John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

12/16/2013

Certified Mail

No	TOXIC REVIEW
No	PSD
No	SYNTHETIC MINOR TO AVOID MAJOR NSR
No	CEMS
Yes	MACT/GACT
Yes	NSPS
No	NESHAPS
No	NETTING
No	MAJOR NON-ATTAINMENT
Yes	MODELING SUBMITTED
No	MAJOR GHG
No	SYNTHETIC MINOR TO AVOID MAJOR GHG

William Patrie
Marathon Petroleum Company LP - Canton Refinery
2408 Gambrinus Avenue SW
Canton, OH 44706

RE: FINALAIR POLLUTION PERMIT-TO-INSTALL
Facility ID: 1576002006
Permit Number: P0113530
Permit Type: Administrative Modification
County: Stark

Dear Permit Holder:

Enclosed please find a final Ohio Environmental Protection Agency (EPA)Air Pollution Permit-to-Install (PTI) which will allow you to install or modify the described emissions unit(s) in a manner indicated in the permit. Because this permit contains several conditions and restrictions, we urge you to read it carefully. Because this permit contains conditions and restrictions, please read it very carefully. In this letter you will find the information on the following topics:

- **How to appeal this permit**
- **How to save money, reduce pollution and reduce energy consumption**
- **How to give us feedback on your permitting experience**
- **How to get an electronic copy of your permit**

How to appeal this permit

The issuance of this PTI is a final action of the Director and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00, made payable to “Ohio Treasurer Josh Mandel," which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General’s Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
77 South High Street, 17th Floor
Columbus, OH 43215

How to save money, reduce pollution and reduce energy consumption

The Ohio EPA is encouraging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Compliance Assistance and Pollution Prevention at (614) 644-3469. Additionally, all or a portion of the capital expenditures related to installing air pollution control equipment under this permit may be eligible for financing and State tax exemptions through the Ohio Air Quality Development Authority (OAQDA) under Ohio Revised Code Section 3706. For more information, see the OAQDA website: www.ohioairquality.org/clean_air

How to give us feedback on your permitting experience

Please complete a survey at www.epa.ohio.gov/survey.aspx and give us feedback on your permitting experience. We value your opinion.

How to get an electronic copy of your permit

This permit can be accessed electronically via the eBusiness Center: Air Services in Microsoft Word format or in Adobe PDF on the Division of Air Pollution Control (DAPC) Web page, www.epa.ohio.gov/dapc by clicking the "Search for Permits" link under the Permitting topic on the Programs tab.

If you have any questions, please contact Canton City Health Department at (330)489-3385 or the Office of Compliance Assistance and Pollution Prevention at (614)644-3469.

Sincerely,

Michael W. Ahern

Michael W. Ahern, Manager
Permit Issuance and Data Management Section, DAPC

Cc: U.S. EPA
Canton; Pennsylvania; West Virginia

FINAL

Division of Air Pollution Control
Permit-to-Install
for
Marathon Petroleum Company LP - Canton Refinery

Facility ID:	1576002006
Permit Number:	P0113530
Permit Type:	Administrative Modification
Issued:	12/16/2013
Effective:	12/16/2013

Division of Air Pollution Control
Permit-to-Install
for
Marathon Petroleum Company LP - Canton Refinery

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Authorization

Facility ID:	1576002006
Facility Description:	Petroleum Refinery
Application Number(s):	A0047136
Permit Number:	P0113530
Permit Description:	Administrative Modification PTI to establish voluntary and federally-enforceable sulfur dioxide (SO2) emission limitations for the existing flare (P003) in order to establish a federally-permitted release under CERCLA/EPCRA release reporting for SO2. This PTI also incorporates the consent decree requirements into a federally-enforceable permit that apply to P003. No physical or operational changes are occurring to P003.
Permit Type:	Administrative Modification
Permit Fee:	$100.00
Issue Date:	12/16/2013
Effective Date:	12/16/2013

This document constitutes issuance to:

Marathon Petroleum Company LP - Canton Refinery
2408 Gambrinus Avenue SW
Canton, OH 44706

of a Permit-to-Install for the emissions unit(s) identified on the following page.

Ohio Environmental Protection Agency (EPA) District Office or local air agency responsible for processing and administering your permit:

Canton City Health Department
420 Market Avenue
Canton, OH 44702-1544
(330)489-3385

The above named entity is hereby granted a Permit-to-Install for the emissions unit(s) listed in this section pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the emissions unit(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Scott J. Nally
Director

Authorization (continued)

Permit Number: P0113530
Permit Description: Administrative Modification PTI to establish voluntary and federally-enforceable sulfur dioxide (SO2) emission limitations for the existing flare (P003) in order to establish a federally-permitted release under CERCLA/EPCRA release reporting for SO2. This PTI also incorporates the consent decree requirements into a federally-enforceable permit that apply to P003. No physical or operational changes are occurring to P003.

Permits for the following Emissions Unit(s) or groups of Emissions Units are in this document as indicated below:

Emissions Unit ID:	**P003**
Company Equipment ID:	North Area Flare
Superseded Permit Number:	
General Permit Category and Type:	Not Applicable

A. Standard Terms and Conditions

1. Federally Enforceable Standard Terms and Conditions

a) All Standard Terms and Conditions are federally enforceable, with the exception of those listed below which are enforceable under State law only:

(1) Standard Term and Condition A.2.a), Severability Clause

(2) Standard Term and Condition A.3.c) through A. 3.e)General Requirements

(3) Standard Term and Condition A.6.c) and A. 6.d), Compliance Requirements

(4) Standard Term and Condition A.9., Reporting Requirements

(5) Standard Term and Condition A.10., Applicability

(6) Standard Term and Condition A.11.b) through A.11.e), Construction of New Source(s) and Authorization to Install

(7) Standard Term and Condition A.14., Public Disclosure

(8) Standard Term and Condition A.15., Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

(9) Standard Term and Condition A.16., Fees

(10) Standard Term and Condition A.17., Permit Transfers

2. Severability Clause

a) A determination that any term or condition of this permit is invalid shall not invalidate the force or effect of any other term or condition thereof, except to the extent that any other term or condition depends in whole or in part for its operation or implementation upon the term or condition declared invalid.

b) All terms and conditions designated in parts B and C of this permit are federally enforceable as a practical matter, if they are required under the Act, or any of its applicable requirements, including relevant provisions designed to limit the potential to emit of a source, are enforceable by the Administrator of the U.S. EPA and the State and by citizens (to the extent allowed by section 304 of the Act) under the Act. Terms and conditions in parts B and C of this permit shall not be federally enforceable and shall be enforceable under State law only, only if specifically identified in this permit as such.

3. General Requirements

a) Any noncompliance with the federally enforceable terms and conditions of this permit constitutes a violation of the Act, and is grounds for enforcement action or for permit revocation, revocation and re-issuance, or modification.

b) It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the federally enforceable terms and conditions of this permit.

c) This permit may be modified, revoked, or revoked and reissued, for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or revocation, or of a notification of planned changes or anticipated noncompliance does not stay any term and condition of this permit.

d) This permit does not convey any property rights of any sort, or any exclusive privilege.

e) The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying or revoking this permit or to determine compliance with this permit. Upon request, the permittee shall also furnish to the Director or an authorized representative of the Director, copies of records required to be kept by this permit. For information claimed to be confidential in the submittal to the Director, if the Administrator of the U.S. EPA requests such information, the permittee may furnish such records directly to the Administrator along with a claim of confidentiality.

4. Monitoring and Related Record Keeping and Reporting Requirements

a) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall maintain records that include the following, where applicable, for any required monitoring under this permit:

(1) The date, place (as defined in the permit), and time of sampling or measurements.

(2) The date(s) analyses were performed.

(3) The company or entity that performed the analyses.

(4) The analytical techniques or methods used.

(5) The results of such analyses.

(6) The operating conditions existing at the time of sampling or measurement.

b) Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.

c) Except as may otherwise be provided in the terms and conditions for a specific emissions unit, the permittee shall submit required reports in the following manner:

(1) Reports of any required monitoring and/or recordkeeping of federally enforceable information shall be submitted to the Canton City Health Department.

(2) Quarterly written reports of (i) any deviations from federally enforceable emissionlimitations, operationalrestrictions, andcontroldeviceoperatingparameterlimitations, excluding deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06, that have been detected by the testing, monitoring and recordkeeping requirements specified in this permit, (ii) the probable cause of such deviations, and (iii) any corrective actions or preventive measures taken, shall be made to the Canton City Health Department. The written reports shall be submitted (i.e., postmarked) quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. See A.15. below if no deviations occurred during the quarter.

(3) Written reports, which identify any deviations from the federally enforceable monitoring, recordkeeping, andreportingrequirements contained in this permit shall be submitted to the Canton City Health Department every six months, by January 31 and July 31 of each year for the previous six calendar months. If no deviations occurred during a six-month period, the permittee shall submit a semi-annual report, which states that no deviations occurred during that period.

(4) This permit is for an emissions unit located at a Title V facility. Each written report shall be signed by a responsible official certifying that, based on information and belief formed after reasonable inquiry, the statements and information in the report are true, accurate, and complete.

d) The permittee shall report actual emissions pursuant to OAC Chapter 3745-78 for the purpose of collecting Air Pollution Control Fees.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction, i.e., upset, of any emissions units or any associated air pollution control system(s) shall be reported to theCanton City Health Departmentin accordance with paragraph (B) of OAC rule 3745-15-06. (The definition of an upset condition shall be the same as that used in OAC rule 3745-15-06(B)(1) for a malfunction.) The verbal and written reports shall be submitted pursuant to OAC rule 3745-15-06.

Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

6. Compliance Requirements

a) All applications, notifications or reports required by terms and conditions in this permit to be submitted or "reported in writing" are to be submitted to Ohio EPA through the Ohio EPA's eBusiness Center: Air Services web service ("Air Services"). Ohio EPA will accept hard copy submittals on an as-needed basis if the permittee cannot submit the required documents through the Ohio EPA eBusiness Center. In the event of an alternative hard copy submission in lieu of the eBusiness Center, the post-marked date or the date the document is delivered in person will be recognized as the date submitted. Electronic submission of applications, notifications or reports required to be submitted to Ohio EPA fulfills the requirement to submit the required information to the Director, the appropriate Ohio EPA District Office or contracted

local air agency, and/or any other individual or organization specifically identified as an additional recipient identified in this permit unless otherwise specified. Consistent with OAC rule 3745-15-03, the electronic signature date shall constitute the date that the required application, notification or report is considered to be "submitted". Any document requiring signature may be represented by entry of the personal identification number (PIN) by responsible official as part of the electronic submission process or by the scanned attestation document signed by the Authorized Representative that is attached to the electronically submitted written report.

Any document (including reports) required to be submitted and required by a federally applicable requirement in this permit shall include a certification by a Responsible Official that, based on information and belief formed after reasonable inquiry, the statements in the document are true, accurate, and complete.

b) Upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Director of the Ohio EPA or an authorized representative of the Director to:

(1) At reasonable times, enter upon the permittee's premises where a source is located or the emissions-related activity is conducted, or where records must be kept under the conditions of this permit.

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit, subject to the protection from disclosure to the public of confidential information consistent with ORC section 3704.08.

(3) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit.

(4) As authorized by the Act, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit and applicable requirements.

c) The permittee shall submit progress reports to the Canton City Health Department concerning any schedule of compliance for meeting an applicable requirement. Progress reports shall be submitted semiannually or more frequently if specified in the applicable requirement or by the Director of the Ohio EPA. Progress reports shall contain the following:

(1) Dates for achieving the activities, milestones, or compliance required in any schedule of compliance, and dates when such activities, milestones, or compliance were achieved.

(2) An explanation of why any dates in any schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

7. Best Available Technology

As specified in OAC Rule 3745-31-05, new sources that must employ Best Available Technology (BAT) shall comply with the Applicable Emission Limitations/Control Measures identified as BAT for each subject emissions unit.

8. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

9. Reporting Requirements

The permittee shall submit required reports in the following manner:

a) Reports of any required monitoring and/or recordkeeping of state-only enforceable information shall be submitted to the Canton City Health Department.

b) Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from state-only required emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the Canton City Health Department. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

10. Applicability

This Permit-to-Install is applicable only to the emissions unit(s) identified in the Permit-to-Install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s)not exempt from the requirement to obtain a Permit-to-Install.

11. Construction of New Sources(s) and Authorization to Install

a) This permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. This permit does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the application and terms and conditions of this permit. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of this permit does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Issuance of this permit is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.

b) If applicable, authorization to install any new emissions unit included in this permit shall terminate within eighteen months of the effective date of the permit if the owner or operator has not undertaken a continuing program of installation or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation. This deadline may be extended by up to 12 months if application is made to the

Director within a reasonable time before the termination date and the permittee shows good cause for any such extension.

c) The permittee may notify Ohio EPA of any emissions unit that is permanently shut down (i.e., the emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31) by submitting a certification from the authorized official that identifies the date on which the emissions unit was permanently shut down. Authorization to operate the affected emissions unit shall cease upon the date certified by the authorized official that the emissions unit was permanently shut down. At a minimum, notification of permanent shut down shall be made or confirmed by marking the affected emissions unit(s) as “permanently shut down” in “Air Services” along with the date the emissions unit(s) was permanently removed and/or disabled. Submitting the facility profile update electronically will constitute notifying the Director of the permanent shutdown of the affected emissions unit(s).

d) The provisions of this permit shall cease to be enforceable for each affected emissions unit after the date on which an emissions unit is permanently shut down (i.e., emissions unit has been physically removed from service or has been altered in such a way that it can no longer operate without a subsequent "modification" or "installation" as defined in OAC Chapter 3745-31). All records relating to any permanently shutdown emissions unit, generated while the emissions unit was in operation, must be maintained in accordance with law. All reports required by this permit must be submitted for any period an affected emissions unit operated prior to permanent shut down. At a minimum, the permit requirements must be evaluated as part of the reporting requirements identified in this permit covering the last period the emissions unit operated.

Unless otherwise exempted,no emissions unit certified by the responsible official as being permanently shut down may resume operation without first applying for and obtaining a permit pursuant to OAC Chapter 3745-31 and OAC Chapter 3745-77 if the restarted operation is subject to one or more applicable requirements.

e) The permittee shall comply with any residual requirements related to this permit, such as the requirement to submit a deviation report, air fee emission report, or other any reporting required by this permit for the period the operating provisions of this permit were enforceable, or as required by regulation or law. All reports shall be submitted in a form and manner prescribed by the Director. All records relating to this permit must be maintained in accordance with law.

12. Permit-To-Operate Application

The permittee is required to apply for a Title V permit pursuant to OAC Chapter 3745-77. The permittee shall submit a complete Title V permit application or a complete Title V permit modification application within twelve (12) months after commencing operation of the emissions units covered by this permit. However, if operation of the proposed new or modified source(s) as authorized by this permit would be prohibited by the terms and conditions of an existing Title V permit, a Title V permit modification of such new or modified source(s) pursuant to OAC rule 3745-77-04(D) and OAC rule 3745-77-08(C)(3)(d)must be <u>obtained before</u>operating the source in a manner that would violate the existing Title V permit requirements.

13. Construction Compliance Certification

The applicant shall identify the following dates in the "Air Services" facility profile for each new emissions unit identified in this permit.

a) Completion of initial installation date shall be enteredupon completion of construction and prior to start-up.

b) Commence operation after installation or latest modification date shall be entered within 90 days after commencing operation of the applicable emissions unit.

14. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

15. Additional Reporting Requirements When There Are No Deviations of Federally Enforceable Emission Limitations, Operational Restrictions, or Control Device Operating Parameter Limitations

If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters.

16. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable permit-to-install fees within 30 days after the issuance of any permit-to-install. The permittee shall pay all applicable permit-to-operate fees within thirty days of the issuance of the invoice.

17. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The new owner must update and submit the ownership information via the "Owner/Contact Change" functionality in "Air Services" once the transfer is legally completed.The change must be submitted through "Air Services" within thirty days of the ownership transfer date.

18. Risk Management Plans

If the permittee is required to develop and register a risk management plan pursuant to section 112(r) of the Clean Air Act, as amended, 42 U.S.C. 7401 et seq. ("Act"), the permittee shall comply with the requirement to register such a plan.

19. Title IV Provisions

If the permittee is subject to the requirements of 40 CFR Part 72 concerning acid rain, the permittee shall ensure that any affected emissions unit complies with those requirements. Emissions exceeding any allowances that are lawfully held under Title IV of the Act, or any regulations adopted thereunder, are prohibited.

B. Facility-Wide Terms and Conditions

1. All the following facility-wide terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only:

   a) [OAC rule 3745-15-03(A)]
   Unless other arrangements have been approved by the Director (the appropriate Ohio Environmental Protection Agency (EPA) District Office or local air agency), all notifications and reports shall be submitted through the Ohio EPA's eBusiness Center: Air Services online web portal.

2. The permittee shall comply with the following requirements of the August 30, 2012, Consent Decree (CD) between Marathon Petroleum Company and United States of America, Number 2:12-cv-11544-DML-MJH for emission unit P003. The permittee shall comply with the CD requirements that have been permitted herein. If the CD is revised and the revisions affect any of the permitted terms, then the permittee shall comply with the revised CD terms in lieu of the affected permitted terms and apply for a revision to this permit as soon as practical after the effective date of the revised CD. The inclusion of the terms specified below does not exclude the permittee's obligation to comply with other effective CD requirements.

   a) For the purposes of Section B.2., the following definitions shall apply:

      1) "Automatic Control System" shall mean a system that utilizes programming logic to automate the operation of the instrumentation and systems so as to produce the operational results.

      2) "BTU/scf" shall mean British Thermal Unit per standard cubic feet.

      3) "Calendar Quarter" shall mean a three month period ending on March 31, June 30, September 30, or December 31.

      4) "Center Steam" shall mean steam piped into the center of a flare stack or center of the lower part of the flare tip where it mixes directly with Vent Gas without entraining air.

      5) "Center Steam Volumetric Flow Rate" or "$Q_{s,cent}$" shall mean the volumetric flow rate of Center Steam supplied to a flare, in scfm, as either measured (if applicable) or estimated using best engineering judgment, on a 5-minute block average.

      6) "Discontinuous Wake Dominated Flow" shall mean gas flow exiting a flare tip that is identified visually by:

         a. the presence of a flame that is: (1) immediately adjacent to the exterior of the flare tip body; and (2) below the exit plane of the flare tip; and

         b. a discontinuous flame, such that pockets of flame that are detached from the portion of the flame that is immediately adjacent to the exterior of the flare tip body.

      7) "Exit Velocity" shall mean the velocity ("v") of the Vent Gas and Center Steam as it exits the flare tip. Exit Velocity shall be calculated by adding together the Vent Gas Volumetric Flow Rate and the Center Steam Volumetric Flow Rate, based on Standard Conditions, and dividing by the unobstructed cross sectional area of the flare tip.

8) "Lower Heating Value" or "LHV" shall mean the theoretical total quantity of heat liberated by the complete combustion of a unit volume or weight of a fuel initially at 25 degrees Centigrade and 760 mmHg, assuming that the produced water is vaporized and all combustion products remain at, or are returned to, 25 degrees Centigrade; however, the standard for determining the volume corresponding to one mole is 20 degrees Centigrade.

