



## MISSOULA CITY-COUNTY AIR QUALITY PERMIT

**Issued To: The University of Montana  
UM Facility Services  
32 Campus Drive MS 9288  
Missoula, MT 59812**

**Application Complete: 6/28/2021  
Preliminary Determination: 7/2/2021  
Final Determination: 7/19/2021  
Permit Final: 8/03/2021  
Permit Number: MC1003-01**

An air quality permit is hereby granted to The University of Montana (UM) pursuant to Chapter VI, Subchapter 1, Air Quality Permits for Air Contaminant Sources, Rules 6.101 through 6.109 of the Missoula City-County Air Pollution Control Program (MAPCP). Permit is valid until revoked or Missoula County annual operating fees are not paid (Rules 5.108, 6.103 and 6.108).

### Section I: Permitted Facilities

- A.** Equipment: Combined heat and power unit (CHP), natural gas boilers #1 (B1) and #2 (B2) and associated equipment. The CHP includes two Airem Energy combustion gas turbines at 26.8 million British thermal units per hour (MMBtu/hr) each which generate electricity, a black start engine to start the combustion gas turbines, and a heat recovery steam generator unit (HRSG) that produces steam for campus use. Boiler B1 has a steam capacity of 70,000 pounds per hour (pph) and boiler B2 has a steam capacity of 30,000 pph. All equipment will be capable of using gas or liquid fuel. Liquid fuel used will be ultra-low-sulfur #2 diesel fuel. Liquid fuel storage tanks are already on site.
- B.** Location: N ½ of NE ¼ of Section 27, Township 13 North, Range 19 West – Heating Plant Building, 840 Connell Ave., Missoula, MT 59812.
- C.** Current Permit Action: UM will construct, operate, and maintain a combined heat and power unit (CHP) to produce steam and electricity for the UM campus. The CHP will be located next to the existing UM heating plant and will become the primary source of steam for the campus. Existing boilers B1 and B2 remain for secondary steam supply. B1 will be retrofitted with a low-NOx burner and diesel fuel capability. The CHP and boilers B1 and B2 will be natural gas-fired, with diesel fuel backup in case of curtailed natural gas supply. Existing boiler #3 will be disabled and removed from service.

The summary of emissions from small sources and emergency generators were included in the Permit Analysis Section IV Emission Inventory for informational purposes. Other than for informational purposes, the small sources and emergency generators are not covered by this permit. MACP Rule 6.102(3)(f) does not require air quality permits for emergency generators at public institutions.

## Section II: Limitations and Conditions

### A. General Facility Requirements

1. The University of Montana must take reasonable precautions to control fugitive particulate emissions from haul roads, access roads, parking lots, or the general plant area (MAPCP Rule 8.102(1)).
2. The University of Montana must treat all unpaved portions of the haul roads, access roads, parking lots, material piles, or the general plant area with water and or chemical dust suppressant as necessary to prevent fugitive particulate emissions. Water and equipment for fugitive dust suppression must be readily available. Paved areas must be cleaned as necessary to prevent emissions (MAPCP Rule 8.102(3)).
3. The University of Montana must comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained at 40 CFR 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* (MAPCP Rule 6.506 and 40 CFR 60, Subpart IIII).
4. The University of Montana must comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained at 40 CFR 60, Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines* (MAPCP Rule 6.506 and 40 CFR 60, Subpart KKKK).
5. The University of Montana must comply with all applicable standards and limitations, and the reporting, recordkeeping, and notification requirements contained in 40 CFR 63, Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, for any applicable diesel engine (MAPCP Rule 6.508 and 40 CFR 63, Subpart ZZZZ).
6. All visible emissions from any equipment must not exhibit opacity of 20% or greater averaged over 6 consecutive minutes (MAPCP Rule 6.501 and Rule 6.504).
7. Days of operation, hours of operation, monthly natural gas usage, monthly diesel fuel usage and monthly production rates must be available on site or upon request by the Missoula City-County Health Department (Department) (MAPCP Rule 6.103).
8. The University of Montana must keep a copy of the permit available for inspection by the Department at the location for which the permit is issued (MAPCP Rule 6.103).
9. At all times, including periods of startup, shutdown, and malfunction, the University of Montana must, to the extent practicable, maintain and operate any affected equipment, including associated air pollution control equipment, in a manner consistent with good combustion practices and air pollution control practices for minimizing emissions (MAPCP Rule 6.501(3)).
10. The Department must be notified promptly by phone 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. If telephone notification is not immediately possible, notification at the beginning of the next working day is acceptable. The Department must investigate and determine if a malfunction has occurred. The

notification must include the following information (MAPCP Rule 5.103):

