



Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

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May 17, 2012

Mr. Larry Zink
Montana Sulphur and Chemical Company
P.O. Box 31118
627 ExxonMobil Road
Billings, MT 59101

Dear Mr. Zink:

Montana Air Quality Permit #2611-04 is deemed final as of May 17, 2012, by the Department of Environmental Quality (Department). This permit is for an existing gas processing and sulfur recovery facility. All conditions of the Department's Decision remain the same. Enclosed is a copy of your permit with the final date indicated.

For the Department,

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

Jenny O'Mara
Environmental Engineer
Air Resources Management Bureau
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VW:JO:JH
Enclosures

Montana Department of Environmental Quality
Permitting and Compliance Division

Montana Air Quality Permit #2611-04

Montana Sulphur and Chemical Company
P.O. Box 31118
627 ExxonMobil Road
Billings, MT 59101

May 17, 2012



MONTANA AIR QUALITY PERMIT

Issued to: Montana Sulphur & Chemical Co.
P. O. Box 31118
Billings, MT 59107

MAQP #2611-04
Administrative Amendment (AA) Request
Received: 07/27/2010
Department Decision on AA: 05/01/2012
Permit Final: 05/17/2012
AFS # 111-0014

A Montana Air Quality Permit (MAQP), with conditions, is hereby granted to Montana Sulphur and Chemical Company (MSCC), 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

MSCC is a gas processing and sulfur recovery facility consisting of an amine unit to treat gases from the Exxon refinery; a Claus plant; a Monaca process to create hydrogen sulfide or carbon disulfide; and associated equipment. MSCC is located near the Exxon refinery and is about 3 miles northeast of Billings. The street address is 627 ExxonMobil Road. The plant is located in the SW ¼ of Section 24, Township 1 North, Range 26 East, Yellowstone County, Montana. A list of permitted equipment can be found in the permit analysis.

B. Current Permit Action

On February 23, 2007, MSCC submitted a de minimis notification to the Montana Department of Environmental Quality-Air Resources Management Bureau (Department) for SuperClaus Unit #2. Additionally, on February 25, 2009, MSCC submitted a de minimis notification to the Department to install an inert gas system boiler (Clever Brooks Boiler) to improve heat recovery.

On May 21, 2010, MSCC submitted a renewal application for their Title V Operating Permit #2611-03. The Department requested additional information on July 19, 2010 and also requested information regarding the status of ATS project. On August 10, 2010, MSCC responded to the Department's request stating that MSCC only constructed the second incinerator and the rest of the process (ATS) was never constructed. Pursuant to Administrative Rules of Montana (ARM) 17.8.762, this portion of the permit would have expired because construction or installation did not commence within the time specified. Therefore, this permit action removes all conditions and applicable references to the ATS unit.

In addition, on July 27, 2010, MSCC requested that the Department update emitting units for clarification to reflect current naming conventions used at the facility. MSCC requested the following:

- Update the mailing address of the facility to 627 ExxonMobil Road;
- Change the name of the redundant incinerator to Incinerator East;
- Change the name of the 100-foot stack to the 30-meter stack;
- Change the name of the existing incinerator to Incinerator West; and
- Change the 35 million british thermal units per hour (MMBtu/hr) Incinerator to Incinerator East.

Additionally, on August 10, 2010, the Department received a de minimis request to add a cooling tower and to replace the boiler treatment lagoon with a boiler blowdown tank. The boiler blowdown tank replaces the 'Boiler Treatment Lagoon with Aeration'. This system allows water previously routed to the lagoon for percolation and evaporation to be released to the blowdown tank system. According to MSCC, MSCC was required to make this change during renewal of their Montana Pollution Discharge and Elimination System (MPDES) Permit.

In response to the renewal application submitted by MSCC, the Department completed several updates to MSCC's Title V Operating Permit (OP) and this was finalized on January 3, 2012. The operating permit includes conditions of the Federal Implementation Plan for the Billings/Laurel, MT Sulfur Dioxide Area (FIP) and the Stipulated Agreement between the Department and MSCC signed in June of 1998. These conditions exist in the Title V OP, however, MSCC is also required to meet the conditions of the MAQP in addition to the Title V applicable requirements.

In addition to those changes mentioned above, this permit action also updates current language and rule references used by the Department and the emission inventory.

SECTION II: Limitations and Conditions

A. Emission Limitations

1. MSCC shall meet the following for the sulfur vaporizer heater and steam/methane superheater:
 - a. MSCC shall be allowed to burn a combination of natural gas and refinery gas in the sulfur vaporizer heater and steam/methane superheater (ARM 17.8.749).
 - b. MSCC shall not burn fuel gas, which contains in excess of 30 parts per million by volume (ppm_v) hydrogen sulfide (H₂S) averaged on an annual basis (ARM 17.8.752).
 - c. MSCC shall not cause or authorize visible emissions to be discharged that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304 (2)).
 - d. Oxides of Nitrogen (NO_x) Emissions from the Monaca heaters shall not exceed (ARM 17.8.749):
 - i. 0.48 pounds per hour (lb/hr) (Sulfur Vaporizer), and
 - ii. 0.27 lb/hr (Steam/Methane).
2. MSCC shall meet the following for the 17 MMBtu/hr boiler:
 - a. MSCC shall not cause or authorize visible emissions to be discharged that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304 (2)).
 - b. MSCC shall fire the 17 MMBtu/hr boiler exclusively on pipeline quality natural gas whenever emissions are vented to any stack other than the 100-Meter Main Stack¹ (ARM 17.8.749).
 - c. MSCC shall vent emissions from the burning of any diesel or oil to the 100-Meter Main Stack (ARM 17.8.749).

¹This stack is referred to as the "100-meter main stack" (213-foot minimum) for purposes of identification only. The GEP stack height is independent of the reference to 100-meters. In addition, MSCC was/is not required to build the new stack to a height of 100 meters. GEP height is 97.5 meters, as determined by DEQ in 1997.

