217/785-1705

CONSTRUCTION PERMIT -- REVISED
NSPS SOURCE

PERMITTEE

ExxonMobil Oil Corporation
Attn: Jeffrey L. Noga – Environmental Group Leader
Post Office Box 874
Joliet, Illinois 60434

Application No.: 06030044 I.D. No.: 197800AAA
Applicant's Designation: Date Received: January 22, 2014
Subject: Continuous Emissions Monitoring Equipment
Date Issued: November 20, 2014
Location: I-55 and Arsenal Road, Channahon

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of Continuous Emissions Monitoring Equipment, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction.

This permit addresses additional air pollution control requirements that now apply to the refinery operated by the Permittee, including installation and operation of certain continuous emissions monitoring equipment, that are applicable due to a Consent Decree. In particular, the Permittee is subject to a Consent Decree, United States of America, State of Illinois, State of Louisiana, and the State of Montana v. Exxon Mobil Corporation and ExxonMobil Oil Corporation (Civil Action Number 05-C-5809 in the Northern District of Illinois entered December 13, 2005, and amended on June 1, 2006, November 13, 2007, and January 27, 2009) ("Consent Decree"). Paragraphs 141 and 142 require the Permittee to submit applications to incorporate various emission limits and standards required by the Consent Decree into enforceable state permits so that these requirements will survive future termination of the Consent Decree.

2. Additional Requirements.

a. The Permittee shall comply with the emission limits, standards and other requirements for certain emission units and events at the source as set forth in the attachments to this permit, as follows:

i. Attachment 1: Requirements for the Fluidized Catalytic Cracking Unit (FCCU).

ii. Attachment 2: Requirements for Heaters, Boilers and Other Fuel Gas Combustion Devices.

iii. Attachment 3: Requirements for Sulfur Recovery Plants (SRPs).

iv. Attachment 4: Requirements for Acid Gas and Hydrocarbon Flaring Incidents.

v. Attachment 5: Definitions.

b. This obligation shall also apply to any future operator or owner of the refinery that takes the place of the Permittee, as well as the current owner of the refinery.

c. Notwithstanding the above, if an SRP or flare becomes subject to 40 CFR 60 Subpart Ja ("NSPS Ja"), the Permittee shall notify the Illinois EPA and thereafter comply with the applicable NSPS Ja root cause analysis and corrective action analysis requirements including 40 CFR 60.103a(c)(3) (SRP only), 40 CFR 60.103a(c)(1) (flare only), and 40 CFR 60.103a(d), 60.103a(e), and 60.108a(c)(6) (SRP and flare), rather than the root cause analysis and corrective action analysis requirements in Attachments 3 and 4 for the particular unit, i.e., Attachment 3, Paragraph 5 and Attachment 4.

3. Existing Requirements.

This Permit does not revise or relax existing applicable requirements for the subject emissions units as are contained in the source's Clean Air Act Permit Program (CAAPP) permit, Permit No. 95120304.

4. Standard Conditions.

a. The requirements of this revised construction permit take effect on the date this revised permit is issued. This condition supersedes Standard Condition 1.

b. i. The Permittee may operate the continuous emissions monitoring system addressed by this permit pursuant to this permit until the CAAPP permit for the refinery addresses this equipment.

ii. This permit does not affect the authorization to operate equipment provided by the CAAPP permit for the refinery.

iii. This Condition supersedes Standard Condition 6.

It should be noted that this permit has been revised to better address certain requirements of the Consent Decree so that these requirements will continue to appropriately apply to the source after termination of the Consent Decree, as required by Paragraph 145 of the Consent Decree.

If you have any questions on this permit, please contact Jason Schnepp at 217/524-3724.

Raymond E. Pilapil   Date Signed: ____________________
Acting Manager, Permit Section
Division of Air Pollution Control

REP:JMS:psj

cc: Region 1
Brad Frost

1. Provisions for NO_x Emissions from the FCCU

   a. Final NO_x Emission Limits.

      The Permittee shall comply with NO_x emission limits of 20 ppmvd at 0% O_2 on a 365-day rolling average basis and 40 ppmvd at 0% O_2 on a 7-day rolling average basis at the FCCU. [From Paragraph 18.b of the Consent Decree]

   b. Startup, Shutdown, and Malfunction.