9) "Malfunction" shall mean any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not Malfunctions. In any action under this permit involving this definition, the permittee shall have the burden of proving a Malfunction and, in interpreting this definition, the ten requirements for a "malfunction" set forth in Section II ("Affirmative Defenses for Malfunctions") of EPA's Policy on Excess Emissions during Malfunctions, Startup, and Shutdown shall apply.

10) "Net Heating Value" shall mean Lower Heating Value.

11) "Pilot Gas" shall mean all gas introduced through the pilot tip of a flare to maintain a flame.

12) "Purge Gas" shall mean the minimum amount of gas introduced between a flare header's water seal and the flare tip to prevent oxygen infiltration (backflow) into the flare tip.

13) "SCFM" or "scfm" shall mean standard cubic feet per minute.

14) "Shutdown" shall mean the cessation of operation for any purpose.

15) "Smoke Emissions" shall have the definition set forth in Section 3.5 of Method 22 of 40 CFR Part 60, Appendix A. Smoke Emissions may be documented by either a person certified pursuant to Method 22 or by a video camera.

16) "Standard Conditions" shall mean a temperature of 68 degrees Fahrenheit and a pressure of 1 atmosphere.

17) "Startup" shall mean the setting in operation for any purpose.

18) "Supplemental Gas" shall mean all gas introduced to a flare to comply with the Net Heating Value requirements of 40 CFR 60.18(b) and 40 CFR 63.11(b).

19) "S/VG_{mass}" shall mean the ratio of the Total Steam Mass Flow Rate to the Vent Gas Mass Flow Rate.

20) "S/VG_{vol}" shall mean the ratio of the Total Steam Volumetric Flow Rate to the Vent Gas Volumetric Flow Rate.

21) "Sweep Gas" shall mean:

    a. For a flare with a flare gas recovery system: the minimum amount of gas introduced into a flare header in order to: (a) prevent oxygen buildup, corrosion,

and/or freezing in the flare header; and (b) maintain a safe flow of gas through the flare header. Sweep Gas in these flares is introduced prior to and is intended to be recovered by the flare gas recovery system.

b. For a flare without a flare gas recovery system: the minimum amount of gas introduced into a flare header in order to: (a) prevent oxygen buildup, corrosion, and/or freezing in the flare header; (b) maintain a safe flow of gas through the flare header, including a higher flow during hot taps; and (c) prevent oxygen infiltration (backflow) into the flare tip.

22) "Total Steam" or "S" shall mean the total of all steam that intentionally is introduced into a steam-assisted flare to assist in combustion.

23) "Total Steam Mass Flow Rate" or "m_s" shall mean the mass flow rate of Total Steam supplied to a flare, in pounds per hour as calculated on a 5-minute block average.

24) "Total Steam Volumetric Flow Rate" or "Q_s" shall mean the volumetric flow rate of Total Steam supplied to a flare, in scfm as measured on a 5-minute block average.

25) "Vent Gas" shall mean the mixture of all gases found prior to the flare tip. This gas includes all Waste Gas, Sweep Gas, Purge Gas, and Supplemental Gas, but does not include Pilot Gas, Total Steam, or air intentionally introduced to a flare to assist in combustion.

26) "Vent Gas Mass Flow Rate" or "m_{vg}" shall mean the mass flow rate of Vent Gas directed to a covered flare, in pounds per hour on a 5-minute block average.

27) "Vent Gas Molecular Weight" or "MW_{vg}" shall mean the Molecular Weight, in pounds per pound-mole, of the Vent Gas, on a 5-minute block average.

28) "Vent Gas Volumetric Flow Rate" or "Q_{vg}" shall mean the volumetric flow rate of Vent Gas directed to a covered flare, in wet scfm, on a 5-minute block average basis.

29) "Visible Emissions" shall mean five minutes or more of Smoke Emissions during any two consecutive hours. For purposes of this permit, Visible Emissions may be documented by either a person certified pursuant to Method 22 or by a video camera.

30) "Waste Gas" shall mean the mixture of all gases from facility operations that is directed to a flare for the purpose of disposing of the gas. "Waste Gas" does not include gas introduced to a flare exclusively to make it operate safely and as intended; therefore, "Waste Gas" does not include Pilot Gas, Total Steam, air intentionally introduced to a flare to assist in combustion, or the minimum amount of Sweep Gas and Purge Gas that is necessary to perform the functions of Sweep Gas and Purge Gas. "Waste Gas" also does not include gas introduced to a flare to comply with regulatory requirements; therefore, "Waste Gas" does not include Supplemental Gas. Depending upon the instrumentation that measures Waste Gas, certain compounds (hydrogen, nitrogen, oxygen, carbon dioxide, carbon monoxide, and/or water (steam)) that are directed to a flare for the purpose of disposing of these compounds may be excluded from calculations relating to Waste Gas flow.

b) By no later than June 30, 2013, the permittee shall have completed the installation and commenced the operation of a Vent Gas flow monitoring system, Vent Gas average molecular weight analyzer, Total Steam flow monitoring system, steam control equipment, gas chromatograph, and meteorological system as specified in terms B.2.c) – h) below.

c) The Vent Gas flow monitoring system shall:

(1) Continuously measure and calculate the total flow, in standard cubic feet per minute (scfm) and pounds per hour (lb/hr), of all Vent Gas. The flow meter shall:

a. have a velocity range from 0.1-250 ft/sec;

b. have repeatability within 1% of the reading over the velocity range;

c. have a design accuracy within 5% initially to 40%, 60%, and 90% of monitor full scale as certified by the manufacturer;

d. have an optimal operational accuracy within 20% of the reading over the velocity range 0.1-1 ft/sec and 5% of the reading from 1-250 ft/s;

e. be installed according to applicable AGA, ANSI, API, or equivalent standard;

f. be calibrated annually;

g. use 68 °F and 1 atmosphere pressure for flow rate corrections.

(2) Continuously analyze pressure and temperature at each point of Vent Gas flow measurement. The temperature and pressure indicators shall be calibrated annually within ±5%;

(3) Have dual channel measurement at each point of Vent Gas flow measurement; and

(4) Have retractable or removable sensors at each point of Vent Gas flow measurement to ensure that the Vent Gas flow monitoring system is maintainable online.

d) The Vent Gas Molecular Weight analyzer shall continuously analyze the average molecular weight of all Vent Gas. This analysis may be performed by an instrument that also serves as part of a Vent Gas flow monitoring system. The analyzer shall have a range of 2 to 120 g/gmol and an accuracy of ±2%.

e) The Total Steam flow monitoring system shall:

(1) Continuously measure and calculate the flow, in scfm and lb/hr, of the Total Steam to P003. The flow meters shall:

a. be repeatable within ±1% of the range of the instrument;

b. have an accuracy within:

i. ±1% from 100% to 15% of the span;

ii. ±2% from 15% to 6% of the span; and

iii. ±3% from 6% to 4% of the span;

c. be installed according to applicable AGA, ANSI, API, or equivalent standard;

d. use 68 °F and 1 atmosphere pressure for flow rate corrections; and

e. be calibrated annually.

(2) Continuously analyze the pressure and temperature of steam at a representative point of steam flow measurement. The temperature and pressure monitors must be calibrated annually within ±5% accuracy.

f) The steam control equipment, including, as necessary, main and trim control valves and piping, shall enable the permittee to control steam flow in a manner sufficient to ensure compliance with the requirements of Section B.2 of this permit.

g) The Gas Chromatograph (GC) shall meet the following criteria:

(1) The GC shall be capable of determining the molar concentrations of the following constituents potentially found in the Vent Gas:

a. Hydrogen;

b. Oxygen;

c. Nitrogen;

d. Carbon Dioxide;

e. Carbon Monoxide;

f. Methane;

g. Ethane;

h. Ethene (aka: Ethylene);

i. Acetylene;

j. Propane;

k. Propene (aka: Propylene);

l. Iso-butane;

m. n-Butane;

n. But-1-ene;

o. iso-Butene;

p. trans-Butene;

q. cis-Butene;

r. 1, 3 Butadiene;

s. Pentane plus (i.e., all hydrocarbons with five C's or more); and

t. Hydrogen Sulfide.

(2) The GC shall measure the concentration on a mole percent (mol/mol%) basis for all constituents except Hydrogen Sulfide (which shall be measured on a parts per million volume (ppmv) basis).

(3) The sample extraction point of the GC may be located upstream of the introduction of Supplemental and/or Sweep and/or Purge Gas if:

a. The composition and flow rate of any such Supplemental and/or Sweep and/or Purge Gas is a known constant; and

b. If this constant is then used in the calculation of the volume percent of all gas constituents of the Vent Gas.

(4) The GC shall maintain accuracy within 5% of the full scale.

(5) The GC shall maintain repeatability within:

a. ±0.5% of full scale for full scale ranges from 2-100%;

b. ±1% of full scale for full scale ranges from 0.05-2%;

c. ±2% of full scale for full scale ranges from 50-500 ppm;

d. ±3% of full scale for full scale ranges from 5-50 ppm;

e. ±5% of full scale for full scale ranges from 0.5-5 ppm.

(6) The minimum sampling frequency shall be one sample every 15 minutes.

(7) The sampling system shall be heat traced and maintained at 57 °C with no cold spots. All system components shall be heated, including the probe external to the flare piping calibration valve, sample lines, sampling loop (or sample introduction system), and GC oven.

(8) Where technically feasible, the sampling location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollution generation, or other point at which a change in the pollutant concentration or emission rate occurs. The location should not be close to air in-leakages. Where technically feasible, the location should also be at least 0.5 diameters upstream from the exhaust or control device.