- d. MSCC is limited to burning 25,000 gallons of any waste or residual oil per rolling 12 months (ARM 17.8.749).
 - e. MSCC is limited to burning 250,000 gallons of diesel per rolling 12 months (ARM 17.8.749).
3. MSCC shall meet the following for the Incinerator East:
 - a. MSCC shall not cause or authorize to be discharged into the atmosphere any visible emissions from the Incinerator East that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes (ARM 17.8.752).
 - b. MSCC shall only vent emissions from the Incinerator East to the 100-Meter Main Stack, or the 30-meter stack. When venting to the 30-meter stack, MSCC shall only use pipeline quality natural gas as fuel (ARM 17.8.749).
 4. MSCC shall meet the following for the 100-Meter Main Stack (213 feet - minimum height):
 - a. Opacity -MSCC shall not cause or authorize visible emissions to be discharged from Incinerator East that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes (ARM 17.8.304 (2)).
 - b. Opacity - MSCC shall not cause or authorize visible emissions to be discharged from the existing Claus operation, and the 17-MMBtu/hr boiler that exhibit an opacity of 40% or greater averaged over 6-consecutive minutes (ARM 17.8.304 (1)).
 5. NO_x emissions from Hydrogen Plant Stack are limited to 125 lb/day and 22.72 tons per year (tpy) (ARM 17.8.752).
 6. SO₂ emissions from the Railroad Boiler are limited to 5.0 tpy when vented to the 100-foot stack or its own local stack. The Railroad boiler may also vent to the 100-Meter Main Stack.
 7. MSCC shall not cause or authorize emissions to be discharged into the outdoor atmosphere from the Incinerator West, the Railroad Boiler, the H-1 Unit, the H1-A Unit, the H1-1 Unit, H1-2 Unit, and the H1-2 Unit that exhibit an opacity of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304(1)).
 8. MSCC shall not process more than 82 tons of hydrogen sulfide (H₂S) gas per day in the liquefaction unit (ARM 17.8.749).
 9. MSCC 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).
 10. All access roads shall use paving, chemical dust suppression, or watering to limit excessive fugitive dust and maintain compliance with the reasonable precaution limitation. Construction and earthmoving activities shall use reasonable precautions to limit excessive fugitive dust to mitigate impacts to nearby residential and commercial places (ARM 17.8.749).
 11. MSCC shall install and operate the following continuous emission monitors/continuous emission rate monitors (Continuous Emission Monitoring System/Continuous Emission Rate Monitoring System (CEMs/CERMs)) on the 100-Meter Main Stack (213 feet):
 - a. Sulfur dioxide (SO₂) CEMS.
 - b. Volumetric flow rate and temperature monitor.

All CEMS shall be operated pursuant to any and all requirements of Exhibit A of the STIP (Appendix F) and pursuant to the FIP.

12. MSCC shall quantify SO₂ emissions from the overall sulfur recovery facility on a quarterly basis and report these emissions within 30 days of the end of each calendar quarter. The quantification method of the SO₂ emission levels for the 100-Meter Main Stack shall be taken from the CEMs/CERMs specified in Section II.A.11. MSCC shall report to the Department any time in which Claus plant emissions are redirected to the 30-meter stack instead of the 100-Meter Main Stack. The report shall also include all SO₂ emissions from the sulfur recovery facilities, which result from bypassing the 100-Meter Main Stack to the flare stacks. In addition, the report must include the time, duration, and quantity of pollutants emitted and the reasons for the bypass. Flaring events shall be summarized daily and submitted along with the quarterly report in accordance with the provisions of the 1998 Stipulation between MSCC and the Department and adopted by the Board of Environmental Review (Board) on June 12, 1998.
13. MSCC shall monitor and record the daily standard cubic feet (scfd) of fuel gas consumed by the railroad boiler, both incinerator units, the sulfur vaporizer heater, and the steam/methane superheater.
 - a. Railroad boiler
 - b. Incinerator East (35 MMBtu/hr) and Incinerator West
 - c. Sulfur vaporizer heater and steam/methane heater
14. MSCC shall operate and maintain a temperature monitor (at a minimum a thermocouple) on the 30-meter stack, and shall monitor and record the average daily (24-hour) stack temperature in the 30-meter stack. MSCC shall report, quarterly, any dates and hours in which the stack temperature exceeds 250 degrees Fahrenheit (°F) (ARM 17.8.749 and STIP).
15. Compliance with Section II.A.4 through A.6 requirements, where applicable, shall be determined by utilizing data taken from CEMs specified in Section II.A.11 and other Department-approved sampling methods. However, opacity compliance may also be determined via EPA Reference Method 9 by a certified observer or monitor. The above does not relieve MSCC from meeting any applicable requirements of 40 CFR Part 60, Appendices A and B, or other stack testing that may be required by the Department (ARM 17.8.105 Testing Requirements). Reporting requirements shall be consistent with 40 CFR Part 60, or as specified by the Department. All gaseous continuous emission monitors shall be required to comply with quality assurance/quality control procedures in 40 CFR Part 60, Appendix F. The CEMs shall be required to be maintained such that it is available and operating at least 90% of the source operating time during any given quarter. CEM systems are to be in operation at all times when the emission units are operating, except for quality assurance and control checks, breakdowns and repairs. In the event that the primary CEM system is unable to meet minimum availability requirements, MSCC shall provide a back up or alternative monitoring system and plan such that continuous compliance can be demonstrated as provided in the 1998 Stipulation. The Department shall approve such contingency plans.
16. Compliance testing and continuous monitor certification shall be as specified in 40 CFR Part 60, Appendices A and B. Test methods and procedures, where there is more than one option for any given pollutant, shall be worked out with the Department prior to commencement of testing and in compliance with the Montana Source Test Protocol and Procedures Manual.
17. The emergency/backup generator shall not operate for more than 500 hours per rolling 12-month average (ARM 17.8.749).

18. MSCC shall maintain a stack for the emergency/backup generator that stands no less than 25 feet above ground level (ARM 17.8.749).
19. MSCC shall operate the emergency/backup generator using low sulfur diesel fuel (sulfur content less than or equal to 500 parts per million (ppm)) (ARM 17.8.749).

B. Monitoring and Reporting

1. MSCC shall install, operate and maintain the applicable CEMs/CERMs listed in Section II.A.11. Emission monitoring shall be subject to 40 CFR Part 60, Appendix B (Performance Specifications 2 and 6) and Appendix F (Quality Assurance/Quality Control) provisions. Any stack testing requirements that may be required shall be conducted according to 40 CFR Part 60, Appendix A and ARM 17.8.105, Testing Requirements provisions.
2. MSCC shall provide quarterly emission reports from the emission rate monitor(s). Emission reporting for SO₂ from the 100-Meter Main Stack shall consist of 24-hour calendar day totals per calendar quarter. The quarterly report shall also include the following:
 - a. Source or unit operating time during the reporting period.
 - b. Monitoring down time which occurred during the reporting period.
 - c. A summary of excess emissions for each pollutant and averaging period identified in Section II.A.1 through A.6.
 - d. Reasons for any excess emissions above those specifically allowed in Section II.A. with mitigative measures utilized and corrective actions taken to prevent a recurrence of the upset situation.
 - e. MSCC shall report quarterly the total amount of refinery fuel gas and natural gas burned at the Incinerator East, the Incinerator West, the hydrogen plant, the railroad boiler, the sulfur vaporizer heater and the steam/methane heater.

MSCC shall submit quarterly emission reports within 30 days of the end of each calendar quarter.

3. Copies of said quarterly emissions report, excess emissions, and all other such items mentioned in Section II.B.2 above, shall be submitted to both the Billings regional office and the Helena office of the Department.

C. 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. The Department may require testing (ARM 17.8.105).

D. Operational and Emission Inventory Reporting Requirements

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

Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505). MSCC shall submit the following information annually to the Department by March 1 of each year; the information may be submitted along with the annual emission inventory (ARM 17.8.505).