      NO_x emissions (i) caused by or attributable to the startup, shutdown, or malfunction of the FCCU and/or (ii) during periods of malfunction of the FCCU's NO_x Control System will not be used in determining compliance with the short-term (7-day) Interim NO_x Limits or Final NO_x Limits established by paragraph 1.a, provided that during such periods the Permittee implements good air pollution control practices to minimize NO_x emissions. Nothing in this paragraph shall be construed to relieve the Permittee of any obligation under any federal, state, or local law, regulation, or permit to report emissions during periods of startup, shutdown, or malfunction, or to document the occurrence and/or cause of a startup, shutdown, or malfunction event. Emissions during any such period of startup, shutdown, or malfunction shall either be: (i) monitored with CEMS as provided by paragraph 1.c; or (ii) monitored in accordance with an alternative monitoring plan approved by the USEPA if it is necessary to bypass the FCCU's main stack during the particular period of startup, shutdown, or malfunction. [From Paragraph 20 of the Consent Decree]

   c. Demonstrating Compliance with NO_x Emission Limits.

      The Permittee shall use NO_x and O_2 CEMS at the FCCU to monitor performance and to report compliance with the terms and conditions of this permit relating to NO_x emissions from the FCCU. As provided for by paragraph 1.b for Startup, Shutdown, and Malfunction, emissions during certain periods may be monitored in accordance with an alternative monitoring plan approved by USEPA. The Permittee shall make emissions monitoring data available to USEPA as soon as practicable following a USEPA request for such data. The CEMS shall be installed, calibrated and certified in accordance with 40 CFR 60.13 and Part 60 Appendices A and F, and the applicable performance specification test of 40 CFR 60 Appendix B. [From Paragraph 21 of the Consent Decree]

2. Provisions for SO_2 Emissions from the FCCU

   a. Final SO_2 Emission Limits.

      The Permittee shall comply with SO_2 emission limits of 25 ppmvd at 0% O_2 on a 365-day rolling average basis and 50 ppmvd at 0% O_2 on a 7-day rolling average basis at the FCCU. [From Paragraph 27.b of the Consent Decree]

b. Startup, Shutdown, and Malfunction.

SO_2 emissions (i) caused by or attributable to the startup or shutdown of the FCCU that is not controlled by a WGS and/or (ii) during periods of malfunction of the FCCU or malfunction of the FCCU's wet gas scrubber (WGS) or SO_2 Reducing Catalyst Additive system will not be used in determining compliance with the short-term (7-day) SO_2 emission limits established by paragraph 2.a, provided that during such periods the Permittee implements good air pollution control practices to minimize SO_2 emissions. Nothing in this paragraph shall be construed to relieve the Permittee of any obligation under any federal, state, or local law, regulation, or permit to report emissions during periods of startup, shutdown, or malfunction, or to document the occurrence and/or cause of a startup, shutdown, or malfunction event. Emissions during any such period of startup, shutdown, or malfunction shall either be: (i) monitored with CEMS as provided by paragraph 2.c; or (ii) monitored in accordance with an Alternative Monitoring Plan approved by USEPA if it is necessary to bypass the FCCU's main stack during the particular period of startup, shutdown, or malfunction. [From Paragraph 31 of the Consent Decree]

c. Demonstrating Compliance with SO_2 Emission Limits.

The Permittee shall use SO_2 and O_2 CEMS at the FCCU to monitor performance and to report compliance with the terms and conditions of this permit relating to SO_2 emissions from the FCCU. As provided for by paragraph 2.b for startup, shutdown and malfunction, emissions during certain periods may be monitored in accordance with an Alternative Monitoring Plan approved by USEPA. The Permittee shall make emissions monitoring data available to USEPA as soon as practicable following a USEPA request for such data. [From Paragraph 32 of the Consent Decree]

3. Provisions for PM Emissions from the FCCU.

a. PM Emission Limits.

Consistent with the NSPS regulations at 40 CFR 60 Subpart J, the Permittee shall comply with an emission limit of 1.0 pounds of PM per 1000 pounds of coke burned for the FCCU. [From Paragraph 34.a of the Consent Decree]

b. Startup, Shutdown, and Malfunction.

PM emissions (i) caused by or attributable to the startup or shutdown of the FCCU that is not controlled by a WGS and/or (ii) during periods of malfunction of the FCCU or malfunction of the FCCU's WGS will not be used in determining compliance with any PM emission limits established by paragraph 3.a, provided that during such periods the Permittee implements good air pollution control practices to minimize PM emissions. Nothing in this paragraph shall be construed to relieve the Permittee of any obligation under any federal, state, or local law, regulation, or permit to report emissions during periods of startup, shutdown, or malfunction, or to document the occurrence and/or cause of a startup, shutdown, or malfunction event. [From Paragraph 36 of the Consent Decree]

4. Provisions for CO Emissions from the FCCU.

   a. CO Emission Limits.

