

## STATEMENT OF BASIS

To: Reviewers

Through: Michael Stoll, Operating Permit Program Manager 

From: Maggie Endres, Program Principal

Subject: Draft Chapter 6, Section 3 Operating Permit 3-2-002, Exxon Mobil Corporation  
Shute Creek Facility

Date: September 16, 2008

### Introduction:

Attached for your review is the draft renewal Wyoming Air Quality Standards and Regulations (WAQSR) Chapter 6, Section 3 Operating Permit for the Shute Creek Facility. The facility processes sour gas by upgrading the methane component of the produced gas stream to pipeline quality by removing H<sub>2</sub>S and other impurities. An acid gas system transports the pressurized gas stripped in the Selexol process through a pipeline to two underground injection wells. The main emission sources include two boilers, three dehydration regeneration heaters, one diesel and two gas turbine and generator engines, two Selexol CO<sub>2</sub> vents, four flares, three cogeneration steam turbine engines, and a Syngas unit furnace.

### Permitting History:

Permit CT-544 (5/22/84): allowed initial construction of the plant. Equipment installed under this permit included the two boilers, two Selexol CO<sub>2</sub> vents, four flares, three dehydration regeneration heaters, and the three generator engines. (Two sulfur recovery units, consisting of two tail gas incinerators and two sulfur storage tank vents with sulfur loading systems installed under this permit, were replaced by a re-injection system permitted under MD-771 listed below.)

Permit CT-544A (7/1/91): modified emission limits from the tail gas incinerators and combined CO<sub>2</sub> vents, and set additional emission limits to reflect as-built equipment. Emission limits were restated in permit OP-224 listed below.

Waiver (12/19/91): allowed the construction of two freeze protection heaters.

Permit OP-224 (1/29/92): sets hourly and annual combined H<sub>2</sub>S limits for the CO<sub>2</sub> vents, and hourly NO<sub>x</sub> and CO limits for the boilers and regeneration heaters. (COS limits for the vents were reset under permit MD-913 listed below). The permit requires continuous emissions monitoring (CEM) for the combined CO<sub>2</sub> vents to monitor H<sub>2</sub>S and COS. The permit requires maintaining the adjustment of all plant gas-fired burners to manufacturer's recommendations for the plant altitude so the emission rates remain below those considered in the permit. The permit also requires reporting the use of emergency equipment on a monthly basis. By Division letter of 12/29/95, the reporting frequency was changed to quarterly. A requirement for continued operation of meteorological and ambient monitoring stations was removed by Division letter of 10/20/95. The Air Quality Related Values monitoring program in the Bridger and Fitzpatrick Wilderness Areas of the Wind River Mountains is no longer required per MD-1039 listed below.

Permit MD-197 (4/4/94): allowed installation of new heat exchangers upstream of the nitrogen rejection units to increase the processing capacity of each train by approximately 2.5 MMSCFD.

Division letter (3/29/95): clarified fuel gas monitoring for the two gas turbine emergency generator engines. The two units are subject to 40 CFR 60 Subpart GG, but are exempt from the nitrogen oxides standard per §60.332(g), because the turbine engines are for emergency use. Per this letter, testing of the units is not warranted nor required, until such time as the Division determines the turbine engines are operating a significant portion of the time.

Permit OP-259 (1/29/96): allowed operation of the new heat exchangers. The permit requires CO<sub>2</sub> vented through the combined CO<sub>2</sub> vents to be reported in the annual emissions inventory.

AP-J17 (4/22/97): By letter dated 12/28/99, the permittee requested this waiver be withdrawn.

Waiver (8/5/97): allowed construction of a 500 gallon highway diesel fuel storage tank.

Waiver AP-V27 (11/21/97): modified the required exit gas temperatures from the CO<sub>2</sub> vents. The requirements were reset under permit MD-1039 listed below.

There are no requirements associated with the next four waivers. Waiver AP-J29 (12/8/98): allowed installation of two vacuum insulated LNG storage tanks. The tanks are not subject to 40 CFR 60 Subpart Kb. AP-BK0 (2/17/00): waived permitting requirements to construct a third helium liquefier and associated equipment. AP-XY0 (7/13/00)/(corrected 8/7/00): allowed construction of an evaporative cooler on each of four existing filter houses. Waiver AP-YM1 (5/9/01): allowed installation of two aboveground storage tanks.

