January 3, 2023

Randy Robichaux
Denbury Onshore, LLC
Bell Creek Central Facility
5851 Legacy Circle.
Suite #1200
Plano, Texas 75024

Sent via email: randy.robichaux@denbury.com

RE: Final Permit Issuance for MAQP #4740-05

Dear Mr. Robichaux:

Montana Air Quality Permit (MAQP) #4740-05 is deemed final as of 12/31/2022 by DEQ.

This permit is for Denbury Onshore Bell Creek Central Facility, an enhanced oil recovery facility. All conditions of the Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For DEQ,

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

Troy M Burrows
Air Quality Scientist
Air Quality Bureau
(406) 444-1452

JM: TMB
Enclosures

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

Montana Air Quality Permit #4740-05

Denbury Onshore, LLC
Bell Creek Central Facility
5851 Legacy Circle.
Suite #1200
Plano, Texas 75024

December 31, 2022

MONTANA AIR QUALITY PERMIT

Issued To: Denbury Onshore, LLC
Bell Creek Central Facility
5851 Legacy Circle.
Suite #1200
Plano, Texas 75024

MAQP: #4740-05
Application Complete: 09/30/2022
Preliminary Determination: 11/14/2022
Department Decision: 12/15/2022
Permit Final: 12/31/2022

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Denbury Onshore, LLC (Denbury), pursuant to Sections 75-2-204, 211, and 215 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 Bell Creek Central Facility (Bell Creek) is located in the NW¼ NE¼ of Section 27, Township 8 South, Range 54 East, in Powder River County, Montana.

B. Current Permit Action

On September 12, 2022, the Department of Environmental Quality (DEQ) received a modification request for additional hours on both the high-and low-pressure flares for operational flexibility, and to update operational limits and potential emissions to reflect projected emissions.

Section II: Conditions and Limitations

A. Emission Limitations

1. Denbury shall operate a vapor recovery unit (VRU) to capture the emissions from all the oil and water storage tanks. The VRU shall inject these emissions into the subsurface when conditions allow (ARM 17.8.752).

2. Denbury shall operate a flare (referred to as the LP Flare) as an emission control system. This flare shall be utilized during periods when the VRU or injection operations are not available to inject its gas stream into the subsurface. (ARM 17.8.749).

3. Denbury shall operate a flare (referred to as the HP Flare) as a control device when excess pressure is relieved through the process equipment relief valves and vents. Operation of the HP flare while combusting process gas shall be limited to 4000 total hours during any rolling 12-month period (ARM 17.8.749).

4. Denbury shall operate the VRU and flares at a minimum control efficiency of 98% (ARM 17.8.749).

5. Denbury shall only burn pipeline quality natural gas in the heat media treater and circular heater (ARM 17.8.752).

6. Denbury shall burn only ultra-low-sulfur diesel (no more than 15 parts per million of sulfur) as fuel for the emergency diesel-fired generator engine (ARM 17.8.752).

7. Denbury shall operate the emergency diesel-fired generator engine for no more than 100 hours per rolling 12-month time period for non-emergency use (ARM 17.8.749).

8. Denbury shall perform the sand pit blowdown procedure for no more than 206 hours per rolling 12-month time period (ARM 17.8.749 and ARM 17.8.1204).

9. Denbury 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. Denbury 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. Denbury 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 17.8.752).

12. Denbury shall comply with all applicable standards and limitations, and the reporting, recordkeeping and notification requirements contained in the following:

    a. 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (ARM 17.8.340 and 40 CFR 60, Subpart IIII)

    b. 40 CFR 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (ARM 17.8.342 and 40 CFR 63, Subpart ZZZZ)

B. Testing Requirements

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

2. DEQ may require further testing (ARM 17.8.105).

C. Operational Reporting Requirements

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

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

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

3. All records compiled in accordance with this permit must be maintained by Denbury as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by DEQ, and must be submitted to DEQ upon request (ARM 17.8.749).

4. Denbury shall document, by month, the emergency diesel-fired generator engine's hours of non-emergency operation. By the 25th day of each month, Denbury shall total the hours for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.7. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

5. Denbury shall document, by month, the hours of sand pit blowdown. By the 25th day of each month, Denbury shall total the hours for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.8. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

6. Denbury shall document by month, the hours when the HP flare is combusting process gas (when the HP flare is not just combusting pilot gas). By the 25th day of each month, Denbury shall total the hours for the previous month. The monthly information will be used to verify compliance with the rolling 12-month limitation in Section II.A.3. The information for each of the previous months shall be submitted along with the annual emission inventory (ARM 17.8.749).

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

SECTION III: General Conditions

A. Inspection – Denbury shall allow DEQ's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Denbury fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Denbury of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by DEQ's decision may request, within 15 days after DEQ renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay DEQ's decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of DEQ's decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, DEQ's decision on the application is final 16 days after DEQ's decision is made.

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

G. Air Quality Operation Fees – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by Denbury may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Duration of Permit – Construction or installation must begin, or contractual obligations entered that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit Analysis
Denbury Onshore, LLC – Bell Creek Central Facility
MAQP #4740-05

I. Introduction/Process Description

Denbury Onshore, LLC (Denbury) owns and operates an enhanced oil recovery facility. The facility is located in NW¼ NE¼ of Section 27, Township 8 South, Range 54 East, in Powder River County, Montana, and known as the Bell Creek Central Facility (Bell Creek).

A. Permitted Equipment

Emitting Unit ID	Emitting Unit Description
EG	Emergency Generator – Diesel-fired engine up to 447 horsepower (hp)
MBK-1107	Circular Treater – Natural gas-fired, 2.0 MMBtu/hr)
BAP-137	Heat Media Treater- Natural gas-fired, 27.0 MMBtu/hr
ABJ-1118	Wet Oil Tank – 5,000 barrel (bbl)
ABJ-1119	Dry Oil Tank – 5,000 bbl
ABJ-2119	Dry Oil Tank – 5,000 bbl
ABJ-1108	Slop Oil Tank – 500 bbl
ABM-1120	Water Vortex Tank – 9,700 bbl
ABJ-1129	Produced Water Tank – 5,000 bbl
ABJ-2129	Produced Water Tank – 5,000 bbl
SANDPIT	Sand Pit Blowdown
FUG	Fugitive Emissions
DUST	Dust Emissions
LOAD	Loading/Unloading Emissions
LP Flare	Emergency Flare
HP Flare	Emergency Flare

B. Source Description

Denbury owns and operates the Bell Creek enhanced oil recovery facility. This facility receives carbon dioxide (CO_2) via pipeline and injects it into the subsurface to enhance the volume of oil that is extracted. The extract is returned to Bell Creek in a production stream that contains produced water, CO_2, and oil. The facility equipment separates the oil, produced water, and CO_2. The separated oil is sent offsite to sales, while recovered produced water and CO_2 is reinjected into the subsurface.

There are two planned production streams coming into the facility. Initially there would be a low-pressure stream only and then over time, as the reservoir pressure increases, the facility would also utilize a high-pressure stream. The low-pressure stream first enters the Low-Pressure Free Water Knockout. The water is separated and routed to the Water Flash Drum for the collection of flash emissions and then sent to the produced water tanks for disposal in a disposal well. The CO_2 and oil are routed to the Low-Pressure Separator. The CO_2 is routed to a Low-Pressure Compressor to be compressed and sent to a High-Pressure Compressor for recycle back to the reservoir. The oil is routed to the Heater Treater which separates any additional moisture and CO_2 from the oil before being sent to the oil sales tank. The high-pressure stream would follow a similar process utilizing equipment specific to that stream. The process media heater heats a glycol mixture. The glycol mixture is used in the various separation units at the facility to enhance the separation process. The glycol mixture is heated at the heater and transfers through

several heat exchangers and separation units before returning to the heater in a closed loop process. The mixture will be reheated and cycled back into the heat exchangers and separators.

To control emissions, Denbury utilizes a Flash Gas Compressor to pick up the emissions from the Heater Treater and Water Flash Drum. This compressor compresses the CO_2 gas and routes it to the low pressure and high-pressure compressors for recycling back into the reservoir. If the Flash Gas Compressor were to shut down, the emissions would be routed to an emergency flare, (LP Flare). A Vapor Recovery Unit (VRU) compressor is utilized to capture and control the emissions from the oil and water storage tanks. These emissions are also recycled to the reservoir and in the event of VRU shutdown would be routed to the LP Flare. A second flare, the high-pressure flare (HP Flare), is used to combust gases which are released through the process equipment relief valves. The production stream contains sand that has been entrained in the stream as it makes its way from the subsurface to the facility. This sand accumulates in the equipment and must be routinely cleaned out to maintain efficient operation. This is accomplished with a sand pit blowdown. The two produced water streams (streams 102B and 301B) are directed into a concrete pit and the system is allowed to depressurize. Both material streams are expected to flash completely, and the emissions are released into the atmosphere while the accumulated sand is deposited into the pit. This procedure is expected to occur no more than 34 minutes per day and is limited to no more than 206 hours per year.

C. Permit History

On August 4, 2012, the Department of Environmental Quality – Air Resources Management Bureau (DEQ) issued **MAQP #4740-00** to Denbury for the Bell Creek enhanced oil extraction facility.

DEQ issued MAQP #4740-00 without a necessary permit condition requiring Denbury to annually certify that the emissions from Bell Creek are less than those that would require the facility to obtain an air quality operating permit as required by (ARM 17.8.1204(3)(b)). DEQ informed Denbury in an August 3, 2012, correspondence of the need to amend the MAQP to include this condition because it was inadvertently left out of MAQP #4740-00. The MAQP has a federally enforceable permit condition that limits the hours per year that the sand pit blowdown can occur, which, when complied with, ensures that the maximum potential emissions of volatile organic compounds (VOC) does not exceed the major source threshold of 100 tons per year. Therefore, Bell Creek is considered to be a synthetic minor source of emissions and must annually certify that their actual emissions do not exceed major source thresholds. The permitting action added a condition requiring this annual certification to the permit. It is an administrative action in accordance with ARM 17.8.764 because there were no increases in emissions. **MAQP #4740-01** replaced MAQP #4740-00.

On November 18, 2013, DEQ received a modification request to add an additional emergency flare at the facility. The proposed new flare is associated with the higher pressure process stream and will be referred to as the HP flare. The existing flare will be referenced as the LP Flare. An incomplete letter was issued to Denbury on December 9, 2013, for missing BACT information. A response was returned to DEQ on December 27, 2013, and determined to be complete as of December 27, 2013. **MAQP #4740-02** replaced MAQP #4740-01.

On October 1, 2015, DEQ received a modification request to remove one heater treater (MBK-1104) from the permit and to add one heat media treater (BAP-137) and one circular heater (MBK-1107) to the permit. It should be noted that the modification occurred in March of 2012 and that the permit action will reflect those modifications accordingly. This permit action will complete the modifications to the permit. **MAQP #4740-03** replaced MAQP #4740-02.

On November 20, 2020, DEQ received a request to administratively amend the MAQP to update the corporate mailing address. This request was assigned **MAQP #4740-04**; however, this permit revision was never issued.

D. Current Permit Action

On September 12, 2022, DEQ received a modification request for additional hours on both the high-and low-pressure flares for operational flexibility, and to update operational limits and potential emissions to reflect projected emissions. DEQ also updated the corporate mailing address with this action. **MAQP #4740-05** replaces MAQP #4740-03.

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 DEQ. Upon request, DEQ 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 DEQ, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by DEQ.

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

   Denbury 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 DEQ upon request.

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

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals, or dilutes an emission of air contaminant that would otherwise violate an air

pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

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

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone
6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}
11. ARM 17.8.230 Fluoride in Forage

Denbury must maintain compliance with the applicable ambient air quality standards.

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

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of less than 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Denbury shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. This rule requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this rule.

6. 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.

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

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

b. 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE). Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are manufactured after April 1, 2006, and are not fire pump engines, and owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005, are subject to this subpart. Based on the information submitted by Denbury, the emergency diesel-fired generator engine is subject to this subpart.

c. 40 CFR 60, Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution. This subpart has requirements that apply to storage vessels that have commenced construction, modification, or reconstruction after August 23, 2011, with potential Volatile Organic Compounds (VOC) emissions in excess of six tons per year. These affected sources must control those emissions by at least 95%. While this facility does have storage vessels that have uncontrolled VOC emissions in excess of the applicability thresholds, MAQP #4740-04 has enforceable conditions that when complied with would limit VOC emissions from the affected tanks to levels less than the applicability thresholds. Therefore, this facility does not have storage vessels that meet the applicability requirements of this subpart.

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

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

b. 40 CFR 63, Subpart HH – National Emissions Standards for Hazardous Air Pollutants (HAPs) from Oil and Natural Gas Production Facilities. Affected units under this subpart are each storage vessel with the potential for flash emissions at major sources of HAPs. Bell Creek would have uncontrolled HAP emissions in excess of major source levels; however, MAQP #4740-04 has enforceable conditions that when complied with would limit HAP emissions from the affected tanks to levels that bring the facility below the major source threshold. Therefore, this facility is an area source of HAPs and does not have affected sources that meet the applicability requirements of this subpart.

c. 40 CFR 63, Subpart ZZZZ – National Emissions Standards for HAPs for Stationary Reciprocating Internal Combustion Engines (RICE). An owner or operator of a stationary reciprocating internal combustion engine (RICE) at a major or area source of HAP emissions is subject to this rule except if the stationary RICE is being tested at a stationary RICE test cell/stand. An area source of HAP emissions is a source that is not a major source. Based on the information submitted by Denbury, the emergency diesel-fired generator engine is subject to this subpart.

D. ARM 17.8, Subchapter 4 – Stack Height and Dispersion Techniques, including, but not limited to:

1. ARM 17.8.401 Definitions. This rule includes a list of definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.402 Requirements. Denbury must demonstrate compliance with the ambient air quality standards with a stack height that does not exceed Good Engineering Practices (GEP). The proposed height of the new or modified stack for Denbury is below the allowable 65-meter GEP stack height.

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

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to DEQ. Denbury submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to DEQ by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by DEQ. 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. DEQ may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

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

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. Denbury has a PTE greater than 25 tons per year of VOC; therefore, an air quality permit is required.

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

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

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. Denbury 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. Denbury submitted an affidavit of publication of public notice for the September 15 and 22, 2022 issues of the *Powder River Examiner*, a newspaper of general circulation in Broadus County and Yellowstone County, as proof of compliance with the public notice requirements

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by DEQ must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

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

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

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Denbury of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes DEQ's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

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

12. ARM 17.8.763 Revocation of Permit. 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 because of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to DEQ.

