Montana Department of
ENVIRONMENTAL QUALITY
Brian Schweitzer, Governor
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May 6, 2010

Mr. Ross Whelchel
Northwestern Energy
Mainline #1 Facility
40 East Broadway
Butte, MT 59701

Dear Mr. Whelchel:

Montana Air Quality Permit #2428-12 is deemed final as of May 6, 2010, by the Department of Environmental Quality (Department). This permit is for Northwestern Energy's Mainline #1 facility. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

Vickie Walsh
Air Permitting Program Supervisor
Air Resources Management Bureau
(406) 444-9741

Shawn Juers
Environmental Engineer
Air Resources Management Bureau
(406) 444-2049

VW:SJ
Enclosure

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #2428-12

Northwestern Energy
Mainline #1 Facility
40 East Broadway
Butte, MT 59701

May 6, 2010

MONTANA AIR QUALITY PERMIT

Issued To: NorthWestern Energy
40 East Broadway
Butte, MT 59701

MAQP: #2428-12
Application Complete: 2/10/2010
Preliminary Determination Issued: 3/19/2010
Department's Decision Issued: 4/20/2010
Permit Final: 5/6/2010
AFS #: 041-0011

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

The NWE natural gas facility is located approximately 4.5 miles southeast of Cut Bank in the South ½ of Section 22, Township 33 North, Range 5 West in Glacier County, Montana. The compressor station is referred to as Mainline #1. A listing of the permitted equipment is contained in Section I.A. of the permit analysis.

B. Current Permit Action

On February 9, 2010, the Department of Environmental Quality – Air Resources Management Bureau (Department) received an MAQP Application from Bison Engineering, Inc. on behalf of NWE. The Department received an affidavit of public notice on February 10, 2010, completing the application. The application requested the following modifications:

- Removal of one 1,100-horsepower (hp) Cooper Superior Compressor Engine (previously emitting unit #6)
- Addition of a newly manufactured 2,370-hp natural gas fired lean burn compressor engine with emission controls
- Removal of hourly operation limits for emitting units #1-3 (660-hp compressor engines)

The current permit action incorporates these changes into the permit. This action also corrects the auxiliary generator capacity to reflect that of the engine driving the generator rather than the generator itself, updates the emissions from glycol dehydration to reflect the ethylene glycol unit in operation instead of the tri-ethylene glycol dehydration unit originally assumed, updates emissions factors where appropriate, and updates the emissions inventory to reflect all corresponding changes. Revision of the applicability of federal regulations was also completed to include 40 CFR 63, Subpart ZZZZ – National Emission Standards for Stationary Reciprocating Internal Combustion Engines, as applicable in the permit analysis.

This project increases compressor capacity to compensate for projected system growth, and removes requirements associated with the 660-hp engines previously included to keep allowable emissions below the Prevention of Significant Deterioration (PSD) thresholds, which are no longer necessary based on the current facility configuration and associated emissions.

SECTION II: Conditions and Limitations

A. Emission Limitations

1. NWE shall properly operate and maintain the 2,370-hp compressor engine and associated control equipment. The engine shall be a four-stroke lean-burn engine equipped and operated with an air-to-fuel ratio (AFR) controller and a catalytic oxidation unit (ARM 17.8.752).

2. The pound per hour (lb/hr) emission limits of the 2,370-hp compressor engine shall be determined using the following equation and pollutant-specific grams per brake horsepower-hour (g/bhp-hr) emission factors (ARM 17.8.752):

   Equation:

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

   Emission Factors:

   NO_X: 1.0 g/bhp-hr
   CO: 0.5 g/bhp-hr
   VOC: 0.5 g/bhp-hr

3. NWE shall operate and maintain catalytic $DeNO_x$ silencers on the three 660-hp compressor engines (ARM 17.8.749).

4. Emissions from each of the three 660-hp compressor engines shall not exceed the following (ARM 17.8.752):

   NO_X: 2.91 lb/hr
   CO: 4.37 lb/hr
   VOC: 1.09 lb/hr

5. Emissions from each of the three 1,100-hp compressor engines shall not exceed the following (ARM 17.8.752):

   NO_X: 4.85 lb/hr
   CO: 7.28 lb/hr
   VOC: 1.82 lb/hr

6. Emissions from each of the two 2,000-hp compressor engines shall not exceed the following (ARM 17.8.752):

   NO_X: 6.61 lb/hr
   CO: 7.05 lb/hr
   VOC: 2.65 lb/hr

7. The auxiliary generator engine shall not exceed a maximum capacity of 600-hp. The total hours of operation of the auxiliary generator engine shall be limited to a maximum of 720 hours during any rolling 12-month period (ARM 17.8.749).

8. 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).

9. 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.8 (ARM 17.8.749).

10. NWE shall not incinerate any material other than oil soaked rags, oil absorbents, and filters in the Smart Ash Burner (ARM 17.8.749).

11. NWE shall comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 60.630, Subpart KKK, as it applies to equipment leaks of VOC from onshore natural gas processing plants (ARM 17.8.340 and 40 CFR 60, Subpart KKK).

12. NWE shall comply with all applicable standards and limitations, monitoring, reporting, recordkeeping, and notification requirements contained in 40 CFR 60, Subpart JJJJ (ARM 17.8.340 and 40 CFR 60, Subpart JJJJ).

B. Testing Requirements

1. The 2,370-hp compressor engine shall be tested for NO_X and CO, concurrently, within 180 days of the initial start-up date of the compressor engine (ARM 17.8.105 and ARM 17.8.749).

2. The 2,370-hp compressor engine shall be tested for NO_X and CO, concurrently, on a semi-annual basis, or according to another testing/monitoring schedule as may be approved in writing by the Department (ARM 17.8.105 and ARM 17.8.749).

3. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

4. The Department may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

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

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

2. NWE shall document, by month, the hours of operation of the auxiliary generator engine. By the 25th day of each month, NWE shall total the hours of operation of the auxiliary generator during the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.7. The information for each of the previous months shall be submitted along with the annual emissions inventory (ARM 17.8.749).

3. NWE shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include ***the addition of a new emissions unit,*** change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).

4. 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 the Department, and must be submitted to the Department upon request (ARM 17.8.749).

D. Notification Requirements

1. NWE shall provide the Department with written notification of the commencement of installation of the new 2,370 hp compressor engine postmarked within 30 days of the commencement of installation (ARM 17.8.749).

2. NWE shall provide the Department with written notification of the actual startup date of the 2,370 hp compressor engine postmarked within 15 days after the actual start-up date (ARM 17.8.749).

SECTION III: General Conditions

A. Inspection – NWE shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (continuous emissions monitoring system (CEMS), continuous emissions rate monitoring system (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 the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department's

decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department's decision on the application is final 16 days after the Department's decision is made.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by 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 #2428-12

I. Introduction/Process Description

NorthWestern Energy (NWE) operates a compressor station and associated equipment, located in the South ½ of Section 22, Township 33 North, Range 5 West in Glacier County near Cut Bank, Montana, known as Mainline #1.

A. Permitted Equipment

This facility consists of the following equipment:

1. One 2,370-horspower (hp) 4-stroke lean-burn compressor engine (currently a 2010 Caterpillar 3608 LE) equipped with an air-to-fuel ratio (AFR) controller and oxidation catalyst.

2. Three 660-hp 4-stroke rich-burn compressor engines each equipped with catalytic converters (currently Ingersoll-Rand compressor engines (installed pre-1968) with the catalytic converters on the engine exhaust to be installed by July 31, 1992).

3. Three 1,100-hp 4-stroke lean-burn compressor engines (currently Cooper-Superior compressor engines, model 8GTLB (installed 1989)).

4. Two 2,000-hp 4-stroke lean-burn compressor engines (currently Cooper-Superior compressor engines, model 12SGTB (installed 1998)).

5. Flare with igniter and monitor for emergency purposes (igniter and monitor to be installed by July 31, 1992).

6. One 600-hp engine driving a 400 kilowatt (kW) auxiliary generator.

7. One Smart Ash Burner, model number 100.

8. One ethylene glycol dehydration unit

9. Two natural gas tanks with vents

10. Building and process heaters (insignificant units) including:

    a. Process gas plant heater
    b. Compressor heater #1
    c. Fuel gas heater
    d. Dehydrator reboiler
    e. Superior compressor building heater

11. Other insignificant units/emissions including:

    a. Two non-vented propane tanks
    b. Two non-vented butane tanks
    c. One non-vented Y-grade tank
    d. Process valves
    e. Propane truck venting
    f. Gas Blowdown
    g. Fugitive emissions from in-plant vehicle traffic

B. Source Description

NWE provides pressure to the natural gas transmission system, which distributes to markets in western Montana. In addition, the facility separates water, propane, butane, and gasoline from the incoming field gas before compressing it into the pipeline system. The primary equipment at the facility consists of one 2,370-hp compressor engine, expected to be installed in 2010, three 660-hp Ingersoll-Rand compressor engines installed prior to 1968, three 1,100-hp Cooper-Superior compressor engines installed in 1989, two 2,000-hp Cooper-Superior compressor engines installed in 1998, a 600-hp engine driving a 400-kW generator, a process heater for gas plant #1, a compressor building heater #1, a fuel gas heater, and a glycol dehydrator. In 1992, NWE also installed $DeNO_x$ catalytic converters to the three 660-hp Ingersoll-Rand compressor engines.