   Consistent with the NSPS regulations at 40 CFR 60 Subpart J, the Permittee shall comply with an emission limit of 500 ppmvd CO corrected to 0% O_2 on a 1-hour average basis for the FCCU. [From Paragraph 39 of the Consent Decree]

   b. Startup, Shutdown, and Malfunction.

   CO emissions (i) caused by or attributable to the startup, shutdown, or malfunction of the FCCU and/or (ii) during periods of malfunction of the FCCU's CO control system will not be used in determining compliance with any short-term (i.e., 1-hour) CO emission limit established by paragraph 4.a, provided that during such periods the Permittee implements good air pollution control practices to minimize CO emissions. Nothing in this paragraph shall be construed to relieve the Permittee of any obligation under any federal, state, or local law, regulation, or permit to report emissions during periods of startup, shutdown, or malfunction, or to document the occurrence and/or cause of a startup, shutdown, or malfunction event. Emissions during any such period of startup, shutdown, or malfunction shall either be: (i) monitored with CEMS as provided by paragraph 4.c; or (ii) monitored in accordance with an Alternative Monitoring Plan approved by USEPA if it is necessary to bypass the FCCU's main stack during the particular period of startup, shutdown, or malfunction. [From Paragraph 41 of the Consent Decree]

   c. Demonstrating Compliance with CO Emissions Limits.

   The Permittee shall use CO and O_2 CEMS at the FCCU to monitor emissions and to report compliance with the terms and conditions of this permit relating to CO emissions from the FCCU. As provided for by paragraph 4.b for startup, shutdown, and malfunction, emissions during certain periods may be monitored in accordance with an Alternative Monitoring Plan approved by USEPA. The Permittee shall make emissions monitoring data available to USEPA as soon as practicable following a USEPA request for such data. [From Paragraph 42 of the Consent Decree]

5. NSPS Applicability for the FCCU Catalyst Regenerator.

The FCCU catalyst regenerator shall be an "affected facility," as that term is used in 40 CFR 60 Subparts A and J, with respect to SO_2, PM, CO, and Opacity, and shall be subject to all of the applicable requirements of NSPS Subparts A and J. For all periods of operation, the Permittee shall ensure that the FCCU catalyst regenerator complies with the applicable emissions limitations imposed by NSPS Subpart J, except during periods of startup, shutdown, or malfunction, as defined by 40 CFR 60.2. At all times, including periods of startup, shutdown, and malfunction, the Permittee shall, to the extent practicable, maintain and operate the FCCU catalyst regenerator and any associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. [From Paragraph 43 of the Consent Decree]

6. Definitions.

The definitions of terms in Attachment 5 shall be applicable for this Attachment 1.

Attachment 2: Requirements for Heaters, Boilers and Other Fuel Gas Combustion Devices

1. NSPS Applicability to Heaters, Boilers and Other Fuel Gas Combustion Devices (Other than South Flare and East Flare).

   a. Each heater and boiler that is used to combust refinery fuel gas shall be an "affected facility", as that term is used in 40 CFR 60 Subparts A and J, and shall be subject to, and comply with the requirements of NSPS Subparts A and J for fuel gas combustion devices. [From Paragraph 59.a of the Consent Decree]

   b. i. The South BRU Thermal Vapor Incinerator 38-B-2 shall be an "affected facility", as that term is used in 40 CFR 60 Subparts A and J, and shall be subject to and comply with the requirements of NSPS Subparts A and J for fuel gas combustion devices. [From Paragraph 59.b of the Consent Decree]

      ii. This permit is issued based on the shutdown of the North BRU Thermal Vapor Incinerator 38-B-1. Future operation of this unit requires a construction permit for restart of the unit as a new source for purposes of New Source Review.

2. The Permittee shall monitor the following units as follows: [From Paragraph 53 of the Consent Decree]

   a. For the Pretreater Charge Heater (17-B-1) and the Pretreater Debutanizer Reboiler (17-B-2), install or continue to operate a NO_x and O_2 continuous emissions monitoring system (CEMS).

   b. For the Reformer Debutanizer Reboiler (2-B-7) and the Saturate Gas Plant Lean Oil Still Reboiler (8-B-1):

      i. Conduct an initial performance test and any periodic tests that may be required by USEPA or by the Illinois EPA; or

      ii. Install or continue to operate a NO_x and O_2 continuous emissions monitoring system.

   Note: The Permittee has indicated the units use qualifying controls consistent with their NO_x Control Plan.