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

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to

any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

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

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

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. PTE > 100 tons/year of any pollutant;

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

   c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing MAQP #4740-04 for Denbury, the following conclusions were made:

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

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

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

   d. This facility is subject to current NSPS. 40 CFR 60, Subpart A – General Provisions, 40 CFR 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, and 40 CFR 60, Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution apply to this facility.

   e. This facility is subject to current NESHAP standards. 40 CFR 63, Subpart A – General Provisions and 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines apply to this facility.

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

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

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

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

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

i. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness. The compliance certification submittal required by ARM 17.8.1204(3)(a) shall contain certification by a responsible official of truth, accuracy, and completeness. This certification and any other certification required under this subchapter shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Denbury has taken federally enforceable permit limits to keep potential emissions below major source permitting thresholds. Therefore, the facility is not a major source and a Title V Operating Permit is not required. However, if minor sources subject to NSPS are required to obtain a Title V Operating Permit, Denbury will be required to obtain a Title V Operating Permit.

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

III. BACT Determination

A BACT determination is required for each new or modified source. Denbury 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 proposed modification at Bell Creek does not include any new or modified sources, and therefore no additional analysis is required pursuant to ARM 17.8.752. The proposed configuration relies on the past BACT analysis but provides additional flexibility in operation between the VRU and LP flare, particularly with the unanticipated operational and reliability issues Denbury has experienced with the VRU. Denbury has spent a significant amount of time and effort to establish consistent operation and increase uptime for the VRU without success. The LP flare provides consistent control to maintain process operations and is within the original determination for BACT. The VRU will remain in place and will be used when available and appropriate. The level of control achieved by utilization of the VRU and LP flare remains consistent and associated with good combustion practices (as commonly required in similar BACT analyses).

Beyond the BACT analysis, Denbury is also requesting a 98% control/destruction efficiency for the VRU and flares (beyond the existing calculated 95% control), per the specifications and Denbury standard practices. This is not proposed as a BACT limit, rather an acknowledgement of the equipment capabilities and Denbury standards.

IV. Emission Inventory

		Total Controlled Emissions (TPY)						
Facility ID	**Source/Equipment**	**NO_x**	**CO**	**SO_2**	**VOC**	**HAPS**	**H_2S**	**PM**
Generator	Emergency Generator Engine	0.69	0.15	0.05	0.06	0.01	0.00	0.10
ABJ-1119 ABJ-2119	(2) 5,000 bbl Dry Oil Tank	-	-	0.00	3.50	0.65	-	-
ABJ-1118	(1) 5,000 bbl wet oil tank	-	-	0.00	0.19	0.03	-	-
ABJ-1108	(1) 500 bbl slop oil tank	-	-	0.00	0.04	0.01	-	-
ABM-1120	(1) 9,700 bbl tank	-	-	0.00	0.00	0.00	-	-
ABJ-1129 ABJ-2129	Produced Water Tanks (2) 5,000 bbl tanks	-	-	0.00	0.00	0.00	-	-

BAP-137	27.00 MMBtu/hr	11.59	9.74	0.07	0.64	0.22	--	0.88
MBK-1107	2.0 MMBtu/hr	0.86	0.72	0.01	0.05	0.02	--	0.07
Sandpit Blowdown	Sandpit Blowdown	-	-	-	4.00	0.34	-	-
Fugitive Equipment Leaks	Fugitive Equipment Leaks	-	-	-	1.09	0.22	-	-
Fugitive Dust	Fugitive Dust	-	-	-	-	-	-	0.4
LP Flare	LP Flare	3.60	16.41	0.00	0.51	0.10	0.00	0.39
HP Flare	HP Flare	2.42	11.03	0.00	0.11	0.01	0.00	0.27
Load	Truck Loading	-	-	-	0.47	0.09	-	-
	Total (with Fugitives)	**19.17**	**38.05**	**0.12**	**10.18**	**1.60**	**0.00**	**2.08**

Calculations

Natural gas-fired circular heater treater

Maximum Process Rate = 2 MMBtu/hr (Supplied information)
Fuel Heating Value = 965 Btu/scf (Supplied information)
EF Scaling Factor for Actual Heating Value = (965 Btu/scf) / (1020 Btu/scf) = 0.946 (AP 42, Table 1.4-1, footnote a, 7/98)
Maximum Hours of Operation = 8,760 hrs/yr

Filterable PM Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.02 ton/yr

Filterable PM_{10} Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.02 ton/yr

Filterable $PM_{2.5}$ Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.02 ton/yr

Condensable $PM=PM_{10}=PM_{2.5}$ Emissions:
Emission Factor = 5.7 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (5.7 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00529 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00529 lb/MMBtu) * (ton/2000 lb) = 0.05 ton/yr

CO Emissions:
Emission Factor = 84 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (84 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.07791 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.07791 lb/MMBtu) * (ton/2000 lb) = 0.68 ton/yr

NO_x Emissions:
Emission Factor = 100 lb/10^6 cf (AP 42, Table 1.4-1, Small Boilers < 100 MMBtu/hr, 7/98)
EF Conversion = (100 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.09275 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.09275 lb/MMBtu) * (ton/2000 lb) = 0.81 ton/yr

Pb Emissions:
Emission Factor = 0.0005 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (0.0005 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

SO_2 Emissions:
Emission Factor = 0.6 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (0.6 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00056 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00056 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

VOC Emissions:
Emission Factor = 5.5 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (5.5 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00510 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00510 lb/MMBtu) * (ton/2000 lb) = 0.04 ton/yr

TOC Emissions:
Emission Factor = 11 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (11 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.01020 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.01020 lb/MMBtu) * (ton/2000 lb) = 0.09 ton/yr

CH_4 Emissions:
Emission Factor = 2.3 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (2.3 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00213 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00213 lb/MMBtu) * (ton/2000 lb) = 0.02 ton/yr
CO2e = 0.02 * 21 = 0.39 ton/yr (CH4 GWP = 21, 40 CFR 98, Subpart A, Table A-1)

N_2O Emissions:
Emission Factor = 2.2 lb/10^6 cf (AP 42, Table 1.4-2, uncontrolled, 7/98)
EF Conversion = (2.2 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00204 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00204 lb/MMBtu) * (ton/2000 lb) = 0.02 ton/yr
CO2e = 0.02 * 310 = 5.54 ton/yr (N2O GWP = 310, 40 CFR 98, Subpart A, Table A-1)

CO_2 Emissions:
Emission Factor = 120000 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (120000 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 111.30334 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (111.30334 lb/MMBtu) * (ton/2000 lb) = 975.02 ton/yr

CO_2e Emissions:
$CO_2e(Total) = CO_2 + CO_2e(CH_4) + CO_2e(N_2O)$
CO2e(Total) = 975 + 0 + 6 = 981 ton/yr

HAPS

Benzene Emissions:
Emission Factor = 0.0021 ton/yr
EF Conversion = (0.0021 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Formaldehyde Emissions:
Emission Factor = 0.0075 lb/10^6 cf (AP 42, Table 1.4-3,Natural gas combustion 7/98)
EF Conversion = (0.0075 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00001 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00001 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Hexane Emissions:
Emission Factor = 1.8 lb/10^6 cf (AP 42, Table 1.4-3,Natural gas combustion 7/98)
EF Conversion = (1.8 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00167 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00167 lb/MMBtu) * (ton/2000 lb) = 0.01 ton/yr

Napthalene Emissions
Emission Factor = 0.00061 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
EF Conversion = (0.00061 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Toluene Emissions
Emission Factor = 0.0034 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
EF Conversion = (0.0034 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (2 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Natural gas-fired heat media treater

Maximum Process Rate = 27 MMBtu/hr (Supplied information)
Fuel Heating Value = 965 Btu/scf (Supplied information)
EF Scaling Factor for Actual Heating Value = (965 Btu/scf) / (1020 Btu/scf) = 0.946 (AP 42, Table 1.4-1, footnote a, 7/98)
Maximum Hours of Operation = 8,760 hrs/yr

Filterable PM Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.21 ton/yr

Filterable PM_{10} Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.21 ton/yr

Filterable $PM_{2.5}$ Emissions:
Emission Factor = 1.9 lb/10^6 cf (AP 42, Table 1.4-2, all PM<1um, 7/98)
EF Conversion = (1.9 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00176 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00176 lb/MMBtu) * (ton/2000 lb) = 0.21 ton/yr

Condensable PM=PM_{10}=$PM_{2.5}$ Emissions:
Emission Factor = 5.7 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (5.7 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00529 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00529 lb/MMBtu) * (ton/2000 lb) = 0.63 ton/yr

CO Emissions:
Emission Factor = 84 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (84 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.07791 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.07791 lb/MMBtu) * (ton/2000 lb) = 9.21 ton/yr

NO_x Emissions:
Emission Factor = 100 lb/10^6 cf (AP 42, Table 1.4-1, Small Boilers < 100 MMBtu/hr, 7/98)
EF Conversion = (100 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.09275 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.09275 lb/MMBtu) * (ton/2000 lb) = 10.97 ton/yr

Pb Emissions:
Emission Factor = 0.0005 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (0.0005 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

SO_2 Emissions:
Emission Factor = 0.6 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (0.6 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00056 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00056 lb/MMBtu) * (ton/2000 lb) = 0.07 ton/yr

VOC Emissions:
Emission Factor = 5.5 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (5.5 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00510 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00510 lb/MMBtu) * (ton/2000 lb) = 0.60 ton/yr

CH_4 Emissions:
Emission Factor = 2.3 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (2.3 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00213 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00213 lb/MMBtu) * (ton/2000 lb) = 0.25 ton/yr
CO2e = 0.25 * 21 = 5.30 ton/yr (CH4 GWP = 21, 40 CFR 98, Subpart A, Table A-1)

N_2O Emissions:
Emission Factor = 2.2 lb/10^6 cf (AP 42, Table 1.4-2, uncontrolled, 7/98)
EF Conversion = (2.2 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00204 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00204 lb/MMBtu) * (ton/2000 lb) = 0.24 ton/yr
CO2e = 0.24 * 310 = 74.81 ton/yr (N2O GWP = 310, 40 CFR 98, Subpart A, Table A-1)

CO_2 Emissions:
Emission Factor = 120000 lb/10^6 cf (AP 42, Table 1.4-2, 7/98)
EF Conversion = (120000 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 111.30334 lb/MMBtu (AP 42, Table 1.4-1, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (111.30334 lb/MMBtu) * (ton/2000 lb) = 13,162.73 ton/yr
Emission Factor = 22300 lb/10^3 gal (AP 42, Table 1.3-12, No. 2, 5/10)
Control Efficiency = 0%
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (22300 lb/10^3 gal) * (ton/2000 lb) = 2,637,198.00000 ton/yr
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (22300 lb/10^3 gal) * (ton/2000 lb) * (1 - 0/100) = 2,637,198.00000 ton/yr

HAPS

Benzene Emissions:
Emission Factor = 0.0021 ton/yr
EF Conversion = (0.0021 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Formaldehyde Emissions:
Emission Factor = 0.0075 lb/10^6 cf (AP 42, Table 1.4-3,Natural gas combustion 7/98)
EF Conversion = (0.0075 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00001 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00001 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Hexane Emissions:
Emission Factor = 1.8 lb/10^6 cf (AP 42, Table 1.4-3,Natural gas combustion 7/98)
EF Conversion = (1.8 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00167 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00167 lb/MMBtu) * (ton/2000 lb) = 0.20 ton/yr

Napthalene Emissions
Emission Factor = 0.00061 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
EF Conversion = (0.00061 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Toluene Emissions
Emission Factor = 0.0034 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
EF Conversion = (0.0034 lb/10^6 cf) / (1,020 MMBtu/10^6 cf) * (0.946) = 0.00000 lb/MMBtu (AP 42, Table 1.4-3, footnote a, 7/98)
Calculation: (27 MMBtu/hr) * (8760 hrs/yr) * (0.00000 lb/MMBtu) * (ton/2000 lb) = 0.00 ton/yr

Haul Roads

Vehicle Miles Traveled (VMT) per Day = 0.12 VMT/day (Estimate)
VMT per hour = (0.115068493150685 VMT/day) * (day/24 hrs) = 0.00 VMT/hr
Hours of Operation = 8,760 hrs/yr

PM Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites provided per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = k * (s / 12)^a * (W / 3)^b = 3.39 lb/VMT
Where: k = constant = 4.9 lbs/VMT (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 3 tons (supplied information)
a = constant = 0.7 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM30/TSP, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (3.39 lb/VMT) * (ton/2000 lb) = 0.07 tons/yr (Uncontrolled Emissions)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (3.39 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.04 tons/yr (Apply 50% control efficiency)

PM_{10} Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites provided per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = k * (s / 12)^a * (W / 3)^b = 0.94 lb/VMT
Where: k = constant = 1.5 lbs/VMT (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 3 tons (supplied information)
a = constant = 0.9 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM10, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (0.94 lb/VMT) * (ton/2000 lb) = 0.02 tons/yr (Uncontrolled Emissions)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (0.94 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.01 tons/yr (Apply 50% control efficiency)

$PM_{2.5}$ Emissions:

Predictive equation for emission factor for unpaved roads at industrial sites provided per AP 42, Ch. 13.2.2, 11/06.
Emission Factor = k * (s / 12)^a * (W / 3)^b = 0.09 lb/VMT
Where: k = constant = 0.15 lbs/VMT (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
s = surface silt content = 7.1 % (Mean value, sand/gravel processing, material storage area, AP 42, Table 13.2.2-1, 11/06)
W = mean vehicle weight = 3 tons (supplied information)
a = constant = 0.9 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
b = constant = 0.45 (Value for PM2.5, AP 42, Table 13.2.2-2, 11/06)
Control Efficiency = 50% (Water spray or chemical dust suppressant)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (0.09 lb/VMT) * (ton/2000 lb) = 0.00 tons/yr (Uncontrolled Emissions)
Calculation: (8760 hrs/yr) * (0.00 VMT/hr) * (0.09 lb/VMT) * (ton/2000 lb) * (1-50/100) = 0.00 tons/yr (Apply 50% control efficiency)

Emergency diesel-fired generator engine

Operational Capacity of Engine = 447 hp
Hours of Operation = 100 hours

Total PM/PM_{10}/$PM_{2.5}$ Emissions:

Emission Factor = 0.0022 lbs/hp-hr (All PM < 1 μm, AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (100 hours) * (447 hp) * (0.0022 lbs/hp-hr) * (ton/2000 lb) = 0.05 ton/yr

NO_x Emissions:
Emission Factor = 0.031 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (100 hours) * (447 hp) * (0.031 lbs/hp-hr) * (ton/2000 lb) = 0.69 ton/yr

CO Emissions:
Emission Factor = 0.00668 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (100 hours) * (447 hp) * (0.00668 lbs/hp-hr) * (ton/2000 lb) = 0.15 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: (100 hours) * (447 hp) * (0.0025141 lbs/hp-hr) * (ton/2000 lb) = 0.06 ton/yr

SO_2 Emissions:
Emission Factor = 0.00205 lbs/hp-hr (AP-42, Sec. 3.3, Table 3.3-1, 10/96)
Calculation: (100 hours) * (447 hp) * (0.00205 lbs/hp-hr) * (ton/2000 lb) = 0.046 ton/yr

The following emissions represent maximum potential emissions of the sand pit blowdown if it occurred continuously (8,760 hours/year).

