oxides of nitrogen
NWE- NorthWestern Energy
PM - particulate matter
PM_{10} - particulate matter with an aerodynamic diameter of 10 microns and less
$PM_{2.5}$ - particulate matter with an aerodynamic diameter of 2.5 microns and less
PPAA - Private Property Assessment Act
Program - Sage Grouse Habitat Conservation Program
PSD - Prevention of Significant Deterioration
SHPO - Montana State Historic Preservation Office
SOC - Species of Concern
SO_2 - sulfur dioxide
tpy – tons per year
U.S.C. - United States Code
VOC - volatile organic compound