- a. By the 25th of each month, MSCC shall calculate a new 12-month total using the previous 12 month's data of total gallons of oil and/or diesel burned in the 17 MMBtu/hr boiler during the previous 12 months to verify compliance with the limitations in Section II.A.2 (ARM 17.8.749).
 - b. By the 25th of each month, MSCC shall calculate a new 12-month total using the previous 12-month's data of the hours of operation and the fuel consumption of the emergency/backup generator. A written report, including the previous 12-month total of the hours of operation and fuel consumption of the emergency/backup generator, shall be submitted annually to the Department along with the annual emission inventory (ARM 17.8.749).
2. MSCC shall notify the Department of any construction or improvement project conducted, pursuant to ARM 17.8.745, that would include *the addition of a new emissions unit*, change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation. The notice must be submitted to the Department, in writing, 10 days prior to startup or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(l)(d) (ARM 17.8.745).
 3. All records compiled in accordance with this permit must be maintained by MSCC as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

SECTION III: General Conditions

- A. Inspection – MSCC shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (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 MSCC fails to appeal as indicated below.
- C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving MSCC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.* (ARM 17.8.756).
- D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties, or other enforcement action as specified in Section 75-2-401, *et seq.*, MCA.

- E. Appeals – Any person or persons jointly or severally adversely affected by the Department’s decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefor, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The filing of a request for a hearing does not stay the Department’s decision, unless the Board issues a stay upon receipt of a petition and a finding that a stay is appropriate under Section 75-2-211(11)(b), MCA. The issuance of a stay on a permit by the Board postpones the effective date of the Department’s decision until conclusion of the hearing and issuance of a final decision by the Board. If a stay is not issued by the Board, the Department’s decision on the application is final 16 days after the Department’s decision is made.
- F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy of the air quality permit shall be made available for inspection by the Department at the location of the source.
- G. Permit Fee – Pursuant to Section 75-2-220, MCA, failure to pay the annual operation fee by MSCC may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.
- H. Duration of Permit – Construction or installation must begin or contractual obligations entered into that would constitute substantial loss within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall expire (ARM 17.8.762).

Montana Air Quality Permit Analysis
Montana Sulphur & Chemical Company (MSCC)
Montana Air Quality Permit (MAQP) #2611-04

I. Introduction/Process Description

A. Permitted Equipment

MSCC receives sulfur-containing fuel gases from Exxon and desulfurizes these gases in its amine unit, and returns low-sulfur fuel gas back to the refinery. The main purpose of the facility is to convert the raw sulfur compounds from fuel gases, acid gases, and other materials to create useful, marketable products. MSCC creates a multitude of products including: elemental sulfur, carbon sulfides; sodium hydrosulfide (NaSH); and dry fertilizers. The plant is located in the SW ¼ of Section 24, Township 1 North, Range 26 East, Yellowstone County, Montana, on 627 ExxonMobil Road, Billings, MT.

This permit covers the following sources:

1. Monaca processing equipment designed for the production of supplementary hydrogen sulfide gas for the MSCC facility. The Monaca system consists of two possible emission sources:
 - a. Sulfur Vaporizer Heater, and
 - b. Steam/Methane Superheater.
2. A 100-Meter Main Stack to serve the existing sulfur recovery operations (i.e., Claus and SuperClaus).
3. Incinerator East, with optional waste heat recovery boiler. Incinerator East may serve as a backup to Incinerator West.
4. A 100-Meter Main Stack [213-foot (minimum height)] and a 125-foot “East” flare stack located near the Monaca unit.
5. A 17 Million british thermal units per hour (MMBtu/hr) Boiler fired on natural gas, waste and/or residual oil, and diesel fuel.
6. An emergency/backup generator.
7. SuperClaus Unit #1 and #2.
8. An inert gas system boiler (Cleaver-Brooks Boiler).
9. A boiler blowdown tank.
10. A cooling tower.

B. Source Description

MSCC operates a gas processing and sulfur recovery facility consisting of an amine unit to treat gases from the Exxon refinery, a Claus plant, and a Monaca process to create hydrogen sulfide or carbon disulfide. MSCC is located in Lockwood, adjacent to the Exxon Refinery, about three miles northeast of Billings. The MSCC plant lies between the railroad mainline and the refinery. The street address is 627 ExxonMobil Road. The plant is located in the vicinity of the SW ¼ of Section 24, Township 1 North, Range 26 East, Yellowstone County, Montana.

The elemental sulfur produced in the Claus plant may be sold directly or further processed into fertilizer products or industrial sulfur products. Sulfur may be sent to the Monaca process (which was installed in 1992) to create hydrogen sulfide. The Monaca process itself has air emissions below the de minimis threshold. It is designed as a completely enclosed system with the exception of the emissions from the two associated heaters which burn natural gas and/or refinery gas. The amount of H₂S gas produced by MSCC is to remain at the level of not more than 3.4 tons per hour (82 tons per day (tpd)). The Monaca unit will allow MSCC different means of producing hydrogen sulfide (H₂S) gas to be used to produce liquid H₂S.

MSCC currently manufactures a number of sulfur containing compounds such as H₂S, NaSH, "sweetened" refinery fuel gas (amine treatment), elemental and flaked sulfur. The current Claus operation extracts elemental sulfur from the Exxon Refinery. At one time, MSCC proposed to add a new ammonium thiosulfate (ATS) process and hydrogen plant to its existing operation but the ATS unit was never constructed and has been removed from the MAQP. However, MSCC did install the Incinerator East that was originally associated with the ATS unit and is currently used to control odors, opacity and adds to facility reliability.

The older Claus sulfur plant consists of a thermal Claus reaction whereby the incoming H₂S stream is partially burned to sulfur dioxide in the sulfur boilers. Additional H₂S is added to the process and elemental sulfur and water are formed. Hydrocarbon compounds are also oxidized to carbon dioxide and water in both the sulfur boiler and incinerator boilers. The efficiency of two-in-series, 2-stage configured Claus processes is 92- 95 percent (%) for sulfur removal (according to AP-42). The production design capacity for the Claus elemental sulfur plant was given at 250 long tons per day (lt/d) but largely depends on the unit configuration.

The hydrogen plant and pressure swing absorption (PSA) unit were installed to produce high purity hydrogen gas. The hydrogen has sales potential and can also be utilized in the production of hydrogen sulfide. The hydrogen plant's heater unit was equipped with low - NO_x burners to minimize those emissions. The hydrogen plant capacity was lowered and hence the NO_x emissions are projected to be less than 25 tons per year (tpy).

C. Permit History

On November 30, 1990, **MAQP #2611** was issued to MSCC. MSCC applied via MAQP Application #2611 to modify its existing sulfur recovery operation. Modifications to some existing equipment, as well as new equipment additions, were planned.

MSCC receives waste or byproduct sulfur feed stocks (acid gases, H₂S) from the Exxon Refinery. During this permit action, MSCC proposed to add new equipment to enable them to manufacture ATS solutions. This material was to be primarily cropland fertilizer, but had other useful applications. The date of the submitted permit application was September 25, 1989. Additional permitting information and clarifications were requested by the Department of Environmental Quality (Department) on October 25, 1989 and April 16, 1990. However, construction of the ATS project was suspended in October of 1992 due to litigation initiated by Exxon. Following the conclusion of the litigation, MSCC intended to proceed with construction.

The basis for this permit application (with respect to the ATS equipment) was due to a net sulfur dioxide (SO₂) emission reduction. However, MSCC had not committed to a permanent SO₂ emission reduction since they reserved the right to maintain the current Claus elemental sulfur operation. Therefore, at that time, it was difficult to quantify the real extent of the actual SO₂ emission reduction. It was estimated that the potential SO₂ emission reduction would have been anywhere from 3050 to 3481 tpy depending on the operating time and efficiency scenario (i.e., best/worst case) of the ATS plant. The SO₂ emission reduction would be zero, however, if the ATS unit was not operated.