C. Permit History

On March 23, 1988, **MAQP #2428** was approved for Montana Power - Mainline #1 to operate six natural gas compressor engines at the Cut Bank liquid plant. On December 21, 1990, MAQP #2428 was altered for the facility to undergo a Prevention of Significant Deterioration (PSD) review. **MAQP #2428A** replaced MAQP #2428.

On July 18, 1991, Montana Power - Mainline #1 received an alteration to MAQP #2428A. The alteration allowed Montana Power - Mainline #1 to add three 1100-hp compressor engines to the facility. Offsets for control of existing emissions were calculated as part of the permit alteration. **MAQP #2428B** replaced MAQP #2428A.

In November 1991, Montana Power - Mainline #1 applied for a permit modification to delete the three 1100-hp compressor engines previously proposed and extend the time frame for installing the catalytic converters on the 660-hp Ingersoll-Rand compressor engines. **MAQP #2428-03** replaced MAQP #2428B.

On February 22, 1998, Montana Power - Mainline #1 received a modification to MAQP #2428-03. Montana Power - Mainline #1 requested that the total hours of operation of the three 660-hp Ingersoll-Rand compressor engines be limited to 24,495 hours per year and that emissions from minor combustion sources be added to the emission inventory. Montana Power also requested that the auxiliary electrical generator powered by a diesel-fired engine be limited to 720 hours of operation per year. The limitations on the compressor engines and the auxiliary generator ensured that the facility's Potential to Emit (PTE) would remain below 250 tons per year of any pollutant so that Montana Power - Mainline #1 would not be defined as a major source under the New Source Review (NSR) program. **MAQP #2428-04** replaced MAQP #2428-03.

On April 3, 1998, Montana Power - Mainline #1 received an alteration to MAQP #2428-04 to remove two existing 1100-hp Cooper-Superior compressor engines and replace them with two 2000-hp Cooper-Superior engines. Montana Power - Mainline #1 also requested that the Smart Ash Burner, used to incinerate oily rags, be included in the permit alteration. The Montana Power - Mainline #1 facility was not a major source because it was not listed and did not have the potential to emit more than 250 tons per year (excluding fugitive emissions) of any air pollutant. The permit alteration revised the emission limitation units from gram per brake horsepower-hour (g/Bhp-hr) to pound per hour (lb/hr). The hourly emission limitation allowed for operational flexibility. **MAQP #2428-05** replaced MAQP #2428-04.

On February 15, 2001, Montana Power - Mainline #1 received a modification for MAQP #2428-05 to remove testing requirements for the following equipment:

- Unit #022-1 – 660-hp Ingersoll-Rand compressor engine
- Unit #022-2 – 660-hp Ingersoll-Rand compressor engine
- Unit #022-3 – 660-hp Ingersoll-Rand compressor engine
- Unit #022-4 - 1,100-hp Cooper Superior compressor engine
- Unit #022-5 - 2,000-hp Cooper Superior compressor engine
- Unit #022-6 - 1,100-hp Cooper Superior compressor engine
- Unit #022-7 - 1,100-hp Cooper Superior compressor engine
- Unit #022-8 - 2,000-hp Cooper Superior compressor engine
- Unit #022-9 - 1,100-hp Cooper Superior compressor engine

Because Montana Power-Mainline #1 had a final Title V Permit (#OP2428-00) that required a minimum of semi-annual emission testing for the above described compressor engines, testing requirements of every 4 years were removed from MAQP #2428-05. Emission limitations for the compressor engines as provided in Section II.A of the permit remained applicable. **MAQP #2428-06** replaced MAQP #2428-05.

On August 10, 2001, the Department of Environmental Quality (Department) received a request from Montana Power - Mainline #1 to alter MAQP #2428-06 for the addition of a 2,370-hp Caterpillar Compressor Engine. On October 24, 2001, the application was deemed complete upon submittal of additional information by Montana Power - Mainline #1. The permit action added the new compressor engine to the permit. The permit action did not trigger the NSR program because the potential emissions from the action were less than the NSR threshold level of 250 tons per year. **MAQP #2428-07** replaces MAQP #2428-06.

Through the Montana Environmental Policy Act (MEPA) process, the applicant proposed mitigation measures, specifically relating to mitigating impacts from a pipeline proposed as a part of the Silver Bow Generation facility (originally permitted under MAQP #3165-00). The Department incorporated a portion of those mitigation measures in this permitting action. The conditions pertaining to the mitigation measures were included in Section II.E of the permit and were intended to remain in the permit for the lifetime of the facility.

On November 23, 2001, Montana Power Company (MPC) notified the Department of a pending merger of MPC with and into Montana Power, L.C.C. (MPC LCC). Due to questions regarding the length of time the new company name would be valid, the Department decided to wait on the name change for the permit. On October 18, 2002, the Department received a request to change the permit from MPC LLC to NorthWestern Corporation. The permit action changed the name on the permit from Montana Power Company - Mainline #1 to Northwestern Corporation - Mainline #1. **MAQP #2428-08** replaced MAQP #2428-07.

On April 11, 2005, the Department received an e-mail from NorthWestern Corporation. NorthWestern Corporation notified the Department that the 2,370-hp Caterpillar compressor engine would not be installed at the NorthWestern Corporation - Mainline #1 compressor station. The permit action removed the 2,370-hp Caterpillar compressor engine and updated the permit to reflect current permit language and rule references used by the Department on MAQP #2428-08. **MAQP #2428-09** replaced MAQP #2428-08.

On February 7, 2008, the Department received a request from NorthWestern Energy to change the name on MAQP #2783-07 from NorthWestern Corporation – Mainline #1 to NWE – Mainline #1. 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. **MAQP #2428-10** replaced MAQP #2428-09.

On January 15, 2010, the Department received a letter from NWE, in conjunction with Bison Engineering Inc., requesting that the applicant-accepted permit conditions for the Silver Bow Generation Project and associated pipeline construction activities, located in Section II Limitations and Conditions, D.1 through D.15 of MAQP #2428-10, be removed. Through the MEPA process, the applicant proposed mitigation measures, and conditions were accepted on March 12, 2002. The Department incorporated a portion of those mitigation measures in the MAQP for Mainline #1.

In reviewing NWE's request to remove these conditions, the following information was evaluated by the Department:

- The MAQP for the Continental Energy Services, Inc. - Silver Bow Generation Plant, MAQP #3165 (last issued as MAQP #3165-02), was revoked on December 18, 2007. Continental Energy Services, Inc., or any other entity, would be required to obtain a MAQP to construct a similar facility.
- The Natural Gas Pipeline to support the generation project was never installed. In addition, depending on the size of the pipeline, a similar pipeline may be subject to the permitting requirements under the Major Facility Siting Act (the Administrative Rules of Montana (ARM) Title 17, Chapter 20).
- On April 11, 2005, the Department received notice from NWE that the 2,370-hp compressor engine permitted in MAQP #2428-07, required for the additional compression needed for the Silver Bow Generation Project, was not going to be installed. Upon NWE's request, the Department removed that compressor engine from the permit in MAQP #2428-09. NWE, or any other entity, would be required to obtain a MAQP to install a similar compressor engine.
- If NWE or any other entity were to re-propose construction or installation of any of the above-described facilities or equipment in the future, applicable MEPA requirements would be required to be met at that time.

In consideration of the information above, the Department granted NWE's request to remove these requirements. The action removed these conditions as an administrative amendment pursuant to ARM 17.8.764(1)(b) – "changes in operation that do not result in an increase in emissions." **MAQP #2428-11** replaced MAQP #2428-10.

D. Current Permit Action

On February 9, 2010, the Department received an MAQP Application from Bison Engineering, Inc. on behalf of NWE. The Department received an affidavit of public notice on February 10, 2010, completing the application. The application requested the following modifications:

- Removal of one 1,100-hp Cooper Superior Compressor Engine (previously emitting unit #6)
- Addition of a newly manufactured 2,370-hp natural gas fired lean burn compressor engine with emission controls
- Removal of hourly operation limits for emitting units #1-3 (660-hp compressor engines)

The current permit action incorporates these changes into the permit. This action also corrects the auxiliary generator capacity to reflect that of the engine driving the generator rather than the generator itself, updates the emissions from glycol hydration prevention/dehydration to reflect the ethylene glycol unit in operation instead of the tri-ethylene glycol dehydration unit originally assumed, updates emissions factors where

appropriate, and updates the emissions inventory to reflect all corresponding changes. Revision to the applicability of federal regulations was also completed to include 40 CFR 63 Subpart ZZZZ– National Emission Standards for Stationary Reciprocating Internal Combustion Engines, as applicable in the permit analysis.

