



Montana Department of  
**ENVIRONMENTAL QUALITY**

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January 25, 2013

Daniel Ulmen – Facilities Operation Manager  
Montana State University-Northern  
Bio-Energy Center  
300 13<sup>th</sup> Street West  
P.O. Box 7751  
Havre, MT 59501

Dear Mr. Ulmen:

Montana Air Quality Permit #4610-01 is deemed final as of January 25, 2013, by the Department of Environmental Quality (Department). This permit is for an engine performance testing 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,

Julie Merkel  
Air Permitting Supervisor  
Air Resources Management Bureau  
(406) 444-3626

Ed Warner  
Environmental Engineer  
Air Resources Management Bureau  
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JM:EW  
Enclosure

Montana Department of Environmental Quality  
Permitting and Compliance Division

Montana Air Quality Permit #4610-01

Montana State University-Northern  
BioEnergy Center  
300 13<sup>th</sup> Street West  
P.O. Box 7751  
Havre, MT 59501

January 25, 2011



## MONTANA AIR QUALITY PERMIT

Issued To:	Montana State University – Northern Bio-Energy Center 300 13 <sup>th</sup> Street West P.O. Box 7751 Havre, MT 59501	MAQP: #4610-01 Application Complete: 12/7/12 Preliminary Determination Issued: 12/24/12 Department Decision: 1/9/13 Permit Final: 1/25/13 AFS #: 041-0013
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A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Montana State University – Northern’s Bio-Energy Center (Bio-Energy Center), 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 Bio-Energy Center is located within the Montana State University – Northern’s campus in Section 8, Township 32 North, Range 16 East in Hill County, Montana.

#### B. Current Permit Action

On November 15, 2012, the Department of Environmental Quality – Air Resources Management Bureau (Department) received an application to modify MAQP #4610-00 to reduce the limit on annual hours of operation for the engine dynamometers. This reduction in hours would decrease the maximum potential emissions of nitrogen oxides (NO<sub>x</sub>) from the facility and therefore justify eliminating permit conditions related to minimum stack heights. The modification also incorporates several boilers and heaters into the MAQP.

### SECTION II: Conditions and Limitations

#### A. Operational and Emission Limitations

1. The Bio-Energy Center’s water-brake engine dynamometer shall not be used with engines with design capacities greater than 600 horsepower (hp) (ARM 17.8.749).
2. The Bio-Energy Center’s chassis dynamometer shall not be used with engines with design capacities greater than 500 hp (ARM 17.8.749).
3. The Bio-Energy Center’s small engine test dynamometer shall only operate up to five engines at any given time. The total combined design capacity of these engines shall not exceed 45 hp (ARM 17.8.749).
4. The Bio-Energy Center’s Alternating Current (A/C) dynamometer shall not be used with engines with design capacities greater than 550 hp (ARM 17.8.749).
5. The Bio-Energy Center shall only combust gasoline, biodiesel, ultra-low sulfur (#2) diesel fuel, or straight vegetable oil (SVO) in the engines unless otherwise approved by the Department in writing (ARM 17.8.749).
6. The water-brake engine dynamometer shall not be operated for more than 500 hours per rolling 12-month period (ARM 17.8.749).

7. The chassis dynamometer shall not be operated for more than 500 hours per rolling 12-month period (ARM 17.8.749).
8. The A/C dynamometer shall not be operated for more than 500 hours per rolling 12-month period (ARM 17.8.749).
9. The Bio-Energy Center shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).
10. The Bio-Energy Center shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).
11. The Bio-Energy Center shall treat all unpaved portions of the haul roads, access roads, parking lots, or general plant area with water and/or chemical dust suppressant as necessary to maintain compliance with the reasonable precautions limitation in Section II.A.10 (ARM 17.8.749).

B. Testing Requirements

1. The Department may require testing (ARM 17.8.105).
2. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

C. Operational Reporting Requirements

1. The Bio-Energy Center 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. Information shall include the following and be in the units required by the Department (ARM 17.8.505):

- a. Hp capacity of engine(s) used for each dynamometer; and
  - b. Hours of operation for each dynamometer.
2. The Bio-Energy Center shall document, by month, the hours of operation for each dynamometer. By the 25<sup>th</sup> day of each month, the Bio-Energy Center shall total the hours of operation for each dynamometer during the previous month. The monthly information will be used to demonstrate compliance with the rolling 12-month limitations in Section II.A.6, II.A.7, and II.A.8. The information for each of the previous months shall be submitted along with the annual emissions inventory (ARM 17.8.749).

3. The Bio-Energy Center shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745, that would include *the addition of new emission unit*, a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).
4. All records compiled in accordance with this permit must be maintained by the Bio-Energy Center 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).

#### SECTION IV: General Conditions

- A. Inspection – The Bio-Energy Center 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 Emission Monitoring System (CEMS), Continuous Emission 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 the Bio-Energy Center fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving the Bio-Energy Center 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 therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.

- G. 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).
- H. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by the Bio-Energy Center may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

Montana Air Quality Permit (MAQP) Analysis  
Montana State University – Northern’s Bio-Energy Center  
MAQP #4610-01

I. Introduction/Process Description

The Montana State University – Northern’s Bio-Energy Center (Bio-Energy Center) operates a heavy duty engine performance testing facility. The Bio-Energy Center is located within the Montana State University – Northern’s campus in Section 8, Township 32 North, Range 16 East in Hill County, Montana.

