UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

July 12, 2017

Gregg Goldstein
Associate General Counsel
TPC Group LLC
One Allen Center
500 Dallas St., Suite 1000
Houston, TX 77002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED: 7007 3020 0000 1522 8458

RE: In the Matter of TPC Group LLC; CAA 06-2017-3361

Dear Mr. Goldstein,

Please find enclosed a copy of the fully-executed Consent Agreement and Final Order (CAFO) that was filed today with the Regional Hearing Clerk in EPA Region 6. TPC Group LLC (TPC Group) will have thirty (30) days from the effective date of the CAFO to pay the civil penalty of seventy two thousand one hundred eighty seven dollars ($72,187).

TPC shall conduct each condition of settlement including, by no later than June 28, 2018, completing the installation and commencing the operation of the instrumentation, controls, and monitoring systems set forth in Appendices A through D. TPC Group shall complete the Environmental Mitigation Project one (1) year after starting monitoring activities as described in the CAFO and Appendix E. TPC Group shall complete the Supplemental Environmental Project one (1) year after the date on which TPC Group begins continuously monitoring as described in the CAFO and Appendix F.

If you have any questions, please contact me at (214) 665-8184 or via email at evans.carlos@epa.gov.

Sincerely,

Carlos Evans
Assistant Regional Counsel
U.S. EPA Region 6

Enclosure (1)

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

In the Matter of: **TPC Group LLC** **2102 Spur 136** **Port Neches, Jefferson County, Texas** **Respondent.**	**EPA Docket No. CAA 06-2017-3361** **CONSENT AGREEMENT** **Proceeding under Section 113(d) of the Clean Air Act**

CONSENT AGREEMENT

A. PRELIMINARY STATEMENT

1. This is an administrative penalty assessment proceeding brought under Section 113(d) of the Clean Air Act (the "CAA" or "Act"), 42 U.S.C. § 7413(d), and Sections 22.13, 22.18, and 22.34 of the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits ("Consolidated Rules"), as codified at 40 C.F.R. Part 22.
2. Complainant is the United States Environmental Protection Agency, Region 6 (the "EPA" or "Complainant"). On the EPA's behalf, the Director of the Compliance Assurance and Enforcement Division has been delegated the authority to settle civil administrative penalty proceedings under Section 113(d) of the Act.
3. Respondent TPC Group LLC ("Respondent") is a limited liability company doing business in the state of Texas. Respondent is a "person" as defined in Section 302(e) of the Act, 42 U.S.C. § 7602(e).
4. As described more fully herein, Complainant alleges that Respondent violated 40 C.F.R. §§ 60.11(d) when operating the North Flare (identification number UWN6R1) and South Flare (identification number UWS6R1) at its chemical manufacturing plant located at 2102 Spur 136 in Port Neches,

Jefferson County, Texas (the "Facility"). Both the North Flare and South Flare are steam-assisted flares.

5. Prior to this proceeding, Respondent installed: a net heating value analyzer ("NHV Analyzer") to continuously measure, calculate, and record the NHV_{vg} for the North Flare and South Flare of the Facility; and vent gas flow meters to continuously measure, calculate, and record the volumetric flow rate of Vent Gas in the header or headers that feed the North Flare and South Flare. Prior to this proceeding, Respondent began operating a Flare Minimization Process that uses a sponge oil unit and boiler to recover and reprocess hydrocarbons before waste gas is sent to the North Flare and South Flare.
6. Complainant and Respondent, having agreed that settlement of this action is in the public interest, consent to the entry of this Consent Agreement along with the corresponding Final Order, hereinafter known together as the "CAFO", without adjudication of any issues of law or fact herein, and Respondent agrees to comply with the terms of this CAFO.

B. JURISDICTION

7. This CAFO is entered into under Section 113(d) of the Act, as amended, 42 U.S.C. § 7413(d), and the Consolidated Rules, 40 C.F.R. Part 22. The alleged violations in this CAFO are pursuant to Section 113(a)(3)(A).
8. The EPA and the United States Department of Justice jointly determined that this matter, although it involves a penalty assessment above $320,000 and alleged violations that occurred more than a year before the initiation of this proceeding, is appropriate for an administrative penalty assessment. 42 U.S.C. § 7413(d); 40 C.F.R. § 19.4.
9. The Regional Judicial Officer is authorized to ratify this CAFO which memorializes a settlement between Complainant and Respondent. 40 C.F.R. § 22.4(b) and 22.18(b).

10. The issuance of this CAFO simultaneously commences and concludes this proceeding. 40 C.F.R. § 22.13(b).

C. DEFINITIONS

11. "Ambient Air" shall mean that portion of the atmosphere, external to buildings, to which persons have access.
12. "Assist Air" shall mean all air that intentionally is introduced prior to or at the flare tip through nozzles or other hardware conveyances for purposes including, but not limited to, protecting the design of the flare tip and promoting turbulence for mixing or inducing air into the flame. Assist Air includes Premix Assist Air and Perimeter Assist Air. Assist Air does not include Ambient Air.
13. "Assist Steam" shall mean steam that intentionally is introduced prior to or at the flare tip through nozzles or other hardware conveyance for the purposes of, including, but not limited to, protecting the design of the flare tip and promoting turbulence for mixing or inducing air into the flame. Assist Steam includes, but is not necessarily limited to, Center Steam, Lower Steam, and Upper Steam.
14. "BTU/scf" shall mean British Thermal Unit per standard cubic foot.
15. "Capable of Receiving Sweep, Supplemental, and/or Waste Gas" shall mean, for a Flare, that the flow of Sweep, Supplemental, and/or Waste Gas is/are not prevented from being directed to the Flare by means of closed valves and/or blinds.
16. "Center Steam" shall mean the portion of Assist Steam introduced into the stack of the flare to reduce burnback.
17. "Combustion Zone Gas" shall mean all gases and vapors found after the flare tip. This gas includes all Vent Gas, Pilot Gas, and Total Steam and Premix Assist Air.
18. "Covered Flare" shall mean each of the following Flares: North Flare (identification number UWN6R1); and South Flare (identification number UWS6R1).

19. "Flare" shall mean a combustion device lacking an enclosed combustion chamber that uses an uncontrolled volume of Ambient Air to burn gases.

20. "In Operation" or "Being In Operation" or "Operating," with respect to a Flare, shall mean any and all times that Sweep, Supplemental, and/or Waste Gas is or may be vented to a Flare. A Flare that is In Operation is Capable of Receiving Sweep, Supplemental, and/or Waste Gas unless all Sweep, Supplemental, and Waste Gas flow is prevented by means of closed valves and/or blinds.

21. "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.

22. "Lower Steam" shall mean the portion of Assist Steam piped to an exterior annular ring near the lower part of the flare tip, which then flows through tubes to the flare tip, and ultimately exits the tubes at the flare tip.