This project increases compressor capacity to compensate for projected system growth, and removes requirements associated with the 660-hp engines previously included to keep allowable emissions below the PSD thresholds, which are no longer necessary based on the current facility configuration and associated emissions.

E. Additional Information

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

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 ARM and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

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

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

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

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

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

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

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

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

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 into the 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 into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, 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 17.8.316 Incinerators. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any incinerator, particulate matter in excess of 0.10 grains per standard cubic foot of dry flue gas, adjusted to 12% carbon dioxide and calculated as if no auxiliary fuel had been used. Further, no person shall cause or authorize to be discharged into the outdoor atmosphere from any incinerator emissions that exhibit an opacity of 10% or greater averaged over 6 consecutive minutes.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). NWE is considered an NSPS affected facility under 40 CFR Part 60 and is subject to the requirements of the following subparts.

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

b. 40 CFR 60, Subpart KKK, Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. NWE's Mainline #1 facility is subject to this subpart. NWE Mainline #1 is expected to remain in compliance with the applicable requirements of this subpart following the installation of the new compressor engine.

c. 40 CFR 60, Subpart LLL, Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions is applicable only to sweetening units or sweetening units followed by a sulfur recovery unit. Mainline #1 does not process sour gas and will not have a sweetening unit; therefore, this subpart does not apply.

d. 40 CFR 60, Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines applies to owners and operators of stationary spark ignition internal combustion engines (SI ICE) that commence construction after June 12, 2006, where the stationary SI ICE are manufactured on or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 hp (except lean burn engines with a maximum engine power greater than or equal to 500 hp and less than 1,350 hp). Therefore, the newly proposed 2,370 hp lean-burn engine is subject to this subpart. The emissions limitations determined through the BACT process are more stringent than the emissions standards of this subpart. The other, existing engines located at this site are not subject to this subpart due to manufacture date.

7. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR Part 63, shall comply with the requirements of 40 CFR Part 63, as listed below:

a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to an NESHAP Subpart as listed below:

b. 40 CFR 63, Subpart HH - National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. For purposes of determination of applicability of this Subpart and Subpart HHH only, NWE's operations at Mainline #1 are split into two different facilities for purposes of determining if they are major with respect to the rule. The Mainline #1 site contains the processing facility (the gas plant), and the transmission facility (the compressor station). Neither the Mainline #1 gas plant nor the Mainline #1 compressor station equipment is considered a major source of HAPs as calculated in this Subpart. Pursuant to 40 CFR 63.760 (b)(2) for area sources, the affected source includes each triethylene glycol dehydration unit located at a facility. NWE currently has an ethylene glycol unit, not a triethylene glycol dehydration unit.

Should a triethylene glycol dehydration unit be used, 40 CFR 63.764 (e)(1)(ii) and 40 CFR 63.765(a) excludes all requirements for glycol dehydration units that emit less than 0.9 megagram (~1 ton) per year of benzene. Records of the determination applicable to this exemption would be required to be maintained in accordance with 40 CFR 63.774(d)(1). It would be probable that NWE would qualify for this exemption should triethylene glycol be used. However, at this time, the Mainline #1 facility does not contain an affected unit pursuant to the area source standards; therefore, Subpart HH does not apply.

c. 40 CFR 63, Subpart HHH - National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities. Owners or operators of natural gas transmission or storage facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR 63, Subpart HHH. In order for a

natural gas transmission and storage facility to be subject to 40 CFR 63, Subpart HHH requirements, the facility must be a major source of HAPs as determined using the maximum natural gas throughput as calculated in either paragraphs (a)(1) and (a)(2) or paragraphs (a)(2) and (a)(3) of 40 CFR 63, Subpart HHH. Based on the information submitted by Bison Engineering, Inc. on behalf of NWE, Mainline#1 is not subject to the provisions of 40 CFR 63, Subpart HHH because neither the gas plant nor the compressor station is a major source of HAPs.

b. 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants from Stationary Reciprocating Internal Combustion Engines (RICE). A source is subject to this subpart if they own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand. Therefore, NWE's Mainline #1 RICE located at this facility is subject to these regulations. Existing engines and the new 2,370-hp engine are subject to this rule. Bison Engineering, Inc., on behalf of NWE, identified Mainline #1 as a major source of HAPs as calculated for 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 application fee concurrent with the submittal of a Montana Air Quality Permit application. A Montana Air Quality Permit Application is incomplete until the proper application fee is paid to the Department. 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 the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

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

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 a Montana Air Quality Permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. NWE has a PTE greater than 25 tons per year of oxides of nitrogen (NO_X), carbon monoxide (CO), and volatile organic compounds (VOC); therefore, a Montana Air Quality Permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. 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 February 5, 2010, issue of the Great Falls Tribune, a newspaper of general circulation in the Town of Great Falls in Cascade County, 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 the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving 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 the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. A Montana Air Quality Permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. A Montana 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. A Montana 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 a Montana Air Quality Permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.

15. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, Montana Code Annotated (MCA).

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

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

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 hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (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 MAQP #2428-12 for NWE, the following conclusions were made:

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

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

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

d. This facility is subject to current NSPS (40 CFR 60, Subpart JJJJ).

e. This facility is subject to current NESHAP standards (40 CFR 63, Subpart ZZZZ).

f. This source is not a Title IV affected source, or a solid waste combustion unit.

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

Therefore, NWE is subject to the Title V operating permit program. NWE has submitted a significant Title V modification application as required for this action.

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 technically practicable and economically feasible, except that BACT shall be utilized.

A BACT analysis was submitted by Bison Engineering, Inc. on behalf of NWE in permit application #2428-12, addressing some available methods of controlling emissions from the new compressor engine. After review, the Department has accepted the proposed BACT limits. The following outlines the Department's review.

The primary criteria pollutants from natural gas-fired reciprocating engines are NO_X, CO, and VOC. The formation of NO_X is exponentially related to combustion temperature in the engine cylinder. CO and VOC species are primarily the result of incomplete combustion. Particulate matter (PM) emissions include trace amounts of metals, non-combustible inorganic material, and condensable, semi-volatile organics which result from volatized lubricating oil, engine wear, or from products of incomplete combustion. Sulfur oxides (SO_X) are very low since sulfur compounds are removed from natural gas at processing plants. However, trace amounts of sulfur containing odorant are added for the purpose of leak detection.

Three generic control techniques have been developed for reciprocating engines: parametric controls (timing and operating at a leaner air-to-fuel ratio); combustion modifications such as advanced engine design (clean-burn cylinder head designs and prestratified charge combustion for rich-burn engines); and post combustion catalytic controls installed on the engine exhaust system. Post-combustion catalytic technologies include selective catalytic reduction (SCR) for lean-burn engines, NSCR for rich-burn engines, and CO oxidation catalysts for lean-burn engines.

The proposed compressor engine is of a 4-stroke lean-burn engine class. The air to fuel ratios of lean-burn engines range from 20:1 to 50:1 and are typically higher than 24:1. The exhaust excess oxygen levels of lean-burn engines are typically around 8 percent, ranging from 4 to 17 percent. Lean-burn engines typically produce lower NO_X emissions than rich-burn engines.

CO BACT:

Because of the stoichiometry of lean burn engines (relatively high excess oxygen in the exhaust stream), NSCR is not technically feasible. NSCR is effectively limited to engines with normal exhaust oxygen levels of 4 percent or less. Furthermore, lean-burn engines can not be retrofitted with NSCR control because of the reduced exhaust temperatures.

This leaves CO oxidation catalysts as the only technically feasible add on control. In a catalytic oxidation system, CO passes over a catalyst, usually a noble metal, which oxidizes the CO to CO_2 at efficiencies of approximately 70 percent for 2-stroke lean-burn engines and approximately 90 percent for 4-stroke lean-burn engines. This technology requires the higher excess oxygen content of lean burn engines to oxidize the CO, and AFR control may be required to optimize the control efficiency of the catalyst.

The Department determined that properly operated and maintained CO oxidation catalyst with AFR control constitutes BACT for control of CO emissions, as proposed by Bison Engineering, Inc. on behalf of NWE. The resulting BACT limit will be 0.5 g/bhp-hr, based on 89% control efficiency. The Department has determined the control options selected have controls and control costs comparable to other recently permitted similar sources and is capable of achieving the appropriate emission standards.

NO_X BACT:

As described in the CO BACT analysis, NSCR is a technically infeasible control option for 4-stroke lean-burn engines. This leaves selective catalytic reduction (SCR) with AFR control, and low NO_X emissions inherent to the design of the lean-burn engine, as technically feasible control technologies.