- a. identification of the emission points and equipment causing the excess emissions;
  - b. magnitude, nature, and cause of the excess emissions;
  - c. time and duration of the excess emissions;
  - d. description of the corrective actions taken to remedy the malfunction and to limit excess emissions;
  - e. information sufficient to assure the department that the failure to operate in a normal manner by the air pollution control equipment, process equipment or processes was not caused entirely or in part by poor maintenance, careless operation, poor design, or any other preventable upset condition or preventable equipment breakdown; and
  - f. readings from any continuous emission monitor on the emission point and readings from any ambient monitors near the emission point.
11. The University of Montana must submit an emergency episode abatement plan for carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), and particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>) within one year of source start up (MAPCP Rule 4.106).
  12. The University of Montana must comply with all applicable sections of the Missoula City-County Air Pollution Control Program rules (MAPCP Rule 6.103).
  13. The University of Montana must maintain compliance with all applicable ambient air quality standards (MAPCP Rule 6.102(5)).
  14. The University of Montana must comply with all applicable state and federal air rules, standards, or statutes. This permit does not relieve the source of the responsibility for complying with any other applicable City, County, Federal or Montana statute, rule, or standard not contained in the permit (MAPCP Rule 6.103).
  15. Permit is valid until revoked, modified or Missoula County annual operating fees are not paid (MAPCP Rules 5.108, 6.103 and 6.108).

**B. CHP and Natural Gas Boilers Conditions and Operational Limits**

1. CHP exhaust stack height will be based on good engineering practices (MAPCP Rule 6.103).
2. The CHP is limited to a maximum of 720 hours of operation with diesel fuel during any rolling 12-month period (MAPCP Rule 6.501).
3. Emissions from the CHP (Combustion Gas Turbines and Heat Recovery Steam Generator Duct Burner (HRSG DB)) must not exceed the limits specified in Table 1 when burning natural gas. Heat input must not exceed 26.8 MMBtu per hour for each combustion turbine (53.6 MMBtu per hour combined) and 83.0 MMBtu per hour for the HRSG DB (MAPCP Rule 6.501).

Table 1: Emission Limits When Burning Natural Gas

Pollutant	Combustion Gas Turbines (2 combined)		HRSG DB	
	lb/MMBtu Limit	lb/hr Limit	lb/MMBtu Limit	lb/hr Limit
Sulfur Dioxide (SO <sub>2</sub> ) <sup>(1)</sup>	0.003	0.182	5.88E-04	0.0488
Particulate Matter (PM) <sup>(2)</sup>	0.0066	0.354	7.45E-03	0.618
PM with an aerodynamic diameter less than or equal to 10 microns (PM <sub>10</sub> ) <sup>(2)</sup>	0.0066	0.354	7.45E-03	0.618
PM with an aerodynamic diameter less than or equal to 2.5 microns (PM <sub>2.5</sub> ) <sup>(2)</sup>	0.0066	0.354	7.54E-03	0.618
Carbon Monoxide (CO) <sup>(3)</sup>	0.055	2.94	0.055	4.55
Oxides of Nitrogen (NO <sub>x</sub> ) <sup>(4)</sup>	0.056	3.00	0.056	4.65
Volatile Organic Compounds (VOC) <sup>(5)</sup>	0.018	0.963	5.39E-03	0.448
Formaldehyde <sup>(6)</sup>	Not Applicable	0.004	7.35E-05	0.006

(1) CGT: AP-42 Table 3.1-2a (4/00). HRSG DB: AP-42 Table 1.4-2.

(2) CGT: AP-42 Table 3.1-2a (4/00) - sum of filterable and condensable; assume PM<sub>2.5</sub> = PM<sub>10</sub>. HRSG DB: AP-42 Table 1.4-2.

(3) CGT: Airem Section 4.3 Spreadsheet, CO - 24 parts per million volume, dry basis (ppmvd) @ 15% O<sub>2</sub>. HRSG DB - 24 ppmvd @ 15% O<sub>2</sub>.