23. "Malfunction" shall mean, as specified in 40 C.F.R. § 60.2, "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 dispute under this CAFO involving this definition, Respondent shall have the burden of proving all of the following:

    a. The excess emissions were caused by a sudden, unavoidable breakdown of technology, beyond the control of the owner or operator;

    b. The excess emissions (1) did not stem from any activity or event that could have been foreseen and avoided, or planned for, and (2) could not have been avoided by better operation and maintenance practices;

c. To the maximum extent practicable the air pollution control equipment or processes were maintained and operated in a manner consistent with good practice for minimizing emissions;

d. Repairs were made in an expeditious fashion when the operator knew or should have known that applicable emission limitations were being exceeded. Off-shift labor and overtime must have been utilized, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

e. The amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions;

f. All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

g. All emission monitoring systems were kept in operation if at all possible;

h. The owner or operator's actions during the period of excess emissions were documented by properly signed, contemporaneous operating logs, or other relevant evidence;

i. The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

j. The owner or operator properly and promptly notified the appropriate regulatory authority.

24. "Monitoring System Malfunction" shall mean any sudden, infrequent, and not reasonably preventable failure of instrumentation or a monitoring system to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not Monitoring System Malfunctions. In any dispute under this CAFO involving this definition, Respondent shall have the burden of proving all of the following:

a. The instrument or monitoring system downtime was caused by a sudden, unavoidable breakdown of technology, beyond the control of the owner or operator;

b. The instrument or monitoring system downtime (a) did not stem from any activity or event that could have been foreseen and avoided, or planned for, and (b) could not have been avoided by better operation and maintenance practices;

c. To the maximum extent practicable the air pollution control equipment or processes were maintained and operated in a manner consistent with good practice for minimizing emissions;

d. Repairs were made in an expeditious fashion when the operator knew or should have known that applicable emission limitations were being exceeded. Off-shift labor and overtime must have been utilized, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

e. The amount and duration of the instrument or monitoring system downtime was minimized to the maximum extent practicable;

f. The owner or operator's actions during the period of instrument or monitoring system downtime were documented by properly signed, contemporaneous operating logs, or other relevant evidence; and

g. The instrument or monitoring system downtime was not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

25. "Net Heating Value" shall mean shall mean the energy released as heat when a compound undergoes complete combustion with oxygen to form gaseous carbon dioxide and gaseous water.

26. "Net Heating Value of Combustion Zone Gas" or "NHV_{cv}" shall mean the Lower Heating Value, in BTU/scf, of the Combustion Zone Gas in the flare. The NHV_{cv} shall be calculated in accordance with Step 3 of Appendix D of this CAFO.

27. "Net Heating Value of Vent Gas" or "NHV_{vg}" shall mean the Lower Heating Value, in BTU/scf, of the Vent Gas directed to the flare. NHV_{vg} shall be calculated in accordance with Step 1 of Appendix D of this CAFO.
28. "Perimeter Assist Air" shall mean the portion of Assist Air introduced at the perimeter of the flare tip or above the flare tip. Perimeter Assist Air includes air intentionally entrained in Lower and Upper Steam. Perimeter Assist Air includes all Assist Air except Premix Assist Air.
29. "Pilot Gas" shall mean gas introduced into the flare tip that provides a flame to ignite the Vent Gas.
30. "Premix Assist Air" shall mean the portion of Assist Air that is introduced to the Vent Gas, whether injected or induced, prior to the flare tip. Premix Assist Air also includes any air intentionally entrained in Center Steam.
31. "Steam-Assisted Flare" shall mean a Flare that utilizes steam piped to a Flare tip to assist in combustion.
32. "Supplemental Gas" shall mean all gas introduced to the flare to comply with the net heating value requirements of 40 C.F.R. § 60.18 (b).
33. "Sweep Gas" shall mean the minimum amount of gas introduced into the flare header 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.
34. "Total Steam" shall mean the total of all steam that is supplied to the flare and includes, but is not limited to, Lower Steam, Center Steam, and Upper Steam.
35. "Upper Steam" shall mean the portion of Assist Steam introduced via nozzles located on the exterior perimeter of the upper end of the flare tip.

36. "Vent Gas" shall mean all gas found just prior to the flare tip. This gas includes all Waste Gas, that portion of Sweep Gas that is not recovered, Purge Gas, and Supplemental Gas, but does not include Pilot Gas, Total Steam, or Assist Air.

37. "Waste Gas" shall mean the mixture of all gases from the Facility operations that is directed to the flare for the purpose of disposing of the gas. "Waste Gas" does not include gas introduced to the flare exclusively to make it operate safely and as intended; therefore "Waste Gas" does not include Pilot Gas, Total Steam, Assist Air, 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 the minimum amount of gas introduced to the flare to comply with regulatory and/or permit requirements regarding the combustible characteristics of Combustion Zone Gas; therefore "Waste Gas" does not include Supplemental Gas.

D. GOVERNING LAW

New Source Performance Standards

38. Section 111(b)(1)(A) of the CAA, 42 U.S.C. § 7411(b)(1)(A), requires EPA to publish and periodically revise a list of categories of stationary sources, including those categories that, in EPA's judgment, cause or contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

39. Once a category is included on the list, Section 111(b)(1)(B) of the CAA, 42 U.S.C. § 7411(b)(1)(B), requires EPA to promulgate a federal standard of performance for new sources within the category, also known as a New Source Performance Standards ("NSPS"). Section 111(e) of the CAA, 42 U.S.C. § 7411(e), prohibits an owner or operator of a new source from operating that source in violation of an NSPS after the effective date of the NSPS applicable to each source.

40. The NSPS are located in Part 60 of Title 40 of the Code of Federal Regulations.

41. Pursuant to Section 111(b)(1)(B) of the CAA, 42 U.S.C. § 7411(b)(1)(B), EPA has promulgated regulations that contain general provisions applicable to all NSPS sources. 40 C.F.R. Part 60, Subpart A, §§ 60.1-60.19 ("NSPS Subpart A").

42. Under NSPS Subpart A, the provisions of 40 C.F.R. Part 60 "apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after publication [in Part 60] of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility." 40 C.F.R. § 60.1.

43. NSPS Subpart A requires that "[a]t all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions." 40 C.F.R. § 60.11(d).

E. FINDINGS OF FACT AND CONCLUSIONS OF LAW

44. At all times relevant to this proceeding, Respondent has owned and operated the Facility.

45. Respondent is the owner and operator of the Facility within the meaning of Section 111(a)(5) of the Act, 42 U.S.C. § 7411(a)(5), and 40 C.F.R. §§ 60.2.