Based on comments received from the Environmental Protection Agency (EPA) relating to the ATS plant and the potential of triggering Prevention of Significant Deterioration of Air Quality (PSD) permitting, the Department established an overall emissions cap at the facility for SO₂ emissions. The permitted cap was 4162 tons per calendar year (tpy). This figure reflected the 1988 rate of emissions from the MSCC facility. The 1988 emissions represented the highest rate of actual SO₂ emissions in recent years.

On November 18, 1993, MSCC was issued **MAQP #2611-01** to construct and operate the Monaca processing equipment at its sulfur processing plant. The Monaca equipment was designed for the production of supplementary hydrogen sulfide for the facility. The Monaca unit is capable of producing about 2 tons per hour of H₂S gas. This gas is then sent to the liquefaction unit. The addition of the Monaca unit did not increase the amount of liquid H₂S produced since it would provide a different mechanism for providing H₂S gas to the liquefaction unit.

In response to comments received by MSCC during the Preliminary Determination comment period, minor changes were made to Section II. A.2. and B, Section III.B.5., Section IV, Section V.H. and Section I.D.12. as part of the Department Decision. Additionally, comments on the draft department decision resulted in a clarification of the monitoring requirements in Section II.F.

MAQP #2611-02 allowed MSCC to install a 17 MMBtu/hr boiler for steam generation and plant heating and to install an additional 35 MMBtu/hr incinerator (also known as Incinerator East). The boiler did not debottleneck any process; thus, sulfur production would not increase as a result of the installation of the boiler. The boiler vents through the 30-meter stack, 100-Meter Main Stack, or its own stack. However, the emissions must be vented to the 100-Meter Main Stack whenever any fuel (diesel or oils) other than natural gas is fired in order to preserve the requirements of the Stipulation adopted by the Board of Environmental Review (Board) on June 12, 1998 (1998 Stipulation). MAQP #2611-02 allowed the incinerator to operate in two different modes. In one mode, the incinerator would serve as a backup to the current incinerator; while in a second mode the incinerator would serve as a source of sulfur feed to the ATS plant. The air dispersion modeling performed by MSCC for the hazardous air pollutants (HAP) emitted from the incinerator demonstrated compliance with the negligible risk requirement.

In addition, this permitting action authorized MSCC to continue construction of the ATS process equipment and updated the permit with correct rule references and current permit language. Originally, when MAQP #2611 was issued for the ATS process, emission limits were established for the ATS equipment and a plant-wide emission limit was included in order to avoid PSD review. The project was not completed by November 30, 1996, and, according to MAQP #2161-01, Section V.H, those portions of the permit pertaining to the ATS process were revoked. Therefore, the emission limits established on a plant-wide basis and for the 100-Meter Main Stack were also rescinded.

On November 13, 1998, MSCC sent a letter to the Department requesting that equipment related to the construction and operation of the ATS operation be retained in the permit. MSCC provided a new Best Available Control Technology (BACT) review for the ATS equipment and stated that MSCC would be preparing a Permit Application (#2611-02) for the incinerator.

MAQP #2611-02 re-established emission limits for the 100-Meter Main Stack and all associated ATS equipment. The SO₂ emission limit for the 100-Meter Main Stack were based on the average of the last 2 years of actual emissions from the 100-Meter Main Stack plus 39 tons minus the SO₂ emissions from the quench water evaporator treating cooling towers emissions (57.52 tpy) (the quench water evaporator treating cooling towers emissions had their own emission limit and were not included in emission limit for the 100-Meter Main Stack).

The previous SO₂ permit limit of 3829 tpy became 3817 tpy. The 21 tons per day (tpd) SO₂ limit for the 100-Meter Main Stack was removed from the permit because it was based on previous modeling for the 100-Meter Main Stack that was conducted at a 65-meter stack height. The limit

was previously included to protect the National Ambient Air Quality Standards (NAAQS). Since that time, the 1998 Stipulation has incorporated emission limits to protect the NAAQS using a buoyancy flux curve. The limits previously established for the ATS equipment remained the same as MAQP #2611-01, with the exception of the plant wide emissions limit. This limit had been omitted because it was no longer necessary with the new limit established for the 100-Meter Main Stack. The limits imposed for the 100-Meter Main Stack and associated equipment were less than those required for PSD review. The facility's allowable emissions for the boiler and incinerator increased by 2.4 tpy of particulate matter with an aerodynamic diameter of less than or equal to 10 microns (PM₁₀), 9 tpy of carbon monoxide (CO), 23.7 tpy of oxides of nitrogen (NO_x), 0.4 tpy of SO₂, and 0.9 tpy of volatile organic compounds (VOC).

In response to comments received by MSCC, in a June 9, 1999, letter during the Preliminary Determination comment period, minor changes were made to Section II. A.2, 3,13,14,17, Section II.E.4, and Section IV.H. as part of the Department Decision. MAQP #2611-02 replaced MAQP #2611-01.

On November 23, 2001, the Department received a request from MSCC for approval of a de minimis action that would add an emergency/backup generator to the facility. MSCC submitted modeling and an emissions inventory with the request to confirm applicability under the de minimis rule as well as compliance with ambient air quality standards under the conditions proposed by MSCC. **MAQP #2611-03** replaced MAQP #2611-02.

D. Current Permit Action

On February 23, 2007, MSCC submitted a de minimis notification to the Department for a SuperClaus Unit #2. Additionally, on February 25, 2009, the Department received a de minimis request from MSCC to install an inert gas system boiler (Clever Brooks Boiler) to improve heat recovery. The Department approved this request on March 13, 2009.

On May 21, 2010, MSCC submitted a renewal application for the Title V Operating Permit #2611-03. The Department requested additional information on July 19, 2010 and also requested information regarding the status of ATS project. On August 10, 2010, MSCC responded to the Department's request stating that MSCC only constructed the second incinerator and the rest of the process (ATS) was never constructed. Pursuant to Administrative Rules of Montana (ARM) 17.8.762, that portion of the permit expired because construction or installation did not commence within the time specified. Therefore, the current permit action removes the ATS unit (with the exception of the incinerator).

Additionally, on July 27, 2010, MSCC requested that the Department update emitting units for clarification to reflect current naming conventions used at the facility. MSCC requested that the Department: update the mailing address of the facility to 627 ExxonMobil Road, change the name of the redundant incinerator to Incinerator East; change the name of the 100-foot stack to the 30-meter stack; change the name of the existing incinerator to Incinerator West; and change the 35 MMBtu/hr Incinerator to Incinerator East.

On August 10, 2010, the Department received a de minimis request to add a cooling tower and to replace the boiler treatment lagoon with a boiler blowdown tank. The boiler blowdown tank replaces the 'Boiler Treatment Lagoon with Aeration'. This system allows water previously routed to the lagoon for percolation and evaporation to be released to the blowdown tank system. According to MSCC, MSCC was required to make this change during renewal of their Montana Pollution Discharge and Elimination System (MPDES) Permit.