3. The Permittee shall install, certify, calibrate, maintain, and operate the CEMS required by paragraph 2 in accordance with 40 CFR 60 Appendices A and F, and the applicable performance specification test of 40 CFR 60 Appendix B. [From Paragraph 54 of the Consent Decree]

4. The Permittee shall not burn Fuel Oil in any boiler or process heater except during periods of Natural Gas Curtailment. Nothing herein is intended to limit, or shall be interpreted as limiting: (i) the use of torch oil in the FCCU regenerator to assist in starting, restarting, maintaining hot standby, or maintaining regenerator heat balance; or (ii) combustion of acid soluble oil in a combustion device. [From Paragraph 60 of the Consent Decree]

5. Definitions.

   The definitions of terms in Attachment 5 shall be applicable for this Attachment 2.

1. Sulfur Recovery Plant (SRP) NSPS Applicability.

   Each SRP shall be an "affected facility", as that term is used in 40 CFR 60 Subparts A and J. [From Paragraph 63 of the Consent Decree]

2. Sulfur Recovery Plant NSPS Compliance.

   The Permittee shall ensure that the SRPs comply with all applicable provisions of NSPS set forth at 40 CFR 60 Subparts A and J, including, but not limited to, the following: [From Paragraph 64 of the Consent Decree]

   a. Emission Limit. The Permittee shall, for all periods of operation of the SRPs, comply with 40 CFR 60.104(a)(2) at each SRP except during periods of startup, shutdown or malfunction. The startup/shutdown provisions set forth in NSPS Subpart A shall not apply to the independent startup or shutdown of a Tail Gas Unit (TGU) serving as a control device for the SRP. [From Paragraph 64.a of the Consent Decree]

   b. Monitoring. The Permittee shall monitor all emissions points (stacks) to the atmosphere for Tail Gas emissions and shall monitor and report excess emissions from each of these SRPs as required by 40 CFR 60.7(c), 60.13, and 60.105(a)(5), (6) or (7). The Permittee shall conduct emissions monitoring from these SRPs with CEMS that are compliant with NSPS requirements at all of the emission points, unless an SO_2 alternative monitoring procedure has been approved by USEPA, pursuant to 40 CFR 60.13(i), for any of the emission points. The requirement for continuous monitoring of the SRP emission points is not applicable to the Acid Gas Flaring Devices used to flare the Acid Gas or Sour Water Stripper Gas diverted from the SRPs. [From Paragraph 64.b of the Consent Decree]

3. Requirements for Sulfur Pits.

   a. The Permittee shall route or re-route all sulfur pit emissions at the refinery so that they are eliminated, controlled, or included and monitored as part of the emissions subject to the relevant NSPS Subpart J limit, 40 CFR 60.104(a)(2). [From Paragraph 69.b of the Consent Decree]

   b. Periodic maintenance may be required for properly designed and operated sulfur pit emission control systems and/or equipment. The Permittee will take all reasonable measures to minimize emissions while such periodic maintenance is being performed. [From Paragraph 69.e of the Consent Decree]

4. Good Operation and Maintenance and PMO Plans. [From Paragraph 65.a of the Consent Decree]

   a. The Permittee shall maintain a summary of the plans, implemented or to be implemented, for enhanced maintenance and operation of the SRPs, the control devices, and the appropriate Upstream Process Units.

i. These plans shall be termed the Preventative Maintenance and Operations Plans ("PMO Plans"). The PMO Plans shall be a compilation of the Permittee's approaches for exercising good air pollution control practices and for minimizing SO_2 emissions from sulfur processing and Upstream Process Units.

ii. The PMO Plans shall have as its goals the elimination of Acid Gas Flaring and operation of the SRPs between scheduled maintenance turnarounds with minimization of emissions.

iii. The PMO Plans shall include, but shall not be limited to, sulfur shedding procedures, startup and shutdown procedures of the SRPs, control devices and Upstream Process Units, emergency procedures and schedules to coordinate maintenance turnarounds of the SRP Claus trains and any control device to coincide with scheduled turnarounds of major upstream process units.

b. The Permittee shall implement the PMO Plans at all times, including periods of startup, shutdown and malfunction, consistent with the requirements imposed by 40 CFR 60.11(d).

c. The Permittee shall summarize and report to the Illinois EPA in a semi-annual report, e.g., the semi-annual monitoring report required by the source's CAAPP permit, any changes to the PMO Plans related to minimizing Acid Gas Flaring and/or SO_2 emissions. [From Paragraph 65.a of the Consent Decree]

5. Tail Gas Incidents.

a. Consistent with the requirements of 40 CFR 60.11(d), the Permittee shall investigate the cause of Tail Gas Incidents, take reasonable steps to correct the conditions that have caused or contributed to such Tail Gas Incidents, and minimize Tail Gas Incidents. [From Paragraph 79 of the Consent Decree]

b. For Tail Gas Incidents, the Permittee shall follow the same investigative, reporting and corrective action procedures as those set forth for AG Flaring Incidents (See Attachment 4). Those procedures shall be applied to TGU shutdowns, bypasses of a TGU, or other events which result in a Tail Gas Incident, including unscheduled shutdowns of an SRP. This paragraph shall apply to Tail Gas Incidents involving combustion of Tail Gas from the North Claus Train, East Claus Train and West Claus Train. [From Paragraph 91 of the Consent Decree]

c. Emission Calculations.