46. At all times relevant to this proceeding, Respondent owned and operated units that emit 1,3-butadiene and hexane at the Facility.

47. The Facility processes crude C4 hydrocarbon into butadiene and other products.

48. The Facility is a "stationary source" as that term is defined in Sections 111(a)(3) of the Act, 42 U.S.C. § 7411(a)(3), and 40 C.F.R. § 60.2.

49. At all times relevant to this proceeding, the Facility was a "major source" within the meaning of the Act's Title V program, Section 501(2) of the Act, 42 U.S.C. § 7661(2), 40 C.F.R. § 70.2.

50. The Facility is subject to the CAA Title V Federal Operating Permit Program. On or about August 3, 2009, Respondent was issued Permit No. 01327 (the "Title V Permit"), an air permit issued under the

Texas Permit Program. The Title V Permit covers various emissions units at the Facility, including each Covered Flare. The Title V Permit requires, inter alia, that the Respondent operate each Covered Flare in compliance with certain provisions of NSPS Subpart A (40 C.F.R. Part 60, Subpart A).

51. In October 2013, EPA issued an information request to Respondent under Section 114 of the Act, 42 U.S.C. § 7414. In January 2014, Respondent responded to EPA's information request. As part of its response, Respondent provided information regarding the Facility's flaring operations, including Vent Gas and Assist Steam flow rates, and NHV_{vg}.

52. Based on its review of the above information, EPA identified the following alleged violations of the CAA at the Covered Flares for the period from July 1, 2011 to October 9, 2014, as described in Section F of this CAFO.

F. ALLEGED VIOLATIONS

Good Air Pollution Control Practices/Operation and Maintenance in Conformance with Design

53. Each Covered Flare is subject to 40 C.F.R. §§ 60.11(d). Under these regulations, Respondent was and is required, at all times, including periods of startup, shutdown, and malfunction, to the extent practicable, to maintain and operate each Covered Flare in a manner consistent with good air pollution control practices for minimizing emissions.

54. On information and belief, at various times during the period between July 1, 2011 and October 9, 2014, as reflected in the data Respondent produced to EPA described in Section E, above, Respondent operated each Covered Flare with a high steam to vent gas ratio. Upon information and belief, this high steam to vent gas ratio increased the likelihood of flame quenching and reduced combustion efficiency.

55. As referenced above, EPA alleges that Respondent's operation of each Covered Flare in this manner violated the requirement to operate each Covered Flare in a manner consistent with good air pollution control practices for minimizing emissions, as required by 40 C.F.R. § 60.11(d).

G. CIVIL PENALTY AND CONDITIONS OF SETTLEMENT

General

56. For the purpose of this proceeding, as required by 40 C.F.R. § 22.18(b)(2), Respondent:

a. Admits that the EPA has jurisdiction over the subject matter alleged in this CAFO;

b. Neither admits nor denies the specific factual allegations contained in the CAFO;

c. Consents to the assessment of a civil penalty as stated below;

d. Consents to the issuance of any specified compliance or corrective order;

e. Consents to the conditions specified in this CAFO;

f. Consents to any stated Permit Action;

g. Waives any right to contest the alleged violations set forth in Section F of this CAFO; and

h. Waives its rights to appeal the Final Order included in this CAFO.

57. For the purpose of this proceeding, Respondent:

a. Agrees that this CAFO states a claim upon which relief may be granted against Respondent;

b. Acknowledges that this CAFO constitutes an enforcement action for purposes of considering Respondent's compliance history in any subsequent enforcement actions;

c. Waives any and all remedies, claims for relief and otherwise available rights to judicial or administrative review that Respondent may have with respect to any issue of fact or law set forth in this CAFO, including any right of judicial review under Section 307(b)(1) of the Clean Air Act, 42 U.S.C. § 7607(b)(1);

d. Consents to personal jurisdiction in any action to enforce this CAFO in the United States District Court for the Eastern District of Texas;

e. Waives any right it may possess at law or in equity to challenge the authority of the EPA to bring a civil action in a United States District Court to compel compliance with this

CAFO and to seek an additional penalty for such noncompliance, and agrees that federal law shall govern in any such civil action; and

f. Agrees that in any subsequent administrative or judicial proceeding initiated by the Complainant or the United States for injunctive relief, civil penalties, or other relief relating to this Facility, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim splitting, or other defenses based on any contention that the claims raised by the Complainant or the United States were or should have been brought in the instant case, except with respect to Respondent's liability that has been specifically resolved pursuant to this CAFO.

Penalty Assessment and Calculation

58. Upon consideration of the entire record herein, including the Findings of Fact and Conclusions of Law, which are hereby adopted and made a part hereof, and upon consideration of the size of the business, the economic impact of the penalty on the business, the Respondent's full compliance history and good faith efforts to comply, the duration of the violation, payment by the violator of penalties previously assessed for the same violation, the economic benefit of noncompliance, the seriousness of the violation, and other factors as justice may require, including Respondent's agreement to perform the additional conditions of settlement and Supplemental Environmental Project ("SEP") set forth below, EPA has assessed a civil penalty in the amount of **Seventy Two Thousand One Hundred Eighty Seven Dollars ($72,187) ("EPA Penalty")**. The EPA Penalty has been determined in accordance with Section 113 of the Act, 42 U.S.C. § 7413, and at no time exceeded EPA's statutory authority.

59. Respondent agrees to:

a. Pay the EPA Penalty within 30 calendar days of the Effective Date of this CAFO. And

b. Pay the EPA Penalty by cashier's check, certified check, or wire transfer made payable to "Treasurer, United States of America, EPA – Region 6." Payment shall be remitted in one of five (5) ways: (1) regular U.S. Postal Service mail including certified mail; (2) overnight mail; (3) wire transfer; (4) automated clearinghouse for receiving U.S. currency; or (5) online payment.

For regular U.S. Postal Service mail, U.S. Postal Service certified mail, or U.S. Postal Service express mail, payment should be remitted to:

U.S. Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
P.O. Box 979077
St. Louis, MO 63197-9000

For overnight mail (non-U.S. Postal Service, e.g. FedEx), payment should be remitted to:

U.S. Bank
Government Lockbox 979077
U.S. EPA Fines & Penalties
1005 Convention Plaza
SL-MO-C2-GL
St. Louis, MO 63101

Contact: Natalie Pearson
(314) 418-4087

For wire transfer, payment should be remitted to:

Federal Reserve Bank of New York
ABA: 021030004
Account Number: 68010727
SWIFT Address: FRNYUS33
33 Liberty Street
New York, NY 10045

Field Tag 4200 of the Fedwire message should read:
"D 68010727 Environmental Protection Agency"

For Automated Clearinghouse (also known as REX or remittance express):

U.S. Treasury REX / Cashlink ACH Receiver
ABA: 051036706

Account Number: 310006, Environmental Protection Agency
CTX Format Transaction Code 22 – checking
Physical location of U.S. Treasury facility:
5700 Rivertech Court
Riverdale, MD 20737

Contact – Jesse White (301) 887-6548

For On-Line Payment

https://www.pay.gov/paygov/
Enter sfo 1.1 in search field
Open form and complete required fields.