An SCR system consists of an ammonia (NH_3) storage, feed, and injection system, and a catalyst and catalyst housing. Selective catalytic reduction systems selectively reduce NO_X emissions by injecting ammonia (either in the form of liquid anhydrous ammonia or aqueous ammonium hydroxide) into the exhaust gas stream upstream of the catalyst. NO_X, NH_3, and oxygen (O_2) react on the surface of the catalyst to form nitrogen (N_2) and water (H_2O).

SCR can achieve efficiencies as high as 90 percent. However, for engines which typically operate at variable loads, such as engines on gas transmission pipelines, an SCR system may not function effectively, causing either periods of ammonia slip or insufficient ammonia to gain the reductions needed. This creates uncertainty in the control efficiency of NO_X, and adds potential NH_3 emissions from the potential ammonia slip. The Department determined this control technology is not appropriate given the low NO_X emissions inherent to the design of the engine proposed, as discussed next.

The NO_X emissions from the proposed engine, without add-on controls, are 1.0 g/bhp-hr. The staging of the combustion inherent to this lean-burn engine allows for burning a leaner fuel mixture that results in lowering of peak flame temperatures. As the formation of NO_X is exponentially related to combustion temperature in the engine cylinder, the lower combustion temperature inherent to the design of this engine assures lower NO_X formation.

The Department determined that properly operating and maintaining the engine, with the low NO_X emissions inherent to the design of this engine, with no additional controls, constitutes BACT in this case. The BACT limit will be 1.0 g/bhp-hr, as proposed by Bison Engineering, Inc. on behalf of NWE. The Department has determined the control option selected has control costs comparable to other recently permitted similar sources and is capable of achieving the appropriate emission standards.

VOC BACT:

The Department is not aware of any BACT determinations that have required controls for VOC emissions alone from compressor engines. The uncontrolled potential to emit of VOC emissions is relatively small and any add-on controls would be cost prohibitive.

However, the control technology selected for CO emissions also reduces VOC emissions. As proposed by Bison Engineering, Inc on behalf of NWE, the Department determined that proper operation and maintenance of the engine and the control technology, as required by the CO BACT, constitutes as BACT for VOC. The BACT limit will be 0.5 g/bhp-hr. The Department determined the control option selected has control costs comparable to other recently permitted similar sources and is capable of achieving the appropriate emissions standards.

III. Emission Inventory*

NorthWestern Energy							
Mainline #1							
Potential To Emit in tons/year							
Source	**NO_X**	**CO**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_X**	**HAP**
EU01: 660-hp Compressor Engine (Ingersoll-Rand)	12.75	19.14	4.77	0.48	0.48	0.01	0.79
EU02: 660-hp Compressor Engine (Ingersoll-Rand)	12.75	19.14	4.77	0.48	0.48	0.01	0.79
EU03: 660-hp Compressor Engine (Ingersoll-Rand)	12.75	19.14	4.77	0.48	0.48	0.01	0.79
EU04: 1100-hp Compressor Engine (Cooper Superior)	21.24	31.89	7.97	0.35	0.35	0.02	2.47
EU05: 2000-hp Compressor Engine (Cooper Superior)	28.95	30.88	11.61	0.63	0.63	0.04	4.50
EU06: 2370-hp Compressor Engine (CAT 3608 LE)	22.89	11.44	11.44	0.72	0.72	0.04	2.35
EU07: 1100-hp Compressor Engine (Cooper-Superior)	21.24	31.89	7.97	0.35	0.35	0.02	2.47
EU08: 2000-hp Compressor Engine (Cooper Superior)	28.95	30.88	11.61	0.63	0.63	0.04	4.50
EU09: 1100-hp Compressor Engine (Cooper-Superior)	21.24	31.89	7.97	0.35	0.35	0.02	2.47
EU10: Glycol Dehydration Unit	N/A	N/A	1.51	ND	ND	N/A	0.07
EU11: Two natural gas storage tanks with vents	N/A	N/A	5.17	ND	ND	N/A	0.00
EU12: Auxiliary Generator	6.70	1.44	0.53	0.48	0.48	0.44	0.01
EU13: Smart Ash Burner	0.33	0.04	0.00	0.03	0.03	0.97	0.00
EU14: Emergency Shutdown Flare	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IEU01: Process Gas Plant heater (Volcano)	1.84	1.55	0.10	0.14	0.14	0.01	0.03
IEU02: All Building Heaters (less than 8 MMBtu Capacity)	3.50	2.94	0.19	0.27	0.27	0.02	0.07
IEU03: Fuel Gas Heater	0.07	0.06	0.00	0.00	0.00	0.00	0.00
IEU04: Propane Truck Venting	N/A	N/A	2.55	ND	ND	N/A	ND
IEU05: Process Valves	N/A	N/A	0.07	ND	ND	N/A	0.00
IEU06: Gas Blowdown	N/A	N/A	0.73	ND	ND	N/A	0.00
IEU07: Fugitive Emissions - In-Plant vehicle traffic	N/A	N/A	N/A	1.21	0.12	N/A	N/A
IEU08: Molecular Sieve Regeneration Heater	0.36	0.31	0.02	0.03	0.03	0.00	0.01
Total:	**195.57**	**232.62**	**83.78**	**6.61**	**5.52**	**1.67**	**21.32**

*Emissions Inventory and Calculation Notes:

Some emissions may show zero due to rounding. See calculations following table.

EU = emitting unit number
IEU = insignificant emitting unit number
PM_{10} = particulate matter with an aerodynamic diameter of 10 microns or less
$PM_{2.5}$ = particulate matter with an aerodynamic diameter of 2.5 microns or less
HAP = hazardous air pollutants
SO_X = oxides of sulfur
SO_2 = sulfur dioxide
Bhp = brake horsepower
Btu = British thermal unit
hr = hour
lb = pound
MM denotes 10^6, M denotes 10^3
N/A = not applicable
ND = no data available
scf = standard cubic feet
VMT = vehicle miles traveled

CALCULATIONS:

660-hp 4-Stroke Rich-Burn Compressor Engines

Heat Input:	5.61	MMBtu/hr
Maximum Heat Capacity :	0.0085	MMBtu/Bhp-hr
Horsepower:	660	bhp
Fuel Usage:	0.00561	MMscf/hr
Hours Of Operation:	8760	hr/yr

NO_X Emissions

Emissions Factor:	2.91	lb/hr	(MAQP Limit)		
Calculations:	2.91 lb/hr *8760 hr/yr =			25491.6	lb/yr
	25491.6 lb/yr * 0.0005 ton/lb =			**12.75**	**ton/yr**

CO Emissions

Emissions Factor:	4.37	lb/hr	(MAQP Limit)		
Calculations:	4.37 lb/hr * 8760 hr/ yr =			38281.2	lb/yr
	38281.2 lb/yr * 0.0005 ton/lb =			**19.14**	**ton/yr**

VOC Emissions

Emissions Factor:	1.09	lb/hr	(MAQP Limit)		
Calculations:	1.09 lb/hr * 8760 hr/ yr =			9548.4	lb/yr
	9548.4 lb/yr * 0.0005 ton/lb =			**4.77**	**ton/yr**

PM_{10} and $PM_{2.5}$ Emissions

Emissions Factor:	0.01941	lbs/MMBtu	(AP-42 Table 3.2-3, 07/2000)		
Calculations:	0.01941lbs/MMBtu*0.0085MMBtu/Bhp-hr*660bhp=			0.10889	lb/hr
	0.1088901lb/hr*8760hours/yr* 0.0005 ton/lb =			**0.48**	**ton/yr**

SO_2 Emissions

Emission Factor:	0.000588	lbs/MMBtu	(AP-42 Table 3.2-3, 07/2000)		
Calculations:	0.000588lbs/MMBtu*0.0085MMBtu/Bhp-hr*660bhp*8760hours/yr=			28.89644	lb/yr
	28.8964368lb/yr* 0.0005ton/lb =			**0.014448**	**ton/yr**

HAP Emissions

Emissions Factor:	0.032184	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0321835lb/MMBtu*0.0085MMBtu/Bhp-hr*660bhp*8760hours/yr=			1581.613	lb/yr
	1581.6130506lb/yr* 0.0005ton/lb =			**0.790807**	**ton/yr**

1100-hp 4-Stroke Lean-Burn Compressor Engines

Heat Input:	7.92	MMBtu/hr
Maximum Heat Capacity :	0.0072	MMBtu/Bhp-hr

Horsepower:	1100	bhp
Fuel Usage:	0.00792	MMscf/hr
Hours Of Operation:	8760	hours/yr

NO_X Emissions

Emissions Factor:	4.85	lb/hr	(MAQP Limit)		
Calculations:	4.85 lb/hr *8760 hr/yr =			42486	lb/yr
	42486 lb/yr * 0.0005 ton/lb =			**21.24**	**ton/yr**

CO Emissions

Emissions Factor:	7.28	lb/hr	(MAQP Limit)		
Calculations:	7.28 lb/hr * 8760 hr/ yr =			63772.8	lb/yr
	63772.8 lb/yr * 0.0005 ton/lb =			**31.89**	**ton/yr**