Sources Contributing to Blowdown Emissions		E&P Emissions based on continuous operation		
		VOCs (tpy)	HAPs (tpy)	H2S*** (tpy)
Natural Gas Separator	MBD-1101	122.933	2.090	0.000
Heater Treater	MBK 1107	0.000	0.000	0.000

Sand pit blowdown is limited to no more than 206 hours per year; therefore, the maximum potential emissions from this activity are:

$$\text{VOC: } \frac{122{,}933 \text{ tons}}{\text{year}} \times \frac{206 \text{ hours}}{8{,}760 \text{ hours}} = 2.9 \frac{\text{tons}}{\text{year}}$$

$$\text{HAPs: } \frac{2.090 \text{ tons}}{\text{year}} \times \frac{206 \text{ hours}}{8{,}760 \text{ hours}} = 0.05 \frac{\text{tons}}{\text{year}}$$

EMISSION SUMMARY

Emission Source	Description	Uncontrolled Pollutants (Potential to Emit)					
		PM_{10}	SO_2	NO_x	CO	VOC	HAPs
ABJ-1119 ABJ-2119	(2) Dry Oil (5000 bbl) Tank Promax	--	0.00	--	--	175.03	32.43
ABJ-1118	(1) Wet Oil (5000 bbl) Tank Promax	--	0.00	--	--	9.31	1.67
ABJ-1108	(1) Slop Oil (500 bbl) Tank Promax	--	0.00	--	--	2.24	0.41
ABJ-1129 ABJ-2129	(2) Produced Water (5000 bbl) Tanks Promax	--	0.00	--	--	0.00	0.00
ABM-1120	(1) Water (9700 bbl) Vortex Tank Promax	--	0.00	--	--	0.00	0.00
BAP-137	27 MMBtu/hr Heater Treater	0.88	0.07	11.59	9.74	0.64	0.22
MBK-1107	2 MMBtu/hr Circular Heater Treater	0.07	0.01	0.86	0.72	0.05	0.02
LP Flare	LP Flare	0.90	0.00	3.60	16.41	25.39	5.07
HP Flare	HP Flare	17.968	0.00	163.98	747.56	773.01	20.52
Engine	Emergency Generator Diesel Fired	0.1	0.0	0.7	0.1	0.06	0.01
Sandpit Blowdown	Sandpit Blowdown	--	--	--	--	1.99	0.34
OTL	Oil Truck Loading	--	--	--	--	0.00	0.00
WTL	Water Truck Loading	--	--	--	--	0.00	0.00
	Totals (TPY) without Fugitives:	19.10	0.12	180.73	774.58	988.17	60.77
Fugitives	Fugitives	--	--	--	--	1.09	0.22
Fugitive Dust	Fugitive Dust	0.4	--	--	--	--	--
	Totals (TPY) with Fugitives:	19.48	0.12	180.73	774.58	989.26	60.99

Emission Source	Description	Controlled Pollutants					
		PM_{10}	SO_2	NO_x	CO	VOC	HAPs
ABJ-1119 ABJ-2119	(2) Dry Oil (5000 bbl) Tank Promax	--	0.00	--	--	3.50	0.65
ABJ-1118	(1) Wet Oil (5000 bbl) Tank Promax	--	0.00	--	--	0.19	0.03
ABJ-1108	(1) Slop Oil (500 bbl) Tank Promax	--	0.00	--	--	0.04	0.01
ABJ-1129 ABJ-2129	(2) Produced Water (5000 bbl) Tanks Promax	--	0.00	--	--	0.00	0.00
ABM-1120	(1) Water (9700 bbl) Vortex Tank Promax	--	0.00	--	--	0.00	0.00
BAP-137	27 MMBtu/hr Heater Treater	0.88	0.07	11.59	9.74	0.64	0.22
MBK-1107	2 MMBtu/hr Circular Heater Treater	0.07	0.01	0.86	0.72	0.05	0.02
LP Flare	LP Flare	0.39	0.00	3.60	16.41	0.51	0.10
HP Flare	HP Flare	0.27	0.00	2.42	11.03	0.11	0.00
Engine	Emergency Generator Diesel Fired	0.10	0.05	0.69	0.15	0.06	0.01
Sandpit Blowdown	Sandpit Blowdown	--	--	--	--	4.00	0.34
OTL	Oil Truck Loading	--	--	--	--	0	0
WTL	Water Truck Loading	--	--	--	--	0	0
	Totals (TPY) without Fugitives:	1.70	0.12	19.17	38.05	9.55	1.46
Fugitives	Fugitives	--	--	--	--	1.09	0.22
Fugitive Dust	Fugitive Dust	0.4	--	--	--	--	--
	Totals (TPY) with Fugitives:	2.08	0.12	19.17	38.05	10.18	1.60
	MAQP#4740-03 Totals (TPY) with Fugitives:	1.29	0.15	13.19	14.00	71.70	5.71
	Proposed Increase (TPY):	0.79	0.03	6/02	24.05	--	--

FUGITIVE EMISSIONS
POTENTIAL-TO-EMIT CALCULATIONS

Equipment Leaks

Component	Count			THC Emission Factors [b] (kg/comp-hr)			Calculated THC Emissions (lb/hr)			Total THC Emissions	
	Lt. Crude	Gas	Produced Water	Lt. Crude	Gas	Produced Water	Lt. Crude	Gas	Produced Water	(lb/hr)	(tpy)
Connections	1430	2672	1144	2.1E-04	2.0E-04	1.1E-04	0.662	1.178	0.277	2.118	9.28
Flanges	586	433	469	1.1E-04	3.9E-04	2.9E-06	0.142	0.372	0.003	0.517	2.27
Open-Ends	51	96	41	1.4E-03	2.0E-03	2.5E-04	0.157	0.423	0.022	0.603	2.64
Pumps	2	0	1.6	1.3E-02	2.4E-03	2.4E-05	0.057	0.000	0.000	0.057	0.25
Valves	475	575	380	2.5E-03	4.5E-03	9.8E-05	2.618	5.705	0.082	8.406	36.82
Others	26	57	21	7.5E-03	8.8E-03	1.4E-02	0.430	1.106	0.642	2.178	9.54
TOTALS:	2570	3833	2056				4.07	8.79	1.03	**13.88**	**60.80**

a Others category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.
b Refer to EPA Publication No.: 453/R-95-017; "Protocol for Equipment Leak Emision Estimates", Table 2-4.

Data Input Cells

Component Speciation
Based on HYSIS output 46,160 lb mole/hr Overall Stream
Stream 100- Overall Composition

Component	Stream Profile (mole %)	Mass Flow Rate (lb/hr)	Stream Flow Rate (lb/hr)	Stream Profile (wt %)	Fugitive Emissions (lb/hr)	Fugitive Emissions (tpy)
Methane	0.0094	6,983.1421	6,983.1421	0.1851	2.57	11.25
Ethane	0.0000	54.0837	54.0837	0.0014	0.02	0.09
Propane	0.0003	540.3192	540.3192	0.0143	0.20	0.87
i-Butane	0.0002	471.6112	471.6112	0.0125	0.17	0.76
n-Butane	0.0003	839.6522	839.6522	0.0223	0.31	1.35
i-Pentane	0.0002	773.8419	773.8419	0.0205	0.28	1.25
n-Pentane	0.0002	642.0746	642.0746	0.0170	0.24	1.03
n-Hexane*	0.0001	348.3518	348.3518	0.0092	0.13	0.56
Hexanes +	0.0058	26,797.6442	26,797.6442	0.7102	9.86	43.18
Benzene*	0.0000	0.8550	0.8550	0.0000	0.00	0.00
Ethyl Benzene*	0.0000	3.9169	3.9169	0.0001	0.00	0.01
Toluene*	0.0000	7.3301	7.3301	0.0002	0.00	0.01
Xylene*	0.0001	268.4320	268.4320	0.0071	0.10	0.43
THC TOTAL	0.0166	37731.2549	37731.2549	1.0000	13.88	60.80
			TOTAL VOC	0.81	11.29	49.46
			TOTAL HAPS	0.02	0.23	1.01
H2O	0.9114	757,895.8478	757,895.8478	0.8047	11.17	48.92
CO2	0.0719	146,013.5530	146,013.5530	0.1550	2.15	9.43
H2S	0.0000	5.6967	5.6967	0.0000	0.00	0.00
Nitrogen	0.0001	151.2011	151.2011	0.0002	0.00	0.01
STREAM TOTAL	1.0072	972,492	941,798	1.9599	27.20	119.16

THC=Total Hydrocarbons

Conversion Factors

2,000	lb/ton
8,760	hr/yr

CALCULATION METHODOLOGY

Calculated THC Emissions (lb/hr) = Component Count * THC Emission Factor (kg/comp-hr) * 2.205 lb/kg
Total THC Emissions (lb/hr) = (Lt. Crude + Gas) Calculated THC Emissions (lb/hr)
Total THC Emissions (tpy) = Total Emissions (lb/hr) * 8760 hr/yr * (1 ton / 2000 lb)
Stream Flow Rate (lb/hr) = Stream Flow Rate (lb mole/hr) * MW
THC Profile (wt %) = THC Flow Rate (lb/hr) / Total THC Flow Rate (lb/hr)
HC Fugitive Emissions (lb/hr) = THC Profile (wt %) * Total THC Emissions (lb/hr)
HC Fugitive Emissions (tpy) = Total THC Emissions (lbs/hr) * 8760 (hrs/yr)*1/2000 (lbs/ton)
Non-HC Fugitive Emissions (lb/hr) = (Stream Profile (wt %) / VOC Stream Profile (wt %)) * Total VOC Emissions (lb/hr)
Non-HC Fugitive Emissions (tpy) = (Stream Profile (wt %) / VOC Stream Profile (wt %)) * Total VOC Emissions (tpy)

ASSUMPTIONS:
Fugitive emissions and component speciation data is based on the HYSYS Inlet Stream 100

TRUCK LOADING EMISSIONS
POTENTIAL-TO-EMIT CALCULATIONS

Emission Source	Truck Loading		
Emission Unit ID	Load		
Oil Production Rate	6,834	bbl/day	HYSYS Stream 119
Throughput*	68.34	bbl/day	estimate based on predicted production
Average Sales Oil Temperature	578	°R	HYSYS Stream 119
Vapor Molecular Weight	45.0	lb/lb mole	HYSYS Stream 119
Saturation Factor	0.6		per AP-42

*Oil is sold by pipeline. Therefore truck loading is for maintenance purposes only.
Throughput was estimated at 1% of the oil production rate.

Reid Vapor Pressure = 6.19
(HYSYS Ouput-Stream 119)

True Vapor Pressure @ Average Tank ABJ-1129 Temperature = 10.98
(HYSYS Ouput-Stream 119)

L_L - lb/1000 gallons loaded = 12.46 x S x P x M/T

Where: L_L = loading loss, lb/1,000 gal loaded
S = saturation factor
P = true vapor pressure of liquid loaded, psia
M = molecular weight of tank vapors, lb/lb mole
T = temperature of bulk liquid loaded, °R

L_L =	6.40	lb/1000 gal loaded
Total HC Emissions =	18.36	lb/day
	0.77	lb/hr

Stream 119 Compositions From HYSYS Simulation

Component	Mass Fraction (HYSYS Data)	Loading Emissions lb/hr	Loading Emissions tpy
Propane	0.0005	0.00	0.00
i-Butane	0.0019	0.00	0.01
n-Butane	0.0047	0.00	0.02
i-Pentane	0.0088	0.01	0.03
n-Pentane	0.0084	0.01	0.03
n-Hexane*	0.0065	0.00	0.02
Hexanes +	0.9590	0.73	3.21
Benzene*	0.0000	0.00	0.00
Ethyl Benzene*	0.0001	0.00	0.00
Toluene*	0.0002	0.00	0.00
Xylene*	0.0061	0.00	0.02
TOTAL VOCs	**0.9962**	0.76	3.34
TOTAL HAPs	**0.0129**	0.01	0.04
Methane	0.0000	0.00	0.00
Ethane	0.0000	0.00	0.00
H2O	0.0000	0.00	0.00
CO2	0.0036	0.00	0.00
H2S	0.0000	0.00	0.00
Nitrogen	0.0000	0.00	0.00
TOTALS	0.9998	0.76	3.34

Data Input Cells

Conversion Factors

2,000	lb/ton
379	scf/lb mole
24	hr/day
60	min/hr
1,000,000	BTU/mmBTU
1,000	scf/mscf
8,760	hr/yr
42	gal/bbl
1,000	scf/mscf
459.69	deg R=deg F + 459.69

CALCULATION METHODOLOGY

Total HC Emissions (lb/hr) = Loading Loss (lb/1000 gal loaded) * Loading Rate (bbl/hr) * 42 gal/bbl
Total HC Emissions (tpy) = Loading Loss (lb/1000 gal loaded) * Total Annual Throughput (bbl/yr) * 42 gal/bbl / 2,000 lb/ton
Loading Emissions (lb/hr) = Total HC Emissions (lb/hr) * Component Mass Fraction
Loading Emissions (tpy) = Mass Fraction (lbs/hr) *8760 hrs/yr/2000 lbs/ton

FUGITIVE DUST EMISSIONS
POTENTIAL-TO-EMIT CALCULATIONS

Source:	Fugitive Dust				
	Vehicle 1	Vehicle 2	Vehicle 3	Vehicle 4	
Mean Vehicle Weight (tons)	3	3	0	0	facility supplied
Vehicle distance traveled on site (ft)	300	300	0	0	facility supplied
Total trips per year	365	365	0	0	facility supplied
Emission Factors [a]	PM10 (lb/VMT)				Data Input Cells
Small (<50 tons)	2.7				
Medium (50-100 tons)	3.6				
Large (>100 tons)	4.5				

[a] Montana DEQ "Instructions for Registering, Updating, or Deregistering an Oil or Gas Well Facility"; Appendix A; April 2009; page 22-23

VMT = vehicle miles traveled

Data	Emission Factor (lb/VMT)	Annual Vehicle Miles Traveled (miles/yr)	Emission Rate (tpy)
Vehicle 1	2.7	21	0.03
Vehicle 2	2.7	20.7	0.03
		Total PM_{10} Emissions	0.06

Conversion Factors	
2,000	lb/ton
0.000189	miles/ft

CALCULATION METHODOLOGY

Annual Vehicle Miles Traveled (AMVT) (miles/yr) = Total Distance Travel Onsite (ft) x 0.000189 (miles/ft) x trips per year

Emission Rate (tpy) = AMVT x emission factor (lb/VMT) / 2000 (lb/ton)

OIL TANK EMISSIONS SUMMARY

Source/Equipment	Uncontrolled Emissions					
	NOx (tpy)	CO (tpy)	SO2 (tpy)	VOC (tpy)	HAPs (tpy)	H2S (tpy)
ABJ-1119 - 5,000 bbl dry oil tank ABJ-2119 - 5,000 bbl dry oil tank	NA	NA	NA	62.41	23.57	0.02
Total	**0.00**	**0.00**	**0.00**	**62.41**	**23.57**	**0.02**

*Reported VOCs value represents calculated emissions for C3+.