PLEASE NOTE: The docket number "CAA 06-2017-3361" should be clearly typed on the check to ensure proper credit. The payment shall also be accompanied by a transmittal letter that shall reference Respondent's name and address, the case name, and docket number "CAA 06-2017-3361." Respondent's adherence to this request will ensure proper credit is given when penalties are received for the Region.

60. Respondent shall also send a simultaneous notice of its payment of the EPA penalty, including a copy of the money order, or check, and the transmittal letter, to the following addresses:

Margaret Osbourne
Chief, Air Toxics Enforcement Section (6EN-AT)
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

and

Region 6 Hearing Clerk (6RC-D)
Lorena Vaughn
U.S. EPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

61. Respondent agrees to pay the following on any overdue EPA Penalty:

a. Interest. Pursuant to Section 113(d)(5) of the Act, 42 U.S.C. § 7413(d)(5), any unpaid portion of a civil penalty must bear interest at the rates established pursuant to 26 U.S.C. § 6621 (a)(2).

b. Nonpayment Penalty. On any portion of a civil penalty more than 90 calendar days delinquent, Respondent must pay a nonpayment penalty, pursuant to Section 113(d)(5) of the Act, 42 U.S.C. § 7413(d)(5), which shall accrue from the date the penalty payment became delinquent, and which shall be in addition to the interest which accrues under subparagraph a. of this paragraph.

62. Respondent shall pay a charge to cover the cost of processing and handling any delinquent penalty claim, pursuant to 42 U.S.C. § 7413(d)(5), including, but not limited to, attorneys' fees incurred by the United States for collection proceedings.

63. If Respondent fails to timely pay any portion of the penalty assessed under this CAFO, the EPA may:

a. Refer the debt to a credit reporting agency, a collection agency, or to the Department of Justice for filing of a collection action in the appropriate United States District Court (in which the validity, amount, and appropriateness of the assessed penalty and of this CAFO shall not be subject to review) to secure payment of the debt, which may include the original penalty, enforcement and collection expenses, nonpayment penalty and interest, 42 U.S.C. § 7413(d)(5) and 40 C.F.R. §§ 13.13, 13.14, and 13.33;

b. Collect the above-referenced debt by administrative offset (i.e., the withholding of money payable by the United States to, or held by the United States for, a person to satisfy the debt the person owes the Government), which includes, but is not limited to, referral to the Internal Revenue Service for offset against income tax refunds, 40 C.F.R. Part 13, Subparts C and H; and

c. Suspend or revoke Respondent's licenses or other privileges, or suspend or disqualify Respondent from doing business with the EPA or engaging in programs the EPA sponsors or funds, 40 C.F.R. § 13.17.

Conditions of Settlement

64. As a Condition of Settlement, Respondent agrees that, no later than June 28, 2018, Respondent shall have completed the installation and commenced the operation of the instrumentation, controls, and monitoring systems set forth in Appendices A through D for each Covered Flare and operate each Covered Flare as required in Appendices A through D.

65. Permits Needed to Meet Compliance Obligations. If any compliance obligation under this CAFO requires Respondent to obtain federal, state, or local permit or approval, Respondent shall submit timely and complete applications and take all other actions necessary to obtain all such permit or approvals.

66. Permits to Ensure Survival of CAFO Limits and Standards. By no later than ninety (90) days after the effective date of this CAFO, Respondent shall submit a complete application to the Texas Commission on Environmental Quality requesting to incorporate the limits and standards in Appendix A into the federally enforceable operating permit.

Certification of Completion

67. At such time as the Respondent believes that it has complied with all terms and conditions of Paragraphs 58-60 (payment of EPA Penalty), that it has achieved compliance with the requirements of Paragraphs 64-66 (Conditions of Settlement) and Section H (Mitigation Project), and that it has satisfactorily completed the Supplemental Environmental Project in Section I, Respondent shall certify to EPA completion of these items and provide any necessary documentation. Respondent represents that the signing representative will be fully authorized by Respondent to certify that the terms and conditions of this CAFO have been met. The certification should include the following statement:

> I certify under penalty of law that I have examined and am familiar with the information submitted in this document and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is, to the best of my

knowledge, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fines and imprisonment.

The certification required above shall be sent to:

Margaret Osbourne
Chief, Air Toxics Enforcement Section (6EN-AT)
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733
Osbourne.margaret@epa.gov

EPA has 90 days to respond with questions or disagreement that the conditions of the CAFO have been satisfied.

68. Respondent agrees that the time period from the Effective Date of this CAFO until compliance with the conditions specified in Paragraphs 64-66 (Conditions of Settlement), Section H (Mitigation Project), and the Supplemental Environmental Project in Section I are completed (the "Tolling Period") shall not be included in computing the running of any statute of limitations potentially applicable to any action brought by Complainant on any claims set forth in Section F of this CAFO (the "Tolled Claims"). Respondent shall not assert, plead, or raise in any fashion, whether by answer, motion or otherwise, any defense of laches, estoppel, or waiver, or other similar equitable defense based on the running of any statute of limitations or the passage of time during the Tolling Period in any action brought on the Tolled Claims.

69. The provisions of this CAFO shall apply to and be binding upon Respondent and its officers, directors, employees, agents, trustees, servants, authorized representatives, successors, and assigns. From the Effective Date of this CAFO until the end of the Tolling Period set out in Paragraph 68, Respondent must give written notice and a copy of this CAFO to any successors in interest prior to transfer of ownership or control of any portion or interest in the Facility. Simultaneously with such notice, Respondent shall provide written notice of such transfer, assignment, or delegation to

the EPA. In the event of any such transfer, assignment or delegation, Respondent shall continue to be bound by the obligations or liabilities of this CAFO until the EPA has provided written approval.

70. By signing this CAFO, Respondent acknowledges that this CAFO will be available to the public and agrees that this CAFO does not contain any confidential business information.

71. By signing this CAFO, the undersigned representative of Complainant and the undersigned representative of Respondent each certify that he or she is fully authorized to execute and enter into the terms and conditions of this CAFO and has legal capacity to bind the party he or she represents to this CAFO.

72. By signing this CAFO, Respondent certifies that the information it has supplied concerning this matter was at the time of submission, and is at the time of signing, truthful, accurate, and complete for each submission, response, and statement. Respondent acknowledges that there are significant penalties for submitting false or misleading information, including the possibility of fines and imprisonment for knowing submission of such information, under 18 U.S.C. § 1001.