(4) CGT: Airem Section 4.3 Spreadsheet, NO<sub>x</sub> (as NO<sub>2</sub>) - 15 ppmvd @ 15% O<sub>2</sub>. HRSG DB Ultra Low-NO<sub>x</sub> Burner - 10 ppmvd @ 15% O<sub>2</sub>.

(5) CGT: Airem Section 4.3 Spreadsheet, VOC (as propane) - 5 ppmvd @ 15% O<sub>2</sub>. HRSG DB - AP-42, Table 1.4-2.

(6) CGT: Airem Section 4.3 Spreadsheet, 0.002 lb/hr. HRSG DB - AP-42 Table 1.4-3.

- Emissions from the CHP (Combustion Gas Turbines and Heat Recovery Steam Generator Duct Burner (HRSG DB)) must not exceed the limits specified in Table 2 when burning diesel. Heat input must not exceed 26.8 MMBtu per hour for each combustion turbine (53.6 MMBtu per hour combined) and 83.0 MMBtu per hour for the HRSG DB (MAPCP Rule 6.501).

Table 2: Emission Limits When Burning Diesel

Pollutant	Combustion Gas Turbines (2 combined)		HRSG DB	
	lb/MMBtu Limit	lb/hr Limit	lb/MMBtu Limit	lb/hr Limit
Sulfur Dioxide (SO <sub>2</sub> ) <sup>(1)</sup>	1.52E-03	0.081	1.54E-03	0.1277
PM <sup>(2)</sup>	0.012	0.616	0.024	1.978
PM <sub>10</sub> <sup>(2)</sup>	0.012	0.616	0.024	1.978
PM <sub>2.5</sub> <sup>(2)</sup>	0.012	0.616	0.024	1.978
Carbon Monoxide (CO) <sup>(3)</sup>	3.30E-03	0.18	0.036	3.00
Oxides of Nitrogen (NO <sub>x</sub> ) <sup>(4)</sup>	0.059	3.18	0.144	11.99
Volatile Organic Compounds (VOC) <sup>(5)</sup>	4.1E-04	0.022	2.46E-03	0.204

(1) CGT: AP-42 Table 3.1-2a (4/00) - assumes ultra low-sulfur diesel 0.0015 weight%. HRSG DB AP-42 Table 1.3-1.

(2) CGT: AP-42 Table 3.1-2a (4/00)-sum of filterable and condensable; assume PM<sub>2.5</sub> = PM<sub>10</sub>. HRSG DB Table 1.3-2.

(3) CGT: AP-42 Table 3.1-1 (4/00), uncontrolled. HRSG DB AP-42 Table 1.3-2

(4) 15 parts per million (ppm) @ 15% oxygen

(5) CGT: AP-42 Table 3.1-2a (4/00). HRSG Table 1.3-3.

5. Boiler B1 will exhaust through a vent located approximately 10 feet above the heating plant roof. Boiler B2 will exhaust through the existing 150-foot brick chimney adjacent to the heating plant building (MAPCP Rule 6.103).
6. Emissions from B1 and B2 must not exceed the limits specified in Table 3 when burning natural gas. B1 maximum heat input capacity for natural gas must not exceed 87.6 MMBtu/hr. B2 maximum heat input capacity for natural gas must not exceed 37.5 MMBtu/hr (MAPCP Rule 6.501).

Table 3: Emission Limits for B1 and B2 Burning Natural Gas

Pollutant	Emission Factor	Units	B1 (lb/hr)	B2 (lb/hr)
NO <sub>x</sub> <sup>(1)</sup>	100 for B2	lb/MMBtu		3.681
NO <sub>x</sub> <sup>(1)</sup>	50 for B1	lb/MMBtu	4.295	
SO <sub>2</sub> <sup>(2)</sup>	0.6	lb/MMBtu	0.052	0.022
CO <sup>(1)</sup>	84	lb/MMBtu	7.215	3.092
VOC <sup>(2)</sup>	5.5	lb/MMBtu	0.472	0.202
PM <sup>(3)</sup>	7.6	lb/MMBtu	0.653	0.280
PM <sub>10</sub> <sup>(3)</sup>	7.6	lb/MMBtu	0.653	0.280
PM <sub>2.5</sub> <sup>(3)</sup>	7.6	lb/MMBtu	0.653	0.280

(1) EPA AP-42, Table 1.4-1, Small Boilers, Uncontrolled. July 1998. B1 will be retrofitted with LNB.