Source/Equipment	Controlled Emissions*					
	NOx (tpy)	CO (tpy)	SO2 (tpy)	VOC (tpy)	HAPs (tpy)	H2S (tpy)
ABJ-1119 - 5,000 bbl dry oil tank ABJ-2119 - 5,000 bbl dry oil tank	NA	NA	NA	3.12	1.18	0.00
Total	**0.00**	**0.00**	**0.00**	**3.12**	**1.18**	**0.00**

* Controlled emissions assumes VRU efficiency of 95%

Conversion Factors	
2,000	lb/ton
24	hr/day
60	min/hr
1,000,000	BTU/mmBTU
1,000	scf/mscf
8,760	hr/yr
42	gal/bbl
454	g/lb
1,000,000	scf/mmscf
7,000	grains/lb

Stream Compositions From HYSYS Simulation

Vapor from ABJ-1119

Streams 122G Mass Flow	**44.7400**	(lb/hr)	From HYSYS Streams 122G
Streams 122G Molar Flow	**0.9938**	(lb mole/hr)	From HYSYS Streams 122G

Vapor from ABJ-2119

Streams 122H Mass Flow	**0.0000**	(lb/hr)	From HYSYS Streams 122H
Streams 122H Molar Flow	**0.0000**	(lb mole/hr)	From HYSYS Streams 122H

	Stream 122G			Stream 122H		
Component	Mole % (HYSYS Composition)	Mass Flow (HYSYS Data) (lb/hr)	Mass Flow (tpy)	Mole % (HYSYS Composition)	Mass Flow (HYSYS Data) (lb/hr)	Mass Flow (tpy)
Propane	**0.0212**	0.9286	4.07	**0.0212**	0.00	0.00
i-Butane	**0.0234**	1.3510	5.92	**0.0234**	0.00	0.00
n-Butane	**0.0445**	2.5680	11.25	**0.0445**	0.00	0.00
i-Pentane	**0.0287**	2.0603	9.02	**0.0287**	0.00	0.00
n-Pentane	**0.0216**	1.5495	6.79	**0.0216**	0.00	0.00
n-Hexane*	**0.0048**	0.4087	1.79	**0.0048**	0.00	0.00
Hexanes +	**0.1487**	5.3326	23.36	**0.1487**	0.00	0.00
Benzene*	**0.0000**	0.0011	0.00	**0.0000**	0.00	0.00
Ethyl Benzene*	**0.0000**	0.0007	0.00	**0.0000**	0.00	0.00
Toluene*	**0.0000**	0.0037	0.02	**0.0000**	0.00	0.00
Xylene*	**0.0004**	0.0439	0.19	**0.0004**	0.00	0.00
TOTAL VOCs	**0.2933**	**14.2481**	**62.41**	**0.2933**	**0.00**	**0.00**
TOTAL HAPs	**0.0052**	**5.3820**	**23.57**	**0.0052**	**0.00**	**0.00**
Methane	**0.0129**	0.2060	0.90	**0.0129**	0.00	0.00
Ethane	**0.0008**	0.0232	0.10	**0.0008**	0.00	0.00
H2O	**0.0016**	0.0293	0.13	**0.0016**	0.00	0.00
CO2	**0.6912**	30.2316	132.41	**0.6912**	0.00	0.00
H2S	**0.0001**	0.0039	0.02	**0.0001**	0.00	0.00
Nitrogen	**0.0000**	0.0007	0.00	**0.0000**	0.00	0.00
TOTALS	**0.9999**	**44.7428**	**195.97**	**0.9999**	**0.00**	**0.00**

HAPS include n-hexane, benzene, toluene, ethyl benzene, and p-xylene

CALCULATION METHODOLOGY

Mass Flow (tpy) = Mass Flow (lb/hr) x 8760 (hr/yr) / 2000 (lb/ton)

Controlled Emissions (tpy) = Uncontrolled Emissions (tpy) * (1 - VRU Efficiency)

SLOP TANK EMISSIONS
POTENTIAL-TO-EMIT CALCULATIONS

Source/Equipment	Uncontrolled Emissions					
	NOx	CO	SO2	VOC	HAPs	H2S
	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
(1) 500 bbl Slop Oil Tank	NA	NA	NA	0.34	0.01	0.00
Total	**0.00**	**0.00**	**0.00**	**0.34**	**0.01**	**0.00**

*Reported VOCs value represents calculated emissions for C3+.

Source/Equipment	Controlled Emissions*					
	NOx	CO	SO2	VOC	HAPs	H2S
	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
(1) 500 bbl Slop Oil Tank	NA	NA	NA	0.02	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**

* No emissons are expected from the slop tank; however, controlled emissions assumes VRU efficiency of 95%

TANKS 4.0.9d Output -	Slop Oil Tank	lb/yr	tpy
VOC	Working Losses	59.93	0.03
	Breathing Losses	612.42	0.31
	Total Emissions	672.35	0.34
H2S	Crude Inlet	0.0000	0.00
HAPS		13.78	0.01

Assumptions:
Flow rate to slop oil tank is 1% of intlet flow rate. Oil has is mixture of all oils from site;therefore, the estimate emission using Crude Oil (RVP5) speciation profile in Tanks 4.09d. Was used to estimate emissions from the slop tank.

HYSYS Stream 122G

Component	Stream Profile (mole %)	Mass Flow Rate (lb/hr)
Propane	0.0212	540.32
i-Butane	0.0234	471.61
n-Butane	0.0445	839.65
i-Pentane	0.0287	773.84
n-Pentane	0.0216	642.07
n-Hexane*	0.0048	348.35
Hexanes +	0.1487	26,797.64
Benzene*	0.0000	0.86
Ethyl Benzene*	0.0000	3.92
Toluene*	0.0000	7.33
Xylene*	0.0004	268.43
TOTAL VOCs		30694.03
TOTAL HAPS		628.89
RATIO HAPS/VOCS		0.02

Conversion Factors

2,000	lb/ton
8,760	hr/yr

CALCULATION METHODOLOGY

Ratio of HAPS Emissions to VOC Emissions = HAPS (lbs/hr)/Total VOCs (lbs/hr)
HAPS Emissions (lbs/yr) = VOC Emissions (lbs/yr)*Ratio of HAPS to VOCs
HAPS Emissions (tons/yr) = VOC Emissions (lbs/yr)/2000 lbs/ton

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Slop Oil Tank
City:	
State:	Montana
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	500-bbl Slop Oil Tank Belle Creek Facility

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	15.50
Liquid Height (ft) :	15.00
Avg. Liquid Height (ft):	5.00
Volume (gallons):	21,172.77
Turnovers:	1.38
Net Throughput(gal/yr):	29,200.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.13

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Billings, Montana (Avg Atmospheric Pressure = 12.92 psia)

Emissions Report for: Annual

Slop Oil Tank - Vertical Fixed Roof Tank

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Crude oil (RVP 5)	59.93	612.42	672.35

WATER TANK EMISSIONS SUMMARY

Source/Equipment	Uncontrolled Emissions					
	NOx	CO	SO2	VOC	HAPs	H2S
	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
(1) 9,700-bbl Vortex Water	NA	NA	NA	45.67	2.14	0.08
(2) 5,000-bbl Produced Water	NA	NA	NA	0.00	0.00	0.00
(1) 5,000 bbl Wet Oil Tank	NA	NA	NA	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**45.67**	**2.14**	**0.08**

*Reported VOCs value represents calculated emissions for C3+.

Source/Equipment	Controlled Emissions*					
	NOx	CO	SO2	VOC	HAPs	H2S
	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
(1) 9,700-bbl Vortex Water	NA	NA	NA	2.28	0.11	0.00
(2) 5,000-bbl Produced Water	NA	NA	NA	0.00	0.00	0.00
(1) 5,000 bbl Wet Oil Tank	NA	NA	NA	0.00	0.00	0.00
Total	**0.00**	**0.00**	**0.00**	**2.28**	**0.11**	**0.00**

* Controlled emissions assumes VRU efficiency of 95%

Stream Compositions From HYSYS Simulation

Component	HYSYS Stream	Stream Mass Flow (lb/hr)	Stream Molar Flow (lb mole/hr)
ABM-1120 - Water Vortex Tank	122B	150.4	3.447
ABJ-1118 - Wet Oil tank	122F	0.00	0.00
ABJ-1129 - Produced Water Tank	122C	0.00	0.00
ABJ-2129 - Produced Water Tank	122D	0.00	0.00

Conversion Factors

2,000 lb/ton	42 gal/bbl
24 hr/day	1,000 scf/mscf
60 min/hr	454 g/lb
1,000,000 BTU/mmBTU	1,000,000 scf/mmscf
1,000 scf/mscf	7,000 grains/lb
8,760 hr/yr	

	Stream 122B			Streams 122C, 122D, and 122F		
	Mole % (HYSYS Composition)	Mass Flow (lb/hr)	Mass Flow (tpy)	Mole % (HYSYS Composition)	Mass Flow (lb/hr)	Mass Flow (tpy)
Propane	**0.0014**	0.18	0.79	**0.0014**	0.00	0.00
i-Butane	**0.0028**	0.53	2.31	**0.0028**	0.00	0.00
n-Butane	**0.0062**	1.18	5.16	**0.0062**	0.00	0.00
i-Pentane	**0.0062**	1.56	6.82	**0.0062**	0.00	0.00
n-Pentane	**0.0050**	1.28	5.59	**0.0050**	0.00	0.00
n-Hexane*	**0.0014**	0.44	1.91	**0.0014**	0.00	0.00
Hexanes +	**0.0378**	5.22	22.85	**0.0378**	0.00	0.00
Benzene*	**0.0000**	0.00	0.01	**0.0000**	0.00	0.00
Ethyl Benzene*	**0.0000**	0.00	0.00	**0.0000**	0.00	0.00
Toluene*	**0.0000**	0.00	0.02	**0.0000**	0.00	0.00
Xylene*	**0.0001**	0.05	0.20	**0.0001**	0.00	0.00
TOTAL VOCs	**0.0609**	**10.43**	**45.67**	**0.0609**	**0.00**	**0.00**
TOTAL HAPs	**0.0015**	**0.49**	**2.14**	**0.0015**	**0.00**	**0.00**
Methane	**0.0002**	0.01	0.02	**0.0002**	0.00	0.00
Ethane	**0.0000**	0.00	0.01	**0.0000**	0.00	0.00
H2O	**0.0227**	1.55	6.79	**0.0227**	0.00	0.00
CO2	**0.9159**	138.36	606.01	**0.9159**	0.00	0.00
H2S	**0.0001**	0.02	0.08	**0.0001**	0.00	0.00
Nitrogen	**0.0000**	0.00	0.00	**0.0000**	0.00	0.00
TOTALS	**0.9998**	**150.36**	**658.58**	**0.9998**	**0.00**	**0.00**

CALCULATION METHODOLOGY

Mass Flow (tpy) = Mass Flow (lb/hr) x 8760 (hr/yr) / 2000 (lb/ton)

Controlled Emissions (tpy) = Uncontrolled Emissions (tpy) * (1 - VRU Efficiency)

LP Flare Promax

LP Flare (wt %)

Flare Gas Volume	47,370	scf/hr (current flowrate)			**Wt Fractions**		**Mole Fractions**	
			(calculated from Promax All tanks to flare + Flare Purge)		VOC	10.20%	CO_2	91.81%
VOC's	0.102	255.15 Btu/scf	0.053	0.029	Benzene	0.38%	CH_4	0.23%
HAPs	0.020		0.010	0.006		0.012		
Molecular Weight		45.46 lb/lb-mole	(calculated from Promax All tanks to flare + Flare Purge)		Toluene	0.09%	**Emission Factors**	
BTU		98%			E-Benzene	0.03%	For ND/MT/WY:	
		2000 lb/ton			Xylene	0.09%	NO_x	0.068 lb/mmbtu
		0.001 mton/kg			n-Hexane	1.44%	CO*	0.31 lb/mmbtu
Conversions		379 scf/lb-mole			2-2-4-Trimethy	0.00%	PM**	7.6 lb/mmbtu
		1.00E+06 Btu/MMBtu or scf/MMScf			H_2S	0.00%	*Per AP-42 13.5-1 (2018)	
		1.1023 tons/Mton					** Per AP-42 Table 1.4-2	
		60.00 min/hr						

*Used mol to wt% conversion tool.