On January 3, 2012 in response to the renewal application submitted by MSCC, the Department completed several updates to MSCC's Title V Operating Permit. The operating permit includes conditions of the Federal Implementation Plan for the Billings/Laurel, MT Sulfur Dioxide Area (FIP) and the Stipulated Agreement between the Department and MSCC signed on June 9, 1998.

These conditions exist in the Title V OP, however, MSCC is required to meet the conditions of the MAQP in addition to the Title V applicable requirements. In addition to those changes mentioned above, this permit action also updates current language and rule references used by the Department and the emission inventory.

E. Additional Information

Additional information, such as applicable rules and regulation, BACT determinations, air quality impacts, and environmental assessments are included in the analysis associated with each change to the permits identified above.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations, which apply to the facility. The complete rules are stated in the ARM and are available upon request from the Department. Upon request, the Department will provide references for locations 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 section 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 emissions of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment, including instruments and sensing devices, and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.
3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq.*, Montana Code Annotated (MCA).

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

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation, or to continue for a period greater than 4 hours.
5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant which would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

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

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.213 Ambient Air Quality Standard for Ozone

6. ARM 17.8.214 Ambient Air Quality Standard for Hydrogen Sulfide
7. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
8. ARM 17.8.221 Ambient Air Quality Standard for Visibility
9. ARM 17.8.222 Ambient Air Quality Standard for Lead
10. ARM 17.8.223 Ambient Air Quality Standard for PM₁₀

MSCC 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 to an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6-consecutive minutes.
2. ARM 17.8.308 Particulate Matter, Airborne. (1) This section requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate. (2) Under this section, MSCC 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 section 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 section.
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 section requires that no person shall burn liquid, solid, or gaseous fuel in excess of the amount set forth in this section. The section limits the sulfur content of the natural gas fired to less than 50 grains per 100 cubic feet of gaseous fuel, calculated as H₂S at standard conditions, which is approximately 795 parts per million (ppm).
6. ARM 17.8.340 Standard of Performance for New Stationary Sources. This section incorporates, by reference, 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS). The following subparts apply to MSCC:
 - a. 40 CFR 60, Subpart A – General Provisions apply to all equipment or facilities subject to a NSPS Subpart as listed below.
 - b. 40 CFR Part 60, Subpart Dc – Standard of Performance for Small Industrial-Commercial-Institutional Steam Generating Units does not apply to the 17 MMBtu/hr Boiler because it was constructed in 1981 before the applicability date of June 9, 1989.
 - c. 40 CFR Part 60, Subpart J – Standards of Performance for Petroleum Refineries does apply to fuel gas combustion devices. Fuel gas means any gas generated at a petroleum refinery and which is combusted. Fuel gas also includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery. However, this subpart does not apply to the incinerator as it is not located at a refinery.

7. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. This rule incorporates, by reference, 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Source Categories.
 - a. 40 CFR 63, Subpart A – General Provisions apply to all equipment or facilities subject to a NESHAPs Subpart as listed below.
 - b. 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants (HAPs) for Stationary Reciprocating Internal Combustion Engines (RICE). An owner or operator of a stationary reciprocating internal combustion engine (RICE) located at a major or area source of HAP emissions may be subject to this rule. Based on the information submitted by MSCC, the RICE equipment to be used under MAQP #2611-04 may be subject to this subpart.
 - c. 40 CFR 63, Subpart CCCCCC - National Emissions Standards for Hazardous Air Pollutants for Gasoline Dispensing Facilities (GDF). An owner or operator of a gasoline dispensing facility located at a major source of HAPs may be subject to this rule. Based on the information submitted by MSCC, the facility has a monthly throughput of less than 10,000 gallons of gasoline and must comply with the requirements in 40 CFR §63.11116.

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

1. ARM 17.8.504 Air Quality Permit Application Fees. This section requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. The current permit action is considered an administrative action associated with a de minimis change and does not require an application fee.
2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department; and 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, as described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions which prorate the required fee amount.

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

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.
2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a person to obtain an air quality permit or permit modification to construct, modify, or use any air contaminant sources that have the potential to emit (PTE) greater than 25 tons per year of any pollutant. MSCC has a PTE greater than 25 tons per year for several pollutants; 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. The permit action is considered administrative and did not require a permit application. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. The permit action is considered administrative and did not require publication.
6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.
7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.
8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.
9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving MSCC of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq.*
10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.
11. ARM 17.8.760 Additional Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those applications that require an environmental impact statement.
12. 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.
13. 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).

14. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, Subchapters 8, 9, and 10.
 15. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of intent to transfer, including the names of the transferor and the transferee, is sent to the Department.
 16. ARM 17.8.770 Additional Requirements for Incinerators. This rule specifies the additional information that must be submitted to the Department for incineration facilities subject to 75-2-215, Montana Code Annotated (MCA).
- F. ARM 17.8, Subchapter 8, Prevention of Significant Deterioration of Air Quality, including, but not limited to:
1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.
 2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications -- Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through 17.8.827 shall apply to any major stationary source and any major modification with respect to each pollutant subject to regulation under the Federal Clean Air Act (FCAA) that it would emit, except as this subchapter would otherwise allow.

MSCC is a major source because emissions are greater than 250 tons per year. However, this permit action is considered an administrative amendment and will not cause an emissions increase and, therefore, does not require PSD review.

- G. ARM 17.8, Subchapter 12, Operating Permit Program Applicability, including, but not limited to:
1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:
 - a. PTE > 100 tons/year of any pollutant;
 - b. PTE > 10 tons/year of any one hazardous air pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or
 - c. PTE > 70 tons/year of particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) in a serious PM₁₀ nonattainment area.
 2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. (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 #2611-04 for MSCC, the following conclusions were made:
 - a. The facility's PTE is greater than 100 tpy for several pollutants.

- b. The facility's PTE is less than 10 tpy for any one HAP and less than 25 tpy of all HAPs.
- c. This source is not located in a serious PM₁₀ nonattainment area.
- d. This facility is subject to NSPS requirements (40 CFR 60, Subparts A, Dc, and J).
- e. This facility is subject NESHAP standards (40 CFR 63, Subpart A, ZZZZ, and CCCCCC).
- f. This source is not a Title IV affected source.
- g. This source is not a solid waste combustion unit.
- h. This source is an EPA designated Title V source.

Based on these facts, the Department has determined that MSCC is a major source of emissions as defined under Title V. MSCC submitted a renewal to their Title V Operating Permit on May 21, 2010 and the Title V Operating Permit #2611-04 became final on January 31, 2012.

H. Montana Code Annotated (MCA) 75-2-103, Definitions, provides, in part, as follows:

- 1. "Incinerator" means any single or multiple-chambered combustion device that burns combustible material, alone or with a supplemental fuel or catalytic combustion assistance, primarily for the purpose of removal, destruction, disposal, or volume reduction of all or any portion of the input material.
- 2. "Solid waste" means all putrescible and nonputrescible solid, semisolid, liquid, or gaseous wastes, including, but not limited to, air pollution control facilities.

I. MCA 75-2-215, Solid or hazardous waste incineration -- additional permit requirements, including, but not limited to, the following requirements:

The Department may not issue a permit to a facility until: (d) the Department has reached a determination that the projected emissions and ambient concentrations will constitute a negligible risk to the public health, safety, and welfare and to the environment.