(9) For the Net Heating Value and analyte measurements, the GC shall be operated and maintained with Performance Specification 9 (PS9) of Appendix B of 40 CFR Part 60 except:

a. The daily mid-level validation procedure in Section 10.2 of PS9 shall be conducted on the Net Heating Value instead of on each analyte. The average instrument response shall not vary by more than 10 percent from the Net Heating Value of the certified calibration gas.

b. The multi-point calibration error check procedure in Section 10.1 of PS9 shall be conducted quarterly for the limited set of analytes listed in term B.2.g)(9)c below. The GC must meet the calibration performance criteria in Sections 13.1 and 13.2 of PS9 for the listed analytes only, such that:

i. the average instrument response must not differ by more than 10 percent of the calibration gas value; and

ii. the precision and linearity check of each analyte listed below shall not deviate more than 5 percent from the average concentration measured.

c. The analytes to be used are:

i. Hydrogen

ii. Nitrogen

iii. Methane

iv. Ethane

v. Propane

vi. Propylene

(10) For the H_2S measurement, the GC shall be operated and maintained in accordance with Performance Specification 7 of Appendix B of 40 CFR Part 60. Quality assurance procedures set forth in Appendix F of 40 CFR Part 60 shall be followed. The span shall be set at 320 ppmv H_2S.

h) The Meteorological Station (Met Station) shall:

(1) include meteorological data instruments capable of measuring wind speed;

(2) be placed at a location where wind is representative of conditions at P003 after Waste Gas minimization is complete;

(3) be located as high as reasonably practicable but does not have to be as high as P003; and

(4) be calibrated annually to ±10%.

i) The instrumentation and monitoring systems identified in B.2.c)-e) and B.2.g)-h) shall be able to produce and record data measurements and calculations for each parameter at the following time intervals.

Instrumentation and Monitoring System	**Recording and Averaging Times**
Vent Gas flow; Vent Gas Molecular Weight (average); Total Steam Flow; Pilot Gas flow (if installed)	Measure continuously and record 5 minute block averages
Gas chromatograph	Measure no less than once every 15 minutes and record that value
Wind speed	Measure continuously and record 5 minute block averages

Nothing in this term is intended to prohibit the permittee from setting up process control logic that uses different averaging times from those in this table provided that the recording and averaging times in this table are available and used for determining compliance with this permit.

j) The permittee shall operate each of the instruments and monitoring systems required in terms B.2.c)-e) and B.2.g)-h) on a continuous basis except for the following periods:

(1) Malfunction of an instrument and/or monitoring system;

(2) Maintenance following instrument and/or monitoring system Malfunction;

(3) Scheduled maintenance of an instrument and/or monitoring system in accordance with the manufacturer's recommended schedule;

(4) Quality assurance/quality control activities; and/or

(5) When P003 is not in service.

k) In no event shall the excepted activities in terms B.2.j)(1)-(4) above for any instrument required in terms B.2.c)-e) and B.2.g)-h) exceed 110 hours in any Calendar Quarter. The time used for GC calibration and validation activities required by term B.2.g)(9) may be excluded for purposes of calculating the 110 hours per Calendar Quarter of instrument downtime. Any hour that meets the requirements of 40 CFR 60.13(h)(2) shall not be counted toward instrument downtime. Specifically:

(1) For a full operating hour (any clock hour where P003 is available for operation for 60 minutes), if there are at least four valid data points to calculate the hourly average (that is, one data point in each of the 15-minute quadrants of the hour), then there is no period of instrument downtime;

(2) For a partial operating hour (any clock hour with less than 60 minutes of unit operation), if there is at least one valid data point in each 15-minute quadrant of the hour in which the unit operates to calculate the hourly average, then there is no period of instrument downtime;

(3) For any operating hour in which required maintenance or quality-assurance activities on the instruments or monitoring systems associated with P003 are performed:

a. If P003 is available for operation in two or more quadrants of the hour and if there are at least two valid data points separated by at least 15 minutes to calculate the hourly average, then there is no period of instrument downtime; or

b. If P003 is available for operation in only one quadrant of the hour and if there is at least one valid data point to calculate the hourly average, then there is no period of instrument downtime.

Nothing in this term supersedes or replaces the monitoring requirements, including operation, maintenance, and quality assurance/quality control requirements of 40 CFR Part 60, Subparts J and Ja (at such time as those requirements become applicable pursuant to terms B.2.z)-aa)). All such requirements shall apply in accordance with the terms set forth in Subparts J and Ja.

l) By no later than December 31, 2016, the following limitations on flaring shall be in effect:

(1) 500,000 standard cubic feet per day (scfd) waste gas flow limit as a 30 day rolling average, and

(2) 432,500 scfd waste gas flow limit as a refinery, 365 day rolling average.

Each exceedance of the 30 day rolling average limit or each exceedance of the 365 day rolling average limit shall constitute one day of violation. An exceedance of either or both of the limits shall not prohibit ongoing refinery operations.

To the extent that MPC has instrumentation capable of measuring the volumetric flow rate of hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (stream) in the Waste Gas, the contribution of all measured flows of any of these elements/compounds may be excluded from the Waste Gas flow rate calculation.

Waste Gas flows during all periods (including but not limited to normal operations and periods of Startup, Shutdown, Malfunction, process upsets, relief valve leakages, power losses due to an interruptible power service agreement, and emergencies arising from events within the boundaries of the refinery), except those described in the next sentence, shall be included. Flows that could not be prevented through reasonable planning and are in anticipation of or caused by a natural disaster, act of war or terrorism, or External Power Loss are the only flows that may be excluded from the calculation of flow rate.

Except for hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) contributions to the flow rate that are excluded by virtue of instrumentation measuring these flows, for any flow that MPC does not include in a computation, MPC shall submit in the semi-annual report, the following: a description of the event that resulted in the exclusion; the date(s) and duration(s) of the flows caused by the event; the estimated Volatile Organic Compounds

(VOC) and Sulfur Dioxide (SO_2) emissions during the event; whether flows from the event still are anticipated to persist after the period covered by the report, and if so, for how long; and the measures taken or to be taken to prevent or minimize the flows including, for future anticipated flow, the schedule by which those measures will be implemented.

m) No later than August 30, 2012, the permittee shall comply with the following requirements at P003:

(1) The permittee shall operate P003 at all times when emissions may be vented to it.

(2) Except for periods of Startup, Shutdown, and/or Malfunction, the permittee shall operate P003 with no Visible Emissions. Method 22 in 40 CFR Part 60, Appendix A, shall be used to determine compliance with this standard. However, Visible Emissions may be determined by either a person certified pursuant to Method 22 or a video camera.

(3) Except for periods of Malfunction of P003, the permittee shall operate P003 with a flame present at all times. The permittee shall monitor the presence of the pilot flame using a thermocouple or any other equivalent device to detect the presence of the pilot flame.

(4) The permittee shall comply with all applicable Subparts of 40 CFR 60, 61 or 63 that state how flares (P003) must be monitored.

(5) At all times, including during periods of Startup, Shutdown, and/or Malfunction, the permittee shall implement good air pollution control practices to minimize emissions from P003.

n) Beginning no later than June 30, 2013, and except for periods of Startup, Shutdown, and/or Malfunction, the permittee shall operate P003 with an Exit Velocity less than 18.3 meters per second (m/sec) (60 feet per second (ft/sec)) on a one-hour block average; provided however, that:

(1) When combusting Vent Gas with a Net Heating Value of greater than 1000 BTU/scf, the permittee may operate P003 with an Exit Velocity equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) on a one-hour block average;

(2) If P003 has a maximum permitted Exit Velocity (V_{max}), the permittee may operate P003 with an Exit Velocity less than V_{max} provided that it also operates with an Exit Velocity of less than 122 m/sec (400 ft/sec) on a one-hour block average; and

(3) V_{max} shall be calculated in accordance with 40 CFR §60.18(f)(5).

o) By no later than July 31, 2013, utilizing the instrumentation and control required to be installed pursuant to terms B.2.c)-h), the permittee shall install and operate on P003 an Automatic Control System that shall:

(1) Automate the control of the Supplemental Gas flow rate; and

(2) Automate the control of the Total Steam Volumetric Flow Rate.

p) The permittee manually may override the operation of the Automatic Control System required in term B.2.o)(2) above (for control of Total Steam Volumetric Flow Rate) if the exception in term

B.2.w) applies, and/or during Startup, Shutdown, or Malfunction of a process unit that feeds P003, and/or to achieve the following:

(1) Stop Smoke Emissions that are occurring;

(2) Meet the Net Heating Value requirements of terms B.2.(r)-(s)

(3) Prevent extinguishing the flare;

(4) Protect personnel safety; and/or

(5) Stop Discontinuous Wake Dominated Flow.

q) By no later than June 30, 2014, the permittee shall operate and maintain P003 in accordance with its design, except if, and only to the extent that, operation and maintenance of P003 in conformance with its design conflicts with compliance with one or more of the requirements of Section B.2 of this permit.

r) The permittee shall operate P003 with a Net Heating Value of Vent Gas (NHV_{vg}) of greater than or equal to 300 BTU/scf, except as provided in term B.2.w), beginning August 30, 2012 and continuing until the earlier of:

(1) Termination of the CD; or

(2) The requirements in 40 CFR 60.18(c)3)(ii) and 63.11(b)(6)(ii) related to the NHV_{vg} are modified.

s) By no later than June 30, 2014, and except as provided in term B.2.w), the permittee shall calculate a Net Heating Value of Combustion Zone Gas ($NHV_{cz\text{-}limit}$) at P003 no less than every fifteen minutes. Except as provided in term B.2.w), the permittee shall operate P003 so as to ensure that P003's NHV_{cz}, on a three-hour rolling average basis, rolled every fifteen minutes, is greater than or equal to its $NHV_{cz\text{-}limit}$ on a three-hour rolling average basis, rolled every fifteen minutes.