Nat Gas Heating Value	1020	Btu/scf
SO_2 Molecular Wt	64	lb/lb-mole
H_2S Molecular Wt	34	lb/lb-mole
CO_2 Density	0.0526	kg/scf
CH_4 Density	0.0192	kg/scf
N_2O EF	0.0001	kg/MMBtu

Emission Source	Manufacturer	Make	Hours of Operation
ZZZ-182 LP Flare	ALL TANKS TO LP	Sub-Total	72
ZZZ-182 LP Flare	LP Flare ZZZ-182 F	Flare Purge	8766
		Total	**8760**

*Hours cannot be greater than 8760

3.927 $ug/m^3/(g/s)$ Max Annual Conc.

Pollutant	Potential Emissions		Actual Emissions			
	lb/hr	tpy	lb/hr	tpy	g/s	ug/m^3
VOC's	5.80	25.39	0.12	0.51		
HAP's	1.16	5.07	0.02	0.10		
Benzene	0.2154	0.94	0.00	0.02	5.43E-04	2.13E-03
E-Benzene	0.0198	0.09	0.00	0.00	4.99E-05	1.96E-04
Toluene	0.0516	0.23	0.00	0.00	1.30E-04	5.11E-04
n-Hexane	0.8199	3.59	0.02	0.07	2.07E-03	8.11E-03
Xylene	0.0498	0.22	0.00	0.00	1.25E-04	4.93E-04
2-2-4-Trimethylpentane	0.0000	0.00	0.00	0.00		
NO_x (uncontrolled)	0.82	3.60	0.82	3.60		
CO (uncontrolled)	3.75	16.41	3.75	16.41		
PM (uncontrolled)	0.09	0.39	0.09	0.39		
H_2S (uncontrolled)	0.00	0.00	0.00	0.00		
SO_2 (uncontrolled)	0.00	0.00	0.00	0.00		

Regulated GHG Emissions

	(tpy CO_2e)
CO_2 (Entrained)	419951.74
CO_2 (Combusted)	7281.61
CH_4 (Uncombusted)	0.40
N_2O (Combusted)	2.079
Total CO_2e	**7911.384**

Mole Fractions Gas From Promax	
Methane	0.23%
Ethane	0.01%
Propane	0.33%
Butane	1.14%
Pentane	1.96%
Hexane	0.93%
Heptane	0.70%
Octane	0.45%
Nonane	0.06%
Decane+	0.01%

LP Flare Promax

Stream Flowrates:

All tanks to LP Flare	94.57	lb/min	47,304	scf/hr
Flare Purge	0.13	lb/min	66.53	scf/hr
Total			47,370	scf/hr

Component	LP Flare (wt %)			LP Flare Mol %			SCFH (All)	Flare	Total Vol%	MW	1/MW	Wt of Gas	Wt%	dH	Heating Value
	All tanks to LP Flare	Flare Purge	Average Wt	All tanks to LP	Flare Purge	Average Mol %									
CO_2	0.889	0.028	0.888	91.938	1.085	91.810	43489.89	0.72	91.81	44.01	0.02272	40.41	88.89	0.00	0.00
Nitrogen	0.000	0.014	0.000	0.000	0.857	0.001	0.06	0.57	0.00	28.01	0.0357	0.00	0.00	0.00	0.00
H_2S	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	34.08	0.02934	0.00	0.00	637.00	0.00
Methane	0.000	0.919	0.002	0.094	96.787	0.230	44.68	64.39	0.23	16.04	0.06233	0.04	0.08	1010.00	2.33
Ethane	0.000	0.009	0.000	0.012	0.502	0.012	5.49	0.33	0.01	30.07	0.03326	0.00	0.01	1770.00	0.22
Propane	0.003	0.004	0.003	0.329	0.164	0.329	155.65	0.11	0.33	44.10	0.02268	0.15	0.32	2516.00	8.28
I-Butane	0.007	0.003	0.007	0.519	0.099	0.519	245.66	0.07	0.52	58.12	0.0172	0.30	0.66	3252.00	16.87
n-Butane	0.008	0.004	0.008	0.623	0.126	0.622	294.47	0.08	0.62	58.12	0.0172	0.36	0.80	3262.00	20.28
I-Pentane	0.011	0.005	0.011	0.683	0.118	0.682	322.99	0.08	0.68	72.15	0.01386	0.49	1.08	4001.00	27.29
n-Pentane	0.012	0.006	0.012	0.757	0.147	0.756	357.92	0.10	0.76	72.15	0.01386	0.55	1.20	4009.00	30.30
Cyclopentane	0.002	0.000	0.002	0.132	0.000	0.132	62.55	0.00	0.13	70.10	0.01427	0.09	0.20	4110.00	5.43
2-methylpentane	0.004	0.000	0.004	0.221	0.000	0.221	104.75	0.00	0.22	86.18	0.0116	0.19	0.42	4157.70	9.19
3-methylpentane	0.003	0.000	0.003	0.166	0.000	0.165	78.37	0.00	0.17	86.18	0.0116	0.14	0.31	4157.70	6.88
n-Hexane	0.014	0.006	0.014	0.762	0.116	0.762	360.68	0.08	0.76	86.18	0.0116	0.66	1.44	4756.00	36.22
Cyclohexane	0.003	0.000	0.003	0.163	0.000	0.162	76.92	0.00	0.16	84.16	0.01188	0.14	0.30	4485.00	7.28
Mcyclohexane	0.000	0.000	0.000	0.002	0.000	0.002	0.96	0.00	0.00	98.19	0.01018	0.00	0.00	5216.00	0.11
n-Heptane	0.015	0.000	0.015	0.699	0.000	0.698	330.48	0.00	0.70	100.20	0.00998	0.70	1.54	5503.00	38.39
n-Octane	0.011	0.000	0.011	0.447	0.000	0.447	211.55	0.00	0.45	114.23	0.00875	0.51	1.12	6249.00	27.91
n-Nonane	0.002	0.000	0.002	0.063	0.000	0.063	29.66	0.00	0.06	128.26	0.0078	0.08	0.18	6997.00	4.38
n-Decane	0.000	0.000	0.000	0.010	0.000	0.010	4.83	0.00	0.01	142.29	0.00703	0.01	0.03	7743.00	0.79
1tr2cl4-MCC5	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	84.16	0.01188	0.00	0.00	4501.00	0.00
Benzene	0.004	0.000	0.004	0.221	0.000	0.221	104.57	0.00	0.22	78.11	0.0128	0.17	0.38	3742.00	8.26
Toluene	0.001	0.000	0.001	0.045	0.000	0.045	21.26	0.00	0.04	92.14	0.01085	0.04	0.09	4475.00	2.01
Ethylbenzene	0.000	0.000	0.000	0.015	0.000	0.015	7.08	0.00	0.01	106.17	0.00942	0.02	0.03	5222.00	0.78
m-xylene	0.000	0.000	0.000	0.020	0.000	0.020	9.60	0.00	0.02	106.16	0.00942	0.02	0.05	5209.00	1.06
p-xylene	0.000	0.000	0.000	0.009	0.000	0.009	4.39	0.00	0.01	106.16	0.00942	0.01	0.02	5209.00	0.48
o-xylene	0.000	0.000	0.000	0.008	0.000	0.008	3.80	0.00	0.01	106.16	0.00942	0.01	0.02	5209.00	0.42
224-Mpentane	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	114.23	0.00875	0.00	0.00	6232.00	0.00
EGlycol	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.00	62.07	0.01611	0.00	0.00	1488.00	0.00
H2O	0.008	0.000	0.008	2.062	0.000	2.059	975.18	0.00	2.06	18.00	0.05556	0.37	0.82	0.00	0.00
Sum Total	1.000	1.000				100.000						45.46			255.15

			Average
VOC's	0.102	0.029	0.102
HAPs	0.020	0.006	0.020

HP Flare Promax

Flare Gas Volume	139,142	scf/hr (calculated from Promax, Stream (TPL11)310 plus flare purge)
Heating Value	127.86	Btu/scf (calculated from Promax, Stream (TPL11)310 plus flare purge)
Molecular Weight	41.78	lb/lb-mole (calculated from Promax, Stream (TPL11)310 plus flare purge)
DRE	98%	
	2000	lb/ton
	0.001	mton/kg
	379	scf/lb-mole
Conversions	1.00E+06	Btu/MMBtu or scf/MMScf
	1.1023	tons/Mton
	60.00	min/hr
Nat Gas Heating Value	1020	Btu/scf
SO_2 Molecular Wt	64	lb/lb-mole
H_2S Molecular Wt	34	lb/lb-mole
CO_2 Density	0.0526	kg/scf
CH_4 Density	0.0192	kg/scf
N_2O EF	0.0001	kg/MMBtu

Wt Fractions		Mole Fractions		
VOC	0.02%	CO_2	89.80%	
Benzene	0.00%	CH_4	8.77%	
Toluene	0.00%			
E-Benzene	0.00%	**Emission Factors**		
Xylene	0.00%	For ND/MT/WY:		
n-Hexane	0.00%	NO_x*	0.068	lb/mmbtu
2-2-4-Trimet	0.00%	CO*	0.31	lb/mmbtu
H_2S	0.00%	PM**	7.6	lb/mmbtu

*Per AP-42 13.5-1 (2018)
** Per AP-42 Table 1.4-2

Emission Source	Manufacturer	Make	Hours of Operation
ZZZ-181 HP Flare	(MAIN)FUEL GAS (added	PSV-110 on the MBF-110 Fuel Gas Scrubber	0.1
ZZZ-181 HP Flare	(MAIN)FUEL GAS (added	ZZZ-181 Flare Purge via FI-181 Rotameter	8766
ZZZ-181 HP Flare	(TPL11)310	PSV-3147 U/S of MBF-3147 HP Station Scrubber	0.1
		Total	8760
		Hours (Limited)	4000

*Hours cannot be greater than 8760

0.6848 ug/m³/(g/s) Max Ann Conc.

Pollutant	Potential Emissions			Actual Emissions		g/s	ug/m3	Combined LP & HP ug/m3
	lb/hr		tpy	lb/hr	tpy			
VOC's	2.83		5.27	0.05	0.11			
HAPs	0.00		0.01	0.00	0.00			
Benzene		0.00	0.00	0.00	0.00	0.0000017	1.12E-06	2.13E-03
E-Benzene		0.00	0.00	0.00	0.00	0.0000003	2.29E-07	1.96E-04
Toluene		0.00	0.00	0.00	0.00	0.0000007	4.56E-07	5.11E-04
n-Hexane		0.00	0.01	0.00	0.00	0.0000082	5.46E-06	8.12E-03
Xylene		0.00	0.00	0.00	0.00	0.0000007	4.54E-07	4.93E-04
2-2-4-Trimethylpentane		0.00	0.00	0.00	0.00			
NO_x (uncontrolled)	1.21		2.420	1.21	2.42			
CO (uncontrolled)	5.52		11.030	5.52	11.03			
PM (uncontrolled)	0.13		0.27	0.13	0.27			
H_2S (uncontrolled)	0.00		0.00	0.00	0.00			
SO_2 (uncontrolled)	0.00		0.00	0.00	0.00			

Regulated GHG Emissions

	(tpy CO_2e)
CO_2 (Entrained)	550935.49
CO_2 (Combusted)	13789.14
CH_4 (Uncombusted)	20.67
N_2O (Combusted)	2.563
Total CO_2e	15069.807

Mole Fractions Gas	
Methane	8.77%
Ethane	0.11%
Propane	0.13%
Butane	0.23%
Pentane	0.51%
Hexane	3.83%
Heptane	0.12%
Octane	0.10%
Nonane	0.10%
Decane+	0.43%

Stream Flowrates:

(MAIN)FUEL GAS (added)	20.43 lb/min	8302 scf/hr
(MAIN)FUEL GAS (added)	0.52 lb/min	211 scf/hr
(TPL11)310	321.46 lb/min	130629 scf/hr
	Total	139142 scf/hr