MSCC previously submitted modeling to demonstrate that the HAPs from the incinerator(s) were less than the Department's threshold levels. The Department previously determined that the health risk assessment model demonstrates negligible risk to public health.

III. BACT Analysis

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

A BACT determination was not required for the current permit action because the permit change is considered an administrative permit change.

IV. Emission Inventory

For a detailed emission inventory of the MSCC plant refer to the analysis contained with MAQP #2611.

A. Allowable emissions are as follows:

1. Hydrogen Plant Stack
NO_x - 22.72 tpy
NO_x - 125 lb/day
2. Railroad Boiler
SO₂ - 5.0 tpy

B. Emission Inventory for the Monaca process:

| <u>Heaters</u> | <u>TPY</u> | | | | | |
|---------------------------|------------|------------------|-----------------|-----------------|------|------|
| | TSP | PM ₁₀ | SO _x | NO _x | VOC | CO |
| Sulfur Vaporizer Heater | 0.06 | 0.06 | 0.107 | 2.10 | 0.11 | 0.42 |
| Steam/Methane Superheater | 0.03 | 0.03 | 0.079 | 1.14 | 0.06 | 0.23 |
| Total | 0.09 | 0.09 | 0.186 | 3.2 | 0.2 | 0.6 |

Sulfur Vaporizer Heater

TSP Emissions

Emission Factor: 3 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
 Control Efficiency: 0.0%
 Heat Input: 4.8E+06 British thermal units per hour (BTU/hr)
 4800000.0 BTU/hr/1,000 BTU/ft³ = 4800 ft³/hr
 Calculations: 4800.00 ft³/hr * 8760 hr/yr * 3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.06 tpy

PM₁₀ Emissions

Emission Factor: 3 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
 Control Efficiency: 0.0%
 Heat Input: 4.8E+06 BTU/hr
 4800000.0 BTU/hr/1,000 BTU/ft³ = 4800 ft³/hr
 Calculations: 4800.00 ft³/hr * 8760 hr/yr * 3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.06 tpy

NO_x Emissions

Emission Factor: 100 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
 Control Efficiency: 0.0%
 Heat Input: 4.8E+06 BTU/hr
 4800000.0 BTU/hr/1,000 BTU/ft³ = 4800 ft³/hr
 Calculations: 4800.00 ft³/hr * 8760 hr/yr * 100 lb/10⁶ ft³ gas * 0.0005 ton/lb = 2.10 tpy

VOC Emissions

Emission Factor: 5.3 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
 Control Efficiency: 0.0%
 Heat Input: 4.8E+06 BTU/hr
 4800000.0 BTU/hr/1,000 BTU/ft³ = 4800 ft³/hr
 Calculations: 4800.00 ft³/hr * 8760 hr/yr * 5.3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.11 tpy

CO Emissions

Emission Factor: 0.6 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
 Control Efficiency: 0.0%
 Heat Input: 4.8E+06 BTU/hr
 4800000.0 BTU/hr/1,000 BTU/ft³ = 4800 ft³/hr
 Calculations: 4800.00 ft³/hr * 8760 hr/yr * 0.6 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.0126 tpy

SO_x Emissions

(Based on 4800 ft³/hour, 30 parts per million (ppm) H₂S and 60 degrees Fahrenheit (°F))

(30 ppm H₂S /1000000) *34.08 lbmole/379.5scf/lbmole*7000gr/lb = 0.018969 gr/scf
0.019 grains per standard cubic feet (gr/scf)*1000000 f³ *1lb/7000 gr = 2.70988 lb/million cubic feet (mmcf) H₂S
2.71lb/mmcf *64.06/34.08 = 5.093750 lb/mmcf
5.09 lb/mmcf *4800 cf/hr*1 mmcf/10⁶ cf = 0.024432 lb/hr
0.0244 lb/hr *8760 hr/year /2000 lb/ton = 0.1070 tpy

Steam/Methane Superheater

TSP Emissions

Emission Factor: 3 lb/10⁶ ft³ gas {AFSEF SCC 1-03-006-03, p.27}
Heat Input: 2.6E+06 BTU/hr
2600000.0 BTU/hr/1,000 BTU/ft³ = 2600 ft³/hr
Calculations: 2600.00 ft³/hr * 8760 hr/yr * 3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.034 tpy

PM₁₀ Emissions

Emission Factor: 3 lb/10⁶ ft³ gas {AFSEF SCC 1-03-006-03, p.27}
Heat Input: 2.6E+06 BTU/hr
2600000.0 BTU/hr/1,000 BTU/ft³ = 2600 ft³/hr
Calculations: 2600.00 ft³/hr * 8760 hr/yr * 3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.034 tpy

NO_x Emissions

Emission Factor: 100 lb/10⁶ ft³ gas {AFSEF SCC 1-03-006-03, p.27}
Heat Input: 2.6E+06 BTU/hr
2600000.0 BTU/hr/1,000 BTU/ft³ = 2600 ft³/hr
Calculations: 2600.00 ft³/hr * 8760 hr/yr * 100 lb/10⁶ ft³ gas * 0.0005 ton/lb = 1.14 tpy

VOC Emissions

Emission Factor: 5.3 lb/10⁶ ft³ gas {AFSEF SCC 1-03-006-03, p.27}
Heat Input: 2.6E+06 BTU/hr
2600000.0 BTU/hr/1,000 BTU/ft³ = 2600 ft³/hr
Calculations: 2600.00 ft³/hr * 8760 hr/yr * 5.3 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.06 tpy

CO Emissions

Emission Factor: 0.6 lb/10⁶ ft³ ga {AFSEF SCC 1-03-006-03, p.27}
Control Efficiency: 0.0%
Heat Input: 2.6E+06 BTU/hr
2600000.0 BTU/hr/1,000 BTU/ft³ = 2600 ft³/hr
Calculations: 2600.00 ft³/hr * 8760 hr/yr * 0.6 lb/10⁶ ft³ gas * 0.0005 ton/lb = 0.0068 tpy

SO_x Emissions

2600 ft³/hour
30 ppm H₂S
60 °F

(30ppm H₂S /1000000) *34.08 lbmole/379.5scf/lbmole*7000gr/lb = 0.018969 gr/scf
0.0190gr/scf*1000000 cf *1lb/7000 gr = 2.70988 lb/mmcf H₂S
2.71lb/mmcf *64.06/34.08 = 5.09375 lb/mmcf
5.09 lb/mmcf *2600 cf/hr = 0.013234 lb/hr
0.0132 lb/hr *8760 hr/year /2000 lb/ton = 0.0579 tpy

The Monaca unit is a closed system. The unit will not vent H₂S to atmosphere. Some H₂S gas will be recycled to the Claus unit from the liquefaction unit. This recycled gas stream is existing. Since the liquefaction unit's capacity will not be changed due to the installation of the Monaca process, there should be no change in the amount of gas recycled to the Claus unit.