73. Respondent specifically waives its right to seek reimbursement of its costs and attorney's fees under 5 U.S.C. § 504 and 40 C.F.R. Part 17. Except as qualified by Paragraph 62, each party shall bear its own attorney's fees, costs, and disbursements incurred in this proceeding.

H. Mitigation Project

74. As a condition of settlement, Respondent shall implement a FLIR Camera Review Program ("Mitigation Project") according to this Section and Appendix E.

75. Respondent shall maintain, and present to the EPA upon request, all documents to substantiate the mitigation dollars expended and shall provide these documents to the EPA within thirty (30) days of a request by the EPA for the documents.

76. Respondent shall certify that Respondent is not otherwise required by law to perform the Mitigation Project described in Appendix E, that Respondent is unaware of any other person who is

required by law to perform the Mitigation Project, and that Respondent will not use the Mitigation Project, or portion thereof, to satisfy any obligations that it may have under other applicable requirements of law.

77. Respondent shall complete the Mitigation Project described in Appendix E one (1) year after starting monitoring activities[1] and shall notify the EPA upon completion of the Mitigation Project.

78. Within sixty (60) days following the completion of the Mitigation Project required under this CAFO, Respondent shall submit to the EPA a report, as described in Appendix E, that documents the date that the Mitigation Project was completed, Respondent's results of implementing the Mitigation Project, including the emission reductions or other environmental benefits achieved, and the cost expended by Respondent in implementing the Mitigation Project.

I. SUPPLEMENTAL ENVIRONMENTAL PROJECT

79. Respondent shall undertake a Fence Line Monitoring Project, which the parties agree is intended to secure significant environmental or public health protection and improvements, according to this Section and Appendix F.

80. One (1) year after the date on which Respondent begins continuously monitoring according to Appendix F,[2] Respondent will complete the Fence Line Monitoring Project.

81. The total expenditure for the SEP shall be no less than Two Hundred and Seventy-Five Thousand Dollars ($275,000).

82. Respondent hereby certifies based on information and belief formed after reasonable inquiry that:

    a. All cost information provided to the EPA in connection with EPA's approval of the SEP is complete and accurate and that Respondent in good faith estimates that the cost to

[1] By no later than 180 days after the Effective date of this CAFO, Respondent will begin conducting monitoring activities at the Facility. Appendix E.E2.d.

[2] Within 30 days of the effective date of this CAFO, Respondent shall submit to EPA for review and approval a Fence Line Monitoring Plan. Within 30 days of EPA's approval of the Fence Line Monitoring Plan, Respondent shall begin continuously monitoring for 1,3-butadiene concentrations. Appendix F.F2.

implement the SEP is at least Two Hundred and Seventy-Five Thousand Dollars ($275,000);

b. As of the effective date of this CAFO, Respondent is not required to perform or develop the SEP by any federal, state, or local law or regulation and is not required to perform or develop the SEP by agreement, grant, or as injunctive relief awarded in any other action in any forum;

c. The SEP is not a project that Respondent was planning or intending to construct, perform, or implement other than in settlement of the claims resolved in this CAFO;

d. Respondent has not received and will not receive credit for the SEP in any other enforcement action;

e. Respondent will not receive reimbursement for any portion of the SEP from another person or entity;

f. For federal income tax purposes, Respondent agrees that it will neither capitalize into inventory or basis nor deduct any costs or expenditures incurred in performing the SEP;

g. Respondent is not a party to any open federal financial assistance transaction that is funding or could fund the same activity as the SEP; and

h. Respondent has inquired of the SEP recipient and/or SEP implementer (if applicable) whether either is a party to an open federal financial assistance transaction that is funding or could fund the same activity as the SEP and has been informed by the recipient and/or implementer (if applicable) that neither is a party to such a transaction.

83. No later than sixty (60) days after the SEP completion date in Paragraph 80, Respondent shall submit a SEP Completion Report. The SEP Completion Report shall contain the information described in Appendix F and the following information:

a. A detailed description of the SEP as implemented;

b. A certification that the SEP has been fully implemented pursuant to the provisions of this CAFO with itemized final costs and copies of receipts for all expenditures;

c. A certification upon completion of the SEP that the Respondent has not, and will not, deduct the SEP from its income taxes; and

d. A description of the environmental and/or public health benefits resulting from implementation of the SEP.

84. In itemizing its costs in the SEP Completion Report, Respondent shall clearly identify and provide acceptable documentation for all eligible costs. For purposes of this Paragraph, "acceptable documentation" includes invoices, purchase orders, or other documentation that specifically identifies and itemizes the individual costs of the goods and/or services for which payment is being made. Canceled drafts do not constitute acceptable documentation unless such drafts specifically identify and itemize the individual costs of the goods and/or services for which payment is being made.

85. Respondent shall, by its representative who is fully authorized by Respondent to legally commit and bind Respondent, sign and certify under penalty of law that the information contained in the SEP Completion Report is true, accurate, and not misleading, by signing the following statement:

> "I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all Appendices, and that based on my inquiry if those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment."

The SEP Completion Report shall be sent to:

Margaret Osbourne
Chief, Air Toxics Enforcement Section (6EN-AT)
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

86. After receipt of the SEP Completion Report described above, EPA will notify Respondent, in writing within ninety (90) days, regarding: (a) any deficiencies in the SEP Completion Report itself along with a grant of an additional thirty (30) days, from receipt of that notification, for Respondent to correct any deficiencies in the SEP Completion Report; or (b) indicate that EPA concludes that the project has been completed satisfactorily; or (c) determine that the project has not been completed satisfactorily.

87. If Respondent fails to comply with any of the terms or provisions of this CAFO relating to performance of the SEP and/or to the extent of Respondent's actual expenditures for the SEP do not equal or exceed the cost of the SEP:

    a. Except as provided in subparagraphs (b)-(e) below, for a SEP which has not been completed satisfactorily pursuant to this CAFO, Respondent shall pay a stipulated penalty to the United States in the amount of Three Hundred Forty-Seven Thousand One Hundred Eighty-Seven Dollars ($347,187).

    b. Where all elements of a SEP have been satisfactorily completed, but the Respondent has expended less than the agreed-upon amount on the SEP, the EPA may, in its discretion, choose to reduce or waive stipulated penalties otherwise due under the settlement agreement.

    c. Where a SEP has not been satisfactorily completed, but the respondent can demonstrate that the partially completed SEP provides some of the expected environmental and/or public health benefits, the EPA may, in its discretion, choose to reduce or waive stipulated penalties otherwise due under the settlement agreement.

    d. If the Respondent fails to timely complete the SEP, the respondent shall pay the stipulated penalties shown below. Respondent's stipulated penalties for failure to timely

complete the SEP shall not exceed Three Hundred Forty-Seven Thousand One Hundred Eighty-Seven Dollars ($347,187).