Component	HP Flare (wt %)				HP Flare (mol %)				(MAIN)FUEL GAS (added)	(MAIN)FUEL GAS (added)	(TPL11)310	Total Vol%	MW	1/MW	Wt of Gas	Wt%	dH	Heating Value
	(MAIN)FUEL GA	(MAIN)FUEL GAS (	(TPL11)310	Average	(MAIN)FUEL	(MAIN)FUEL	(TPL11)310	Average										
CO_2	0.028	0.028	0.970	0.913	1.085	95.585	95.585	89.801	90.109	201.978	124861.217	89.946	44.01	0.0227	39.59	94.76	0.00	0.00
Nitrogen	0.014	0.014	0.000	0.001	0.857	0.045	0.045	0.127	71.158	0.094	58.313	0.093	28.01	0.0357	0.03	0.06	0.00	0.00
H_2S	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	34.08	0.0293	0.00	0.00	637.00	0.00
Methane	0.919	0.919	0.012	0.067	96.787	3.192	3.192	8.772	8035.201	6.744	4169.355	8.776	16.04	0.0623	1.41	3.37	1010.00	88.64
Ethane	0.009	0.009	0.000	0.001	0.502	0.037	0.037	0.106	41.643	0.078	48.031	0.065	30.07	0.0333	0.02	0.05	1770.00	1.14
Propane	0.004	0.004	0.001	0.001	0.164	0.116	0.116	0.131	13.590	0.244	151.092	0.119	44.10	0.0227	0.05	0.13	2516.00	2.98
i-Butane	0.003	0.003	0.001	0.002	0.099	0.104	0.104	0.118	8.209	0.220	135.888	0.104	58.12	0.0172	0.06	0.14	3252.00	3.37
n-Butane	0.004	0.004	0.001	0.001	0.126	0.087	0.087	0.107	10.419	0.185	114.236	0.090	58.12	0.0172	0.05	0.12	3262.00	2.93
i-Pentane	0.005	0.005	0.001	0.001	0.118	0.068	0.068	0.093	9.830	0.143	88.456	0.071	72.15	0.0139	0.05	0.12	4001.00	2.83
n-Pentane	0.006	0.006	0.002	0.002	0.147	0.091	0.091	0.111	12.163	0.193	119.371	0.095	72.15	0.0139	0.07	0.16	4009.00	3.80
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.012	0.012	0.137	0.000	0.025	15.725	0.011	70.10	0.0143	0.01	0.02	4110.00	0.47
2-methylpentane	0.000	0.000	0.001	0.001	0.000	0.029	0.029	0.080	0.000	0.060	37.376	0.027	86.18	0.0116	0.02	0.06	4157.70	1.12
3-methylpentane	0.000	0.000	0.000	0.000	0.000	0.021	0.021	0.091	0.000	0.045	27.726	0.020	86.18	0.0116	0.02	0.04	4157.70	0.83
n-Hexane	0.006	0.006	0.002	0.002	0.116	0.094	0.094	0.112	9.647	0.200	123.349	0.096	86.18	0.0116	0.08	0.20	4756.00	4.55
Cyclohexane	0.000	0.000	0.000	0.000	0.000	0.024	0.024	0.087	0.000	0.050	30.741	0.022	84.16	0.0119	0.02	0.04	4485.00	0.99
Mcyclohexane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.632	0.000	0.001	0.546	0.000	98.19	0.0102	0.00	0.00	5216.00	0.02
n-Heptane	0.000	0.000	0.002	0.002	0.000	0.108	0.108	0.116	0.000	0.228	141.155	0.102	100.20	0.0100	0.10	0.24	5503.00	5.59
n-Octane	0.000	0.000	0.002	0.002	0.000	0.091	0.091	0.102	0.000	0.193	119.483	0.086	114.23	0.0088	0.10	0.24	6249.00	5.37
n-Nonane	0.000	0.000	0.001	0.000	0.000	0.017	0.017	0.105	0.000	0.036	22.303	0.016	128.26	0.0078	0.02	0.05	6997.00	1.12
n-Decane	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.433	0.000	0.007	4.613	0.003	142.29	0.0070	0.00	0.01	7743.00	0.26
1tr2ci4-MCCS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	84.16	0.0119	0.00	0.00	4501.00	0.00
Benzene	0.000	0.000	0.000	0.000	0.000	0.026	0.026	0.083	0.000	0.054	33.618	0.024	78.11	0.0128	0.02	0.05	3742.00	0.91
Toluene	0.000	0.000	0.000	0.000	0.000	0.009	0.009	0.179	0.000	0.019	11.629	0.008	92.14	0.0109	0.01	0.02	4475.00	0.37
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.395	0.000	0.008	5.074	0.004	106.17	0.0094	0.00	0.01	5222.00	0.19
m-xylene	0.000	0.000	0.000	0.000	0.000	0.004	0.004	0.389	0.000	0.008	5.152	0.004	106.16	0.0094	0.00	0.01	5209.00	0.19
p-xylene	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.768	0.000	0.004	2.588	0.002	106.16	0.0094	0.00	0.00	5209.00	0.10
o-xylene	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.866	0.000	0.004	2.295	0.002	106.16	0.0094	0.00	0.00	5209.00	0.09
224-Mpentane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	114.23	0.0088	0.00	0.00	6232.00	0.00
EGlycol	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	62.07	0.0161	0.00	0.00	1488.00	0.00
H2O	0.000	0.000	0.001	0.001	0.000	0.229	0.229	0.222	0.000	0.485	299.698	0.216	18.00	0.0556	0.04	0.09	0.00	0.00
Sum Total	1.000	1.000	1.000	1.000	100.000	100.000	100.000		8301.97	211.31	130629.03				41.78			127.86

VOC's	0.029	0.029	0.016	0.017
HAPs	0.006	0.006	0.003	0.003

Emission Source	Burner Rating (MMBtu/hr)	Hours of Operation (hours/year)
Process Media Heater BAP-137	27	8760

Destruction Efficiency	0%	
Lower Heating Value	150.17	Btu/scf
Nat Gas Heating Value	1020	Btu/scf
	2000	lb/ton
	0.4536	kg to lbs

Combustion Burner

Totals	**27**	**8760**

Criteria Pollutants and GHG

		Uncontrolled Emissions		Controlled Emissions	
Pollutant	**lb/MMscf[1]**	**lb/hour**	**Tons/year**	**lb/hour**	**Tons/year**
NO_x	100	2.65	11.59	2.65	11.59
CO	84	2.22	9.74	2.22	9.74
SO_2	0.6	0.02	0.07	0.02	0.07
PM	7.6	0.20	0.88	0.20	0.88
VOC	5.5	0.15	0.64	0.15	0.64
HAP	1.89	0.05	0.22	0.05	0.22
CO_2	120000	3176.47	13912.94		
Pollutant	**kg/MMBtu[2]**				
CH_4	0.003	0.18	0.78		
N_2O	0.0006	0.04	0.16		
		CO2e	13979.11		

[1]NOx, CO, VOC, HAP, PM & SO2 Emission Factors are from AP-42 Table 1.4-1 and 1.4-2 (Emission Factors for Nitrogen Oxides (NOx) and Carbon Monoxide (CO) from Natural Gas Combustion).

[2]Nitrogen

Toxic Air Pollutants

Pollutant	Emission Factor (lb/MMScf)	lb/hour	Tons/year
2-Methylnaphthalene	0.000024	6.353E-07	2.783E-06
3-Methylchloranthrene	0.0000018	4.765E-08	2.087E-07
7,12-Dimethylbenz(a)anthrancene	0.000016	4.235E-07	1.855E-06
Acenaphthene	0.0000018	4.765E-08	2.087E-07
Acenaphthylene	0.0000018	4.765E-08	2.087E-07
Anthracene	0.0000024	6.353E-08	2.783E-07
Benz(a)anthracene	0.0000018	4.765E-08	2.087E-07
Benzene	0.0021	5.559E-05	2.435E-04
Benzo(a)pyrene	0.0000012	3.176E-08	1.391E-07
Benzo(b)fluoranthene	0.0000018	4.765E-08	2.087E-07
Benzo(g,h,I)perylene	0.0000012	3.176E-08	1.391E-07
Benzo(k)fluoranthene	0.0000018	4.765E-08	2.087E-07
Chrysene	0.0000018	4.765E-08	2.087E-07
Dibenzo(a,h)anthrancene	0.0000012	3.176E-08	1.391E-07
Dichlorobenzene	0.0012	3.176E-05	1.391E-04
Fluorathene	0.000003	7.941E-08	3.478E-07
Fluorene	0.0000028	7.412E-08	3.246E-07
Formaldehyde	0.075	1.985E-03	8.696E-03
Hexane	1.8	4.765E-02	2.087E-01
Indeno(1,2,3-cd)pyrene	0.0000018	4.765E-08	2.087E-07
Naphthalene	0.00061	1.615E-05	7.072E-05
Phenanathrene	0.000017	4.500E-07	1.971E-06
Pyrene	0.000005	1.324E-07	5.797E-07
Toluene	0.0034	9.000E-05	3.942E-04
Arsenic	0.0002	5.294E-06	2.319E-05
Beryllium	0.000012	3.176E-07	1.391E-06
Cadmium	0.0011	2.912E-05	1.275E-04
Chromium	0.0014	3.706E-05	1.623E-04
Cobalt	0.000084	2.224E-06	9.739E-06
Manganese	0.00038	1.006E-05	4.406E-05
Mercury	0.00026	6.882E-06	3.014E-05
Nickel	0.0021	5.559E-05	2.435E-04
Selenium	0.000024	6.353E-07	2.783E-06
	Total TAPs	0.050	0.219

Emission Factors are from AP-42 Table 1.4-1 and 1.4-2

Combustion Burner

Destruction Efficiency	0%	
Lower Heating Value	150.17	Btu/scf
Nat Gas Heating Value	1020	Btu/scf
Conversion	2000	lb/ton
	0.4536	kg to lbs

Emission Source	Burner Rating (MMBtu/hr)	Hours of Operation (hours/year)
MBK-1107	2	8760
Totals	**2**	**8760**

Criteria Pollutants and GHG

		Uncontrolled Emissions		Controlled Emissions	
Pollutant	**lb/MMscf[1]**	**lb/hour**	**Tons/year**	**lb/hour**	**Tons/year**
NO_x	100	0.20	0.86	0.20	0.86
CO	84	0.16	0.72	0.16	0.72
SO_2	0.6	0.00	0.01	0.00	0.01
PM	7.6	0.01	0.07	0.01	0.07
VOC	5.5	0.01	0.05	0.01	0.05
HAP	1.89	0.00	0.02	0.00	0.02
CO_2	120000	235.29	1030.59		
Pollutant	**kg/MMBtu[2]**				
CH_4	0.003	0.01	0.06		
N_2O	0.0006	0.00	0.01		
		CO2e	1035.49		

[1]NOx, CO, VOC, HAP, PM & SO2 Emission Factors are from AP-42 Table 1.4-1 and 1.4-2 (Emission Factors for Nitrogen Oxides (NOx) and Carbon Monoxide (CO) from Natural Gas Combustion).

Toxic Air Pollutants

Pollutant	Emission Factor (lb/MMScf)	lb/hour	Tons/year
2-Methylnaphthalene	0.000024	4.706E-08	2.061E-07
3-Methylchloranthrene	0.0000018	3.529E-09	1.546E-08
7,12-Dimethylbenz(a)anthrancene	0.000016	3.137E-08	1.374E-07
Acenaphthene	0.0000018	3.529E-09	1.546E-08
Acenaphthylene	0.0000018	3.529E-09	1.546E-08
Anthracene	0.0000024	4.706E-09	2.061E-08
Benz(a)anthracene	0.0000018	3.529E-09	1.546E-08
Benzene	0.0021	4.118E-06	1.804E-05
Benzo(a)pyrene	0.0000012	2.353E-09	1.031E-08
Benzo(b)fluoranthene	0.0000018	3.529E-09	1.546E-08
Benzo(g,h,I)perylene	0.0000012	2.353E-09	1.031E-08
Benzo(k)fluoranthene	0.0000018	3.529E-09	1.546E-08
Chrysene	0.0000018	3.529E-09	1.546E-08
Dibenzo(a,h)anthrancene	0.0000012	2.353E-09	1.031E-08
Dichlorobenzene	0.0012	2.353E-06	1.031E-05
Fluorathene	0.000003	5.882E-09	2.576E-08
Fluorene	0.0000028	5.490E-09	2.405E-08
Formaldehyde	0.075	1.471E-04	6.441E-04
Hexane	1.8	3.529E-03	1.546E-02
Indeno(1,2,3-cd)pyrene	0.0000018	3.529E-09	1.546E-08
Naphthalene	0.00061	1.196E-06	5.239E-06
Phenanathrene	0.000017	3.333E-08	1.460E-07
Pyrene	0.000005	9.804E-09	4.294E-08
Toluene	0.0034	6.667E-06	2.920E-05
Arsenic	0.0002	3.922E-07	1.718E-06
Beryllium	0.000012	2.353E-08	1.031E-07
Cadmium	0.0011	2.157E-06	9.447E-06
Chromium	0.0014	2.745E-06	1.202E-05
Cobalt	0.000084	1.647E-07	7.214E-07
Manganese	0.00038	7.451E-07	3.264E-06
Mercury	0.00026	5.098E-07	2.233E-06
Nickel	0.0021	4.118E-06	1.804E-05
Selenium	0.000024	4.706E-08	2.061E-07
	Total TAPs	0.004	0.016

Emission Factors are from AP-42 Table 1.4-1 and 1.4-2

Fugitives

Description: Oil and Gas Production-Natural Gas Production-Equipment Leak Fugitives
Operating Hours: 8760

Gas Service Fugitive Component Type	Number of Components	Factor (lb/hr/source)	Total Emissions (lbs/hr)	Total Emissions (tons/yr)
Valves	87	0.009920	0.86	3.78
Connectors	309	0.000440	0.14	0.60
Open-Ended Line	11	0.004410	0.05	0.21
Pressure Relief Valves	5	0.019400	0.10	0.42
Total Hydrocarbon Emissions (THC)		*Total*	1.14	5.01

Light Liquid Service Fugitive Component Type	Number of Components	Factor (lb/hr/source)	Total Emissions (lbs/hr)	Total Emissions (tons/yr)
Valves	29	0.005500	0.16	0.70
Flanges	46	0.000243	0.01	0.05
Connectors	28	0.000463	0.01	0.06
Open-ended Lines	0	0.003090	0.00	0.00
Other Components	6	0.016500	0.10	0.43
Pump Seals	0	0.028660	0.00	0.00
Total Hydrocarbon Emissions (THC)		*Total*	0.28	1.24

Oil/Water Service Fugitive Component Type	Number of Components	Factor (lb/hr/source)	Total Emissions (lbs/hr)	Total Emissions (tons/yr)
Valves	0	0.0002160	0.00	0.00
Flanges	0	0.0000060	0.00	0.00
Connectors	0	0.0002430	0.00	0.00
Open-ended Lines	0	0.0005500	0.00	0.00
Other Components	0	0.0309000	0.00	0.00
Total Hydrocarbon Emissions (THC)		*Total*	0.00	0.00

Gas Service Speciation	Stream Weight %	Emissions (lb/hr)	Emissions (tons/yr)
Total VOC	5.45%	0.06	**0.27**
Total HAP	1.70%	0.02	**0.08**

Light Liq. Service Speciation	Stream Weight %	Emissions (lb/hr)	Emissions (tons/yr)
Total VOC	65.81%	0.19	**0.81**
Total HAP	11.22%	0.03	**0.14**

Total Fugitive Component	(lb/hr)	(tons/yr)
Total VOC	0.25	**1.09**
Total HAPS	0.05	**0.22**

Notes:

(1) Emission factors are EPA average emission factors for oil and gas production operations, ref: EPA-453/R-95-017, November 1995, pages 2-13, 2-14, and 2-15.
(2) Component counts are estimates based on 40 CFR 98 Subpart W methodology.
(3) Gas Stream weight composition is based on site specific gas analysis.
(4) Light Liquid Speciation based on site specific analysis of unpressurized liquid (tank outlet).
(5) The "other" equipment type was derived from compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

Fugitive Dust

Onsite Travel	300	ft
	0.06	miles
Non-public Access Road Travel	365	ft
	0.07	miles

Emission Factors [a]	(lb/VMT)	
Small (<50 tons)	2.7	
Medium (50-100 tons)	3.6	
Large (>100 tons)	4.5	
Number of Trucks/day	6	
Annual Miles Traveled	275.82	(miles/yr)
PM_{10} Emissions	0.37	(tpy)

Assumptions

[a]Montana DEQ "Instructions for Registering, Updating, or Deregistering an Oil or Gas Well Facility"; Appendix A; May 2011

VMT = vehicle miles traveled

Assumes an oil tanker carries 90 bbls. Using SG of 0.88 with the density of water 8.34 lb/gal a tanker carries approximately 26,000 lbs (14 tons)

Assumes a PW tanker is 10% heavier than oil = 22 tons

Calculation Methodology

Total Trips Annually = # trucks x 365 days/yr

Annual Vehicle Miles Traveled (AMVT) (miles/yr) = Total Distance Travel Onsite and on non public access roads (miles) x Trips Annually

Of tanker truck visits = total tank capacity/200 bbls/tanker

Emission Rate (tpy) = AMVT x Emission Factor (lb/VMT) / 2000 (lb/ton)

Oil and Water Truck Loading

Inputs

Saturation Factor (s)	0.60			
True Vapor Pressure	1.36	psia	VOC Wt Fraction	65.81%
Molecular Weight	56.86	lb/lb-mole.	HAP Wt Fraction	11.22%
Truck Loading Rate (Oil)	180	bbl/hr	H_2S Wt Fraction	0.00%
Truck Loading Rate (Water)	180	bbl/hr		
Load Time Oil	1	hours		
Load Time Water	1	hours		
Annual Production Oil	2,895,180	bbl/yr		
Annual Production Water	28,591,910	bbl/yr		
Oil is sold through LACT				
Control % Oil[1]	100.00%	Oil is sold via pipeline and typically 100% controlled, assumed 1% pipeline maintenance		
Produced water is transferred through LACT				
Control % Water[1]	100.00%	Water is sold via pipeline and typically 100% controlled, assumed 1% pipeline maintenance		
Temp Bulk Liquid	43.4	°F		
Oil : Water Ratio	0.01			
	503.4	°F to Rankine		
Conversions	42	gal/bbl		
	2000	lb/ton		
	12.46	Loading Constant		

[1] If Oil/Water is hauled by truck, Control % = 0; If Oil/Water is sold by LACT, Control % = 100

	Uncontrolled		Controlled		
	Emissions (lb/hr)	Emissions (ton/year)	VOC (tpy)	HAP (tpy)	H_2S (tpy)
Oil Truck Loading	8.70	69.98	0.46	0.08	0.00
Water Truck Loading	0.09	6.91	0.01	0.01	0.00

(EPA AP-42 Values) Table 1 below is required to supply the saturation factor variable in the above equation.