(2) EPA AP-42, Table 1.4-2, July 1998.

(3) EPA AP-42, Table 1.4-2, all PM is assumed to be less than 1.0 ug, therefore PM emission factors, Small Boilers, Uncontrolled. July 1998.

7. Emissions from B1 and B2 must not exceed the limits specified in Table 4 when burning diesel fuel. Maximum gallons of diesel fuel burned must not exceed 506 gallons per hour for B1 and 271 gallons per hour for B2 (MAPCP Rule 6.501).

Table 4: Emission Limits for B1 and B2 When Burning Diesel Fuel

Pollutant	Emission Factor	Units	B1 (lb/hr)	B2 (lb/hr)
NO <sub>x</sub> <sup>(1)</sup>	20 for B2	lb/10 <sup>3</sup> gallons		5.42
NO <sub>x</sub> <sup>(1)</sup>	10 for B1	lb/10 <sup>3</sup> gallons	5.06	
SO <sub>2</sub> <sup>(2)</sup>	0.213	lb/10 <sup>3</sup> gallons	0.11	0.058
CO <sup>(1)</sup>	5	lb/10 <sup>3</sup> gallons	2.53	1.36
VOC <sup>(3)</sup>	0.2	lb/10 <sup>3</sup> gallons	0.10	0.05
PM <sup>(4)</sup>	2.00	lb/10 <sup>3</sup> gallons	1.01	0.54
PM <sub>10</sub> <sup>(4)</sup>	1.00	lb/10 <sup>3</sup> gallons	0.51	0.27
PM <sub>2.5</sub> <sup>(4)</sup>	0.25	lb/10 <sup>3</sup> gallons	0.13	0.07

(1) EPA AP-42, Table 1.3-1, May 2010.

(2) EPA AP-42, Table 1.3-1, May 2010. Assume ultra low-sulfur Diesel Fuel, sulfur content is 15 ppm, S = 0.0015%.

(3) EPA AP-42, Table 1.3-3, Non-Methane Total Organic Compounds (NMTOC).

(4) EPA AP-42, Table 1.3-6. May 2010.

(5) EPA AP-42, Table 1.3-10. May 2010

8. The CHP, B1 and B2 must only use pipeline quality natural gas as a fuel except when natural gas is not available and when diesel fuel is required for maintenance or equipment testing. The use of diesel fuel in the CHP, B1 and B2 may not exceed 720 hours each for any 12-month rolling average (MAPCP Rule 6.103).
9. Liquid fuel used in CHP, B1, B2, and the black start engine must be ultra-low-sulfur #2 diesel fuel (MAPCP Rule 6.103).
10. After the initial compliance test required in Section II.C.2., the University of Montana must continuously monitor operating parameters to determine if the combustion gas turbines are operating in low-NOx burn mode. The University of Montana must submit a monitoring plan to the Department after the initial compliance test is completed (MAPCP Rule 6.506 and 40 CFR 60, Subpart KKKK).

**C. Emission Testing and Air Modeling**

1. All compliance tests must be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (MAPCP Rule 5.102).
2. Within 180 days of CHP start up, determine compliance with CO and NOx emission limits specified in Section II.B.3. Table 1 and Section II.B.4. Table 2 with a source test. Test must take place at the outlet of the heat recovery unit for the Combustion Gas Turbines and Heat Recovery Steam Generator Duct Burner (MAPCP Rule 5.102, Rule 6.506 and 40 CFR 60.8).
3. Continuous compliance with the NOx emission limit must be demonstrated by monitoring appropriate operating parameters (MAPCP Rule 6.506 and 40 CFR 60.4335 and 60.4340).
3. The Department may require further testing or modeling (MAPCP Rule 5.102).

**D. Reporting Requirements**

1. Within 15 days after actual startup of the CHP, The University of Montana must notify the Department of the date of actual startup (MAPCP Rule 6.103, Rule 6.506 and 40 CFR 60.7).
2. The University of Montana must 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 from the CHP, B1 and B2. Information must be in the units required by the Department. This information may be used to verify compliance with permit limitations (MAPCP Rule 6.103).
3. The University of Montana must submit reports as required by 40 CFR Section 60.7(c) to the Department. Reports must be postmarked by January 30 and July 30 of each year and the six months covered will be January through June and July through December each calendar year (MAPCP Rule 6.506 and 40 CFR 60, Subpart KKKK).
4. The records compiled in accordance with this permit must be maintained by The University of Montana for at least 5 years following the date of the measurement (MAPCP Rule 6.103).