(1) The $NHV_{cz\text{-}limit}$ shall be calculated in accordance with the following equations, conversion factors, constants, and variables:

The average lower flammability limit of the Vent Gas is calculated by the equation below. This calculation uses the weighted average of the LFLs of the individual compounds weighted by their volume fraction of the Vent Gas. All inerts, including nitrogen, are assumed to have an infinite lower flammability limit (e.g. $LFL_{N2} = \infty$).

$$LFL_{vg} = \frac{1}{\sum_{i=1}^{n}\left(\frac{x_i}{LFL_i}\right)}$$

The Lower Flammability Limit (LFL) values of each individual Vent Gas compound can be found in Table 1 below.

The net heating value of the Vent Gas is calculated and reported from the gas chromatograph (GC) at the conclusion of each analytical cycle. The equation below is

used by the GC to calculate the Vent Gas net heating value from each individual compound net heating value. Individual compound volume fractions, expect for water, are measured directly by the GC. If a Net Heating Value Analyzer/Calculator is used, the permittee shall use the measured value to determine the Net Heating Value of the Vent Gas (NHV_{vg}). Individual compound net heating values are listed in Table 1 below.

$$NHV_{vg} = \sum_{i=1}^{n} (x_i * NHV_i)$$

Table 1 includes two alternative values for the Net Heating Value of hydrogen: the actual NHV of hydrogen (274 BTU/scf) and an "adjusted" NHV of hydrogen (1212 BTU/scf). The permittee has the option of using either in calculating NHV_{vg}; however, whichever option is selected also must be used in calculating NHV_{cz}.

Using LFL_{vg} and NHV_{vg} from above, the $NHV_{vg\text{-}LFL}$ is calculated with the equation below.

$$NHV_{vg-LFL} = NHV_{vg} * LFL_{vg}$$

The Net Heating Value of the Gases in the Combustion Zone (NHV_{cz}) of the flare that is needed to ensure an acceptable Combustion Efficiency is determined by multiplying $NHV_{vg\text{-}LFL}$ from above by Combustion Efficiency Multipliers from Table 2 below. This is shown with the below equation.

$$NHV_{cz-limit} = \left(A + B * x_{propylene}\right) * NHV_{vg-LFL}$$

The Combustion Efficiency Multipliers appropriate to the flare category and the volume percent of hydrogen in the Vent Gas can be found in Table 2.

(2) The NHV_{cz} shall be calculated in accordance with the following equations, conversion factors, constants, and variables:

The NHV in the combustion zone (NHV_{cz}) combines the NHVs of the Vent Gas, Pilot Gas, and steam and can be calculated based on mass flow measurement (Equation 1) or on volumetric flow measurement (Equation 2). These two equations are equivalent for combustion zone conditions. The NHV of steam is assumed to be zero. Vent Gas flow rate (□*vg or* Q_{vg}) and steam flow rate (□*s or* Q_s) are measured by on-line flow meters. The Pilot Gas flow rate (□*pg or* Q_{pg}) is constant for the flare and set by an orifice.

$$NHV_{cz} = \frac{\left(\frac{\dot{m}_{vg} * NHV_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg} * NHV_{pg}}{MW_{pg}}\right)}{\left(\frac{\dot{m}_{vg}}{MW_{vg}}\right) + \left(\frac{\dot{m}_{pg}}{MW_{pg}}\right) + \left(\frac{\dot{m}_{s}}{MW_{H_2O}}\right) + \left(\frac{\dot{m}_{air}}{MW_{air}}\right)} \qquad \textit{Equation 1}$$

$$NHV_{cz} = \frac{\left(Q_{vg} * NHV_{vg}\right) + \left(Q_{pg} * NHV_{pg}\right)}{Q_{vg} + Q_{pg} + Q_s + Q_{air}} \qquad \textit{Equation 2}$$

The following values are determined based on the type of flare being a Steam-Assisted Flare without a Minimum Steam Reduction System (MSRS):

$$\dot{m}_s \text{ or } Q_s = measured\ value$$

$$\dot{m}_{air}\ or\ Q_{air} = 0$$

The molecular weight of the Vent Gas (MW_{vg}) is calculated by the GC using the below equation. An on-line ultrasonic flow meter may also be used to calculate MW_{vg}. Individual compound molecular weights are listed in Table 1 below.

$$MW_{vg} = \sum_{i=1}^{n} (x_i * MW_i)$$

The NHV of the Pilot Gas (NHV_{pg}) and MW of the Pilot Gas (MW_{pg}) are calculated using the below equations. Individual compound volume fractions are measured by laboratory analysis of a Pilot Gas sample, or may be taken from the natural gas supplier's laboratory certificate of analysis.

$$NHV_{pg} = \sum_{i=1}^{n} (pg_i * NHV_i)$$

$$MW_{pg} = \sum_{i=1}^{n} (pg_i * MW_i)$$

The complete combustion of an organic compound comprised of a combination of carbon and hydrogen atoms is shown in the following equation:

$$C_xH_y + \left(x + \frac{y}{4}\right) O_2 \rightarrow xCO_2 + \left(\frac{y}{2}\right) H_2O$$

The x and y values for each compound can be found in Table 1.

Therefore, the stoichiometric oxygen molar flow rate (moles/hr) for any given combustible compound flow is defined by mass basis (Equation 3) or by volumetric basis (Equation 4) using the following equations:

$$\dot{n}_{O2-stoich} = x_j \left(\frac{\dot{m}_{vg}}{MW_{vg}}\right)\left(x + \frac{y}{4}\right) \qquad \textit{Equation 3}$$

$$\dot{n}_{O2-stoich} = x_j \left(\frac{Q_{vg}}{385.5}\right)\left(x + \frac{y}{4}\right) \qquad \textit{Equation 4}$$

The stoichiometric oxygen mass flow rate for the Vent Gas (lb/hr) or stoichiometric oxygen volumetric flow rate for the Vent Gas (scfh) is given by mass basis (Equation 5) or by volumetric basis (Equation 6) using the following equations:

$$\dot{m}_{O2-stoich-vg} = MW_{O2} * \sum_{j=1}^{n} \dot{n}_{O2-stoich_j} \qquad \textit{Equation 5}$$

$$Q_{O2-stoich-vg} = 385.5 * \sum_{j=1}^{n} \dot{n}_{O2-stoich_j} \qquad \textit{Equation 6}$$

The stoichiometric air mass flow rate (lb/hr) for the Vent Gas is given by mass basis using Equation 7. The stoichiometric air volumetric flow rate (scfh) for the Vent Gas is given by volumetric basis using the Equation 8.

$$\dot{m}_{air-stoich-vg} = \frac{MW_{air}}{0.21 * MW_{O2}} * \dot{m}_{O2-stoich-vg} \qquad \textit{Equation 7}$$

$$Q_{air-stoich-vg} = \frac{Q_{O2-stoich-vg}}{0.21} \qquad \textit{Equation 8}$$

(3) The flare must be operated to ensure that NHV_{cz} is equal to or above $NHV_{cz\text{-}limit}$ to ensure acceptable combustion efficiency. This is shown below.

$$NHV_{cz} \geq NHV_{cz-limit}$$

(4) Key to the abbreviations, constants, and variables and the Tables referenced in B.2.s)(1)-(3) above:

$0.21 = mole\ fraction\ of\ oxygen\ in\ air\ (0.21\ lb - mol O_2/lb - mol\ air$

$385.5 = conversion\ from\ pound\ moles\ to\ standard\ cubic\ feet\ (385.5\ scf/lb - mol)$

$A = overall\ combustion\ efficiency\ multiplier\ for\ NHV_{vg-LFL} (unitless)$

$B = propylene\ combustion\ efficiency\ multiplier\ for\ NHV_{vg-LFL}\ (unitless)$

$C_{vg} = concentration\ of\ VOC\ in\ the\ vent\ gas\ (vol\ \%)$

$i = individual\ numbered\ compound\ from\ column\ i\ in\ Table\ 1\ (unitless)$

$j = individual\ numbered\ compound\ from\ column\ j\ in\ Table\ 1\ (unitless)$

$LFL_i = lower\ flammability\ limit\ of\ individual\ compound\ (vol\ \%)$

$LFL_{vg} = lower\ flammability\ limit\ of\ vent\ gas\ (vol\ \%)$

$\dot{m}_{air} = mass\ flow\ rate\ of\ air\ (lb/hr)$

$\dot{m}_{air-stoich-vg} = stoichiometric\ air\ mass\ flow\ for\ vent\ gas\ (lb/hr)$

$\dot{m}_{O2-stoich-vg} = stoichiometric\ oxygen\ mass\ flow\ for\ the\ vent\ gas\ (lb/hr)$

$\dot{m}_{pg} = mass\ flow\ rate\ of\ pilot\ gas\ (lb/hr)$

$\dot{m}_s = mass\ flow\ rate\ of\ total\ steam\ (lb/hr)$

$\dot{m}_{vg} = mass\ flow\ rate\ of\ vent\ gas\ (lb/hr)$

$\dot{n}_{O2-stoich} = stoichiometric\ oxygen\ molar\ flow\ for\ an\ individual\ compound\ (lb/hr)$

$MW_{H_2O} = molecular\ weight\ of\ water\ (18.02\ lb/lb - mol)$

$MW_i = molecular\ weight\ of\ individual\ compound\ (lb/lb-mol)$

$MW_{O2} = molecular\ weight\ of\ oxygen\ (32.0\ \ lb/lb-mol)$

$MW_{air} = molecular\ weight\ of\ air\ (28.9\ \ lb/lb-mol\ )$

$MW_{pg} = molecular\ weight\ of\ pilot\ gas\ (lb/lb-mol)$

$MW_{vg} = molecular\ weight\ of\ vent\ gas\ (lb/lb-mol)$

$n = list\ of\ individual\ compounds\ from\ Table\ 1\ (unitless)$

$NHV_{cz} = net\ heating\ value\ of\ the\ combustion\ zone\ (BTU/scf)$

$NHV_i = net\ heating\ value\ of\ individual\ compound\ (BTU/scf)$

$NHV_{vg-LFL} = net\ heating\ value\ vent\ gas\ at\ lower\ flammability\ limit\ (BTU/scf)$