Calculation of the Quantity of SO_2 Emissions Resulting from a Tail Gas Incident. For the purposes of this permit, the quantity of SO_2 emissions resulting from a Tail Gas Incident shall be calculated by one of the following methods, based on the type of event: [From Paragraph 91.b of the Consent Decree]

i. If Tail Gas is combusted in a flare, the SO_2 emissions are calculated using the methods outlined in paragraph 1.d of Attachment 4; or

ii. If Tail Gas exceeding the 250 ppmvd NSPS J limit is emitted from a monitored SRP incinerator, then the following formula applies:

$$ER_{TGI} = \sum_{i=1}^{TD_{TGI}} [FR_{Inc.}]_i [Conc.\ SO_2 - 250]_i [0.169 \times 10^{-6}] [[20.9 - \%O_2]/[20.9]]_i$$

Where:

ER_{TGI} = Emissions from Tail Gas Unit at the SRP incinerator, pounds of SO_2 over a 24 hour period

TD_{TGI} = Hours when the incinerator CEM was exceeding 250 ppmvd SO_2 on a rolling twelve hour average, corrected to 0% O_2, in each 24 hour period of the Incident

i = Each hour within TD_{TGI}

$FR_{Inc.}$ = Incinerator Exhaust Gas Flow Rate (standard cubic feet per hour, dry basis) (actual stack monitor data or engineering estimate based on the acid gas feed rate to the SRP) for each hour of the Incident

Conc. SO_2 = The average SO_2 concentration (CEMS data) that is greater than 250 ppm in the incinerator exhaust gas, ppmvd corrected to 0% O_2, for each hour of the Incident

% O_2 = O_2 concentration (CEMS data) in the incinerator exhaust gas in volume % on dry basis for each hour of the Incident

0.169×10^{-6} = [lb mole of SO_2 / 379 scf SO_2] [64 lbs SO_2 / lb mole SO_2] [1×10^{-6}]

Standard conditions = 60 degree F; 14.7 lb_{force}/sq.in. absolute

In the event the concentration SO_2 data point is inaccurate or not available or a flow meter for $FR_{Inc.}$, does not exist or is inoperable, then the Permittee shall estimate emissions based on best engineering judgment.

6. Definitions.

The definitions of terms in Attachment 5 shall be applicable for this Attachment 3.

1. AG Flaring Incidents.

a. i. The Permittee shall at all times and to the extent practicable, including during periods of startup, shutdown, upset and/or malfunction, implement good air pollution control practices to minimize emissions from the South Flare (49-B-305b) and the East Flare (49-B-305a), in a manner consistent with the requirements imposed by 40 CFR 60.11(d). [From Paragraph 70 of the Consent Decree]

ii. Consistent with the requirements of 40 CFR 60.11(d), the Permittee shall investigate the cause of AG Flaring Incidents, take reasonable steps to correct the conditions that have caused or contributed to such AG Flaring Incidents, and minimize AG Flaring Incidents. [From Paragraph 79 of the Consent Decree]

b. Investigation and Reporting.

No later than 45 days following the end of an AG Flaring Incident, the Permittee shall record the following information. This information shall be submitted to the Illinois EPA in a semi-annual report (e.g., the semi-annual monitoring report required by the source's CAAPP permit). [From Paragraph 80 of the Consent Decree]

i. The date and time that the AG Flaring Incident started and ended. To the extent that the AG Flaring Incident involved multiple releases either within a 24 hour period or within subsequent, contiguous, non-overlapping 24 hour periods, the Permittee shall identify the starting and ending dates and times of each release. [From Paragraph 80.i of the Consent Decree]

ii. An estimate of the quantity of SO_2 that was emitted and the calculations that were used to determine that quantity. [From Paragraph 80.ii of the Consent Decree]

iii. The steps, if any, that the Permittee took to limit the duration and/or quantity of SO_2 emissions associated with the AG Flaring Incident. [From Paragraph 80.iii of the Consent Decree]

iv. A detailed analysis that sets forth the Root Cause and all significant contributing causes of that AG Flaring Incident, to the extent determinable. [From Paragraph 80.iv of the Consent Decree]