Penalty Per Day	Period of Noncompliance
$250	1st through 14th day
$500	15th through 30th day
$750	31st day and beyond

e. For failure to submit the SEP Completion Report required Paragraphs 83-85 above, Respondent shall pay stipulated penalties as follows:

Penalty Per Day	Period of Noncompliance
$100	1st through 14th day
$250	15th through 30th day
$500	31st day and beyond

f. The EPA may, in the unreviewable exercise of its discretion, reduce or waive stipulated penalties otherwise due under this CAFO.

88. The determination of whether the SEP has been satisfactorily completed and whether Respondent has made a good faith, timely effort to implement the SEP shall be at the sole, reasonable discretion of the EPA.

89. Nothing herein shall obligate Respondent to publicize its involvement in the SEP; however, any public statement, oral or written, made by respondent to publicize its participation in SEP activities shall include the following language:

> This project was undertaken in connection with the settlement of an enforcement action taken by the U.S. Environmental Protection Agency for violations of the Clean Air Act and the regulations promulgated thereunder.

J. EFFECT OF CONSENT AGREEMENT AND FINAL ORDER

90. In accordance with 40 C.F.R. § 22.18(c), this CAFO resolves only Respondent's liability for federal civil penalties for the violations alleged in Section F and the facts that form the basis for those alleged violations.

91. Penalties paid pursuant to this CAFO shall not be deductible for purposes of federal taxes.

92. This CAFO constitutes the entire agreement and understanding of the parties and supersedes any prior agreements or understandings, whether written or oral, among the parties with respect to the subject matter hereof.

93. The material terms, conditions, and compliance requirements of this CAFO may not be modified or amended except upon the written agreement of both parties, and approval of the Regional Judicial Officer. The correction of errors and other non-substantive changes are not material terms and may be modified by written agreement of the parties.

94. Any violation of the included Final Order may result in a civil judicial action for an injunction or civil penalties of up to $37,500 per day of violation, or both, as provided in Section 113(b)(2) of the Act, 42 U.S.C. § 7413(b)(2), as well as criminal sanctions as provided in Section 113(c) of the Act, 42 U.S.C. § 7413(c). The EPA may use any information submitted under this CAFO in an administrative, civil judicial, or criminal action.

95. Nothing in this CAFO shall relieve Respondent of the duty to comply with all applicable provisions of the Act and other federal, state, or local laws or statutes, nor shall it restrict the EPA's authority to seek compliance with any applicable laws or regulations, nor shall it be construed to be a ruling on, or a determination of, an issue related to any federal, state, or local permit.

96. Nothing herein shall be construed to limit the power of the EPA to undertake any action against Respondent or any person in response to conditions that may present an imminent and substantial endangerment to the public health, welfare, or the environment.

K. EFFECTIVE DATE

97. Respondent and Complainant agree to the issuance of the included Final Order. Upon filing the EPA will transmit a copy of the filed CAFO to the Respondent. This CAFO shall become effective after execution of the Final Order by the Regional Judicial Officer on the date of filing with the Hearing Clerk.

The foregoing Consent Agreement In the Matter of TPC Group LLC, Docket No. CAA 06-2017-3361, is Hereby Stipulated, Agreed, and Approved for Entry.

FOR RESPONEDNT:

Date: 7/11/17

Michael White
Senior Vice President, Operations
TPC Group LLC
TPC Group LLC Houston Plant
8600 Park Place Blvd.
Houston, TX 77017

The foregoing Consent Agreement In the Matter of TPC Group LLC, Docket No. CAA 06-2017-3361, is Hereby Stipulated, Agreed, and Approved for Entry.

FOR COMPLAINANT:

Date: 7/11/17

Cheryl T. Seager, Director
Compliance Assurance and Enforcement Division
U.S. EPA, Region 6
1445 Ross Avenue
Dallas, Texas 75202

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

In the Matter of: **TPC Group LLC** **2102 Spur 136** **Port Neches, Jefferson County, Texas** **Respondent.**	**EPA Docket No.** CAA 06-2017-3361

FINAL ORDER

Pursuant to Section 113(d) of the Clean Air Act ("CAA" or the "Act"), 42 U.S.C. § 7413(d), and the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties, 40 C.F.R. Part 22, the attached Consent Agreement resolving this matter is incorporated by reference into this Final Order and is hereby ratified.

Respondent is ORDERED to comply with all terms of the Consent Agreement. In accordance with 40 C.F.R. § 22.13(b), this Final Order shall become effective upon filing with the Regional Hearing Clerk.

Dated 7-12-17

Regional Judicial Officer
U.S. EPA, Region 6

Thomas Rucki

CERTIFICATE OF SERVICE

I hereby certify that on the 12th day of July, 2017, the original and one copy of the foregoing Consent Agreement and Final Order was hand delivered to the Regional Hearing Clerk, U.S. EPA – Region 6, 1445 Ross Avenue, Suite 1200, Dallas, Texas 75202-2733, and a true and correct copy was delivered to the following individual(s) by the method indicated below:

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

TPC Group LLC
Gregg Goldstein
Associate General Counsel
One Allen Center
500 Dallas St., Suite 1000
Houston, TX 77002

Sandra Hardy
U.S. EPA, Region 6
Dallas, Texas

APPENDIX A
INSTRUMENTATION AND MONITORING SYSTEMS

A1. **Flare Data and Monitoring Systems and Protocol Report ("Flare Data and Monitoring Systems and Protocol Report").** For each Covered Flare, by no later than 60 days from the Effective Date of the CAFO, Respondent shall submit a report, to EPA that includes the following:

a. A detailed description of each instrument and piece of monitoring equipment, including the specific model and manufacturer, that Respondent has installed or will install in compliance with Paragraphs A3, A4, and A5 of this Appendix; and

b. A narrative description of the monitoring methods and calculations that Respondent shall use to comply with the requirements of Paragraph A10 and the NHV_{CZ} Requirements in this CAFO.

A2. **Installation and Operation of Monitoring Systems.** By no later than June 28, 2018, Respondent shall have completed the installation and commenced the operation of the instrumentation, controls, and monitoring systems set forth in Paragraphs A3-A5 for each Covered Flare.