A. Permitted Equipment

The following is a list and description of permitted equipment at the Bio-Energy Center:

1. Boilers, heaters, furnaces

There are numerous natural gas-fired boilers and water heaters throughout the Montana State University – Northern campus. The combined heating capacity from the natural-gas fired boilers is 39.93 million British thermal units per hour (MMBtu/hr). There is also a dual-fuel boiler located in the Renewable Fuels Building that is capable of burning natural gas or glycerin and biodiesel and has a heating capacity of 0.150 MMBtu/hr.

2. Small Engine Dynamometer

This dynamometer is located in the Applied Technology Center (ATC) Building. This unit is rated to test 4-5 engines with rated capacities up to 15 horsepower (hp) each. However, due to other circumstances the dynamometer is only capable of testing four 5-hp engines simultaneously or fewer engines with greater hp. The facility is limited to test any combination of engines as long as the combined capacity of the engines does not exceed 45 hp.

3. Water-Brake Engine Dynamometer

The water-brake engine test dynamometer located in the ATC Building has a loaded capacity of up to 1000 hp. However, the Bio-Energy Center requested a federally enforceable limit on the water-brake engine test dynamometer to engines no larger than 600 hp. The water-brake engine dynamometer room has its own ventilation system that exhausts to a dedicated stack. Due to the mechanical and control system design, the water-brake engine dynamometer and the chassis dynamometer cannot be operated at the same time.

4. Alternating Current (A/C) Dynamometer

This dynamometer has a loaded design capacity of 550 hp. The MAQP contains conditions which prohibit the use of engines that exceed this maximum rated capacity.

5. Chassis Dynamometer

This is setup to allow a vehicle to park on the chassis dynamometer to measure the power output from the vehicle wheels. This dynamometer has the same design capacity as the water-brake engine dynamometer; however, due to its

installation configuration the maximum rated capacity is reduced to 500 hp. The MAQP contains conditions which prohibit the use of engines that exceed this maximum rated capacity. The chassis dynamometer room has its own ventilation system that exhausts to a dedicated stack. Due to the mechanical and control system design, the water-brake engine dynamometer and the chassis dynamometer cannot be operated at the same time.

6. Oilseed press and biodiesel pilot processing plant

The purpose of the oilseed press is to research Montana-grown oilseeds. The types of seed that are typically used are canola, safflower, flax, camelina, and mustard. The Renewable Fuels Building contains five cold presses and one filter press and does not use any chemicals or heat to extrude the oil. The capacity of each press is 1 ton per day (24 hours). The maximum capacity of all the presses is 3 tons of seed per week.

The biodiesel plant consists of a 50 gallon biodiesel reactor. The process produces a small amount of methanol that is vented to the outside. The methanol is generally distilled and recovered as part of the process. The reactor can handle 15 gallons of methanol, and the unit is a closed loop system with minimal emissions.

7. Miscellaneous storage tanks

The Bio-Energy Center is also equipped several small storage tanks (two 200 gallon storage tanks, three small portable tanks with vents, and a 700 gallon tank).

B. Source Description

The Bio-Energy Center operates a heavy duty engine performance testing facility for research and education. The primary purpose of the facility is emission testing on fuels, new engine enhancement technology for the reduction of emissions, and increased engine performance on a variety of test engines.

C. Permit History

The Montana Department of Environmental Quality – Air Resources Management Bureau (Department) issued **MAQP #4610-00** to the Bio-Energy Center on February 10, 2011. The MAQP covered three boilers in the ATC-East building (now referred to as the Renewable Fuels Building), a small engine dynamometer, a water-brake engine dynamometer, an A/C dynamometer, a chassis dynamometer, an oilseed press and a biodiesel pilot processing plant, and miscellaneous storage tanks. The Bio-Energy Center proposed limits on annual hours of operation for engines on the dynamometers to keep maximum potential emissions below major source thresholds. In order to demonstrate compliance with the national ambient air quality standard (NAAQS) for nitrogen dioxide (NO<sub>2</sub>), the Department established minimum height requirements for the dynamometer exhaust stacks.

D. Current Permit Action

On November 15, 2012, the Department received an application to modify MAQP #4610-00. The Bio-Energy Center proposed reduced annual hours for the various dynamometers in order to bring the facility's maximum potential nitrogen oxide (NO<sub>x</sub>) emissions to below the Department's threshold for requiring a quantitative demonstration of compliance with ambient



air quality standards. By reducing the potential NO<sub>x</sub> emissions to below this level, the Department could justify removing the minimum exhaust stack height requirements for the dynamometers. The Department modified some permit conditions to more closely reflect the maximum design capacities of the dynamometers and also to expand the list of approved fuels to include straight vegetable oil (SVO). The permit condition listing the approved fuels has also been modified to allow for the use of other fuels if the Bio-Energy Center first obtains written approval from the Department. This would grant the Bio-Energy Center the flexibility to potentially use fuels that are not explicitly listed without first having to modify the MAQP. The Bio-Energy Center application also included a list of additional natural gas-fired equipment that is in use throughout the campus. The emission inventory has been updated to reflect the new annual hours of operation, the updated maximum hp levels for engines on the dynamometers, the effect on emissions from the use of SVO as fuel in the engines, and the additional natural gas-fired equipment that is found on campus. **MAQP #4610-01** replaces #4610-00.

#### 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 Administrative Rules of Montana (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).