VOC Emissions

Emissions Factor:	1.82	lb/hr	(MAQP Limit)		
Calculations:	1.82 lb/hr * 8760 hr/ yr =			15943.2	lb/yr
	15943.2 lb/yr * 0.0005 ton/lb =			**7.97**	**ton/yr**

PM_{10} and $PM_{2.5}$ Emissions

Emissions Factor:	0.009987	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0099871lbs/MMBtu*0.0072MMBtu/Bhp-hr*1100bhp=			0.079098	lb/hr
	0.079097832lb/hr*8760hours/yr* 0.0005 ton/lb =			**0.35**	**ton/yr**

SO_2 Emissions

Emission Factor:	0.000588	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.000588lbs/MMBtu*0.0072MMBtu/Bhp-hr*1100bhp*8760hours/yr=			40.79497	lb/yr
	40.7949696lb/yr* 0.0005ton/lb =			**0.02**	**ton/yr**

HAP Emissions

Emissions Factor:	0.0713	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0713lb/MMBtu*0.0072MMBtu/Bhp-hr*1100bhp*8760hours/yr=			4946.737	lb/yr
	4946.73696lb/yr* 0.0005ton/lb =			**2.47**	**ton/yr**

2000-hp 4-Stroke Lean-Burn Compressor Engines

Heat Input:	14.4	MMBtu/hr
Maximum Heat Capacity :	0.0072	MMBtu/Bhp-hr
Horsepower:	2000	bhp
Fuel Usage:	0.0144	MMscf/hr
Hours Of Operation:	8760	hours/yr

NO_X Emissions

Emissions Factor:	6.61	lb/hr	(MAQP Limit)		
Calculations:	6.61 lb/hr *8760 hr/yr =			57903.6	lb/yr
	57903.6 lb/yr * 0.0005 ton/lb =			**28.95**	**ton/yr**

CO Emissions

Emissions Factor:	7.05	lb/hr	(MAQP Limit)		
Calculations:	7.05 lb/hr * 8760 hr/ yr =			61758	lb/yr
	61758 lb/yr * 0.0005 ton/lb =			**30.88**	**ton/yr**

VOC Emissions

Emissions Factor:	2.65	lb/hr	(MAQP Limit)		
Calculations:	2.65 lb/hr * 8760 hr/ yr =			23214	lb/yr
	23214 lb/yr * 0.0005 ton/lb =			**11.61**	**ton/yr**

PM_{10} and $PM_{2.5}$ Emissions

Emissions Factor:	0.009987	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0099871lbs/MMBtu*0.0072MMBtu/Bhp-hr*2000bhp=			0.143814	lb/hr
	0.14381424lb/hr*8760hours/yr* 0.0005 ton/lb =			**0.63**	**ton/yr**

SO_2 Emissions

Emission Factor:	0.000588	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.000588lbs/MMBtu*0.0072MMBtu/Bhp-hr*2000bhp*8760hours/yr=			74.17267	lb/yr
	74.172672lb/yr* 0.0005ton/lb =			**0.04**	**ton/yr**

HAP Emissions

Emissions Factor:	0.0713	lb/MMBtu	(AP-42 Table 3.2-2, 07/2000)		
Calculations:	0.0713lb/MMBtu*0.0072MMBtu/Bhp-hr*2000bhp*8760hours/yr=			8994.067	lb/yr
	8994.0672lb/yr* 0.0005ton/lb =			**4.50**	**ton/yr**

2370-hp 4-stroke lean burn engine

Rated bhp:	2370	bhp
Hours of Operation:	8760	hr/yr
Heat Input	6914	Btu/bhp-hr

NO_X Emissions - controlled

Emissions Factor:	1	g/bhp-hr	(BACT - AFR and NSCR MAQP 2428-12)		
Calculations:	1 g/bhp-hr * 2370 bhp * 8760 hr/yr * 0.002205 lb/g. =			45778.45	lb/yr
				22.89	**ton/yr**

CO and VOC Emissions

Emissions Factor:	0.5	g/bhp-hr	(BACT - MAQP 2428-12)		
Calculations:	0.5 g/bhp-hr * 2370 bhp * 8760 hr/yr * 0.002205 lb/g =			22889.22	lb/yr
				11.44	**ton/yr**

HAP Emissions

Emissions Factor:	0.0327	lb/MMBtu	AP-42 Table 3.2-2 (07/2000)&Manufacturer specs (formaldehyde)		
Max Fuel Rate:	6914	Btu/bhp-hr	(CAT G3306TA Info)		
Calculations:	0.0327 lb/MMBtu * 10^-6 MMBtu/Btu * 6914 Btu/bhp-hr =			0.0002	lb/bhp-hr
	0.0002260878 lb/bhp-hr * 2370 bhp * 8760hr/yr =			4693.85	lb/yr
				2.35	**ton/yr**

PM_{10} Emissions

Emissions Factor:	0.0099871	lb/MMBtu	(AP-42 Table 3.2-2 (07/2000))		
Max Fuel Rate:	6914	Btu/bhp-hr			
Calculations:	0.0099871lb/MMBtu*6914Btu/bhp-hr*8760hr/yr*2370bhp=			1433.5777	lb/yr
	1433.57766411528lb/yr* 0.0005 ton/lb =			**0.72**	**ton/yr**

SO_2 Emissions

Emissions Factor:	0.000588	lb/MMBtu			
Max Fuel Rate:	6914	Btu/bhp-hr			
Calculations:	0.000588lb/MMBtu*6914Btu/bhp-hr*8760hr/yr*2370bhp=			84.4032	lb/yr
	84.4032468384lb/yr* 0.0005 ton/lb =			**0.04**	**ton/yr**

Natural Gasoline Storage Tank Vent
VOC emissions determined using the TANKS2 program. (From Previous Title V Application)

VOC Emissions
1.180 lb/hr or 5.17 tons/year

Smart Ash Burner - 100
Specific weight oil = 7.208 lb/gal
Oil incinerated = 12153 gal/yr
Process rate = 10 lb/yr
Percent sulfur in oil = 2 %
Manufacture process rate is 50 lb/hr of material

Assume: 20% of the material is oil

PM_{10} and $PM_{2.5}$ Emissions
Emission Factor: 1.20 lb/ton (Stack Test)
Calculations: 1.20 lb/ton * 10 lb/hr * 0.0005 tons/lb = 0.006 lb/hr
0.006 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0263 ton/yr

NO_X Emissions
Emission Factor: 55.00 lb/1000 gal (AP-42, Table 1.3-1, 10/96)
Calculations: 55.00 lb/1000 gal * 12153 gal/yr * 1 yr/8760 hr = 0.0763 lb/hr
0.0763 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.3342 ton/yr

CO Emissions
Emission Factor: 1.64 lb/ton (Stack Test)
Calculations: 1.64 lb/ton * 10 lb/hr *0.0005 tons/lb = 0.0082 lb/hr
0.0082 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.0359 ton/yr

VOC Emissions
Emission Factor: 0.10 lb/1000 gal (AP-42, Table 1.3-1, 10/96)
Calculations: 0.10 lb/1000 gal * 12153 gal/yr * 1 yr/8760 hr = 0.00014 lb/hr
0.00014 lb/hr * 8760 hr/yr * 0.0005 ton/lb =0.00061 ton/yr

SO_X Emissions
Emission Factor: 159.00 lb/1000 gal (AP-42, Table 1.3-1, 10/96)
Calculations: 159.00 lb/1000 gal * 12153 gal/yr * 1 yr/8760 hr = 0.22059 lb/hr
0.22059 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.96616 ton/yr

HAP Emissions
Emissions Factor:
Calculations:

AP-42 Tables 1.3-9 and 1.3-11, 09/1998	Emissions Factor: lb/Mgal	lb/yr	
Benzene	2.14E-04	0.002601	
Ethylbenzene	6.36E-05	0.000773	
Formaldehyde	3.30E-02	0.401049	
Naphthalene	1.13E-03	0.013733	
1,1,1-Trichloroethane	2.36E-04	0.002868	
Toluene	6.20E-03	0.075349	
o-Xylene	1.09E-04	0.001325	
OCDD	3.10E-09	3.77E-08	
Antimony	5.25E-03	0.063803	
Arsenic	1.32E-03	0.016042	
Beryllium	2.78E-05	0.000338	
Cadmium	3.98E-04	0.004837	
Chloride	3.47E-01	4.217091	
Chromium	8.45E-04	0.010269	
Chromium VI	2.48E-04	0.003014	
Cobalt	6.02E-03	0.073161	
Lead	1.51E-03	0.018351	
Manganese	3.00E-03	0.036459	
Mercury	1.13E-04	0.001373	
Nickel	8.45E-02	1.026929	
Phosphorous	9.46E-03	0.114967	
Selenium	6.83E-04	0.0083	
Total:		6.092632	lb/yr
		0.003046	**ton/yr**