$NHV_{cz-limit} = limit\ net\ heating\ value\ of\ the\ combustion\ zone\ (BTU/scf)$

$NHV_{pg} = net\ heating\ value\ of\ pilot\ gas\ (BTU/scf)$

$NHV_{vg} = net\ heating\ value\ of\ vent\ gas\ (BTU/scf)$

$pg_i = individual\ compound\ volume\ fraction\ in\ pilot\ gas\ (vol\ fraction)$

$Q_{air-stoich-vg} = stoichiometric\ air\ volumetric\ flow\ for\ the\ vent\ gas\ (scfh)$

$Q_{O2-stoich-vg} = stoichiometric\ oxygen\ volumetric\ flow\ for\ the\ vent\ gas\ (scfh)$

$Q_{vg} = vent\ gas\ volumetric\ flow\ rate\ (scfh)$

$Q_{pg} = pilot\ gas\ volumetric\ flow\ rate\ (scfh)$

$Q_s = steam\ volumetric\ flow\ rate\ (scfh)$

$Q_{air} = air\ volumetric\ flow\ rate\ (scfh)$

$x = moles\ of\ carbon\ per\ mole\ of\ C_xH_y (mol/mol)$

$x_i = individual\ compound\ volume\ fraction\ in\ the\ vent\ gas\ (vol\ fraction)$

$x_j = individual\ combustible\ compound\ volume\ fraction\ in\ the\ vent\ gas\ (vol\ fraction)$

$x_{propylene} = volume\ fraction\ of\ propylene\ in\ the\ vent\ gas\ (vol\ fraction)$

$y = moles\ of\ hydrogen\ per\ mole\ of\ C_xH_y\ (mol/mol)$

Table 1:

Individual Compound Properties

$i^{(1)}$	j	Compound	NHV_i(Btu/scf)	MW_i(lb/lbmol)	LFL_i(vol fraction)	C_x	H_y
1	1	Hydrogen	274 or 1212[(2)]	2.02	0.04	0	2
2	-	Oxygen	0	32	∞	n/a	n/a
3	-	Nitrogen	0	28.01	∞	n/a	n/a
4	-	CO_2	0	44.01	∞	n/a	n/a
5	-	CO	316	28.01	0.125	n/a	n/a
6	2	Methane	896	16.04	0.05	1	4
7	3	Ethane	1595	30.07	0.03	2	6
8	4	Ethylene	1477	28.05	0.027	2	4
9	5	Acetylene	1404	26.04	0.025	2	2
10	6	Propane	2281	44.1	0.021	3	8
11	7	Propylene	2150	42.08	0.024	3	6
12	8	iso-Butane	2957	58.12	0.018	4	10
13	9	n-Butane	2968	58.12	0.018	4	10
14	10	iso-Butene	2928	56.11	0.018	4	8
15	11	trans-Butene	2826	56.11	0.017	4	8
16	12	cis-Butene	2830	56.11	0.016	4	8
17	13	1,3-Butadiene	2690	54.09	0.02	4	6
18	14	Pentane+ (C_5+)	3655	72.15	0.014	5	12
19	-	Water[(3)]	0	18.02	∞	n/a	n/a

[1] i=all compounds, j=organic compounds and hydrogen

[2] If using an H_2-adjusted NHV_{vg} and NHV_{cz}, then use 1212 BTU/scf for hydrogen.

[3] A GC does not measure water. If water is measured by means of another instrument, the properties of water listed in this row shall be used.

Note: Benzene is not required to be speciated by the GC because benzene is present in the Vent Gas only in *de minimis* quantities. Because benzene speciation is not required, it is not listed in Table 1.

Table 2:

Combustion Efficiency Multipliers for Steam-Assisted Flares: Variables Based on Minimum Steam Requirements and VOC Concentration in the Vent Gas

Minimum Steam	VOC Vent Gas Concentration	A Multiplier	B Multiplier*	
			Condition X	Condition Y
≤ 1000 lb/hr	≤ 20.0%	6.45	4.0	0.0
≤ 1000 lb/hr	> 20.0%	6.85	4.0	0.0
> 1000 lb/hr	≤ 20.0%	7.1	4.0	0.0
> 1000 lb/hr	> 20.0%	7.4	4.0	0.0

*The B Multiplier used depends on the relationship of hydrogen and propylene in the Vent Gas as follows:

Condition X: 3 ≤ H_2% ≤ 8 and Propylene% ≥ H2% (all percentages are volume or mole percentages)

Condition Y: Any condition not meeting the requirements for Condition X.

Note: The specifications for Condition X are based on the best information available as of the date this permit was issued. If new information becomes available thereafter, the permittee may modify these conditions; any such modification does not constitute a material modification to the permit.

The VOC Vent Gas Concentration referenced in Table 2 shall be calculated on an annual average basis as follows:

$$C_{vg} = \sum_{j=4}^{n} x_j * 100$$

Note: The summation does not include methane or ethane.

t) By no later than June 30, 2014, and except as provided in term B.2.w) and B.2.t):

(1) The permittee shall operate P003 at less than or equal to either:

a. A S/VG_{mass} of 3.0 on a one-hour rolling average, rolled every five minutes; or

b. A S/VG_{vol} of 2.7 on a one-hour rolling average, rolled every five minutes.

(2) The permittee shall record both the S/VG_{mass} and the S/VG_{vol} for P003.

(3) The permittee may submit a request to EPA for an adjustment of the Total Steam Mass Flow Rate and Total Steam Volumetric Flow Rate at P003, based on the Steam Contribution Factor at P003. In any such request, the permittee must demonstrate and justify the equation it proposes to use to calculate the Non-Mixing Total Steam at P003 that is the subject of the request.

(4) Notwithstanding the requirements of terms B.2.t)(1)- t)(3) above, the permittee is not subject to the emissions standards in these terms if the exception in instrument downtime [see term B.2.w)] applies and/or in order to achieve the following:

a. Stop Smoke Emissions that are occurring;

b. Meet the Net Heating Value requirements of term B.2.r);

c. Prevent extinguishing the Flare; and/or

d. Protect personnel safety.

u) By no later than June 30, 2014, for P003, the permittee shall comply with either B.2.u)(2)a. or B.2.u)(2)b. In the first semi-annual report due after the applicable compliance date, MPC shall identify which compliance option it selected for P003. The permittee subsequently may change the option it previously had selected for P003 but only after notifying EPA in a semi-annual report that it intends to make the change 30 days after submission of the report. In the report, the permittee shall include the reason for changing the compliance option.

(1) The Minimum Momentum Flux Ratio (MFR) shall be calculated in accordance with the following equations, conversion factors, MFR constants, MFR measured variables, and MFR calculated variables:

a. The MFR is defined using the following equations:

$$MFR = \frac{(\rho_{vg+s,cent} * v_{vg+s,cent})^2}{\rho_{air} * {v_{air}}^2}$$

$$\rho_i = \frac{MW_i * P}{R * T_{abs}} = \frac{MW_i * 14.696psi}{10.73 \frac{psi*ft^3}{lbmol*°R} * (460°R + 68°R)} = \frac{MW_i}{385.5}$$

$$\rho_{vg+s,cent} = \frac{vg + s,cent}{Q_{vg} + Q_{s,cent}} = \frac{vg + s,cent}{\frac{vg}{\rho_{vg}} + \frac{s,cent}{\rho_{s,cent}}}$$

$$v_{vg+s,cent} = \frac{Q_{vg} + Q_{s,cent}}{A_{tip-unob}} = \frac{\frac{vg}{\rho_{vg}} + \frac{s,cent}{\rho_{s,cent}}}{A_{tip-unob}}$$

where:

Constants:

$MW_i = molecular\ weight\ of\ component\ i\ \left(\frac{lb}{lbmol}\right)$

$P = absolute\ ambient\ pressure\ (14.73\ psia)$

$\rho_{air} = density\ of\ air\ \left(\frac{lb}{ft^3}\right) = 0.075 \frac{lb}{ft^3}$

$\rho_{s,cent} = density\ of\ center\ steam\ \left(\frac{lb}{ft^3}\right) = 0.047\ \frac{lb}{ft^3}$

$R = gas\ constant\ \left(10.73\ \frac{psi * ft^3}{lmbol * °R}\right)$

$T_{abs} = absolute\ temperature\ (°R) = 460°R + 68°R = 528°R$

Measured variables:

$$_{s,cent} = mass\ flow\ rate\ of\ Center\ Steam \left(\frac{lb}{hr}\right)$$

$Q_{s,cent} = volumetric\ flow\ rate\ of\ Center\ Steam\ (scfh)$

$v_{air} = velocity\ of\ wind\ \left(\frac{ft}{hr}\right) = this\ is\ measured\ directly$

Calculated Variables:

$A_{tip-unob} = unobstructed\ cross-sectional\ area\ of\ flare\ tip\ (ft^2)$

$MFR = momentum\ flux\ ratio\ (unitless)$

$\rho_{vg} = density\ of\ Vent\ Gas\ \left(\frac{lb}{ft^3}\right)$

$\rho_i = density\ of\ component\ i\ \left(\frac{lb}{ft^3}\right)$

$v_{vg} = velocity\ of\ Vent\ Gas\ \left(\frac{ft}{hr}\right)$

$v_{s,cent} = velocity\ of\ Center\ Steam\ \left(\frac{ft}{hr}\right)$

$\rho_{vg+s,cent} = density\ of\ Vent\ Gas\ plus\ Center\ Steam$

The remaining Variables and Constants are defined in B.2.s)(4) above.