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

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

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

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

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

The Bio-Energy Center must maintain compliance with the applicable ambient air quality standards.

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

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and reasonable precautions be taken to control emissions of airborne particulate. (2) Under this rule, the Bio-Energy Center 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 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. (4) Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million Btu fired. (5) Commencing July 1, 1971, no person shall burn any gaseous fuel containing sulfur compounds in excess of 50 grains per 100 cubic feet of gaseous fuel, calculated as hydrogen sulfide at standard conditions.
5. ARM 17.8.324 Hydrocarbon Emissions--Petroleum Products. (3) No person shall load or permit the loading of gasoline into any stationary tank with a capacity of 250 gallons or more from any tank truck or trailer, except through a permanent submerged fill pipe, unless such tank is equipped with a vapor loss control device as described in (1) of this rule.
6. ARM 17.8.340 Standard of Performance for New Stationary Sources. This section incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). The Bio-Energy Center is a stationary source that tests CI ICE.

Pursuant to 40 CFR Part 60.420(b), the provisions of this subpart would not be applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand. Therefore, the Bio-Energy Center is not considered an affected facility under 40 CFR Part 60.

7. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. This section incorporates, by reference, 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants (NESHAP). Since the emissions of HAPs from the Bio-Energy Center facility are less than 10 tons per year (tpy) for any individual HAP and less than 25 tpy for all HAPs combined, the Bio-Energy Center facility is not subject to the provisions of 40 CFR Part 61.
8. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This section incorporates, by reference, 40 CFR Part 63, NESHAP for Source Categories. When the emissions of HAP from a facility is less than 10 tpy for any individual HAP and less than 25 tpy for all HAP combined, the facility is not subject to the major source provisions of 40 CFR Part 63. If the Bio-Energy Center increases its emissions or its potential to emit such that it becomes a major source of HAP, then the following could apply:
  - 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAPs Subpart as listed below.
  - 40 CFR 63, Subpart P – National Emissions Standards for Hazardous Air Pollutants (HAPs): Engine Test Cell/Stands. An owner or operator of a test cell/stand at a major of HAP emissions is subject to this rule. At this time, this facility is not a major source of HAPs and is not subject to the major source provisions of 40 CFR Part 63.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. The Bio-Energy Center 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 an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the Potential to Emit (PTE) greater than 25 tpy of any pollutant. The Bio-Energy Center has a PTE greater than 25 tpy of NO<sub>x</sub>; therefore, an air quality permit is required.
  3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.
  4. ARM 17.8.745 Montana Air Quality Permits--Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that do not require a permit under the Montana Air Quality Permit Program.
  5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration, or use of a source. The Bio-Energy Center 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. The Bio-Energy Center submitted an affidavit of publication of public notice for the September 21, 2012, issue of the *Havre Daily News, LLC*, a newspaper of general circulation in the town of Havre, 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 Best Available Control Technology (BACT) shall be utilized. The BACT analysis is discussed in Section III of this permit analysis.
  8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by 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 the Bio-Energy Center 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. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction has commenced (begin or contractual obligations entered into that would constitute substantial loss) within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.
  12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).
  13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
  14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.
- 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.

The facility is not a “listed facility” and the PTE is less than 250 tpy of any pollutant (excluding fugitive emissions). Therefore, the Bio-Energy Center facility is not deemed a major stationary source and is not subject to review under the PSD program.

- 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 tpy of any pollutant;
    - b. PTE > 10 tpy of any one HAP, PTE > 25 tpy of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

- c. PTE > 70 tpy of particulate matter with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) in a serious PM<sub>10</sub> nonattainment area.
2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #4610-01 for the Bio-Energy Center, the following conclusions were made:
    - a. The facility's PTE is < 100 tpy for any pollutant.
    - b. The facility's PTE is < 10 tpy for any one HAP and < 25 tpy for all HAPs.
    - c. This source is not located in a serious PM<sub>10</sub> nonattainment area.
    - d. This facility is not subject to any current NSPS.
    - e. This facility is not subject to a current NESHAP standard.
    - f. This source is not a Title IV affected source.
    - g. This source is not an EPA designated Title V source.

The Bio-Energy Center has accepted federally-enforceable limits on annual hours of operation which result in reduced potential emissions; however, the primary function of these limits is to reduce potential emissions to a level that eliminates the need for the facility to quantitatively demonstrate compliance with ambient air quality standards based on Department policy. By taking these federally-enforceable conditions into account when analyzing the PTE, the Bio-Energy Center is a true minor source with regards to Title V.

### III. BACT Determination

A BACT determination is required for each new or modified source. The Bio-Energy Center 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.

The current permitting action does not represent a new source of engine emissions; however, the inclusion of SVO as a potential fuel does represent a modification of an emitting unit because it is a change in operation. The Bio-Energy Center is a research and testing facility specializing in heavy-duty engine technology. The research includes emissions tests while using various fuels (gasoline, diesel, biodiesel, and SVO) in the engines, and trying new engine enhancement technology for the reduction of emissions thereby increasing engine performance. The facility tests engines that vary in size ranging from 5 hp up to 515 hp. These types of facilities could be considered a test engine cells/stands under 40 CFR 63, Subpart P. However, because the Bio-Energy Center is not major stationary source for HAPs, it is not subject to this subpart. The BACT analysis from the initial permitting of the facility concluded that control equipment is generally not considered for this type of testing facility because control equipment might alter the combustor in the engine or the combustion characteristics of the engine. Test engine cells/stands are generally not subject to emission limitations unless they are located at a major stationary source and the Bio-Energy Center is not considered a major stationary source.