**PERMIT ANALYSIS**  
The University of Montana

**I. Introduction**

**A. Permitted Equipment:**

Combined heat and power unit (CHP), natural gas boilers #1 (B1) and #2 (B2) and associated equipment. The CHP includes two combustion gas turbines at 26.8 million British thermal units per hour (MMBtu/hr) which generate electricity, a black start engine to start the combustion gas turbines, and a heat recovery steam generator unit that produces steam for campus use. Boiler B1 has a steam capacity of 70,000 pph and boiler B2 has a steam capacity of 30,000 pph. All equipment will be capable of using gas or liquid fuel. Liquid fuel used will be ultra-low-sulfur #2 diesel fuel. Liquid fuel storage tanks are already on site.

**B. Process Description:**

UM will construct, operate, and maintain a combined heat and power unit (CHP) to produce steam and electricity for the UM campus. The CHP will be located next to the existing UM heating plant and will become the primary source of steam for the campus. Existing boilers B1 and B2 remain for secondary steam supply. B1 will be retrofitted with a low-NOx burner and diesel fuel capability. The CHP and boilers B1 and B2 will be natural gas-fired, with diesel fuel backup in case of curtailed natural gas supply.

**C. Permit History:**

The UM heating plant is currently equipped with three natural gas boilers that provide steam for the campus. The current heating plant does not have an air quality permit. With the addition of the CHP to the UM heating plant, an air quality permit is required (MAPCP Rule 6.102).

UM will construct, operate, and maintain CHP to produce steam and electricity for the UM campus. The CHP will be located next to the existing UM heating plant and will become the primary source of steam for the campus. Existing boilers B1 and B2 remain for secondary steam supply. B1 will be retrofitted with a new low-NOx burner and diesel fuel capability. The CHP and boilers B1 and B2 will be natural gas-fired, with diesel fuel backup in case of curtailed natural gas supply. The third existing boiler, B3, will be disabled and removed from service.

**II. Applicable Rules and Regulations**

**A. MAPCP Chapter 4 - Emergency Episode Avoidance Plan.** Rule 4.106 requires stationary sources to submit an emergency episode plan of abatement to the Department. The plan is subject to review and approval by the Department and must sufficiently demonstrate the ability of the source to reduce emissions as required under each stage of the emergency episode avoidance plan.

- B. MAPCP Chapter 5, Subchapter 1, General Provisions, Rules 5.101 through 5.114 including, but not limited to:**
1. Rule 5.101 Inspections. This section requires the source to allow duly authorized inspectors to enter and inspect the property at any reasonable time.
  2. Rule 5.102 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere must, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and must conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
  3. Rule 5.103 Malfunctions. 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.
- C. MAPCP Chapter 6, Subchapter 1, Air Quality Permits for Air Pollutant Sources, Rules 6.102 through 6.109 including but not limited to:**
1. Rule 6.102 Air Quality Permits Required. This section requires a source to obtain a construction and operating permit if the source has the potential to emit over 25 tons per year of any pollutant. A source not otherwise required to obtain an air quality permit may obtain such a permit for the purpose of establishing federally enforceable limits on its potential to emit. The University of Montana has submitted the application for an air pollution source permit as required.
  2. Rule 6.103 General Conditions. This section states that conditions may be placed on the construction permit to comply with applicable provisions of the program and that the source can operate in compliance with provisions of this program and applicable Federal and State rules. The University of Montana has submitted information indicating that they are capable of meeting conditions of the construction permit. An air quality permit is valid unless additional construction that is not covered by an existing construction and operating permit begins on the source or a change occurs in the method of operation that could result in an increase of emissions begins at the source.
  3. Rule 6.105 Air Quality Permit Application Requirements. This section requires the source to submit an application for a construction permit. The University of Montana has submitted the necessary information for a complete application to the Department.
  4. Rule 6.106 Public Review of Air Quality Permit Application. This section requires the source to notify the public of its application for a permit. The University of Montana has submitted proof of compliance with the public notice requirements.
  5. Rule 6.107 Issuance or Denial of an Air Quality Permit. This section states that conditions may be placed on the construction permit to comply with applicable provisions of the program and that the source can operate in compliance with provisions of this program and applicable Federal and State rules. The University of Montana has submitted information indicating that they are capable of meeting the construction permit conditions.