C. 17 MMBtu/hr Boiler and Incinerator

| <u>Unit</u> | <u>PM-10</u> | <u>NO_x</u> | <u>VOC</u> | <u>CO</u> | <u>SO_x</u> |
|--------------------|--------------|-----------------------|-------------|-------------|-----------------------|
| Boiler _NG | 0.57 | 7.45 | 0.41 | 2.61 | 0.04 |
| Boiler _WO* | 0.64 | 0.24 | 0.01 | 0.06 | 18.38 |
| Boiler _RO* | 0.13 | 0.69 | 0.0035 | 0.06 | 19.63 |
| Boiler _DSL | 0.03 | 0.25 | 0.0025 | 0.06 | 17.75 |
| Total Boiler WC | 1.23 | 8.38 | 0.42 | 2.73 | 37.42 |
| <u>Incinerator</u> | <u>1.17</u> | <u>15.33</u> | <u>0.41</u> | <u>6.25</u> | <u>0.04</u> |
| Total | 2.4 | 23.7 | 0.8 | 9.0 | 37.5 |

* Indicates worst case was chosen - oil usage limited to 25,000 gal/yr - Emissions from the incinerator and firing of fuel other than natural gas in the boiler vent to 100-meter Main Stack. Consequently, only 0.4 tpy of SO₂ emissions are allowed from the boiler.

NATURAL GAS USAGE FOR 17 MMBtu/hr Boiler

| | | |
|--------------------------------|--------|-------------------------------------|
| Boiler Fuel Combustion Rate | 17 | MMBtu/hr |
| Approximate Fuel Heating Value | 1000 | Btu/scf (AP-42 Section 1.4-1, 3/98) |
| Annual Max Fuel Usage | 148.92 | MMscf/yr |

PM₁₀ Emissions:

| | | |
|------------------|---|--|
| Emission Factor: | 7.6 | lb/MMscf gas (AP-42 Section 1.4-6, 3/98) |
| Calculations: | 148.92 MMscf/yr * 7.6 lb/MMscf gas * 0.0005 ton/lb = 0.57 tpy | |

NO_x Emissions:

| | | |
|------------------|---|--|
| Emission Factor: | 100 | lb/MMscf gas (AP-42 Section 1.4-5, 3/98) |
| Calculations: | 148.92 MMscf/yr * 100 lb/MMscf gas * 0.0005 ton/lb = 7.45 tpy | |

VOC Emissions:

| | | |
|------------------|---|--|
| Emission Factor: | 5.5 | lb/MMscf gas (AP-42 Section 1.4-6, 3/98) |
| Calculations: | 148.92 MMscf/yr * 5.5 lb/MMscf gas * 0.0005 ton/lb = 0.41 tpy | |

CO Emissions:

| | | |
|------------------|--|--|
| Emission Factor: | 35 | lb/MMscf gas (AP-42 Section 1.4-5, 3/98) |
| Calculations: | 148.92 MMscf/yr * 35 lb/MMscf gas * 0.0005 ton/lb = 2.61 tpy | |

SO₂ Emissions:

| | | |
|------------------|---|--|
| Emission Factor: | 0.6 | lb/MMscf gas (AP-42 Section 1.4-6, 3/98) |
| Calculations: | 148.92 MMscf/yr * 0.6 lb/MMscf gas * 0.0005 ton/lb = 0.04 tpy | |

WASTE OIL USAGE FOR 17 MMBtu/hr Boiler

| | | |
|--------------------------------|-----|---|
| Boiler Fuel Combustion Rate | 17 | MMBtu/hr |
| Approximate Fuel Heating Value | 150 | MMBtu/10 ³ gal (AP-42 Section 1.11-3, 10/96) |
| Max Hourly Fuel Usage | 140 | gal/hr NamePlate Rating |
| Fuel usage Limit: | 25 | 10 ³ gal/yr |

PM-10 Emissions:

| | | |
|------------------|--|--|
| Emission Factor: | 51 | lb/10 ³ gal (AP-42 Section 1.11-4, 10/96) |
| Calculations: | 25 10 ³ gal/yr * 51 lb/10 ³ gal * 0.0005 ton/lb = 0.64 tpy | |

NO_x Emissions:

| | | |
|------------------|--|--|
| Emission Factor: | 19 | lb/10 ³ gal (AP-42 Section 1.11-5, 10/96) |
| Calculations: | 25 10 ³ gal/yr * 19 lb/10 ³ gal * 0.0005 ton/lb = 0.24 tpy | |

VOC Emissions:

Emission Factor: 1 lb/10³ gal (AP-42 Section 1.11-6, 10/96)
Calculations: 25 10³ gal/yr * 1 lb/10³ gal * 0.0005 ton/lb = 0.01 tpy

CO Emissions:

Emission Factor: 5 lb/10³ gal (AP-42 Section 1.11-5, 10/96)
Calculations: 25 10³ gal/yr * 5 lb/10³ gal * 0.0005 ton/lb = 0.06 tpy

SO2 Emissions:

Assumed 10% Sulfur as Worst Case to avoid PSD
Emission Factor: 1470 lb/10³ gal (AP-42 Section 1.11-5, 10/96)
Calculations: 25 10³ gal/yr * 1470 lb/10³ gal * 0.0005 ton/lb = 18.38 tpy

RESIDUAL OIL USAGE FOR 17 MMBtu/hr Boiler

Boiler Fuel Combustion Rate 17 MMBtu/hr
Approximate Fuel Heating Value 150 MMBtu/10³ gal (AP-42 Section 1.11-3, 10/96)
Max Hourly Fuel Usage 140 gal/hr NamePlate Rating
Proposed Limit 25 10³ gal/yr

PM-10 Emissions:

Emission Factor: 10 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 10 lb/10³ gal * 0.0005 ton/lb = 0.13 tpy

NO_x Emissions:

Emission Factor: 55 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 55 lb/10³ gal * 0.0005 ton/lb = 0.69 tpy

VOC Emissions:

Emission Factor: 0.28 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 0.28 lb/10³ gal * 0.0005 ton/lb = 0.0035 tpy

CO Emissions:

Emission Factor: 5 lb/10³ gal (AP-42 Section 1.3-11, 9/98)
Calculations: 25 10³ gal/yr * 5 lb/10³ gal * 0.0005 ton/lb = 0.06 tpy

SO2 Emissions:

Assumed 10% Sulfur as Worst Case to avoid PSD
Emission Factor: 1570 lb/10³ gal (AP-42 Section 1.3-11, 10/96)
Calculations: 25 10³ gal/yr * 1570 lb/10³ gal * 0.0005 ton/lb = 19.63 tpy

DIESEL USAGE FOR 17 MMBtu/hr Boiler

Boiler Fuel Combustion Rate 17 MMBtu/hr
Approximate Fuel Heating Value 140 MMBtu/10³ gal (AP-42 Section 1.11-3, 10/96)
Max Hourly Fuel Usage 140 gal/hr NamePlate Rating
Proposed Limit 250 10³ gal/yr

PM₁₀ Emissions:

Emission Factor: 2 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 2 lb/10³ gal * 0.0005 ton/lb = 0.03 tpy

NO_x Emissions:

Emission Factor: 20 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 20 lb/10³ gal * 0.0005 ton/lb = 0.25 tpy

VOC Emissions:

Emission Factor: 0.2 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
Calculations: 25 10³ gal/yr * 0.20 lb/10³ gal * 0.0005 ton/lb = 0.0025 tpy

CO Emissions:

Emission Factor: 5 lb/10³ gal (AP-42 Section 1.3-12, 9/98)
 Calculations: 25 10³ gal/yr * 5 lb/10³ gal * 0.0005 ton/lb = 0.06 tpy

SO₂ Emissions:

Assumed 10% Sulfur as Worst Case to avoid PSD
 Emission Factor: 1420 lb/10³ gal (AP-42 Section 1.3-11, 10/96)
 Calculations: 25 10³ gal/yr * 1420 lb/10³ gal * 0.0005 ton/lb = 17.75 tpy

35 MMBtu/hr INCINERATOR EAST

Incinerator Fuel Combustion Rate 35 MMBtu/hr
 Approximate Fuel Heating Value 1000 Btu/scf (AP-42 Section 1.4-1, 3/98)
 Annual Max Fuel Usage 306.6 MMscf/yr

PM₁₀ Emissions:

Emission Factor: 7.6 lb/MMscf gas (AP-42 Section 1.4-6, 3/98)
 Calculations: 306.60 MMscf/yr * 7.6 lb/MMscf gas * 0.0005 ton/lb = 1.17 tpy

NO_x Emissions:

Emission Factor: 100 lb/MMscf gas (AP-42 Section 1.4-6, 3/98)
 Calculations: 306.60 MMscf/yr * 100 lb/MMscf gas * 0.0005 ton/lb = 15.33 tpy

VOC Emissions:

Emission Factor: 5.5 lb/MMscf gas (AP-42 Section 1.4-6, 3/98)
 Calculations: 148.92 MMscf/yr * 5.5 lb/MMscf gas * 0.0005 ton/lb = 0.41 tpy

CO Emissions:

Emission Factor: 84 lb/MMscf gas (AP-42 Section 1.4-5, 3/98)
 Calculations: 148.92 MMscf/yr * 84 lb/MMscf gas * 0.0005 ton/lb = 6.25 tpy

SO₂ Emissions:

Emission Factor: 0.6 lb/MMscf gas (AP-42 Section 1.4-6, 3/98)
 Calculations: 148.92 MMscf/yr * 0.6 lb/MMscf gas * 0.0005 ton/lb = 0.04 tpy

D. Emergency/backup Generator

| Pollutant | Emission Rates ¹ (lb/hr) | Rated Horsepower (bhp) | AP-42 Factors (lb/bhp-hr) | Operating Schedule (hr/yr) | Emission Rate (lb/hr) | Emission Rate (tpy) |
|------------------|--|---------------------------|------------------------------|-------------------------------|--------------------------|------------------------|
| CO | 9.81 | 1100 | -- | 500 | 9.81 | 2.45 |
| NO _x | 28.37 | 1100 | -- | 500 | 28.37 | 7.09 |
| PM ₁₀ | ----- | 1100 | 0.0007 | 500 | 0.77 | 0.19 |
| SO ₂ | --- | 1100 | 0.0008 | 500 | 0.89 | 0.22 |
| VOC ₂ | --- | 1100 | -- | 500 | 1.95 | 0.49 |

- All emission rates from manufacturer except PM₁₀ and SO₂. PM₁₀ emission rate based upon factor from AP-42, Table 3.4-1 (10/96) and manufacturer horsepower rating of 1100 bhp. Assumes all PM is PM₁₀. SO₂ emission rate based upon maximum fuel sulfur content of 500 ppm (0.05%); factor from AP-42, Table 3.4-1 (10/96); and the manufacturer's horsepower rating of 1100 bhp.
- Manufacturer reported only hydrocarbon emissions. Therefore, the calculations assume all emitted hydrocarbon are VOC.

E. SuperClaus Unit #2

| Potential to Emit (tpy)* | | | | | |
|--------------------------|-----------------|-----|-----------------|------|--------|
| PM | NO _x | CO | SO ₂ | VOC | Pb |
| 0.17 | 2.2 | 1.8 | 0.11 | 0.12 | 1.1E-5 |

*PTE from de minimis request dated 2/23/2007.

F. Inert gas system boiler (Clever-Brooks Boiler)

Process Information: 8760 hours per year
 Heat Input: 8.55 MMBtu/hr
 Fuel usage: 9000 scf/hr
 Fuel usage: 78.8 MMscf/hr
 Fuel Heating Value: 950 MMBtu/MMscf

| Potential to Emit (tpy)* | | | | | | |
|--------------------------|------------------|-------------------|-----------------|------|-----------------|------|
| PM | PM ₁₀ | PM _{2.5} | NO _x | CO | SO ₂ | VOC |
| 0.30 | 0.30 | 0.30 | 3.94 | 3.31 | 0.02 | 0.22 |

*PTE from de minimis request dated 2/25/2009 (all emissions were derived using AP-42, Table 1.4-2 (7/98))

PM/PM₁₀/PM_{2.5} Emissions:

Emission Factor: 7.6 lb/MMscf gas (AP-42 Section 1.4-2, 7/98)
 Calculations: 78.8 MMscf/yr * 7.6 lb/MMscf gas * 0.0005 ton/lb = 0.30 tpy

NO_x Emissions:

Emission Factor: 100 lb/MMscf gas (AP-42 Section 1.4-1, 7/98)
 Calculations: 78.8 MMscf/yr * 100 lb/MMscf gas * 0.0005 ton/lb = 3.94 tpy

VOC Emissions:

Emission Factor: 5.5 lb/MMscf gas (AP-42 Section 1.4-2, 7/98)
 Calculations: 78.8 MMscf/yr * 5.5 lb/MMscf gas * 0.0005 ton/lb = 0.22 tpy

CO Emissions:

Emission Factor: 84 lb/MMscf gas (AP-42 Section 1.4-1, 7/98)
 Calculations: 78.8 MMscf/yr * 84 lb/MMscf gas * 0.0005 ton/lb = 3.31 tpy

SO₂ Emissions:

Emission Factor: 0.6 lb/MMscf gas (AP-42 Section 1.4-6, 3/98)
 Calculations: 78.8 MMscf/yr * 0.6 lb/MMscf gas * 0.0005 ton/lb = 0.02 tpy

G. Boiler Blowdown Tank and Cooling Tower

| Potential to Emit* (tpy) | | |
|--------------------------|------------------|-------------------|
| PM | PM ₁₀ | PM _{2.5} |
| 4.34 | 4.34 | 4.35 |

*PTE from de minimis request dated 8/10/2010.

V. Existing Air Quality

The MSCC facility is located at 627 ExxonMobil Road in the vicinity of the SW ¼ of Section 24, Township 1 North, Range 26 East, Yellowstone County, Montana. This area is considered attainment for all criteria pollutants. The Laurel nonattainment area for SO₂ is nearby and the Billings nonattainment area for CO is adjacent to the facility.

This permit action adds de minimis equipment (inert gas boiler, cooling tower and boiler blowdown tank) and removes the previously permitted ATS unit. Additionally, this permit action updates emitting units for clarification to reflect current naming conventions used at the facility. Therefore, the Department does not believe this project will result in a violation of any ambient air quality standard or increment.

VI. Takings or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

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

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

VII. Environmental Assessment

This permitting action will not result in an increase of emissions from the facility and is considered an administrative action; therefore, an Environmental Assessment is not required.

Permit Analysis Prepared by: Jenny O'Mara
Date: April 25, 2012