The Bio-Energy Center included test information in their MAQP application that addressed the impact on emissions from the combustion of SVO. The information indicated that while operating under full load the emissions for nearly all criteria pollutants is less than when combusting diesel in

that same engine under the same load conditions. The emissions of NO<sub>x</sub>; however, were shown to be 19% higher than when combusting diesel under the same conditions. All emissions calculations for engines in this MAQP have been updated to reflect this potential increase in NO<sub>x</sub>. While there is a change in potential emission rates from the engines, the nature of the facility as a test engine cell/stand remains the same. Therefore, the BACT analysis conclusion remains unchanged as proper operation and maintenance with no add-on controls.

The natural gas-fired heating equipment that was incorporated into the MAQP during this action are various boilers found at the Montana State University – Northern campus. These units are all small sources of emissions when considered individually and the cost of any add-on pollution control equipment would be prohibitively expensive for the level of control they would provide. The combustion of natural gas results in inherently low levels of emissions of all criteria pollutants. Therefore, the Department has concluded that BACT for these units is proper operation and maintenance with no add-on controls.

#### IV. Emission Inventory

Emission Source	Tons per Year							
	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	CO	VOC	SO <sub>2</sub>	CO <sub>2e</sub>
Natural gas boilers	1.30	1.30	1.30	16.12	6.86	0.94	0.10	20701
Biodiesel boiler	0.02	0.01	0.01	0.09	0.02	0.00	0.01	105
600 hp Engine Dynamometer	0.33	0.33	0.33	5.54	1.00	0.38	0.31	173
500 hp Chassis Dynamometer	0.28	0.28	0.28	4.62	0.84	0.31	0.26	144
550 hp A/C Dynamometer	0.30	0.30	0.30	5.08	0.92	0.35	0.28	158
45 hp Various small engines	0.43	0.43	0.43	7.28	1.32	0.50	0.40	227
<b>Total Emissions</b>	<b>2.66</b>	<b>2.66</b>	<b>2.65</b>	<b>38.72</b>	<b>10.95</b>	<b>2.48</b>	<b>1.37</b>	<b>21507</b>

NOTES:

PM	Particulate Matter	CO	Carbon Monoxide
PM <sub>10</sub>	PM ≤ 10 microns	VOC	Volatile Organic Compounds
PM <sub>2.5</sub>	PM ≤ 2.5 microns	SO <sub>2</sub>	Sulfur Dioxide
NO <sub>x</sub>	Nitrogen Oxides	CO <sub>2e</sub>	Carbon Dioxide Equivalent

Maximum Hours of Operation:	8760 hrs/yr	for natural gas and biodiesel boilers
	500 hrs/yr	for Engine Dynamometer (up to 600 hp)
	500 hrs/hr	for Chassis Dynamometer (up to 500 hp)
	500 hrs/yr	for A/C Dynamometer (up to 550 hp)
	8760 hrs/yr	for various small engines (up to 45 hp)

#### Emissions from Dynamometers

##### Water-Brake Engine Dynamometer

Note: Emissions are based on the power output of the engine (600 hp).

Operational Capacity of Engine = 600 hp

Hours of Operation = 500 hours

##### **Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (600 hp) \* (0.0022 lbs/hp-hr) \* (ton/2000 lb) = 0.33 ton/yr

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

Emission Factor = 0.036921 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96, increased by 19.1% for SVO)

Calculation: (500 hours) \* (600 hp) \* (0.036921 lbs/hp-hr) \* (ton/2000 lb) = 5.54 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (600 hp) \* (0.00668 lbs/hp-hr) \* (ton/2000 lb) = 1.00 ton/yr

**VOC Emissions:**

Emission Factor = 0.0025141 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (500 hours) \* (600 hp) \* (0.0025141 lbs/hp-hr) \* (ton/2000 lb) = 0.38 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (600 hp) \* (0.00205 lbs/hp-hr) \* (ton/2000 lb) = 0.308 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (600 hp) \* (1.15 lbs/hp-hr) \* (ton/2000 lb) = 172.50 ton/yr

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**Chassis Dynamometer**

Note: Emissions are based on the power output of the engine (500 hp).

Operational Capacity of Engine = 500 hp

Hours of Operation = 500 hours

**Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (500 hp) \* (0.0022 lbs/hp-hr) \* (ton/2000 lb) = 0.28 ton/yr

**NO<sub>x</sub> Emissions:**

Emission Factor = 0.036921 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96, increased by 19.1% for SVO)

Calculation: (500 hours) \* (500 hp) \* (0.036921 lbs/hp-hr) \* (ton/2000 lb) = 4.62 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (500 hp) \* (0.00668 lbs/hp-hr) \* (ton/2000 lb) = 0.84 ton/yr

**VOC Emissions:**

Emission Factor = 0.0025141 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (500 hours) \* (500 hp) \* (0.0025141 lbs/hp-hr) \* (ton/2000 lb) = 0.31 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (500 hp) \* (0.00205 lbs/hp-hr) \* (ton/2000 lb) = 0.256 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (500 hp) \* (1.15 lbs/hp-hr) \* (ton/2000 lb) = 143.75 ton/yr

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**A/C Dynamometer**

Note: Emissions are based on the power output of the engine (550 hp).