6. Rule 6.108 Revocation or Modification of an Air Quality Permit. This section states conditions under which an air quality permit may be revoked or modified.
7. Rule 6.109 Transfer of Permit. This section states that a permit issued under this program may not be transferred from one location to another, or from one piece of equipment to another, unless the activity will not exceed one year, and the conditions listed in Rule 6.109(2) have been met.

**D. MAPCP Chapter 6, Subchapter 5, Emissions Standards, Rules 6.501 to 6.508 including, but not limited to:**

1. Rule 6.501 Emission Control Requirements. This section requires that Best Available Control Technology (BACT) be utilized at all sources that require permits. The University of Montana has submitted plans to install Dry Low-NOx burners on the CGT turbines and an Ultra Low-NOx burner on the HRSG duct burner to control NOx emissions.
2. Rule 6.506(4). Standard of Performance for New Stationary Sources.
  - a. 40 CFR Part 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. This subpart applies to steam generating units constructed after June 9, 1989 with heat input capacities greater than 10 MMBtu/hr and less than or equal to 100 MMBtu/hr. NSPS Subpart Dc does not apply to the existing boilers because they pre-date the regulation. The heat recovery steam generator is covered under NSPS Subpart KKKK and so is exempt from NSPS Subpart Dc.
  - b. 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. This standard applies to internal combustion engines with displacement less than 30 liters per cylinder, that are constructed (ordered) after July 11, 2005, and manufactured after April 1, 2006 (except fire pump engines, for which the key date is July 1, 2006).
  - c. 40 CFR 60, Subpart KKKK – Standards of Performance for Stationary Combustion Turbines. This Subpart established emission standards and compliance schedules for the control of emissions from combustion turbines that commenced construction, modification or reconstruction after February 18, 2005. This standard applies to the combustion gas turbines and the heat recovery steam generator duct burner.
3. Rule 6.508. National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Source Categories.
  - a. 40 CFR 63, Subpart ZZZZ – NESHAPs for Stationary Reciprocating Internal Combustion Engines (RICE). As an area source, the diesel RICE will be subject to this rule. However, although diesel RICE engines are an affected source, per 40 CFR 63.6590(b)(3) they do not have any requirements unless they are new or reconstructed after June 12, 2006.
  - b. 40 CFR 63, Subpart JJJJJ – NESHAPs for Area Sources: Industrial, Commercial, and Institutional Boiler: Final Rule promulgated March 21, 2011). The UM hazardous air pollutant (HAP) emissions are less than 10 tons for any single HAP and less than 25 tons for all HAP's. See Table 5 for a HAP Emission Inventory Summary. Boilers B1, B2 and the HRSG are not subject to this regulation because they are natural-gas fired.

Table 5: Hazardous Air Pollutants Emission Inventory Summary

Source	Max HAP's (tpy)
CHP	0.7972
Natural Gas Boiler B1 and B2	1.7200
Black Start Engine	0.00263
Total HAPS	2.51

**E. MAPCP Chapter 8, Subchapter 1, Fugitive Particulate**, Rule 8.102 including but not limited to:

1. Rule 8.102(2) Fugitive emissions. This section requires reasonable precautions to limit emissions from any stationary source to less than 20% opacity averaged over six consecutive minutes, except where superseded by NSPS requirements.
2. Rule 8.102(3) General Requirements. This section states that reasonable measures will be required by the Department to control emissions from any building or its appurtenances or a road, or a driveway, or an open space. Measures include, but are not limited to, paving or frequent cleaning of road, driveways, and parking lots.

**F. MAPCP Chapter 10, Subchapter 2 Sulfur Limits**, Rule 10.201 through 10.203 including but not limited to:

1. Rule 10.201 Regulation of Sulfur in Fuel. A person may not burn liquid or solid fuels containing sulfur in excess of one pound of sulfur per million BTU fired. A person may not 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. Exceptions to this rule must be approved by the Department.
2. Rule 10.202 Sulfur in Fuel Burned Within the Missoula Air Stagnation Zone. A person may not burn liquid or solid fuels containing sulfur in excess of 0.28 pounds of sulfur per million BTU fired within the Missoula Air Stagnation Zone. Exceptions to this rule must be approved by the Department.