Cargo Carrier	Mode of Operation	Saturation Factor
Tank Trucks and Rail Tank Cars	Submerged loading of a clean cargo tank	0.5
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00

Petroleum Liquid	Vapor MW at 60F Mv(lb/lb-mole)	Condensed Vapor Density at 60F Wvc(lb/gal)	Liquid Density at 60F W1 (lb/gal)			
Crude Oil RVP5	50	4.5	7.1			
True Vapor Pressure, Pva (psi) at various temperatures in °F						
40	50	60	70	80	90	100
1.8	2.3	2.8	3.4	4	4.8	5.7

(EPA AP-42 Values) Table 2 below may be used to provide the vapor pressure and molecular weight values for the above equation.

A full copy of the hardcopy emission inventory and health risk assessment submitted with the application for MAQP #4740-05 is on file with DEQ.

V. Existing Air Quality

The location for the Bell Creek facility is in NW¼ NE¼ of Section 27, Township 8 South, Range 54 East, in Powder River County, Montana. This area is classified as unclassifiable/attainment for all pollutants for EPA-established national ambient air quality standards. MAQP #4740-05 contains operating and monitoring requirements to ensure that proper operation of the facility would not result in air emissions that violate any ambient air quality standard.

VI. Air Quality Impacts

The permitting action is increasing the annual operational flare hours for the facility. The emissions for the facility have decreased due to corrections to the calculations based on onsite inspections and operations. The decrease is minor, and the conditions and limitations established in MAQP #4740-05 have ensured that the air quality impacts will be negligible.

VII. Ambient Air Impact Analysis

Based on the information provided and the conditions established in MAQP #4740-05, DEQ determined that the impact from this permitting action will be negligible.

VIII. Health Risk Assessment

A health risk assessment was conducted to demonstrate that the proposed increase in flaring complies with the negligible risk requirement of MCA 75-2-215 for incinerators. The environmental effects unrelated to human health were not considered in determining compliance with the negligible risk standard but were evaluated as required by the Montana Environmental Policy Act, in determining compliance with all applicable rules or other requirements requiring protection of public health, safety, and welfare and the environment. Pursuant to ARM 17.8.770(1)(c), pollutants may be excluded from the human health risk assessment if it is determined that exposure from inhalation is the only appropriate pathway to consider in the human health risk assessment and if the ambient concentrations of the pollutants (calculated using the potential to emit, enforceable limits or controls may be considered) are less than the levels specified in Table 1 or Table 2 of ARM 17.8.770. The modeled emission rates for each HAP are converted to ambient impact results using the AERSCREEN model results. The pollutant-specific AERSCREEN model results are calculated as shown in the following example calculation:

- LP Flare Benzene Emissions = 0.00359 lb/hr = 0.0004523 g/s
- LP Flare Unit-based Result = 3.927 (µg/m3)/(g/s)
- Benzene Impact: 0.0004523 g/s * 3.927 (µg/m3)/(g/s) = 0.00178 µg/m3

The modeled impacts from the LP flare and the HP flare are shown in the following tables:

Flare Modeled Emission Rates and AERSCREEN Results

Hazardous Air Pollutant	LP Modeled Emission Rate (lb/hr)	LP Modeled Impact (µg/m^3)	HP Modeled Emission Rate (lb/hr)	HP Modeled Impact (µg/m^3)	Total Modeled Impact (µg/m^3)
Benzene	0.00359	1.77E-03	0.000718	3.01E-05	1.84E-03
Ethylbenzene	0.00032	1.61E-04	0.000300	2.51E-05	1.86E-04
n-Hexane	0.01739	8.61E-03	0.002802	2.35E-04	8.84E-03
Toluene	0.00086	4.23E-04	0.000325	2.73E-05	4.51E-04
m-Xylene	0.00081	4.02E-04	0.0004701	3.94E-05	4.41E-04

The total modeled impacts are compared to the applicable risk assessment *de minimis* levels in Table 4. All of the modeled impacts from the AERSCREEN analysis fall below the pollutant-specific *de minimis* levels. No further risk assessment analysis is required.

Flare HAPs Modeling and Risk Assessment Data

ARM 17.8.770 *De Minimis* Levels					
Hazardous Air Pollutant	Total Modeled Impact (µg/m³)	Cancer Chronic (µg/m³)	Non-Cancer Chronic (µg/m³)	Non-Cancer Acute (µg/m³)	Exclude from Further Analysis?
Benzene	1.84E-03	1.02E-02	0.71	N/A	Yes
Ethylbenzene	1.86E-04	N/A	10.0	N/A	Yes
n-Hexane	8.84E-03	N/A	2.0	N/A	Yes
Toluene	4.51E-04	N/A	4.0	N/A	Yes
m-Xylene	4.41E-04	N/A	3.0	N/A	Yes

IX. Environmental Assessment

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

Denbury Onshore, LLC – Bell Creek Facility

Environmental Assessment (EA)

Montana Air Quality Permit number (MAQP): 4740-05

Air Quality Bureau

APPLICANT: Denbury Onshore, LLC (Denbury)		
SITE NAME: Bell Creek Facility		
PROPOSED PERMIT NUMBER: Montana Air Quality Permit (MAQP) #4740-05		
APPLICATION RECEIVED: 09/12/2022		
APPLICATION DEEMED COMPLETE: 09/30/2022		
LOCATION: NW¼ NE¼ of Section 27, Township 8 South, Range 54 East, in Powder River County, Montana.		**COUNTY: Powder River**
PROPERTY OWNERSHIP:	**FEDERAL ____ STATE ____ PRIVATE _X___**	
EA PREPARER:	**T. Burrows**	
EA Draft Date	**EA Final Date**	**Permit Final Date**
11/14/2022	**12/15/2022**	**12/31/2022**

COMPLIANCE WITH THE MONTANA ENVIRONMENTAL POLICY ACT

The Montana Department of Environmental Quality (DEQ) prepared this Environmental Assessment (EA) in accordance with requirements of the Montana Environmental Policy Act (MEPA). An EA functions to determine the need to prepare an Environmental Impact Statement (EIS) through an initial evaluation and determination of the significance of impacts associated with the proposed action. However, an agency is required to prepare an EA whenever, as here, statutory requirements do not allow sufficient time for the agency to prepare an EIS (ARM 17.4.607(3)(c)). This document may disclose impacts over which DEQ has no regulatory authority.

COMPLIANCE WITH THE CLEAN AIR ACT OF MONTANA

The state law that regulates air quality permitting in Montana is the Clean Air Act of Montana (CAA), §§ 75-2-101, *et seq.*, Montana Code Annotated (MCA). DEQ may not approve a proposed action contained in an application for an air quality permit unless the project complies with the requirements set forth in the CAA and the administrative rules adopted thereunder, ARMs 17.8.101 *et. seq.* The project is subject to approval by the DEQ Air Quality Bureau (AQB) as the potential project emissions exceed the 5 tons per year threshold of regulated pollutants for modifications of permitted facilities (ARM 17.8.743). DEQ's approval of an air quality permit application does not relieve Stillwater from complying with any other applicable federal, state, or county laws, regulations, or ordinances. Stillwater is responsible for obtaining any other permits, licenses, or approvals (from DEQ or otherwise) that are required for any part of the proposed action. Any action DEQ takes at this time is limited to the pending air quality permit application currently before DEQ's AQB and the authority granted to DEQ under the Clean Air Act of Montana. This action is not indicative of any other action DEQ may take on any future (unsubmitted) applications

made pursuant to any other authority (*e.g.,* Montana's Water Protection Act). DEQ will decide whether to issue the pending air quality permit pursuant to the requirements of the CAA alone. DEQ may not withhold, deny, or impose conditions on the permit based on the information contained in this Environmental Assessment. § 75-1-201(4), MCA.

SUMMARY OF THE PROPOSED ACTION

Denbury Onshore, LLC – Bell Creek Facility (Denbury) is modifying the permit to reflect the following changes:

- Increased usage (up to 8,760 hours per year from 500) of the Low Pressure (LP) Flare that backs up the vapor recovery unit (VRU).
- Increased usage (up to 4000 hours per year from 400) of the High Pressure (HP) Flare.
- Updated and corrected component counts based on onsite inspections and operations (resulting in lower fugitive emissions).

Table 1: Proposed Action Details

Proposed Action	
General Overview	Denbury is updating the permit to reflect the following changes: Current 500 hours per year limit on the Low-Pressure (LP) Flare increased to 8760 hours per year, the current limit of 400 hours per year for the High Pressure (HP) Flare increased to 4000 hours per year and correcting the PTE to reflect current component counts based on onsite inspections and operations (resulting in lower fugitive emissions).
Proposed Action Estimated Disturbance	
Disturbance	There would be no additional disturbance as this project would be contained on the current facility property.
Proposed Action	
Duration	**Operational Life:** Although equipment may have functional lives of 20 to 30 years depending on equipment maintenance efforts, the facility would be expected to remain operational as long as economic conditions are favorable.
Construction Equipment	There is no need for additional construction equipment for this project.
Personnel Onsite	No change in staff is necessary to accommodate the project.
Location and Analysis Area	**Location**: The proposed action is located at NW¼ NE¼ of Section 27, Township 8 South, Range 54 East, in Powder River County, Montana. The Project would occur inside the current Denbury property boundary. **Analysis Area**: The area being analyzed as part of this environmental review includes the immediate project area, as well as neighboring lands surrounding the analysis area, as reasonably appropriate for the impacts being considered.
Air Quality	The Draft EA will be attached to the Preliminary Determination Air Quality Permit which would include all enforceable conditions for operation of the emitting units. Any revisions to the EA would be addressed and included in the Final EA attached to DEQ's Decision.

Conditions Incorporated into the Proposed Action	The conditions developed in the Preliminary Determination of the MAQP dated November 14, 2022, set forth in Sections II.A-D.

PURPOSE AND BENEFIT FOR PROPOSED ACTION

DEQ's purpose in conducting this environmental review is to act upon Denbury's air quality permit application No. 4740-05 to: Change the current 500 hours per year limit on the Low-Pressure (LP) Flare to 8760 hours per year, the current limit of 400 hours per year for the High Pressure (HP) Flare to 4000 hours per year and correcting the PTE to reflect current component counts based on onsite inspections and operations (resulting in lower fugitive emissions).

The benefits of the proposed action, if approved, include authorizing Denbury to continue current operations with additional flare capacity and operational flexibility.

Authority to Denbury for operation of the Bell Creek site would continue until the permit is revoked, either at the request of Denbury or by DEQ because of non-compliance with the conditions within the air quality permit.

REGULATORY RESPONSIBILITIES

In accordance with ARM 17.4.609(3)(c), DEQ must list any federal, state, or local, authorities that have concurrent or additional jurisdiction or environmental review responsibility for the proposed action and the permits, licenses, and other authorizations required. Denbury must conduct its operations according to the terms of its permit, the CAA, §§ 75-2-101, *et seq*., MCA, and ARMs 17.8.101, *et seq*.

Denbury must cooperate fully with, and follow the directives of, any federal, state, or local entity that may have authority over Denbury's Bell Creek facility. These permits, licenses, and other authorizations may include: Powder River County, Occupational Safety and Health Administration (OSHA), DEQ AQB (air quality) and Water Protection Bureau (groundwater and surface water discharge; stormwater), and Montana Department of Transportation and Powder River County (road access).

EVALUATION AND SUMMARY OF POTENTIAL IMPACTS TO THE PHYSICAL AND HUMAN ENVIRONMENT IN THE AREA AFFECTED BY THE PROPOSED ACTION:

The impact analysis will identify and evaluate direct and secondary impacts. Direct impacts are those that occur at the same time and place as the action that triggers the effect. Secondary impacts mean "a further impact to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action." ARM 17.4.603(18). Where impacts are expected to occur, the impacts analysis estimates the duration and intensity of the impact.
The duration of an impact is quantified as follows:

- **Short-term**: Short-term impacts are defined as those impacts that would not last longer than the proposed operation of the site.
- **Long-term**: Long-term impacts are defined as impacts that would remain or occur following shutdown of the proposed facility.

The severity of an impact is measured using the following:

- **No Impact**: There would be no change from current conditions.
- **Negligible Impact**: An adverse or beneficial effect would occur but would be at the lowest levels of detection.
- **Minor Impact**: The effect would be noticeable but would be relatively small and would not affect the function or integrity of the resource.

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

TOPOGRAPHY, GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. The annual operation remains unchanged and there are minor increases in authorized processes and equipment capacities. The facility would continue to operate in the same manner. There are no anticipated changes to the impacts on geology and soil quality, stability, and moisture which already occur due to operational activities.