A3. **Vent Gas and Assist Steam Monitoring Systems.**

a. Respondent shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Vent Gas (which includes Waste, Sweep, Purge, and any Supplemental Gas used) in the header or headers that feed each Covered Flare. Different flow monitoring methods may be used to measure different gaseous streams that make up the Vent Gas provided that the flow rates of all gas streams that contribute to the Vent Gas are determined.

b. Respondent shall install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Assist Steam used with each Covered Flare.

c. Each flow rate monitoring system must be able to correct for the temperature and pressure of the system and output parameters in standard conditions (i.e., a temperature of 20 °C (68 °F) and a pressure of 1 atmosphere).

d. In lieu of a monitoring system that directly measures volumetric flow rate, Respondent may choose from the following additional options for monitoring any gas stream:

i. Mass flow monitors may be used for determining the volumetric flow rate of Steam provided that Respondent converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix D;

ii. Mass flow monitors may be used for determining the volumetric flow rate of Vent Gas, provided Respondent determines the molecular weight of such Vent Gas using compositional analysis data collected pursuant to the monitoring method specified in Paragraph A5.a or A5.b and provided that Respondent converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix D; and

iii. Continuous pressure/temperature monitoring system(s) and appropriate engineering calculations may be used in lieu of a continuous volumetric flow monitoring system provided the molecular weight of the gas is known and provided Respondent complies with the methodology in Step 2 of Appendix D for calculating volumetric flow rates. For Vent Gas, Respondent must determine molecular weight using compositional analysis data collected pursuant to the monitoring method specified in Paragraph A5.a or A5.b.

A4. Equipment Controls.

a. Respondent shall install, operate, calibrate, and maintain equipment, including main and trim control valves and piping, that enables Respondent to control Assist Steam flow in a manner sufficient to ensure compliance with this CAFO.

b. Respondent shall install and operate automated controls to automatically adjust the steam flow rates with changes to the vent gas flow rates to maintain the steam to vent gas mass ratio.

c. Respondent shall install and operate automated controls of the supplemental gas rate in relation to the vent gas flow rate to ensure compliance with the NHV_{cz} standard.

A5. Vent Gas Compositional Monitoring or Direct Monitoring of Net Heating Value of Vent Gas. For each flare, Respondent shall determine the concentration of individual components in the Vent Gas or shall directly monitor the Net Heating Value of the Vent Gas (NHV_{vg}) in compliance with one of the methods specified in Subparagraphs A5.a–A5.c. Respondent may elect to use different monitoring methods (of the methods provided in Subparagraphs A5.a–A5.c) for different gaseous streams that make up the Vent Gas provided the composition or Net Heating Value of all gas streams that contribute to the Vent Gas are determined.

a. Install, operate, calibrate, and maintain a calorimeter capable of continuously measuring, calculating, and recording the NHV_{vg} at standard conditions. If Respondent elects this method, Respondent may, at its discretion, install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the hydrogen concentration in the Vent Gas; or

b. Install, operate, calibrate, and maintain a monitoring system capable of continuously measuring (i.e., at least once every 15 minutes), calculating, and recording the individual component concentrations present in the Vent Gas; or

c. Direct compositional or Net Heating Value monitoring is not required for purchased ("pipeline quality") natural gas streams. The Net Heating Value of purchased natural gas streams may be determined using annual or more frequent grab sampling at any one representative location. Alternatively, the Net Heating Value of any purchased natural gas stream can be assumed to be 920 BTU/scf.

A6. Instrumentation and Monitoring Systems: Specifications, Calibration, Quality Control, and Maintenance.

a. The instrumentation and monitoring systems identified in Paragraphs A3 and A5 shall:

i. Meet or exceed all applicable minimum accuracy, calibration and quality control requirements specified in Appendix B;

ii. Have an associated readout (i.e., a visual display or record) or other indication of the monitored operating parameter that is readily accessible onsite for operational control or inspection by Respondent;

iii. Be capable of measuring the appropriate parameter over the range of values expected for that measurement location; and

iv. Use an associated data recording system with a resolution that is equal to or better than the required instrumentation/system accuracy.

b. Respondent shall operate, maintain, and calibrate each instrumentation and monitoring system identified in Paragraphs A3 and A5 according to a continuous parametric monitoring system (CPMS) monitoring plan that contains the information listed in Paragraph C1 of Appendix C.

c. All monitoring systems that fall under the monitoring method in Paragraph A5.b must also meet the requirements of Paragraph C2 of Appendix C.

d. For each instrumentation and monitoring system identified in Paragraphs A3 and A5, Respondent shall comply with the out-of-control procedures described in Paragraph C3 of Appendix C, and with the data reduction requirements specified in Paragraph C4 of Appendix C.

A7. **Instrumentation and Monitoring Systems: Recording and Averaging Times.** The instrumentation and monitoring systems identified in Paragraphs A3 and A5 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 (including Waste, Sweep, Purge, and Supplemental) and Assist Steam Flow Monitoring Systems	Measure continuously and record 15-minute block averages
Vent Gas Compositional Monitoring (if using the methodology in Paragraph A5.b)	Measure no less than once every 15 minutes and record that value
Vent Gas Net Heating Value Analyzer (if using the methodology in Paragraph A5.a)	Measure continuously and record 15 minute block averages

Nothing in this Paragraph is intended to prohibit Respondent 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 CAFO.

A8. **Instrumentation and Monitoring Systems: Operation.** Except for periods of Monitoring System Malfunctions, repairs associated with Monitoring System Malfunctions, and required monitoring system quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments), Respondent shall operate each of the instruments and monitoring systems required in Paragraphs A3 and A5 and collect data on a continuous basis at all times when the Covered Flare that the instrument and/or monitoring system is associated with is capable of receiving Sweep, Supplemental, and/or Waste Gas.

Flare Combustion Efficiency

A9. **General Emission Standards Applicable to Flares**. By the Effective Date of the CAFO, Respondent shall comply with the requirements set forth in this Paragraph at all times required by rule when a Covered Flare is In Operation.

a. Operation during Vent Gas Venting. Respondent shall operate each flare at all times when Vent Gas may be vented to it in accordance with 40 C.F.R. § 60.18(e).

b. Pilot Flame Presence. Respondent shall comply with the requirements of the Facility's Title V permit and 40 C.F.R. § 60.18(c)(2).

c. No Visible Emissions. Respondent shall comply with the requirements of the Facility's Title V permit and 40 C.F.R. § 60.18(c)(1).

d. Flare Tip Velocity. Respondent shall comply with the requirements of the Facility's Title V permit and 40 C.F.R. § 60.18(c)(4).

e. Monitoring According to Applicable Provisions. Respondent shall comply with all applicable Subparts of 40 C.F.R. Parts 60, 61, and 63 which state how a particular flare must be monitored.

f. Good Air Pollution Control Practices. At all times, including during periods of Startup, Shutdown, and/or Malfunction, Respondent shall, to the extent practicable, implement good air pollution control practices to minimize emissions from each flare.

A10. **Combustion Zone Net Heating Value Standard.** By no later than June 28, 2018 at any time that Supplemental, Sweep, and/or Waste Gas is routed to a flare for at least 15 minutes, Respondent shall operate the flare(s) to maintain the NHV_{cz} at or above 270 BTU/scf determined on a 15-minute block period basis. Respondent shall monitor and calculate NHV_{cz} in accordance with Appendix D.