Operational Capacity of Engine = 550 hp

Hours of Operation = 500 hours

**Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (550 hp) \* (0.0022 lbs/hp-hr) \* (ton/2000 lb) = 0.30 ton/yr



**NO<sub>x</sub> Emissions:**

Emission Factor = 0.036921 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96, increased by 19.1% for SVO)

Calculation: (500 hours) \* (550 hp) \* (0.036921 lbs/hp-hr) \* (ton/2000 lb) = 5.08 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (550 hp) \* (0.00668 lbs/hp-hr) \* (ton/2000 lb) = 0.92 ton/yr

**VOC Emissions:**

Emission Factor = 0.0025141 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (500 hours) \* (550 hp) \* (0.0025141 lbs/hp-hr) \* (ton/2000 lb) = 0.35 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (550 hp) \* (0.00205 lbs/hp-hr) \* (ton/2000 lb) = 0.282 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (500 hours) \* (550 hp) \* (1.15 lbs/hp-hr) \* (ton/2000 lb) = 158.13 ton/yr

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**Small Engine Dynamometer**

Note: Emissions are based on the power output of the engine (45 hp).

Operational Capacity of Engine = 45 hp

Hours of Operation = 8,760 hours

**Total PM/PM<sub>10</sub>/PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 mm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) \* (45 hp) \* (0.0022 lbs/hp-hr) \* (ton/2000 lb) = 0.43 ton/yr

**NO<sub>x</sub> Emissions:**

Emission Factor = 0.036921 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96, increased by 19.1% for SVO)

Calculation: (8,760 hours) \* (45 hp) \* (0.036921 lbs/hp-hr) \* (ton/2000 lb) = 7.28 ton/yr

**CO Emissions:**

Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) \* (45 hp) \* (0.00668 lbs/hp-hr) \* (ton/2000 lb) = 1.32 ton/yr

**VOC Emissions:**

Emission Factor = 0.0025141 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, TOC, Exhaust & Crankcase, 10/96)

Calculation: (8,760 hours) \* (45 hp) \* (0.0025141 lbs/hp-hr) \* (ton/2000 lb) = 0.50 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) \* (45 hp) \* (0.00205 lbs/hp-hr) \* (ton/2000 lb) = 0.404 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 1.15 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)

Calculation: (8,760 hours) \* (45 hp) \* (1.15 lbs/hp-hr) \* (ton/2000 lb) = 226.67 ton/yr

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**Natural Gas Boilers**

<b><u>Location</u></b>	<b><u>Boiler Class</u></b>	<b><u>Btu rating</u></b>	<b><u>Boiler Type</u></b>	<b><u>Date of Installation</u></b>
ATC	Hot water	200000	Vertical wet	
ATC-East		110000		in 2010 application
Cowan	Hot water	1260000	Fire Tube	2003
Cowan	Hot water	1260000	Fire Tube	2003
Electronic Bldg	Low pressure	2629000	Fire Tube	
Electronic Bldg	Low pressure	2629000	Fire Tube	
Food Service	Hot water	250000	Compact	
Food Service	Hot water	250000	Compact	
Food Service	Hot water	250000	Compact	
Food Service	Low pressure	6278000	Fire Tube	1971
Gym	Hot water	400000	Compact	
Gym	Low pressure	2400000	Fire tube	
Gym	Low pressure	2400000	Fire tube	
Gym	Hot water	400000	Compact	
Hagener Science Bld	Hot water	850000	Compact	2010
Hagener Science Bld	Hot water	850000	Compact	2010
Hagener Science Bld	Hot water	850000	Compact	2010
Hagener Science Bld	Hot water	250000	Compact	
Library Building	Low pressure	300000	water tube	2008
Library Building	Low pressure	300000	water tube	2008
Library Building	Low pressure	300000	water tube	2008
Mackenzie hall	Kewanee	2000000	fire tube	1971 (but installed new burner in 2004)
Mackenzie hall	Hot water	250000	compact	
Mackenzie hall	Hot water	250000	compact	
Metals bldg	Low pressure	1600000	cast iron	1974
Morgan hall	Low pressure	2452000	cast iron	
Morgan hall	Hot water	250000	compact	
Morgan hall	Hot water	250000	compact	
Morgan hall	Hot water	250000	compact	
Morgan hall	Hot water	250000	compact vertical	
Morgan hall	Hot water	1000000	wet	
Morgan hall	Low pressure	2452000	cast iron	
Pershing Hall	Low pressure	450000	compact	2006
Pershing Hall	Low pressure	450000	compact	2006
Pershing Hall	Low pressure	450000	compact	2006
Physical Plant	Low pressure	210000	other	2006
Physical Plant	Low pressure	210000	other	2011
Student Union	Low pressure	2740000	Fire Tube	

*Total Btu capacity*                                  39.93                                  MMBtu/hr

Maximum Process Rate = 0.03915 10<sup>6</sup> cf/hr (Application information, 39.93 MMBtu/hr capacity, 1020 Btu/scf)

Maximum Hours of Operation = 8,760 hrs/yr

**Filterable PM Emissions:**

Emission Factor = 1.9 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, all PM<1um, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (1.9 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.3258 ton/yr

**Filterable PM<sub>10</sub> Emissions:**

Emission Factor = 1.9 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, all PM<1um, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (1.9 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.32578 ton/yr