v. An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of an AG Flaring Incident resulting from the same Root Cause or significant contributing causes in the future. If two or more reasonable alternatives exist to address the Root Cause, the analysis shall discuss the alternatives, if any, that are available, the probable effectiveness and cost of the alternatives, and whether or not an outside consultant should be retained to assist in the analysis. Possible design, operation and maintenance changes shall be evaluated. If the Permittee concludes that corrective action(s) is (are) required under paragraph 1.c (Corrective Action), the report shall include a description of the action(s) and, if not already completed, a schedule for its (their) implementation, including proposed commencement and completion dates. If the Permittee concludes that corrective action is not required under paragraph 1.c (Corrective Action), the report shall explain the basis for that conclusion. [From Paragraph 80.v of the Consent Decree]

vi. To the extent that investigations of the causes and/or possible corrective actions still are underway on the due date of the report, a statement of the anticipated date by which a follow-up report fully conforming to the requirements of paragraphs 1.b.iv and 1.b.v above shall be submitted. [From Paragraph 80.vii of the Consent Decree]

vii. To the extent that completion of the implementation of corrective action(s), if any, is not finalized at the time of the submission of the report required under this paragraph 1.b, then, by no later than 30 days after completion of the implementation of corrective action(s), the Permittee shall submit a report to the Illinois EPA identifying the corrective action(s) taken and the dates of commencement and completion of implementation.

c. Corrective Action.

In response to any AG Flaring Incident, the Permittee shall take, as expeditiously as practicable, such interim and/or long-term corrective actions, if any, as are consistent with good engineering practice to minimize the likelihood of a recurrence of the Root Cause and all significant contributing causes of that AG Flaring Incident. [From Paragraph 81.a of the Consent Decree]

d. Emission Calculations.

i. Calculation of the Quantity of SO_2 Emissions Resulting from AG Flaring. For purposes of this permit, the quantity of SO_2 emissions resulting from an AG Flaring Incident shall be calculated by the following formula:

Tons of SO_2 = [FR][TD][ConcH_2S][8.44 x 10-5]

The quantity of SO_2 emitted shall be rounded to one decimal point. (Thus, for example, for a calculation that results in a number equal to 10.050 tons, the quantity of SO_2 emitted shall be rounded to 10.1 tons.) For purposes of determining the occurrence of, or the total quantity of SO_2 emissions resulting from, an AG Flaring Incident that is comprised of intermittent AG Flaring, the quantity of SO_2 emitted shall be equal to the sum of the quantities of SO_2 flared during each 24-hour period starting when the Acid

Gas was first flared. [From Paragraph 90.a of the Consent Decree]

ii. Calculation of the Rate of SO_2 Emissions During AG Flaring. For purposes of this permit, the rate of SO_2 emissions resulting from an AG Flaring Incident shall be expressed in terms of pounds per hour and shall be calculated by the following formula:

ER = [FR][ConcH_2S][0.169]

The emission rate shall be rounded to one decimal point. (Thus, for example, for a calculation that results in an emission rate of 19.95 pounds of SO_2 per hour, the emission rate shall be rounded to 20.0 pounds of SO_2 per hour; for a calculation that results in an emission rate of 20.05 pounds of SO_2 per hour, the emission rate shall be rounded to 20.1.) [From Paragraph 90.b of the Consent Decree]

iii. Meaning of Variables and Derivation of Multipliers Used in the Equations above:

ER = Emission Rate in pounds of SO_2 per hour

FR = Average Flow Rate to Flaring Device(s) during Flaring Incident in standard cubic feet per hour

TD = Total Duration of Flaring Incident in hours

ConcH_2S = Average Concentration of Hydrogen Sulfide in gas during Flaring Incident (or immediately prior to Flaring Incident if all gas is being flared) expressed as a volume fraction (scf H_2S/scf gas)

8.44 x 10-5 = [lb mole H_2S/379 scf H_2S][64 lbs SO_2/lb mole H_2S][Ton/2000 lbs]

0.169 = [lb mole H_2S/379 scf H_2S][1.0 lb mole SO_2/1 lb mole H_2S][64 lb SO_2/1.0 lb mole SO_2]

The flow of gas to the AG Flaring Device(s) ("FR") shall be as measured by the relevant flow meter or reliable flow estimation parameters. Hydrogen sulfide concentration ("ConcH_2S") shall be determined from the Sulfur Recovery Plant feed gas analyzer, from knowledge of the sulfur content of the process gas being flared, by direct measurement by Tutwiler or Draeger (or other colorimetric) tube analysis or by any other method approved by USEPA or the Illinois EPA. In the event that any of these data points is unavailable or inaccurate, the missing data point(s) shall be estimated according to best engineering judgment. The investigation records required under paragraph 1.b shall include the data used in the calculation and an explanation of the basis for any estimates of missing data points. [From Paragraph 90.c of the Consent Decree]