Direct Impacts: No direct impacts are predicted to topography, geology, stability, and moisture with the proposed project.

Secondary Impacts: No secondary impacts to topography, geology, stability, and moisture would be expected because the project is located within the existing Denbury property.

WATER QUALITY, QUANTITY, AND DISTRIBUTION:

There are no planned discharges into surface water because of this project. Therefore, there will be no impact to water quality, quantity, and distribution.

Direct Impacts: No direct impacts are predicted with the proposed project.

Secondary Impacts: No secondary impacts to water quality, quantity, and distribution would be expected because the project is located within the existing Stillwater mine property.

AIR QUALITY:

This permit action results in minor increases to maximum potential emission levels in the emission inventory and the annual facility operations remain unchanged. The facility would continue to operate in the same manner as it currently does but with more operational flexibility.

Direct Impacts: No impacts are anticipated due to the minor decrease in some potential emission levels.

Secondary Impacts: No secondary impacts to air quality would be expected.

VEGETATION COVER, QUANTITY AND QUALITY:

There are no known rare or sensitive plants or cover types present in the site area. No fragile or unique resources or values, or resources of statewide or societal importance, are present.

Direct Impacts: The information provided above is based on the information that DEQ had available to it at the time of completing this EA and provided by the applicant. Available information includes the permit application, analysis of aerial photography, topographic maps, geologic maps, soil maps, and other research tools. As the proposed action would be located within the Denbury Bell Creek site, the vegetation is limited at the site. No impacts to vegetation cover, quantity and quality are expected.

Secondary Impacts: No secondary impacts are expected since there will be no land disturbance at the site.

TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory and there are no new emitting units being authorized. The facility would continue to operate in the same manner as it has previously.

Direct Impacts: There are no anticipated impacts to terrestrial, avian, and aquatic life and habitat.

Secondary Impacts: No secondary impacts to terrestrial, avian, and aquatic life and habitats stimulated or induced by the direct impacts analyzed above or from the project would be expected.

UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. The annual operation remains unchanged, and the facility would continue to operate in the same manner as it currently does, but with additional operational flexibility.

Direct Impacts: There are no anticipated impacts to unique endangered, fragile, or limited environmental resources because of this action.

Secondary Impacts: No secondary impacts to unique endangered, fragile, or limited environmental resources would be expected because of this action.

HISTORICAL AND ARCHAEOLOGICAL SITES:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. The annual operation remains unchanged, and the facility would continue to operate in the same manner within the current Denbury property. No additional land would be disturbed beyond the current property. However, should structures need to be altered, or if cultural materials are inadvertently discovered during this proposed action, SHPO requests their office be contacted for further investigation.

Direct Impacts: No impacts are anticipated to any historical and archaeological sites.

Secondary Impacts: No secondary impacts to historical and archaeological sites are anticipated since the proposed action is located on land currently used by the mine.

SAGE GROUSE EXECUTIVE ORDER:

The project would not be in core, general or connectivity sage grouse habitat, as designated by the Sage Grouse Habitat Conservation Program (Program) at: http://sagegrouse.mt.gov.

Direct Impacts: The proposed action is not located within Sage Grouse habitat, so no direct impacts would occur.

Secondary Impacts: No secondary impacts to sage grouse or sage grouse habitat would be expected since the proposed action is not located within Sage Grouse habitat.

AESTHETICS:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. The annual operations remain unchanged, and the facility would continue to operate in the same manner within the current Denbury property.

Direct Impacts: There are no anticipated impacts to aesthetics.

Secondary Impacts: There are no anticipated secondary impacts to aesthetics.

DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

There is no potential increase in demands on the environmental resources of land, water, air, or energy.

Direct Impacts: There would be no direct impacts to demands on land, water, air, or energy based on this project.

Secondary Impacts: There are no anticipated secondary impacts to demands on land, water, air, or energy.

IMPACTS ON OTHER ENVIRONMENTAL RESOURCES:

No other environmental resources are known have been identified in the area beyond those discussed above.

Direct Impacts: There is no impact to other environmental resources.

Secondary Impacts: No secondary impacts to other environmental resources are anticipated because of the proposed action.

HUMAN HEALTH AND SAFETY:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. Regulated air pollutants have the potential to negatively impact human health. The small increase in maximum potential emission levels could have a negligible impact on human health. A new health risk assessment has been performed for this modification.

Direct Impacts: Negligible change in impacts to human health and safety are anticipated because of this project action. There would be some additional flaring at the site. This would result in minor increases in pollutants at the site due to the increased efficiency of the flares.

Secondary Impacts: No secondary impacts to human health and safety are anticipated because of the proposed action.

INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION:

This permit action results in a minor increase to some maximum potential emission levels in the emission inventory. The current action does not present any potential effects on the agricultural or industrial production. There is no agricultural activity at the site**.**

Direct Impacts: There will be no impacts on the industrial, commercial, and agricultural activities and production in the area.

Secondary Impacts: No secondary impacts to industrial, commercial, and agricultural activities and production are anticipated because of the proposed action.

QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

There will be no change in the number of employees at the Denbury Bell Creek site due to the proposed modification.

Direct Impacts: The proposed action would be expected to have no impact on the distribution of employment.

Secondary Impacts: No secondary impact is expected on employment from the proposed action because the same employee base would be used at the mine.

LOCAL AND STATE TAX BASE AND TAX REVENUES:

The facility would continue to operate in the same manner as before. There would be no changes to the operation. There would be no effects on the local tax and state tax base or tax revenue.

Direct Impacts: Local, state, and federal governments would be responsible for appraising the property, setting tax rates, collecting taxes, from the companies, employees, or landowners benefitting from this operation. No impact is expected on the tax base and revenue with the proposed action.

Secondary Impacts: No secondary impacts to local and state tax base and tax revenues are anticipated because of the proposed action.

DEMAND FOR GOVERNMENT SERVICES:

The proposed modification is on a currently operational site.

Direct Impacts: Compliance review and assistance oversight by DEQ AQB would be conducted in concert with other area activity when in the vicinity. The proposed action would have only minor impacts on demand for government services, mainly through oversight by DEQ AQB.

Secondary Impacts: No secondary impacts are anticipated on government services with the proposed action and a minimal increase in impact would occur from the permitting and compliance needs associated with the proposed project.

LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

DEQ did not find any locally adopted environmental plans and goals.

Direct Impacts: No impacts from the proposed action would be expected relative to any locally adopted community planning goals.

Secondary Impacts: No secondary impacts to the locally adopted environmental plans and goals are anticipated because of the proposed action.

ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

The current site of the proposed action is an operating pipeline facility. No wilderness areas or other recreational sites will be affected in the vicinity.

Direct Impacts: There would be no impacts to the access to wilderness activities because of the proposed modification.

Secondary Impacts: No secondary impacts to access and quality of recreational and wilderness activities are anticipated because of the proposed modification, which is contained within the current Denbury site.

DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

The proposed project would not change the number of workers at the site, so there would be no impact to the density and distribution of population.

Direct Impacts: The project would not add to the population or require additional housing, therefore, no impacts to density and distribution of population and housing are anticipated.

Secondary Impacts: No secondary impacts to density and distribution of population and housing are anticipated because of the proposed action.

SOCIAL STRUCTURES AND MORES:

Operational activity would continue to occur in the same manner as before. The current modification does not present any potential effects on social structures or mores.

Direct Impacts: The proposed modification is located on a currently operational site, no disruption of native or traditional lifestyles would be expected, therefore, no impacts to social structure and mores are anticipated.

Secondary Impacts: No secondary impacts to social structures and mores are anticipated because of the proposed action.

CULTURAL UNIQUENESS AND DIVERSITY:

Operational activity would continue to occur in the same manner as before. The current modification does not present any potential effects on cultural uniqueness or diversity.

Direct Impacts: No impacts to cultural uniqueness and diversity are anticipated from this project.

Secondary Impacts: No secondary impacts to cultural uniqueness and diversity are anticipated because of the proposed action.

PRIVATE PROPERTY IMPACTS:

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

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 to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if NO is checked in response to questions 5a or 5b; the shaded areas)

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

OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

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

ADDITIONAL ALTERNATIVES CONSIDERED:

No Action Alternative: In addition to the proposed action, DEQ also considered the "no-action" alternative. The "no-action" alternative would result in the active permit not reflecting the updated maximum potential emission levels and not allowing the changes to give Denbury more production flexibility. Denbury has complied with the requirements for updating the air quality permit. Therefore, the "no-action" alternative was eliminated from further consideration.

CUMULATIVE IMPACTS:

Cumulative impacts are the collective impacts on the human environment within the borders of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location and generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through preimpact statement studies, separate impact statement evaluation, or permit processing procedures.

Currently, there are no other permit applications for this facility pending before DEQ. Although additional permits may be necessary for this facility in the future, without a pending permit application containing the requisite information, DEQ cannot speculate about which permits may be necessary or which permits may be granted or

denied. This environmental review analyzes only the proposed action submitted by Denbury, which is the air quality permit regulating the emissions from the equipment as listed in the "proposed action" section, above.

DEQ considered potential impacts related to this project and potential secondary impacts. Due to the limited activities in the analysis area, cumulative impacts related to this proposed action would be minor. The cumulative table for any direct and secondary impacts is located at the very end of this EA.

PUBLIC INVOLVEMENT:

Scoping for this proposed action consisted of internal efforts to identify substantive issues and/or concerns related to the proposed action. Internal scoping consisted of internal review of the EA document by DEQ Air Permitting staff. Additionally, the EA for the Denbury – Bell Creek Facility was reviewed extensively.

Internal efforts also included queries to the following websites/ databases/ personnel:
- Montana State Historic Preservation Office
- Montana DEQ
- Montana Natural Heritage Program

A thirty-day public comment period occurs along with the Preliminary Determination on MAQP #4740-05 and is posted to the DEQ website.

OTHER GOVERNMENTAL AGENCIES WITH JURSIDICTION:

The proposed action would be fully located on privately-owned land. All applicable local, state, and federal rules must be adhered to, which, at some level, may also include other local, state, federal, or tribal agency jurisdiction. Other Governmental Agencies which may have overlapping, or sole jurisdiction include but may not be limited to: Powder River County Commission or County Planning Department (zoning), Occupational Safety and Health Administration (worker safety), DEQ AQB (air quality) and Water Protection Bureau (groundwater and surface water discharge; stormwater), DNRC (water rights), and MDT and Powder River County (road access).

NEED FOR FURTHER ANALYSIS AND SIGNIFICANCE OF POTENTIAL IMPACTS:

Under ARM 17.4.608, DEQ is required to determine the significance of impacts associated with the proposed action. This determination is the basis for the agency's decision concerning the need to prepare an environmental impact statement and refers to DEQ's evaluation of individual and cumulative impacts. DEQ is required to consider the following criteria in determining the significance of each impact on the quality of the human environment:

1. The severity, duration, geographic extent, and frequency of the occurrence of the impact.

   "Severity" is analyzed as the density of the potential impact while "extent" is described as the area where the impact is likely to occur. An example could be that a project may propagate ten noxious weeds on a surface area of 1 square foot. In this case, the impact may be a high severity over a low extent. If those ten noxious weeds were located over ten acres there may be a low severity over a larger extent.

   "Duration" is analyzed as the time period in which the impact may occur while "frequency" is analyzed as how often the impact may occur. For example, an operation that occurs throughout the night may have impacts associated with lighting that occur every night (frequency) over the course of the one season project (duration).

2. The probability that the impact will occur if the proposed action occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur.

3. Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts.

4. The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values.

5. The importance to the state and to society of each environmental resource or value that would be affected.

6. Any precedent that would be set because of an impact of the proposed action that would commit the DEQ to future actions with significant impacts or a decision in principle about such future actions.

7. Potential conflict with local, state, or federal laws, requirements, or formal plans.

The significance determination is made by giving weight to these criteria in their totality. For example, impacts with moderate or major severity may be determined to be not significant if the duration of the impacts is short-term. As another example, however, moderate, or major impacts of short-term duration may be considered significant if the quantity and quality of the resource is limited and/or the resource is unique or fragile. As a final example, moderate or major impacts to a resource may be determined to be not significant if the quantity of that resource is high or the quality of the resource is not unique or fragile.

Preparation of an EA is the appropriate level of environmental review under MEPA if statutory requirements do not allow sufficient time for an agency to prepare an environmental impact statement, pursuant to ARM 17.4.607. An agency determines whether sufficient time is available to prepare an environmental impact statement by comparing statutory requirements that establish when the agency must make its decision on the proposed action with the time required to obtain public review of an environmental impact statement plus a reasonable period to prepare a draft environmental review and, if required, a final environmental impact statement.

SIGNIFICANCE DETERMINATION:

The severity, duration, geographic extent, and frequency of the occurrence of the primary, secondary, and cumulative impacts associated with the proposed action would be limited. Denbury proposes to modify operations at the Bell Creek site as described in MAQP #4740-05. The modification would occur completely on the Denbury property and is located on private land.

DEQ has not identified any significant impacts associated with the proposed action for any environmental resource. Approving Denbury's air quality permit application would not set precedent that commits DEQ to future actions with significant impacts or a decision in principle about such future actions. If Denbury submits another permit application, DEQ is not committed to approve that application. DEQ would conduct a new environmental assessment for any subsequent air quality permit applications sought by Denbury. DEQ would decide on Denbury's subsequent application based on the criteria set forth in the CAA.

DEQ's issuance of a modified MAQP to Denbury for this proposed operation also does not set a precedent for DEQ's review of other applications, including the level of environmental review. A decision of on the appropriate level of environmental review is made based on case-specific considerations of the criteria set forth in ARM 17.4.608.

DEQ does not believe that the proposed action has any growth-inducing or growth-inhibiting aspects or that it conflicts with any local, state, or federal laws, requirements, or formal plans. Based on a consideration of the criteria set forth in ARM 17.4.608, the proposed state action is not predicted to significantly impact the quality of the human environment. Therefore, at this time, preparation of an EA is determined to be the appropriate level of environmental review under MEPA.

Environmental Assessment and Significance Determination Prepared By:

T. Burrows	Air Quality Permitter
Name	Title

EA Reviewed By:

Ed Warner	Lead Engineer
Name	Title

References

Air Quality Permit Application Deemed Complete October 27, 2022
Air Quality Bureau Permitted Source List-GIS Layer