**Filterable PM<sub>2.5</sub> Emissions:**

Emission Factor = 1.9 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, all PM<1um, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (1.9 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.32578 ton/yr

**Condensable PM<sub>2.5</sub> Emissions:**

Emission Factor = 5.7 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (5.7 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.97735 ton/yr

**CO Emissions:**

Emission Factor = 40 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (40 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 6.85856 ton/yr

**NO<sub>x</sub> Emissions:**

Emission Factor = 94 lb/10<sup>6</sup> cf (AP 42, Table 1.4-1, Residential Furnace < 0.3 MMBtu/hr, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (94 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 16.11763 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 0.6 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (0.6 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.10288 ton/yr

**VOC Emissions:**

Emission Factor = 5.5 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (5.5 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.94305 ton/yr

**CH<sub>4</sub> Emissions:**

Emission Factor = 2.3 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Control Efficiency = 0%

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (2.3 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.39437 ton/yr

CO<sub>2</sub>e = 0.39437 \* 21 = 8.28172 ton/yr

**N<sub>2</sub>O Emissions:**

Emission Factor = 2.2 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, uncontrolled, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (2.2 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 0.37722 ton/yr

CO<sub>2</sub>e = 0.37722 \* 310 = 116.93853 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 120000 lb/10<sup>6</sup> cf (AP 42, Table 1.4-2, 7/98)

Calculation: (0.03915 10<sup>6</sup> cf/hr) \* (8760 hrs/yr) \* (120000 lb/10<sup>6</sup> cf) \* (ton/2000 lb) = 20,575.69 ton/yr

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**Biodiesel-fired boiler**

Maximum Process Rate = 0.00107 10<sup>3</sup> gal/hr (0.150 MMBtu/hr, 140 MMBtu/10<sup>3</sup> gal for No. 2 fuel oil)

Maximum Hours of Operation = 8,760 hrs/yr

**Filterable PM Emissions:**

Emission Factor = 2 lb/10<sup>3</sup> gal (AP 42, Table 1.3-1, Distillate oil-fired < 100 MMBtu/hr, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (2 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00939 ton/yr

**Filterable PM<sub>10</sub> Emissions:**

Emission Factor = 1 lb/10<sup>3</sup> gal (AP 42, Table 1.3-6, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (1 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00469 ton/yr

**Filterable PM<sub>2.5</sub> Emissions:**

Emission Factor = 0.25 lb/10<sup>3</sup> gal (AP 42, Table 1.3-6, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.25 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00117 ton/yr

**Condensable PM<sub>2.5</sub> Emissions:**

Emission Factor = 1.3 lb/10<sup>3</sup> gal (AP 42, Table 1.3-2, No. 2 fuel oil, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (1.3 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00610 ton/yr

**CO Emissions:**

Emission Factor = 5 lb/10<sup>3</sup> gal (AP 42, Table 1.3-2, No. 2 fuel oil, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (5 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.02346 ton/yr

**NO<sub>x</sub> Emissions:**

Emission Factor = 20 lb/10<sup>3</sup> gal (AP 42, Table 1.3-1, Distillate oil-fired < 100 MMBtu/hr, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (20 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.09386 ton/yr

**SO<sub>2</sub> Emissions:**

Emission Factor = 2.84 lb/10<sup>3</sup> gal (AP 42, Table 1.3-1, Distillate oil-fired < 100 MMBtu/hr, 0.2% S, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (2.84 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.01333 ton/yr

**VOC Emissions:**

Emission Factor = 0.713 lb/10<sup>3</sup> gal (AP 42, Table 1.3-3, NMTOC, Residential Furnace, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.713 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00335 ton/yr

**CH<sub>4</sub> Emissions:**

Emission Factor = 1.78 lb/10<sup>3</sup> gal (AP 42, Table 1.3-3, NMTOC, Residential Furnace, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (1.78 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00835 ton/yr

CO<sub>2</sub>e = 0.00835 \* 21 = 0.17542 ton/yr

**N<sub>2</sub>O Emissions:**

Emission Factor = 0.26 lb/10<sup>3</sup> gal (AP 42, Table 1.3-8, Distillate Oil fired, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (0.26 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 0.00122 ton/yr

CO<sub>2</sub>e = 0.00122 \* 310 = 0.37824 ton/yr

**CO<sub>2</sub> Emissions:**

Emission Factor = 22300 lb/10<sup>3</sup> gal (AP 42, Table 1.3-12, No. 2, 5/10)

Calculation: (0.00107 10<sup>3</sup> gal/hr) \* (8760 hrs/yr) \* (22300 lb/10<sup>3</sup> gal) \* (ton/2000 lb) = 104.65 ton/yr

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**V. Existing Air Quality**

This facility is located in an area that is currently designated as attainment/unclassifiable for all criteria pollutants.

**VI. Ambient Air Impact Analysis**

The Department determined, based on the allowable emissions this facility may emit, that the impacts from this permitting action will be minor. While the emissions calculations for the engines reflect an increased NO<sub>x</sub> emission rate from burning SVO versus diesel or biodiesel, the net impact

from this permitting action is a decrease in annual emissions from all pollutants due to a decrease in annual hours of allowable operation for the dynamometers. The decrease in hours of operation brings the potential emissions for all pollutants to below the Department's thresholds for requiring a quantitative demonstration of compliance with ambient air quality standards. Based on the relatively low levels of emissions, and the intermittent nature of the operation of the dynamometers, the Department believes it will not cause or contribute to a violation of any ambient air quality standard.

## VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted the following private property taking and damaging assessment.

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

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

## VIII. Environmental Assessment

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: Montana State University – Northern  
Bio-Energy Center  
300 13<sup>th</sup> Street West  
P.O. Box 7751  
Havre, Montana 59501

Montana Air Quality Permit (MAQP) Number: #4610-01

Preliminary Determination Issued: 12/24/12

Department Decision Issued: 1/09/13

Permit Final:

1. *Legal Description of Site:* The Montana State University – Northern’s Bio-Energy Center (Bio-Energy Center) is located within the Montana State University – Northern’s campus in Section 8, Township 32 North, Range 16 East in Hill County, Montana.
2. *Description of Project:* The Bio-Energy Center proposed reduced annual hours for the various dynamometers in order to bring the facility’s maximum potential nitrogen oxide (NO<sub>x</sub>) emissions to below the Montana Department of Environmental Quality – Air Resources Management Bureau’s (Department) threshold for requiring a quantitative demonstration of compliance with ambient air quality standards. By reducing the potential NO<sub>x</sub> emissions to below this level, the Department could justify removing the minimum exhaust stack height requirements for the dynamometers. The Department modified some permit conditions to more closely reflect the maximum design capacities of the dynamometers and also to expand the list of approved fuels to include straight vegetable oil (SVO). The permit condition listing the approved fuels has also been modified to allow for the use of other fuels if the Bio-Energy Center first obtains written approval from the Department. This would grant the Bio-Energy Center the flexibility to potentially use fuels that are not explicitly listed without first having to modify the MAQP. The Bio-Energy Center application also included a list of additional natural gas-fired equipment that is in use throughout the campus.
3. *Objectives of Project:* The Bio-Energy Center is an education and research facility. The projected actual usage of the dynamometers was for far fewer hours per year than originally permitted for; therefore, the Bio-Energy Center would be willing to accept further restrictions in allowable operating hours in order to reduce the potential impact to the ambient air quality. By reducing this potential impact, the Department could justify removing the minimum exhaust stack height requirements for the dynamometers. This relieves the Bio-Energy Center from the financial burden of modifying the buildings and exhaust systems.
4. *Alternatives Considered:* In addition to the proposed action, the Department also considered the "no action" alternative. The "no action" alternative would deny the issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no action" alternative to be appropriate. 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 #4610-01.

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 would be reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and would 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.

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

The current permitting action allows for the use of SVO as a fuel which does represent an increase in the NO<sub>x</sub> emission rate versus using diesel or biodiesel. However, the net impact from this permitting action is a decrease in annual emissions from all pollutants due to a decrease in annual hours of allowable operation for the dynamometers. While there are additional natural gas-fired emitting units that have been incorporated into the MAQP during this action, these units are all existing units that were in place prior to the Bio-Energy Center receiving an air quality permit. Therefore, the Department believes that the proposed project would have no impact to terrestrial and aquatic life and habitats; water quality, quantity, and distribution; geology and soil quality, stability and moisture; vegetation cover, quantity, and quality; or aesthetics.

- F. Air Quality

The current permitting action allows for the use of SVO as a fuel which does represent an increase in the NO<sub>x</sub> emission rate versus using diesel or biodiesel. However, the net impact from this permitting action is a decrease in annual emissions from all pollutants due to a decrease in

annual hours of allowable operation for the dynamometers. While there are additional natural gas-fired emitting units that have been incorporated into the MAQP during this action, these units are all existing units that were in place prior to the Bio-Energy Center receiving an air quality permit. While the overall annual decrease in potential emissions represents no negative impact to air quality, there is a possibility for a slight increase in short term emissions when burning SVO due to its combustion characteristics. Therefore, the Department believes that the proposed project represents a minor impact on air quality.

#### G. Unique, Endangered, Fragile, or Limited Environmental Resources

In an effort to assess any potential impacts to any unique endangered, fragile, or limited environmental resources, the Department contacted the Montana National Heritage Program (MNHP) during the initial issuance of MAQP #4610-00. Search results concluded there are five known animal species of concern located within three miles of the facility at that time. The search area, in this case, is defined by the township and range of the proposed site, with an additional one-mile buffer. The MNHP concluded that the sensitive species of concern include the Chestnut-collared Longspur, Pearl Dace and Sauger. Other species of concern include the Northern Redbelly Dace and the Iowa Darter. Of these species, only the Chestnut-collared Longspur would be expected to potentially locate near the current site location.

However, this facility would be located within a college campus so it would be unlikely that the Chestnut-collared Longspur would nest or breed near the campus. The other species of concerns are located outside of the area of concern. The current permitting action results in a decrease in potential annual emissions from the facility. Therefore, the Department believes there would be no impacts to any unique, endangered, fragile, or limited environmental resources in the area.

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

The current permitting action results in a decrease in potential annual emissions from the facility due to the reduction in allowable hours of operation. There are no proposed changes to water or energy resources; however, the Bio-Energy Center would be allowed to burn SVO in the engines which results in an increase in the NO<sub>x</sub> emission rate versus using diesel or biodiesel. Therefore, the Department believes there would be a minor impact to the environmental resource of air.