2. HC Flaring Incidents.

   a. The Permittee shall at all times and to the extent practicable, including during periods of startup, shutdown, upset and/or malfunction, implement good air pollution control practices to minimize emissions from the South Flare (49-B-305b) and the East Flare (49-B-305a), in a manner consistent with the requirements imposed by 40 CFR 60.11(d). [From Paragraph 70 of the Consent Decree]

   b. For HC Flaring Incidents, the Permittee shall follow the same investigative, reporting and corrective action procedures as those set forth for AG Flaring Incidents. However: [From Paragraph 92 of the Consent Decree]

      i. The Permittee shall submit the HC Flaring Incident reports in a semi-annual report. [From Paragraph 92.i of the Consent Decree]

      ii. For each HC Flaring Device, the Permittee may prepare and record a single Root Cause Analysis for one or more Root Causes found by that analysis to routinely recur. [From Paragraph 92.ii of the Consent Decree]

      iii. For the 6 month period after the installation of a flare gas recovery system (that is, during the time in which the flare gas recovery system is being commissioned), the Permittee shall not be required to undertake HC Flaring Incident investigations if the Root Cause of the HC Flaring Incident is directly related to the commissioning of the flare gas recovery system. [From Paragraph 92.iii of the Consent Decree]

      iv. In lieu of analyzing possible corrective actions under paragraph 1(b)(v) and taking interim and/or long-term corrective action under paragraph 1(c) for a HC Flaring Incident attributable to the startup or shutdown of a process unit that the Permittee has previously analyzed under this paragraph, the Permittee may identify such prior analysis when submitting the report required under this paragraph. [From Paragraph 92.iv of the Consent Decree]

      v. To the extent that a HC Flaring Incident has as its Root Cause the bypass of a flare gas recovery system for the purpose of an emergency or to ensure safe operation of refinery processes or for periodic maintenance, the Permittee shall keep records of the description of the HC Flaring Incident and include the date, time, and duration of such Incident in a semi-annual report. [From Paragraph 92.v of the Consent Decree]

3. Definitions.

   The definitions of terms in Attachment 5 shall be applicable for this Attachment 4.

Introduction: These definitions of terms in this attachment shall be applicable for this permit and its attachments.

“Acid Gas” or “AG” shall mean any gas that contains hydrogen sulfide and is generated at a refinery by the regeneration of an amine scrubber solution but does not mean Tail Gas. [From Paragraph 10.a of the Consent Decree]

“Acid Gas Flaring” or “AG Flaring” shall mean the combustion of Acid Gas and/or Sour Water Stripper Gas in an AG Flaring Device. Nothing in this definition shall be construed to modify, limit, or affect EPA’s authority to regulate the flaring of gases that do not fall within the definitions of Acid Gas or Sour Water Stripper Gas contained in this permit. [From Paragraph 10.b of the Consent Decree]

“Acid Gas Flaring Device” or “AG Flaring Device” shall mean the South Flare (49-B-305b) and the East Flare (49-B-305a) that are used to combust Acid Gas and/or Sour Water Stripper Gas. The term “Acid Gas Flaring Device” does not include facilities in which gases are combusted to produce sulfur or sulfuric acid. [From Paragraph 10.c of the Consent Decree]

> Note: The South Flare (49-B-305b) and the East Flare (49-B-305a) are “dual-service” flaring devices, constituting both Acid Gas/Hydrocarbon Flaring Devices.

“Acid Gas Flaring Incident” or “AG Flaring Incident” shall mean the continuous or intermittent combustion of Acid Gas and/or Sour Water Stripper Gas from one or more AG Flaring Devices that results in the emission of SO_2 equal to, or in excess of, 500 pounds in any 24 hour period. Where such continuous or intermittent combustion from one or more AG Flaring Devices continues into subsequent, contiguous, non-overlapping 24 hour period(s), and SO_2 equal to, or in excess of, 500 pounds is emitted in each subsequent, contiguous, non-overlapping 24 hour period(s), then only one AG Flaring Incident shall have occurred. Subsequent, contiguous, non-overlapping 24 hour periods are measured from the initial commencement of AG Flaring within the AG Flaring Incident. [From Paragraph 10.d of the Consent Decree]

“ExxonMobil” shall mean ExxonMobil Oil Corporation and its successors and assigns. [From Paragraph 10.p of the Consent Decree]