MD-771 (6/19/02): allowed the addition of an acid gas re-injection system to eliminate the sulfur recovery units and associated SO<sub>2</sub> emissions. The project also involved the construction of a cogeneration facility, consisting of three 35.8 MW combined cycle GE Frame 6 combustion turbines and a Syngas unit furnace. NO<sub>x</sub>, CO and SO<sub>2</sub> emission limits are set for the turbines and NO<sub>x</sub> and CO limits are set for the furnace. Continuous emissions monitoring systems (CEMs) are required for the turbines to monitor NO<sub>x</sub> and SO<sub>2</sub>. The turbines are subject to 40 CFR 60 Subpart GG, and the furnace is subject to Subpart Dc. By letter dated 12/15/03, the EPA approved use of the CEMs in place of monitoring the sulfur and nitrogen content of the fuel for the turbines. The permit requires the permittee to follow a "Procedure for Minimization of Abnormal Emissions" during startup, shutdown or abnormal operating conditions. The permittee must obtain Division approval in writing before permanently removing the sulfur recovery units.

There are no requirements associated with the next three waivers. WV-0781 (4/28/03): allowed temporary use of various diesel fired equipment for two weeks. Waiver AP-0861 (7/21/03): allowed the addition of various storage tanks that are not subject to 40 CFR 60 Subpart Kb. Waiver AP-0863 (7/21/03): allowed a fourth helium liquefier.

MD-913 (8/5/03): increases the combined pound and ton emission limits for carbonyl sulfide (COS) from the CO<sub>2</sub> vent stacks to 1600 lb/hr and 7008 TPY.

MD-1039 (8/6/04): alters temperature and monitoring requirements for the CO<sub>2</sub> vent stacks and also removed the requirement to participate in the Air Quality Related Values monitoring program in the Bridger and Fitzpatrick Wilderness Areas of the Wind River Mountains.

The following waivers have no remaining requirements associated with them. WV-2377 (8/26/04) and AP-2578 (10/18/04): each allowed temporary use of three diesel generator engines. Waiver (8/10/05) and Waiver (6/29/06): each allowed temporary use of two diesel engines.

Waiver (8/14/06): allowed temporary use of ten diesel fired generator sets. AP-5532 (12/11/06): allowed the use of three diesel generators for one year. Waiver AP-6732 (9/28/07): allowed temporary flaring of sour gas and use of diesel fired equipment during turnaround.

Waiver AP-6935 (11/20/07): allows temporary operation of three Tier I diesel generators. Each engine is limited to 300 operating hours. The permit expires 12/31/08.

**Applicable Requirements:**

Applicable requirements include the conditions from the WAQSR Ch 6, Sec 2 permits listed above, visible emission limits set forth in Ch 3, Sec 2, NO<sub>x</sub> emission limit as specified in Ch 3, Sec 3, and SO<sub>2</sub> emissions inventory requirements specified in Ch 14, Sec 3.

40 CFR 60: The Syngas furnace is subject to the recordkeeping and reporting requirements of 40 CFR 60, Subpart Dc. The two gas turbines and three cogeneration steam turbines are subject to the requirements of Subpart GG. Pursuant to §60.332(g), the two gas turbines are exempt from the NO<sub>x</sub> emission standards since these turbines are for emergency use only. Subpart LLL requirements no longer apply because the sulfur recovery system has been replaced with the acid gas re-injection system per MD-771 listed above.

40 CFR 63: The two gas turbines and three cogeneration steam turbines are subject to the requirements of 40 CFR 63, Subpart YYYY. Existing stationary combustion turbines do not have to meet the requirements of Subpart YYYY and of 40 CFR Part 63, Subpart A. No initial notification is necessary. The two boilers and the Syngas furnace are subject to only the initial notification requirements of Subpart DDDDD.

40 CFR 72: The cogeneration facility is not subject to the acid rain provisions because less than a third of the power is sold.

A compliance schedule is included with the operating permit to bring the cogeneration turbines into compliance. An additional month has been added to the first two milestone items in the compliance schedule due to a weather related business disruption in the Houston, Texas area.

**Periodic Monitoring:**

For several sources, the permittee did not propose any periodic monitoring, and instead only indicated how they would report annual emissions. Periodic monitoring was applied according to the Division's current guidance document.

Periodic monitoring for visible emissions from the boilers, heaters, turbines, and Syngas furnace consists of ensuring natural gas, or fuel gas for the cogeneration turbines, are the sole fuel sources for these units. CEM systems are used to monitor H<sub>2</sub>S and COS emissions from the CO<sub>2</sub> vents. For the cogeneration steam turbines, CEM systems are used to monitor NO<sub>x</sub> and SO<sub>2</sub> emissions, and CO monitoring shall be performed at least semi-annually. The Syngas furnace shall be monitored at least annually for NO<sub>x</sub> emissions. The boilers are to be tested at least once during the permit term to determine NO<sub>x</sub> emissions.