**G. MAPCP Chapter 12, Odors**, Rule 12.101 through 12.105 including but not limited to:

1. Rule 12.102 Odor Control Equipment. A person operating any business or using any machine, device, equipment, process or other contrivance that discharges odorous air pollutants into the outdoor air must provide, properly install, use, and maintain in good working order such control devices as may be specified by the department.

**H. MAPCP Chapter 14, Enforcement and Administrative Procedures**, Rule 14.101 through 14.108 including but not limited to:

1. Rule 14.105 Credible Evidence. For the purpose of establishing compliance with this Program or establishing whether a person has violated or is in violation of any standard or limitation adopted pursuant to this Program or Title 17, Chapter 8 of the Montana Code Annotated, nothing in these rules precludes the use, including the exclusive use, of any relevant evidence.

2. Rule 14.106 Administrative Review. A person subject to a Notice of Violation or Order to Take Corrective Action or an action by the department that revokes, suspends or modifies a permit issued under the authority of this MAPCP may request an administrative review by the Health Officer or his or her designee.

**I. MAPCP Chapter 15, Penalties, Rule 15.101 through 14.105 including but not limited to:**

1. Rule 15.103 Civil Penalties. A person who violates a provision, regulation, or rule enforced under the MAPCP, or an order made pursuant to the MAPCP, is guilty of an offense and upon conviction subject to a fine not to exceed ten thousand dollars (\$10,000.00). Each day of the violation constitutes a separate offense.
3. Rule 15.105 Non-Compliance Penalties. This rule explains the non-compliance penalties and procedures for stationary sources.

**III. Best Available Control Technology (BACT) Determination**

The complete BACT analysis can be found in the permit application. The proposed CHP is comprised of a Dry Low-NOx burner on the CGT turbines and an Ultra-Low-NOx burner on the Heat Recovery Steam Generator Duct Burner.

Department air quality rules (Rule 6.501) require that a proposed new source or modification employ Best Available Control Technology (BACT) for all pollutants not previously emitted or whose emissions would increase as a result of the new source or modification. This permitting action will add the CHP and associated equipment to existing natural gas-fired boilers at the UM heating plant.

BACT analysis is provided for NOx, VOC and CO emissions for the CHP emitting units. Control of SO<sub>2</sub> and PM (PM, PM<sub>10</sub> and PM<sub>2.5</sub>) emissions are minimized using natural gas fuel as the primary fuel for the CHP system. The Combustion Gas Turbines (CGT) and the Heat Recovery Steam Generator Duct Burner will be capable of burning ultra-low-sulfur diesel fuel as backup in case natural gas supplies are curtailed or interrupted. SO<sub>2</sub> emissions will be minimized using ultra-low-sulfur diesel fuel in all equipment.

BACT is defined as the most effective control option that is technically feasible without creating unacceptable economic, energy use, or other environmental impacts. Control options can be eliminated as BACT on the basis of technical, economic, energy, or environmental considerations. The BACT analysis procedure will be conducted using the following general steps:

- Step 1: Identify available control technologies.
- Step 2: Eliminate technically infeasible options.
- Step 3: Rank remaining control technologies by control effectiveness.
- Step 4: Analyze energy, environmental and economic considerations, using top-down procedure.
- Step 5: Select BACT and provide documentation.

For NOx, the CGT BACT analysis found that the Dry Low-NOx Burner technology was BACT for the combustion gas turbines. More advanced technology is not readily available for a turbine this small and other pollution control technologies were not cost effective. The Dry Low-NOx Burner technology keeps combustion temperatures low to reduce NOx formation.

For CO and VOC, the CGT BACT analysis found that the proposed Dry Low -NOx CGT turbines are the best option for minimizing CO and VOC emissions while controlling NOx emissions.

The NOx BACT analysis for the entire CHP exhaust found that the Dry Low-NOx burner on the CGT turbines and the Ultra-Low-NOx burner on the Heat Recovery Steam Generator Duct Burner constitute BACT for the CHP system. Other control methods would increase energy consumption and have undesirable environmental impacts.