(2) At P003, the permittee shall either:

a. Maintain a minimum MFR of 0.0030 on a 60 minute rolling average basis, rolled every 5 minutes; or

b. Propose a Flare specific MFR. The permittee shall submit such a proposal to US EPA for approval. In any such proposal, the permittee shall demonstrate to US EPA's satisfaction that at the proposed MFR, Discontinuous Wake Dominated Flow or measured Combustion Efficiency less than 98% will not occur for P003.

(3) The MFR requirements in term B.2.u)(1) and (2) are not applicable in the following circumstances:

a. During any period of Vent Gas flow to P003 where there are less than 6 consecutive 5-minute averages of MFR;

b. At any time that the wind speed at the refinery is greater than or equal to 35 mph on a 60-minute rolling average basis, rolled every 5-minutes; and/or

c. If an exception in term B.2.w) applies.

(4) Calculation of MFR "on a 60-minute rolling average basis, rolled every 5-minutes," when there are more than 5 but less than 12 consecutive 5 minute averages of MFR. During any period of Vent Gas flow to P003 when there are more than 5 but less than 12 consecutive 5-minute averages of MFR, the MFR "on a 60-minute rolling average basis, rolled every 5 minutes" shall be calculated using the 5 minute averages that are greater than "0" during that period; the 5 minute averages when MFR is "0" because there is no Vent Gas flow shall not be used in calculating the 60-minute rolling average, rolled every 5 minutes.

v) By no later than June 30, 2014, the permittee shall operate P003 with a minimum of a 98% Combustion Efficiency at all times when Waste Gases are vented to it. To demonstrate continuous compliance with the 98% Combustion Efficiency, the permittee shall operate P003 within the range of operating parameters set forth in terms B.2.r) through u).

w) A failure to comply with the work practices or standards in terms B.2.o) and terms B.2.r)-u) shall not constitute a violation of such work practice or standard if the noncompliance results from downtime of instruments or equipment due to the following:

(1) Malfunction of an instrument, for an instrument needed to meet the requirement(s);

(2) Maintenance following instrument Malfunction, for an instrument needed to meet the requirement(s);

(3) Scheduled maintenance of an instrument in accordance with the manufacturer's recommended schedule, for an instrument needed to meet the requirement(s); and/or

(4) Quality assurance/quality control activities on an instrument needed to meet the requirement(s).

This exception shall no longer be applicable if the activities in term B.2.w) exceed 110 hours in any calendar quarter for any instrument. The calculation of instrument downtime shall be made in accordance with 40 CFR 60.13(h)(2) and as described in term B.2.k).

x) The requirements of terms B.2.r) through B.2.v) are not applicable to P003 when the only gas or gases being vented to P003 is/are Pilot Gas and/or Purge Gas.

y) The permittee shall comply with the following recordkeeping requirements:

(1) By no later than three months after June 30, 2013, the permittee shall calculate and record, in accordance with the recording and averaging times required in term B.2.i), each of the following parameters:

a. Total Steam Volumetric Flow Rate (in scfm) and Total Steam Mass Flow Rate (in lb/hr);

b. Vent Gas Volumetric Flow Rate (in scfm) and Vent Gas Mass Flow Rate (in lb/hr);

c. S/VG_{mass} in (lb steam/lb Vent Gas);

d. S/VG_{vol} (in scfm steam/lb Vent Gas);

e. NHV_{vg} (in BTU/scf);

f. NHV_{cz} (in BTU/scf)

g. $NHV_{cz\text{-}limit}$ (in BTU/scf)

(2) By no later than six months after June 30, 2013, commencing if and when the excepted activities B.2.j)(1)-j)(4) for any instrument subject to term B.2.j) exceed 110 hours in any Calendar Quarter, the permittee shall record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) taken.

(3) By no later than July 31, 2013 for compliance with the work practice standards in term B.2.o):

a. The permittee shall record each time it manually overrides its Automatic Control System, including the date, time, duration, reason for the override, and corrective actions taken; and

b. Where the reason for the override was to stop Visible Emissions that were occurring, the permittee shall include a copy of the visible emission record or, if available, the digital video record (with a time stamp), of P003 during the period of the manual override.

(4) By no later than August 30, 2012 for compliance with term B.2.m), and by no later than June 30, 2014 for compliance with terms B.2.r) through v) at any time that the permittee deviates from those standards, the permittee shall record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) taken.

z) As of August 30, 2012, P003 shall continue to be an “affected facility” within the meaning of Subparts A and J of 40 CFR Part 60; however, except as set forth in term B.2.aa), P003 shall comply with the requirements of Subparts A and J, including all monitoring, recordkeeping, reporting, and operating requirements, by no later than December 31, 2016.

aa) P003 shall be an “affected facility” within the meaning of Subparts A and Ja of 40 CFR Part 60, and shall comply with the requirements of Subparts A and Ja, including all monitoring, recordkeeping, reporting, and operating requirements, by the later of:

(1) December 31, 2016; or

(2) The date(s) by which a “modified” flare (within the meaning of Subpart Ja) must comply with the requirements of Subpart Ja.

a. To the extent that the later of the two possible dates is the date listed in B.2.aa)(1) above, then Subpart Ja, and not Subpart J, is the applicable Subpart on and after December 31, 2016.

b. To the extent that the later of the two possible dates is "the date listed in B.2.aa)(2) above, then Subpart J is applicable between December 31, 2016 and the applicable date(s) of Subpart Ja. Thereafter, only Subpart Ja is applicable.

c. On and after the date(s) that P003 is subject to Subpart Ja, Subpart J no longer is applicable to P003.

C. Emissions Unit Terms and Conditions

1. P003, North Area Flare

Operations, Property and/or Equipment Description:

North Area Flare 4-14-B-2; Steam-assisted flare used to control emissions resulting from process upsets, relief valve leakage, block valve leakage, emergency situations, process blow downs, process start-ups and shutdowns, and certain miscellaneous process vents subject to 40 CFR 63, Subpart CC requirements. This flare is not equipped with a minimum steam reduction system (MSRS).

a) The following emissions unit terms and conditions are federally enforceable with the exception of those listed below which are enforceable under state law only.

(1) None.

b) Applicable Emissions Limitations and/or Control Requirements

(1) The specific operation(s), property, and/or equipment that constitute each emissions unit along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures are identified below. Emissions from each unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
a.	OAC rule 3745-31-05(F) [Voluntary limits on allowable emissions]	Sulfur dioxide (SO_2) emissions shall not exceed 2,635 pounds per day (lb/day). See b)(2)a.
b.	40 CFR 60.18(c)(1) 40 CFR 63.11(b)(4)	The requirements of these rules are equal to or less stringent than August 30, 2012 Consent Decree.
c.	40 CFR 60, Subpart J (40 CFR 60.100 – 60.109) See b(2)b.	See Section B.2.z) and term b(2)b.
d.	40 CFR 60, Subpart Ja (40 CFR 60.100a – 60.109a) See b)(2)d.	See Section B.2.aa) and term b(2)c.
e.	40 CFR Part 60, Subpart GGGa (40 CFR 60.590a-593a)	See b(2)d.

	Applicable Rules/Requirements	Applicable Emissions Limitations/Control Measures
f.	40 CFR Part 63, Subpart CC (40 CFR 63.640-679)	See b)(2)e.
g.	August 30, 2012 Consent Decree, Number 2:12-cv-11544-DML-MJH	See Section B.2., and terms c)(2), d)(7), and e)(2).

(2) Additional Terms and Conditions

a. The permittee has requested to voluntarily limit allowable emissions of SO_2 to establish a federally permitted release of SO_2 under CERCLA/EPCRA release reporting requirements. This "Phase 1" SO_2 limit of 2,635 lb/day, is intended to reflect the maximum actual daily SO_2 emissions from P003 under the current operating configuration prior to implementing any of the flare gas minimization initiatives that are required by the CD. The Phase 1 limit will be in effect from the time the PTI is issued until the applicable NSPS Subparts J and Ja compliance date in the CD, December 31, 2016. On December 31, 2016, this Phase 1 SO_2 emission limit will be replaced by the "Phase 2" limits derived from the NSPS Subpart Ja requirements (as provided in term B.2.aa)). The Phase 2 limits will include a fuel gas H_2S concentration limit of 162 ppm on a 3-hr rolling average basis (refer to 40 CFR 60.103a(h)), waste gas volumetric flow rate limits (as provided in term B.2.l) , and a newly derived daily SO_2 limit that reflects applicability of Subparts J or Ja. The new limits will therefore be proposed in a subsequent permit revision application to be submitted before December 31, 2016.

b. Upon the date specified in term B.2.z), when combusting fuel gas that is not the result of process upsets, relief valve leakage, or other emergency situations, the permittee shall not burn any mixture of refinery fuel gas, natural gas and/or landfill gas in this emissions unit that contains hydrogen sulfide (H_2S) in excess of 230 mg/dscm (0.10 gr/dscf or 162 ppmv).

c. Upon the date specified in term B.2.aa), the permittee shall not burn in any affected flare any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hour rolling average basis. The combustion in a flare of process upset gases or fuel gas that is released to the flare as a result of relief valve leakage or other emergency malfunctions is exempt from this limit per 40 CFR 60.103a(h). Excess emissions are defined in 40 CFR 60.107a(i).

d. The flare is used as a control device to comply with the requirements for 40 CFR 60, Subpart GGGa and 40 CFR 60, Subpart VVa (as referenced by Subpart GGGa) for certain emission units.

e. Operate the flare in accordance with 40 CFR 63.11(b) at all times other than non-routine emergencies. During non-routine emergencies, operate the flare in accordance with 40 CFR 63.6(e).

c) Operational Restrictions

(1) See Section B.2.