“Flaring Device” shall mean an AG Flaring Device and/or an HC Flaring Device. [From Paragraph 10.r of the Consent Decree]

“Flaring Incident” shall mean an AG Flaring Incident, a Tail Gas Incident, and/or an HC Flaring Incident. [From Paragraph 10.s of the Consent Decree]

“Fuel Oil” shall mean any liquid fossil fuel with sulfur content of greater than 0.05% by weight. [From Paragraph 10.t of the Consent Decree]

“Hydrocarbon Flaring” or “HC Flaring” shall mean the combustion of refinery-generated gases, except for Acid Gas and/or Sour Water Stripper Gas and/or Tail Gas, in a Hydrocarbon Flaring Device. Nothing in this definition shall be construed to modify, limit, or affect USEPA’s authority to regulate the flaring of gases that do not fall within the definitions contained in this permit. [From Paragraph 10.v of the Consent Decree]

"Hydrocarbon Flaring Device" or "HC Flaring Device" shall mean the South Flare (49-B-305b) and the East Flare (49-B-305a) that are used to control (through combustion) any excess volume of a refinery-generated gas other than Acid Gas and/or Sour Water Stripper Gas and/or Tail Gas. To the extent that the Permittee utilizes Flaring Devices other than the South Flare (49-B-305b) and the East Flare (49-B-305a) for the purpose of combusting any excess of a refinery-generated gas other than Acid Gas and/or Sour Water Stripper Gas, those Flaring Devices shall be HC Flaring Devices and shall be subject to the provisions of this permit. [From Paragraph 10.w of the Consent Decree]

Note: The South Flare (49-B-305b) and the East Flare (49-B-305a) are "dual-service" flaring devices constituting both Acid Gas/Hydrocarbon Flaring Devices.

"Hydrocarbon Flaring Incident" or "HC Flaring Incident" shall mean the continuous or intermittent flaring of refinery-generated gases, except for Acid Gas or Sour Water Stripper Gas or Tail Gas, in a Hydrocarbon Flaring Device that results in the emission of SO_2 equal to, or greater than 500 pounds in a 24-hour period. Where such continuous or intermittent flaring from a Hydrocarbon Flaring Device continues into subsequent, contiguous, non-overlapping 24 hour period(s), and SO_2 equal to, or in excess of, 500 pounds is emitted in each subsequent, contiguous, non-overlapping 24 hour period(s), then only one HC Flaring Incident shall have occurred. Subsequent, contiguous, non-overlapping 24 hour periods are measured from the initial commencement of flaring within the HC Flaring Incident. [From Paragraph 10.x of the Consent Decree]

"Natural Gas Curtailment" shall mean a restriction imposed by a natural gas supplier, which limits the Permittee's ability to obtain natural gas. [From Paragraph 10.ad of the Consent Decree]

"Root Cause" shall mean the primary cause(s) of AG Flaring Incident(s), Hydrocarbon Flaring Incident(s), or Tail Gas Incident(s), as determined through a process of investigation. [From Paragraph 10.am of the Consent Decree]

"Sour Water Stripper Gas" or "SWS Gas" shall mean the gas produced by the process of stripping or scrubbing refinery sour water. [From Paragraph 10.an of the Consent Decree]

"Sulfur Recovery Plant" or "SRP" shall mean a process unit that recovers sulfur from hydrogen sulfide by a vapor phase catalytic reaction of sulfur dioxide and hydrogen sulfide. The SRP at the Joliet refinery consists of three Claus trains: North Train, East Train and West Train. [From Paragraph 10.aq of the Consent Decree]

"Tail Gas" or "TG" shall mean exhaust gas from the Claus trains and/or the tail gas cleanup unit ("TGU") section of the SRP. [From Paragraph 10.ar of the Consent Decree]

"Tail Gas Unit" or "TGU" shall mean a control system utilizing a technology for reducing emissions of sulfur compounds from a Claus Sulfur Recovery Plant. [From Paragraph 10.as of the Consent Decree]

"Tail Gas Incident" shall mean combustion of Tail Gas that either is:

(1) combusted in a flare and results in 500 pounds or more of SO_2 emissions in any 24 hour period ; or

(2) combusted in a thermal incinerator and results in excess emissions of 500 pounds or more of SO_2 in any 24-hour period. Only those time periods that are in excess of a SO_2 concentration of 250 ppm (rolling 12-hour average) shall be used to determine the amount of excess SO_2 emissions from the incinerator. ExxonMobil shall use engineering judgment and/or other monitoring data to estimate emissions during periods in which the SO_2 continuous emission analyzer has exceeded the range of the instrument or is out of service. [From Paragraph 10.at of the Consent Decree]