The CO and VOC BACT analysis for the entire CHP exhaust found that the Dry Low-NOx burner on the CGT turbines and the Ultra-Low-NOx burner on the Heat Recovery Steam Generator Duct Burner constitute BACT for the CHP system. The CHP is designed to reduce NOx emissions and further CO or VOC reductions would use more energy, natural gas in this case.

#### IV. Emission Inventory

The complete detailed emission inventory if available for review at the Department. Summary of the potential emissions for a calendar year are presented in Table 6.

**Table 6: Potential to Emit – Annual Emission Inventory Summary**

Source	Annual	Annual	Pollutant			
	Steam Production (thousand pounds per year)	Operating Hours	NOx (tpy)	CO (tpy)	VOC (tpy)	SO <sub>x</sub> (tpy)
Combustion Gas Turbines (2) - Natural Gas	613,200	8,760	13.1	12.9	4.22	0.80
HRSG Duct Burner - Natural Gas		8,760	20.4	19.91	1.96	0.21
Combustion Gas Turbines (2) - Diesel	50,400	720	1.14	0.06	7.9E-03	0.029
HRSG Duct Burners - Diesel		720	4.32	1.08	0.07	0.05
Boiler #1 - Natural Gas	613,200	8,760	18.8	31.6	2.07	0.23
Boiler #1 - Diesel	40,320	720	1.82	0.91	0.04	0.04
Boiler #2 - Natural Gas	262,800	8,760	16.1	13.5	0.89	0.10
Boiler #2 - Diesel	21,600	720	1.95	0.49	0.02	0.02
Black Start Engine - Diesel		500	1.45	1.45	0.14	2.7E-03
Small Stationary Sources		8,760	8.07	6.74	0.45	0.07
Emergency Generators		100	5.14	1.53	0.40	0.32
<b>Full facility-wide PTE after project, burning natural gas.</b>	<b>1,489,200</b>		<b>83.10</b>	<b>87.64</b>	<b>10.13</b>	<b>1.73</b>
<b>Full facility-wide PTE after project, burning fuel oil.</b>	<b>112,320</b>		<b>23.89</b>	<b>12.26</b>	<b>1.13</b>	<b>0.53</b>

**Table 6: Continued Potential to Emit – Annual Emission Inventory Summary**

Source	Annual	Annual	Pollutant					
	Steam Production (thousand pounds per year)	Operating Hours	PM (tpy)	PM <sub>10</sub> (tpy)	PM <sub>2.5</sub> (tpy)	Pb (tpy)	CO <sub>2</sub> e <sup>1</sup> (Mtpy)	HAPS (tpy)
Combustion Gas Turbines (2) - Natural Gas	613,200	8,760	1.55	1.55	1.55	-	24,939	8.51E-02
HRSG Duct Burner - Natural Gas		8,760	2.71	2.71	2.71	1.8E-04	38,619	6.73E-01
Combustion Gas Turbines (2) - Diesel	50,400	720	0.22	0.22	0.22	2.7E-04		2.38E-02
HRSG Duct Burners - Diesel		720	0.71	0.71	0.71	2.7E-04		1.53E-02
Boiler #1 - Natural Gas	613,200	8,760	2.86	2.86	2.86	1.9E-04	40,767	1.72E+00
Boiler #1 - Diesel	40,320	720	0.36	0.18	0.05			
Boiler #2 - Natural Gas	262,800	8,760	1.23	1.23	1.23	8.1E-05	17,472	
Boiler #2 - Diesel	21,600	720	0.20	0.10	0.02	1.2E-04		
Black Start Engine - Diesel		500	1.7E-02	1.7E-02	1.7E-02		261	2.63E-03
Small Stationary Sources		8,760	0.61	0.61	0.61		8,690	
Emergency Generators		100	0.34	0.34	0.34		177	
<b>Full facility-wide PTE after project, burning natural gas.</b>	<b>1,489,200</b>		<b>9.31</b>	<b>9.31</b>	<b>9.31</b>	<b>4.47E-04</b>	<b>130,925</b>	<b>2.49</b>
<b>Full facility-wide PTE after project, burning fuel oil.</b>	<b>112,320</b>		<b>2.46</b>	<b>2.18</b>	<b>1.97</b>	<b>6.61E-04</b>		<b>0.04</b>

**V. Environmental Assessment and Air Quality Impacts**

Because The University of Montana is a state agency, the Montana Environmental Policy Act process will be completed by The University of Montana in a separate process.