(2) See the August 30, 2012, Consent Decree (CD) between Marathon Petroleum Company LP and United States of America, Number 2:12-cv-11544-DML-MJH, and any subsequent revisions thereof.

d) Monitoring and/or Recordkeeping Requirements

(1) [OAC rule 3745-31-05(F)]
The permittee shall record the following information for each day for the flare and process operations:

a. Daily Vent Gas flow rate, mscf/min, for each 10 minute period of operation;

b. Hourly H_2S concentration (ppmv) for each 10 minute period of operation;

c. Daily SO_2 emissions (lb/day), calculated using the following equation:

$$\text{Daily } SO_2 \text{ Emissions } \left(\frac{\text{lb}}{\text{day}}\right) = \sum_{n=1}^{24}\left[\sum_{j=1}^{6}\frac{X_j * 1{,}000 * Y_j * 1 * 64 * 10}{385.5 * 24 * 60}\right]$$

Where:

n = number of hours per day

j = number of 10 minute periods per hour

X_j= Vent Gas flow rate, mscf/min, measured for each 10 minute period of flare operation

Y_j = H_2S Concentration (ppmv), measured for each 10 minute period of flare operation, as a decimal fraction (i.e. ppmv ÷ 1,000,000)

1,000 = Conversion factor, scf/mscf

1 = Conversion factor, 1 lbmol SO_2/lbmol H_2S

64 = SO_2 molecular weight, lb/lbmol

24 = Conversion factor, hour/day

60 = Conversion factor, min/hour

10 = Period of data measurement, minutes

385.5 = Conversion factor assuming ideal gas at 20°C and 1 atm, scf/lbmol

(2) [40 CFR 60.18(d) and 40 CFR 63.11]
The permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design and the requirements contained in this permit. The Net Heating Value of a gas, the actual exit velocity for the flare, and the maximum permitted velocity for a steam-assisted flare shall be determined as required by 40 CFR 63.11 and specified in terms f)(2)-(3) of this permit.

(3) [40 CFR 60.18 and 40 CFR 63.11]
The permittee shall properly install, operate, and maintain a device to continuously monitor the pilot flame when the emissions unit is in operation. The monitoring device and any recorder shall be installed, calibrated, operated, and maintained in accordance with the manufacturer's recommendations, instructions, and operating manuals.

(4) [40 CFR 60.13 and 63.8]
The permittee shall record the following information each day for the flare and process operations:

a. all periods during which there was no pilot flame; and

b. the operating times for the flare, monitoring equipment, and the associated emissions unit.

(5) The permittee shall comply with the monitoring and recordkeeping requirements pursuant to 40 CFR Part 60, Subpart J, when applicable per term B.2.z):

40 CFR 60.105(a)(4)	Continuous monitoring of H_2S fuel gas concentration

(6) The permittee shall comply with the monitoring and recordkeeping requirements pursuant to 40 CFR Part 60, Subpart Ja, when applicable per term B.2.aa).:

40 CFR 60.103a(a)-(b)	Flare management plan
40 CFR 60.103a(c)-(f)	Root cause analysis of SO_2 emissions in excess of 500 lbs or any discharge to the flare in excess of 500,000 scf above the baseline in any 24-hour period
40 CFR 60.107a(a)(2)	Continuous monitoring of H_2S fuel gas concentration
40 CFR 60.107a(a)(3)	Exemption for fuel gas streams that are inherently low in sulfur content
40 CFR 60.107a(e)	Sulfur monitoring for assessing root cause analysis threshold
40 CFR 60.107a(f)	Continuous monitoring of flow rate of gas discharged to flare
40 CFR 60.108a(c)(1)	Flare record keeping requirements

40 CFR 60.108a(c)(5)	Records for fuel stream exemptions
40 CFR 60.108a(c)(6)	Records of SO_2 discharges greater than 500 lbs or discharges in excess of 500,000 scf above baseline in any 24-hour period

(7) The permittee shall comply with the monitoring and recordkeeping requirements included in Section B.2. of this permit, and any other applicable requirements within the August 30, 2012, Consent Decree (CD) between Marathon Petroleum Company LP and United States of America, Number 2:12-cv-11544-DML-MJH, and any subsequent revisions thereof.

e) Reporting Requirements

(1) [OAC 3745-15-03(B)(1) and (C), and/or 40 CFR 63.10]
The permittee shall submit quarterly deviation reports that, at a minimum, identify:

a. all periods of time during which the pilot flame was not functioning properly or the flare was not maintained as required in this permit. The reports shall include the date, time, and duration of each such period.

The quarterly deviation reports shall be submitted in accordance with the reporting requirements of the Part A: Standard Terms and Conditions of this permit.

(2) The permittee shall comply with all the reporting requirements included in Section B.2. of this permit, and any other applicable requirements within in the August 30, 2012, Consent Decree (CD) between Marathon Petroleum Company LP and United States of America, Number 2:12-cv-11544-DML-MJH, and any subsequent revisions thereof.

(3) The permittee shall comply with the requirements pursuant to 40 CFR Part 60, Subpart J when applicable per term B.2.z):

40 CFR 60.105(e)	Excess emissions reports

(4) The permittee shall comply with the reporting requirements pursuant to 40 CFR Part 60, Subpart Ja when applicable per term B.2.aa):

40 CFR 60.107a(i)	Definition of excess emissions
40 CFR 60.108a(d)	Excess emissions reports

f) Testing Requirements

(1) Compliance with the Emissions Limitations and/or Control Requirements specified in section b) of these terms and conditions shall be determined in accordance with the following methods:

a. Emission Limitation:

SO_2 emissions shall not exceed 2,635 lb/day until new limits are proposed by December 31, 2016.

Applicable Compliance Method:

The emission limitation was established by using the flare gas flow rate (scf/day) and flare gas H_2S concentration (ppmv), to calculate a daily emission limit of SO_2, as shown below. The concentration and flow rate values were provided by the permittee in the permit application to represent normal relief value or block value gas venting to the flare.

$$ER_{SO2} = Q_{FG} * \frac{1}{MVC} * C_{H2S} * R_{SO2:H2S} * MW_{SO2}$$

$$ER_{SO2} = \frac{2{,}300{,}000\ scf}{day} * \frac{1\ lbmol}{385.5\ scf} * 6900\ ppmv * \frac{1\ lbmol\ SO_2}{1\ lbmol\ H_2S} * \frac{64\ lb\ SO_2}{lbmol} * \frac{1\ fraction}{1{,}000{,}000\ pmv}$$

$$ER_{SO2} = 2365\ lb/day$$

where:

ER_{SO2} = Daily SO_2 emission rate (lb/day);

Q_{FG} = Flare gas flow rate (2,300,000 scf/day);

MVC = Molar volume conversion factor at 68°F and 1atm (385.5 scf/lbmol);

C_{H2S} = Flare gas H_2S concentration (6,900 ppmv);

$R_{SO2:H2S}$ = Molar ratio of SO_2 to H_2S in a combustion reaction (1 lbmol SO_2/1 lbmol H_2S); and

MW_{SO2} = Molecular weight of SO_2 (64 lb/lbmol).

Compliance may be demonstrated based on the recordkeeping required in term d)(1) above.

b. Emission Limitation:

When applicable per term B.2.z), the permittee shall not burn any mixture of refinery fuel gas, natural gas and/or landfill gas in this emissions unit that contains hydrogen sulfide (H_2S) in excess of 230 mg/dscm (0.10 gr/dscf or 162 ppmv) [40 CFR 60, Subpart J].

Applicable Compliance Method:

Ongoing compliance shall be demonstrated through the data collected as required in term d)(5); and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the requirements of 40 CFR Part 60, Subpart J.

If required, the permittee shall determine compliance according to the methods required by 40 CFR Part 60, Subpart J:

40 CFR 60.106(e)	H_2S performance tests

c. Emission Limitation:

When applicable per term B.2.aa), the permittee shall not burn in any affected flare any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hour rolling average basis [40 CFR 60, Subpart Ja].

Applicable Compliance Method:

Ongoing compliance shall be demonstrated through the data collected as required in term d)(6); and through demonstration of compliance with the quality assurance/quality control plan, which shall meet the requirements of 40 CFR Part 60, Subpart Ja.

If required, the permittee shall determine compliance according to the methods required by 40 CFR Part 60, Subpart Ja:

40 CFR 60.104a(j)	H_2S performance tests

(2) [40 CFR 60.18(f)(3) and 40 CFR 63.11(b)(6)(ii)]
The net heating value of the gas being combusted at the flare shall be calculated as follows:

$$H_T = k \sum_{i=1}^{n} C_i H_i$$

where:

H_T = net heating value of the sample, MJ/scm; where the net enthalpy per mole of off gas is based on combustion at 25 degrees Celsius and 760 mm Hg, but the standard temperature of 20 degrees Celsius is used for determining the volume corresponding to one mole;

k = constant, 1.740 x 10^{-7} (1/ppm) (g mole/scm) (MJ/kcal), where the standard temperature for mole/scm is 20 degrees Celsius;

C_i = concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77 or 90;

H_i = net heat of combustion of sample component i, kcal/g mole at 25 degrees Celsius and 760 mm Hg. The heat of combustion may be determined using ASTM D2382-76 or 88 or D4809-95 if published values are not available or cannot be calculated;

i = subscript denoting a specific component in the sample; and

n = total number of components within the sample.

The conversion factor of 26.84 Btu scm/MJ scf can be used to convert the net heating value of the gas (H_T) from MJ/scm to Btu/scf.

(3) [40 CFR 60.18(f)(4) and 40 CFR 63.11(b)(7)(i)]
The actual exit velocity of the flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure) of the flare header or headers that feed the flare, as determined by Reference Methods 2, 2A, 2C, or 2D (found in 40 CFR 60, Appendix A), as appropriate, by the unobstructed (free) cross-sectional area of the flare tip

The conversion factor of 3.281 ft/m can be used to convert the velocity from m/sec to ft/sec.

g) Miscellaneous Requirements

(1) None.