#### I. Historical and Archaeological Sites

The Department previously contacted the Montana Historical Society – State Historic Preservation Office (SHPO) in an effort to identify any historical, archaeological, or paleontological sites or findings near the proposed project. According to SHPO any structure over 50 years of age would be considered historic and would potentially eligible for listing on the National Register of Historic Places. For any structures over 50 years old that would be altered, SHPO generally recommends that they be contacted for a determination of eligibility; however SHPO further states, that as long as there is no disturbance or alteration to structures over 50 years of age then there is a low likelihood that cultural properties would be impacted. At this time, SHPO believes that a cultural resource inventory is unwarranted.

Therefore, the Department believes that there would be no impact to cultural properties. However, if buildings older than 50 years old are altered or cultural materials are inadvertently discovered during this project, MSU-Northern should contact SHPO to investigate.



J. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the physical and biological aspects of the human environment would be minor. The current permitting action allows for the use of SVO as a fuel which does represent an increase in the NO<sub>x</sub> emission rate versus using diesel or biodiesel. However, the net impact from this permitting action is a decrease in annual emissions from all pollutants due to a decrease in annual hours of allowable operation for the dynamometers. While there are additional natural gas-fired emitting units that have been incorporated into the MAQP during this action, these units are all existing units that were in place prior to the Bio-Energy Center receiving an air quality permit. The overall impact due to the permitting action would be minor. Therefore, the Department believes that impacts to Air Quality would be minor.

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

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

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

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

The proposed permitting action would not cause a disruption to any native or traditional lifestyles or communities (social structures or mores, or cultural uniqueness and diversity) in the area because there are no proposed changes to the nature of operations at the Bio-Energy Center. The surrounding area includes a hospital and care centers in addition to the college campus. The project would not cause additional impact to social structures or mores because these activities are consistent with the proposed permit and would be located in an area that would have similar characteristics. Therefore, the Department believes there would be no disturbance to social structures and mores, and cultural diversity.

C. Local and State Tax Base and Tax Revenue

The current permitting action would not impact the local and state tax base and tax revenue because there are no proposed changes to the nature of operations at the Bio-Energy Center.

D. Agricultural or Industrial Production

The current permitting action would not impact agricultural or industrial production because there are no proposed changes to the nature of operations at the Bio-Energy Center.

E. Human Health

As described in Section 7.F of the EA, the impacts from this project on human health would be minor because there is the possibility for a slight increase in short term emissions when burning SVO due to its combustion characteristics. MAQP #4610-01 would be conditioned to ensure that the facility would be operated in compliance with all applicable rules and standards. Therefore, the Department would expect minor effects to human health.

F. Access to and Quality of Recreational and Wilderness Activities

No significant recreational or wilderness activities exist near or within the Bio-Energy Center property boundaries and all recreational activities would remain available. Based on the information submitted (see Section 7.F of the EA) and the distance between and direction from the recreational sites and the Bio-Energy Center facility, there would not be any noticeable impacts. This project would not cause denial of access and would not impact wilderness activities, therefore, the Department determined that this facility would have no impact to recreational and wilderness activities.

G. Quantity and Distribution of Employment

The current permitting action would not impact the quantity and distribution of employment because there are no proposed changes to the nature of operations at the Bio-Energy Center.

H. Distribution of Population

The current permitting action would not impact the distribution of population because there are no proposed changes to the nature of operations at the Bio-Energy Center.

I. Demands of Government Services

Demands on government services from this facility would be minor because once the appropriate permits are in place, there would be little additional need for government services other than compliance assistance. The Bio-Energy Center continues to work with all affected local and state agencies to alleviate any additional demands on Government Services. Therefore, the Department believes the demands on Government Services would be minor.

J. Industrial and Commercial Activity

The area both currently and historically has been primarily used for institutional purposes. This project fits within this category. The proposed changes would have no perceivable impacts to the surrounding area. The current permitting action would not impact the industrial and commercial activity because there are no proposed changes to the nature of operations at the Bio-Energy Center.

#### K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals that would be affected by the proposed facility. MAQP #4610-01 would be issued to protect air quality.

#### L. Cumulative and Secondary Impacts

Overall, the cumulative and secondary impacts from this project on the social and economic aspects of the human environment would be minor because it represents only a minor change in potential impacts to human health. There are no proposed changes in the nature of operations at the Bio-Energy Center. Overall, the Bio-Energy Center project would result in additional jobs for the area. As described in Section 8.G of this EA, the facility would employ approximately 6-10 full-time people. The emissions rate increase that could result from this permit would be minimal and the annual impact would be a decrease in allowable emissions. Therefore, the Department believes that it would result in few cumulative or secondary impacts.

*Recommendation:* An Environmental Impact Statement (EIS) is not required.

*If an EIS is not required, explain why the EA is an appropriate level of analysis:* All potential effects resulting from the current permitting action are minor, therefore, an EIS is not required. In addition, the source would be applying the Best Available Control Technology and the analysis indicates compliance with all applicable air quality rules and regulations.

*Other groups or agencies contacted or which may have overlapping jurisdiction:* Department of Environmental Quality – Permitting and Compliance Division (Air Resources Management Bureau); Montana Natural Heritage Program; and State Historic Preservation Office (Montana Historical Society).

*Individuals or groups contributing to this EA:* Department of Environmental Quality (Air Resources Management Bureau and Water Quality Bureau) Montana Natural Heritage Program, and State Historic Preservation Office (Montana Historical Society).

*EA Prepared By:* Ed Warner

*Date:* December 10, 2012