Emergency Flare

Fuel Consumption:	0.00000851	MMscf/hr
Fuel heating Value:	1	MMBtu/MMscf
Hours of Operation:	8760	hr/yr

PM Emissions:

Emissions Factor: 7.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)

Calculations:	7.6lb/MMscf*0.00000851MMscf/hr=	0.000064676	lb/hr
	0.000064676lb/hr*8760hr/yr*0.0005 ton/lb =	**0.00028**	**ton/yr**

NO_X Emissions:

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	100lb/MMscf*0.00000851MMscf/hr=	0.000851	lb/hr
	0.000851lb/hr*8760hr/yr*0.0005 ton/lb =	**0.00373**	**ton/yr**

CO Emissions:

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	84lb/MMscf*0.00000851MMscf/hr=	0.00071484	lb/hr
	0.00071484lb/hr*8760hr/yr*0.0005 ton/lb =	**0.00313**	**ton/yr**

VOC Emissions:

Emissions Factor:	5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	5.5lb/MMscf*0.00000851MMscf/hr=	0.000046805	lb/hr
	0.000046805lb/hr*8760hr/yr*0.0005 ton/lb =	**0.00021**	**ton/yr**

SO_X Emissions:

Emissions Factor:	0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	0.6lb/MMscf*0.00000851MMscf/hr=	0.000005106	lb/hr
	0.000005106lb/hr*8760hr/yr*0.0005 ton/lb =	**0.00002**	**ton/yr**

Process Gas Plant Heater

Heat Input:	4.2	MMBtu/hr
Fuel Heating Value:	1000	MMBtu/MMscf
Hours of Operation:	8760	hr/yr

PM_{10} and $PM_{2.5}$ Emissions:

Emissions Factor:	7.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	7.6lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.03192	lb/hr
	0.03192lb/hr*8760hr/yr*0.0005 lb/ton =	**0.14**	**ton/yr**

NO_X Emissions:

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	100lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.42	lb/hr
	0.42lb/hr*8760hr/yr*0.0005 lb/ton =	**1.84**	**ton/yr**

CO Emissions:

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	84lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.3528	lb/hr
	0.3528lb/hr*8760hr/yr*0.0005 lb/ton =	**1.55**	**ton/yr**

VOC Emissions:

Emissions Factor:	5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	5.5lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.0231	lb/hr
	0.0231lb/hr*8760hr/yr*0.0005 lb/ton =	**0.10**	**ton/yr**

SO_2 Emissions:

Emissions Factor:	0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	0.6lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.00252	lb/hr
	0.00252lb/hr*8760hr/yr*0.0005 lb/ton =	**0.01**	**ton/yr**

HAP Emissions:

Emissions Factor:	1.886 lb/MMscf (AP-42 Table 1.4-3 and 1.4-4, 07/1998)		
Calculations:	1.886lb/MMscf*1000^-1MMBtu/MMscf^-1*4.2MMBtu/hr=	0.0079212	lb/hr
	0.0079212lb/hr*8760hr/yr*0.0005 lb/ton =	**0.03**	**ton/yr**

All Building Heaters

Heat Input:	8	MMBtu/hr
Fuel Heating Value:	1000	MMBtu/MMscf
Hours of operation:	8760	hrs/yr

PM_{10} and $PM_{2.5}$:

Emissions Factor:	7.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	7.6lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=	0.0608	lb/hr
	0.0608lb/hr*8760hrs/yr*0.0005 lb/ton =	**0.27**	**ton/yr**

NO_X Emissions:

Emissions Factor:	100 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	100lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=	0.8	lb/hr
	0.8lb/hr*8760hrs/yr*0.0005 lb/ton =	**3.50**	**ton/yr**

CO Emissions:

Emissions Factor:	84 lb/MMscf (AP-42 Table 1.4-1, 07/1998)		
Calculations:	84lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=	0.672	lb/hr
	0.672lb/hr*8760hrs/yr*0.0005 lb/ton =	**2.94**	**ton/yr**

VOC Emissions:

Emissions Factor:	5.5 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	5.5lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=	0.044	lb/hr
	0.044lb/hr*8760hrs/yr*0.0005 lb/ton =	**0.19**	**ton/yr**

SO_2 Emissions:

Emissions Factor:	0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)		
Calculations:	0.6lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=	0.0048	lb/hr
	0.0048lb/hr*8760hrs/yr*0.0005 lb/ton =	**0.02**	**ton/yr**

HAP Emissions:

Emissions Factor:	1.886	lb/MMscf	(AP-42 Table 1.4-3 and 1.4-4, 07/1998)		
Calculations:	1.886lb/MMscf*1000^-1MMBtu/MMscf^-1*8MMBtu/hr=			0.015088	lb/hr
	0.015088lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.07**	**ton/yr**

Fuel Gas Heater

Heat Input:	0.15	MMBtu/hr
Fuel Heating Value:	1000	MMBtu/MMscf
Hours of operation:	8760	hrs/yr

PM_{10} and $PM_{2.5}$:

Emissions Factor:	7.6	lb/MMscf	(AP-42 Table 1.4-2, 07/1998)		
Calculations:	7.6lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.00114	lb/hr
	0.00114lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.005**	**ton/yr**

NO_X Emissions:

Emissions Factor:	100	lb/MMscf	(AP-42 Table 1.4-1, 07/1998)		
Calculations:	100lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.015	lb/hr
	0.015lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.066**	**ton/yr**

CO Emissions:

Emissions Factor:	84	lb/MMscf	(AP-42 Table 1.4-1, 07/1998)		
Calculations:	84lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.0126	lb/hr
	0.0126lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.055**	**ton/yr**

VOC Emissions:

Emissions Factor:	5.5	lb/MMscf	(AP-42 Table 1.4-2, 07/1998)		
Calculations:	5.5lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.000825	lb/hr
	0.000825lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.004**	**ton/yr**

SO_2 Emissions:

Emissions Factor:	0.6	lb/MMscf	(AP-42 Table 1.4-2, 07/1998)		
Calculations:	0.6lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.00009	lb/hr
	0.00009lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.0004**	**ton/yr**

HAP Emissions:

Emissions Factor:	1.886	lb/MMscf	(AP-42 Table 1.4-3 and 1.4-4, 07/1998)		
Calculations:	1.886lb/MMscf*1000^-1MMBtu/MMscf^-1*0.15MMBtu/hr=			0.000283	lb/hr
	0.0002829lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.001**	**ton/yr**

Propane Truck Venting
VOC Emissions
(From Previous Title V Application)
0.5811 lb/hr or 2.55 ton/yr

Process Valves

Production Rate:	20	MMscf/day
Hours of Operations:	8760	hrs/yr
Quantity:	2	

Calculations:

Emissions Factor:	0.01	lb VOC/MMscf (Prior Title V Application)		
Calculations:	0.01lbVOC/MMscf*20MMscf/day*0.0416666666666667day/hr =		0.008333	lb/hr
	0.00833333333333333lb/hr*2*8760hrs/yr*0.0005 ton/lb =		**0.073**	**ton/yr**

Gas Blow Down

Prod. Rate 200,000.0 cf/yr
VOC Emissions
Emission Factor: 0.0073 lb VOC/cf (From Title V Application)
Calculations: 0.0073 lb VOC/cf * 200000.0 cf/yr * 1 yr/365 days * 1 day/24 hr = 0.16 lb/hr
0.16 lb/hr * 365 days/year * 0.0005 ton/lb *24 hr/day = 0.73 ton/yr

HAP Emissions	0.000068498	ton/yr	(Prior Title V Application)

Molecular Sieve Regen Htr

Heat Input:	0.83	MMBtu/hr	(Prior Title V Application)
Fuel Heating Value:	1000	MMBtu/MMscf	
Hours of operation:	8760	hrs/yr	

PM_{10} and $PM_{2.5}$:

Emissions Factor:	7.6	lb/MMscf	(AP-42 Table 1.4-2, 07/1998)		
Calculations:	7.6lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr=			0.006308	lb/hr
	0.006308lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.028**	**ton/yr**

NO_X Emissions:

Emissions Factor:	100	lb/MMscf	(AP-42 Table 1.4-1, 07/1998)		
Calculations:	100lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr=			0.083	lb/hr
	0.083lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.364**	**ton/yr**

CO Emissions:

Emissions Factor:	84	lb/MMscf	(AP-42 Table 1.4-1, 07/1998)		
Calculations:	84lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr=			0.06972	lb/hr
	0.06972lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.305**	**ton/yr**

VOC Emissions:

Emissions Factor:	5.5	lb/MMscf	(AP-42 Table 1.4-2, 07/1998)		
Calculations:	5.5lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr=			0.004565	lb/hr
	0.004565lb/hr*8760hrs/yr*0.0005 lb/ton =			**0.020**	**ton/yr**

SO_2 Emissions:

Emissions Factor: 0.6 lb/MMscf (AP-42 Table 1.4-2, 07/1998)
Calculations: 0.6lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr= 0.000498 lb/hr
0.000498lb/hr*8760hrs/yr*0.0005 lb/ton = **0.0022** **ton/yr**

HAP Emissions:

Emissions Factor: 1.886 lb/MMscf (AP-42 Table 1.4-3 and 1.4-4, 07/1998)
Calculations: 1.886lb/MMscf*1000^-1MMBtu/MMscf^-1*0.83MMBtu/hr= 0.001565 lb/hr
0.00156538lb/hr*8760hrs/yr*0.0005 lb/ton = **0.007** **ton/yr**

Road Dust

AP-42 13.2.2 equation 1.a

$$E = k\,(s/12)^a (W/3)^b$$

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)

PM_{10} Calculations

k =	1.5			
a =	0.9			
b =	0.45			
s =	14.1	(Application)		
W =	40	(Application - Trucks)		
VMT =	78	(Application - Trucks)		
E =	5.563	lb/VMT		
PM_{10} =	433.9527	lb/yr =	0.217	ton/yr
W =	0.25	(Application - Cars)		
VMT =	3510	(Applicatoin - Cars)		
E=	0.566883	lb/VMT		
PM_{10} =	1989.761	lb/yr =	0.99488	ton/yr
TOTAL:			**1.212**	**ton/yr**

$PM_{2.5}$ Calculations

k =	0.15			
a =	0.9			
b =	0.45			
s =	14.1	(Application)		
W =	40	(Application - Trucks)		
VMT =	78	(Application - Trucks)		
E =	0.556	lb/VMT		
PM_{10} =	43.39527	lb/yr =	0.022	ton/yr
W =	0.25	(Application - Cars)		
VMT =	3510	(Application - Cars)		
E=	0.056688	lb/VMT		
PM_{10} =	198.9761	lb/yr =	0.099488	ton/yr
TOTAL:			**0.121**	**ton/yr**

Auxiliary Generator (diesel) – 600 hp engine driving 400 kW generator

Hours of Operation: 720 hr/yr
Heat Input: 4.2 MMBtu/hr
Maximum Heat Capacity: 0.007 mmbTU/Bhp-hr
Horsepower: 600 hp

PM-10 Emissions
Emission Factor: 0.0022 lb/hp-hr (AP-42, Table 3.3-1 (10/96))
Calculations: 0.0022 lb/hp-hr * 600 hp = 1.32 lb/hr
1.32 lb/hr * 720 hr/yr * 0.0005 ton/lb = 0.48 ton/yr

NO_x Emissions
Emission Factor: 0.031 lb/hp-hr (AP-42, Table 3.3-1 (10/96))
Calculations: 0.031 lb/hp-hr * 600 hp = 18.6 lb/hr
18.6 lb/hr * 720 hr/yr * 0.0005 ton/lb = 6.70 ton/yr

CO Emissions
Emission Factor: 0.00668 lb/hp-hr (AP-42, Table 3.3-1 (10/96))
Calculations: 0.00668 lb/hp-hr * 600 hp = 4.008 lb/hr
4.008 lb/hr * 720 hr/yr * 0.0005 ton/lb = 1.44 ton/yr

VOC Emissions
Emission Factor: 0.00247 lb/hp-hr (AP-42, Table 3.3-1 (10/96))
Calculations: 0.00247 lb/hp-hr * 600 hp = 1.482 lb/hr
1.482 lb/hr * 720 hr/yr * 0.0005 ton/lb = 0.53 ton/yr

SO_x Emissions
Emission Factor: 0.00205 lb/hp-hr (AP-42, Table 3.3-1 (10/96))
Calculations: 0.00205 lb/hp-hr * 600 hp = 1.23 lb/hr
1.23 lb/hr * 720 hr/yr * 0.0005 ton/lb = 0.44 ton/yr

Input values for the following Gly-Calc reports were taken from an October 2001 sample taken of the gas influent to the heat exchanger. The wet gas was assumed not fully saturated, with a water content of 33.79 lb/MMBtu provided. A schematic of the process with depiction of the sample point, and the sample analyses, are on file with the Department, as well as the original input files and emissions report submitted by Bison Engineering, Inc.

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: MAQP #2428-12
File Name:
Date: March 03, 2010

DESCRIPTION:

Description: Ethylene Glycol Hydrate Prevention based on 10/16/2001 sample taken from the gas going into the heat exchanger

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 70.00 deg. F
Pressure: 540.00 psig
Wet Gas Water Content: Subsaturated
Specified Wet Gas Water Content: 33.79 lbs. H2O/MMSCF

Component	Conc. (vol %)
Carbon Dioxide	3.9900
Nitrogen	3.0700
Methane	78.0500
Ethane	7.0700
Propane	3.9000
Isobutane	0.7000
n-Butane	1.4000
Isopentane	0.4200
n-Pentane	0.3300
n-Hexane	0.1100
Other Hexanes	0.1500
Heptanes	0.8100
2,2,4-Trimethylpentane	0.0241
Benzene	0.0054
Toluene	0.0112
Ethylbenzene	0.0020
Xylenes	0.0065

DRY GAS:

Flow Rate: 20.0 MMSCF/day

LEAN GLYCOL:

Glycol Type: EG
Water Content: 20.0 wt% H2O
Recirculation Ratio: 3.0 gal/lb H2O

COLD SEPARATOR:

Temperature: -40.0 deg. F
Pressure: 530.0 psig

PUMP:

Glycol Pump Type: Electric/Pneumatic

GRI-GLYCalc VERSION 4.0 - EMISSIONS SUMMARY

Case Name: MAQP #2428-12
File Name:
Date: March 03, 2010

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.4814	11.553	2.1084
Ethane	0.5957	14.296	2.6091
Propane	0.2123	5.095	0.9298
Isobutane	0.0294	0.705	0.1286
n-Butane	0.0627	1.504	0.2746
Isopentane	0.0152	0.365	0.0667
n-Pentane	0.0020	0.048	0.0087
n-Hexane	0.0023	0.055	0.0101
Other Hexanes	0.0038	0.092	0.0168
Heptanes	0.0054	0.130	0.0237
2,2,4-Trimethylpentane	0.0001	0.003	0.0006
Benzene	0.0079	0.189	0.0345
Toluene	0.0010	0.023	0.0043
Ethylbenzene	0.0008	0.020	0.0036
Xylenes	0.0030	0.071	0.0130
Total Emissions	1.4229	34.150	6.2323
Total Hydrocarbon Emissions	1.4229	34.150	6.2323
Total VOC Emissions	0.3459	8.300	1.5148
Total HAP Emissions	0.0151	0.362	0.0661
Total BTEX Emissions	0.0127	0.304	0.0554

V. Existing Air Quality

The existing air quality of the Cut Bank area is expected to be in compliance with all currently effective state and federal requirements. Current sources in the area include the existing gas plant and the inactive Flying J Refinery.

VI. Ambient Air Impact Analysis

Air quality modeling was conducted for the NWE facility in 1991 (MAQP #2428B). The modeling was done to determine compliance with PSD increments and ambient air quality standards. The modeling results demonstrated that there were no significant impacts to the NO_X and CO PSD increments. The modeling also demonstrated that neither the National Ambient Air Quality Standards (NAAQS), nor the Montana Ambient Air Quality Standards (MAAQS) would be violated.

Modeling was also conducted for MAQP #2428-05. The modeling was done to determine the ambient annual concentration of HAPs resulting from the Smart Ash Burner. Upper air and surface air data from the National Weather Service for Great Falls (1991) were used to assist in determining the impacts. The modeling results satisfied the conditions of MCA 75-2-215 and ARM 17.8.706(5) (the predecessor to ARM 17.8.770).

The following table provides for a history of selected permitting actions. As demonstrated below, the current permitting action provides for lower allowable plant wide emissions than permitted in past actions:

	Tons per year*		
	NO_X	CO	VOC
MAQP #2428B modification application – 1986 EI	385	96	77
MAQP #2428B modification application – 1989 EI	513	288	125
MAQP #2428B modification application – 1991 EI	340	281	116
MAQP #2428-07	236	314	119
MAQP #2428-12	196	233	84

*EI = total emissions as presented in the "emissions statistics" table of the MAQP #2428B modification application.

Furthermore, the net emissions change associated with the current permitting action is minor, with a small increase in NO_X emissions, and a decrease in CO and VOC emissions. The following table illustrates the net allowable emissions change associated with the current MAQP #2428-12 action compared to that of MAQP #2428-11:

	Tons per year		
	NO_X	CO	VOC
MAQP #2428-11	190.29	245.25	96.03
MAQP #2428-12	195.57	232.62	83.78
Net Difference:	**5.28**	**-12.63**	**-12.25**

The facility wide allowable emissions of MAQP #2428-12 are lower than previous permitting actions, and considerably lower than those emissions of MAQP #2428B. Additionally, the current change in emissions associated with this action results in a very small increase of NO_X, just slightly greater than 5 tons per year, with decreases in CO and VOC. Based on this information and the previous modeling analyses, the Department believes this action 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, the Department conducted the following private property taking and damaging assessment.

YES	NO	
XX		1. Does the action pertain to land or water management or environmental regulation affecting private real property or water rights?
	XX	2. Does the action result in either a permanent or indefinite physical occupation of private property?
	XX	3. Does the action deny a fundamental attribute of ownership? (ex.: right to exclude others, disposal of property)
	XX	4. Does the action deprive the owner of all economically viable uses of the property?
	XX	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?
	XX	6. Does the action have a severe impact on the value of the property? (consider economic impact, investment-backed expectations, character of government action)
	XX	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?
	XX	7a. Is the impact of government action direct, peculiar, and significant?
	XX	7b. Has government action resulted in the property becoming practically inaccessible, waterlogged or flooded?
	XX	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?
	XX	Takings or damaging implications? (Taking or damaging implications exist if YES is checked in response to question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

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

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air Resources Management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: NorthWestern Energy
40 East Broadway
Butte, MT 59701

Montana Air Quality Permit Number: 2428-12
Preliminary Determination Issued: 3/19/2010
Department Decision Issued: 4/20/2010
Permit Final: 5/6/2010

1. *Legal Description of Site*: South ½ of Section 22, Township 33 North, Range 5 West in Glacier County, Montana.

2. *Description of Project*: This project removes an uncontrolled 1,100-hp compressor engine and replaces it with a 2,370-hp compressor engine. The project also increases the allowed hours of operation of the 660-hp compressor engines by removing the hour limitations on these engines.

3. *Objectives of Project*: The purpose of this project is to increase the total compressor capacity of the compressor station to compensate for projected system growth, and to remove the administrative burden associated with hourly limitations on the 660-hp compressor engines by removing the hours of operation limitation on those engines.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because NWE demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in MAQP #2428-12.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. *The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			XX			Yes
B	Water Quality, Quantity, and Distribution			XX			Yes
C	Geology and Soil Quality, Stability and Moisture			XX			Yes
D	Vegetation Cover, Quantity, and Quality			XX			Yes
E	Aesthetics			XX			Yes
F	Air Quality			XX			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			XX			Yes
H	Demands on Environmental Resource of Water, Air and Energy			XX			Yes
I	Historical and Archaeological Sites			XX			Yes
J	Cumulative and Secondary Impacts			XX			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic Life and Habitats

Through the BACT process, MAQP #2428-12 would require the proposed compressor engine to be equipped with control technology. These controls would greatly reduce the potential emissions from this source. Overall, the net change of emissions as a result of the permitting action would be very small on an industrial scale. Any impacts to terrestrial and aquatic life and habitats would be expected to be minor.

B. Water Quality, Quantity and Distribution

The proposed project would not result in water usage as a part of normal operations of the compressor engine. Effects to water quality, quantity, and distribution, if any, would be expected to be minor.

C. Geology and Soil Quality, Stability and Moisture

Small amounts of water may be required for fugitive dust control of the access roads and the general facility property during installation and as needed during regular operations. Any change in the deposition of pollutants would be expected to be very minor as the change in emissions associated with this project is small as a result of the control requirements that would be placed in MAQP #2428-12, and the dispersion of those emissions. Impacts to geology and soil quality, stability, and moisture would be expected to be minor.

D. Vegetation Cover, Quantity, and Quality

Deposition of pollutants would be expected to be very minor due to the small change in emissions in MAQP #2428-12. Furthermore, fugitive dust control would continue to be required of the access roads and the general facility property. Therefore, any impacts to vegetation cover, quantity, and quality would be expected to be minor, if any.

E. Aesthetics

The proposed project is to install a compressor engine at an already existing industrial natural gas facility. A minor impact to aesthetics may be expected.

F. Air Quality

MAQP #2428-12 would require emission controls on the proposed compressor engine. These emission controls would greatly reduce the potential emissions from this source. Furthermore, these conditions and limitations are derived from rules designed to protect air quality. Therefore, impacts to the air quality would be expected to be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources

The Department contacted the Montana Natural Heritage Program (MNHP) to request any information available on plant and animal species of concern in the vicinity of NWE's facility. No records of species of special concern were found. As described in Section 7.F above, conditions and limitations that would be placed in MAQP #2428-12 would require control of emissions from the new engine. Therefore, with a small net emissions change, and no species of concern found during the file search conducted by MNHP, the Department has determined minor, if any, impacts to unique endangered, fragile or limited environmental resources would be expected as a result of this project.

H. Demands on Environmental Resource of Water, Air and Energy

The project is to install a natural gas compressor engine. This engine would be fired on natural gas. However, the engine would be required to ensure proper distribution of natural gas through the pipeline.

As described in Section 7.B above, the proposed project would not result in water usage as a part of normal operations of the compressor engine. However, small amounts of water may be required for fugitive dust control of the access roads and the general facility property during installation and as needed during normal operations.

As described in Section 7.F above, impacts to the air quality would be expected to be minor.

Overall, the demands on the environmental resources of water, air, and energy would be expected to be minor.

I. Historical and Archaeological Sites

The Department contacted the State Historic Preservation Office (SHPO) to request information on any known cultural properties in the area. No known historical or archaeological sites were found. Minor, if any, effects to any historical or archaeological sites would be expected as a result of installation of this project as the current project would take place within an already developed compressor station area.

J. Cumulative and Secondary Impacts

Potential physical and biological effects of any individual considerations above would be expected to be minor. Collectively, the potential cumulative and secondary impacts would be expected to be minor.

8. *The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.*

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores			XX			Yes
B	Cultural Uniqueness and Diversity			XX			Yes
C	Local and State Tax Base and Tax Revenue			XX			Yes
D	Agricultural or Industrial Production			XX			Yes
E	Human Health			XX			Yes
F	Access to and Quality of Recreational and Wilderness Activities			XX			Yes
G	Quantity and Distribution of Employment			XX			Yes
H	Distribution of Population			XX			Yes
I	Demands for Government Services			XX			Yes
J	Industrial and Commercial Activity			XX			Yes
K	Locally Adopted Environmental Plans and Goals					XX	Yes
L	Cumulative and Secondary Impacts			XX			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The current project would replace an existing compressor engine at an existing industrial site. No additional employment is expected as a result of this project. Minor, if any, effects to social structures and mores or cultural uniqueness and diversity would be expected as a result of this project.

C. Local and State Tax Base and Tax Revenue

The current project would replace an existing compressor engine at an existing industrial site, and would increase the total compression capacity of the facility to compensate for projected increase in demand. Impacts to local and state tax base and revenue associated with this project would be expected to be minor.

D. Agricultural or Industrial Production

The current project would take place at an existing industrial facility. Impacts from the installation of the engine would be expected to be minor. Limitations and conditions in MAQP #2428-12 would minimize emissions. As the current project would replace an existing compressor engine at an existing industrial site, effects to agricultural or industrial production would be expected to be minor.

E. Human Health

MAQP #2428-12 would contain conditions and limitations derived from rules designed to protect human health. Impacts to human health would be expected to be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The current project would take place at an existing facility. Furthermore, the Department is not aware of any access to recreational and wilderness activities of which this facility affects. A small increase in noise associated with the new engine may be expected. A temporary increase in activity may be expected during the installation of the new engine. Overall, any effects to the quality of recreational and wilderness activities would be expected to be minor.

G. Quantity and Distribution of Employment
H. Distribution of Population

Installation of the proposed compressor engine may require a temporary increase of activity in the area; however, no additional employment is expected as a result of this project. Any effects to quantity and distribution of employment or distribution of population would be expected to be minor.

I. Demands for Government Services

The proposed compressor engine would require the proper permitting and associated compliance activities from the state. However, the engine would replace an existing engine, and the project would also eliminate the administrative burden associated with hourly limitations placed on the 660-hp engines. The facility remains below Prevention of Significant Deterioration thresholds. Effects to the demands for government services would be expected to be minor.

J. Industrial and Commercial Activity

Installation of the proposed compressor engine may require a temporary increase of activity in the area. However, as the engine would be installed at an already existing industrial site, any effects to industrial and commercial activity would be expected to be minor.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans and goals affected by the issuance of MAQP #2428-12. The MAQP would contain limits for protecting air quality and keeping facility emissions in compliance with state and federal air quality standards.

L. Cumulative and Secondary Impacts

Potential economic and social effects of any individual considerations above would be expected to be minor. The Department has determined that collectively, the potential cumulative and secondary impacts would be expected to be minor.

Recommendation: No Environmental Impact Statement (EIS) is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the construction and operation of a compressor engine. MAQP #2428-12 includes conditions and limitations to ensure the facility will operate in compliance with all applicable rules and regulations. In addition, there are no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

Individuals or groups contributing to this EA: Department of Environmental Quality – Air Resources Management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program

EA prepared by: Shawn Juers
Date: 3/3/2010