A11. **Recordkeeping: Timing and Substance**. At the time paragraph A10 applies, Respondent shall comply with recordkeeping requirements to calculate and record each of the following parameters:

a. Volumetric flow rates of all gas streams that contribute to the Vent Gas volumetric flow rate (in scfm) (in 15-minute block averages) in accordance with any calculation requirements of Paragraph A5 and Step 2 of Appendix D;

b. Assist Steam volumetric flow rate (in scfm) (in 15-minute block averages) in accordance with any calculation requirements of Paragraph A5 and Step 2 of Appendix D;

c. NHV_{vg} (in BTU/scf) (in 15-minute block averages) in accordance with Step 1 of Appendix D; and

d. NHV_{cz} (in BTU/scf) (in 15-minute block averages) in accordance with Step 3 of Appendix D.

APPENDIX B

CALIBRATION AND QUALITY CONTROL REQUIREMENTS FOR CPMS

Parameter	Minimum accuracy requirements	Calibration requirements
Temperature	±1 percent over the normal range of temperature measured, expressed in degrees Celsius (C), or 2.8 degrees C, whichever is greater	Conduct calibration checks at least annually; conduct calibration checks following any period of more than 24 hours throughout which the temperature exceeded the manufacturer's specified maximum rated temperature or install a new temperature sensor. At least quarterly, inspect all components for integrity and all electrical connections for continuity, oxidation, and galvanic corrosion, unless the CPMS has a redundant temperature sensor.
		Record the results of each calibration check and inspection.
		Locate the temperature sensor in a position that provides a representative temperature; shield the temperature sensor system from electromagnetic interference and chemical contaminants.
Flow Rate for All Flows Other Than Flare Vent Gas	±5 percent over the normal range of flow measured or 280 liters per minute (10 cubic feet per minute), whichever is greater, for gas flow	At least quarterly, inspect all components for leakage, unless the CPMS has a redundant flow sensor.
	±5 percent over the normal range measured for mass flow	Record the results of each calibration check and inspection. Locate the flow sensor(s) and other necessary equipment (such as straightening vanes) in a position that provides representative flow; reduce swirling flow or abnormal velocity distributions due to upstream and downstream disturbances.
Flare Vent Gas Flow Rate	±20 percent of flow rate at velocities ranging from 0.03 to 0.3 meters per second (0.1 to 1 foot per second) ±5 percent of flow rate at velocities greater than 0.3 meters per second (1 foot per second)	Conduct a flow sensor calibration check at least biennially (every two years); conduct a calibration check following any period of more than 24 hours throughout which the flow rate exceeded the manufacturer's specified maximum rated flow rate or install a new flow sensor. At least quarterly, inspect all components for leakage, unless the CPMS has a redundant flow sensor.
		Record the results of each calibration check and inspection.

		Locate the flow sensor(s) and other necessary equipment (such as straightening vanes) in a position that provides representative flow; reduce swirling flow or abnormal velocity distributions due to upstream and downstream disturbances.
Pressure	±5 percent over the normal operating range or 0.12 kilopascals (0.5 inches of water column), whichever is greater	Review pressure sensor readings at least once a week for straightline (unchanging) pressure and perform corrective action to ensure proper pressure sensor operation if blockage is indicated. Using an instrument recommended by the sensor's manufacturer, check gauge calibration and transducer calibration annually; conduct calibration checks following any period of more than 24 hours throughout which the pressure exceeded the manufacturer's specified maximum rated pressure or install a new pressure sensor.
		At least quarterly, inspect all components for integrity, all electrical connections for continuity, and all mechanical connections for leakage, unless the CPMS has a redundant pressure sensor.
		Record the results of each calibration check and inspection.
		Locate the pressure sensor(s) in a position that provides a representative measurement of the pressure and minimizes or eliminates pulsating pressure, vibration, and internal and external corrosion.
Net Heating Value by Calorimeter	±2 percent of span	Specify calibration requirements in your site specific CPMS monitoring plan. Calibration requirements should follow manufacturer's recommendations at a minimum. Temperature control (heated and/or cooled as necessary) the sampling system to ensure proper year-round operation.
		Where feasible, select a sampling location at least two equivalent diameters downstream from and 0.5 equivalent diameters upstream from the nearest disturbance. Select the sampling location at least two equivalent duct diameters from the nearest control device, point of pollutant generation, air in-leakages, or other point at which a change in the pollutant concentration or emission rate occurs.
Net Heating Value by Gas Chromatograph	As specified in Performance Specification 9 of 40 CFR part 60, appendix B	Follow the procedure in Performance Specification 9 of 40 CFR part 60, appendix B, except that a single daily mid-level calibration check can be used (rather than triplicate analysis), the multi-point calibration can be conducted quarterly (rather than monthly), and the sampling line temperature must be maintained at a minimum temperature of 60 °C (rather than 120 °C).

Hydrogen analyzer	±2 percent over the concentration measured or 0.1 volume percent, whichever is greater	Specify calibration requirements in your site specific CPMS monitoring plan. Calibration requirements should follow manufacturer's recommendations at a minimum.
		Select the sampling location at least two equivalent duct diameters from the nearest control device, point of pollutant generation, air in-leakages, or other point at which a change in the pollutant concentration occurs.

APPENDIX C
ADDITIONAL CPMS REQUIREMENTS

C1. **Continuous Parametric Monitoring System (CPMS) Monitoring Plan.** The owner or operator shall develop and implement a CPMS quality control program documented in a CPMS monitoring plan that covers each flare and each CPMS installed to comply with the provisions of this settlement. The owner or operator shall have the CPMS monitoring plan readily available on-site at all times and shall submit a copy of the CPMS monitoring plan to the Administrator upon request by the Administrator. The CPMS monitoring plan must contain the information listed in paragraphs (a) through (e) of this section.

a. Identification of the specific flare being monitored and the flare type (air-assisted only, steam-assisted only, air- and steam-assisted, pressure-assisted, or non-assisted).

b. Identification of the parameter to be monitored by the CPMS and the expected parameter range, including worst case and normal operation.

c. Description of the monitoring equipment, including the information specified in paragraphs (i) through (vii) of this section.

i. Manufacturer and model number for all monitoring equipment components installed to comply with applicable provisions of this order.

ii. Performance specifications, as provided by the manufacturer, and any differences expected for this installation and operation.

iii. The location of the CPMS sampling probe or other interface and a justification of how the location meets the requirements of the table in Appendix B.

iv. Placement of the CPMS readout, or other indication of parameter values, indicating how the location is readily accessible onsite for operational control or inspection.

v. Span of the CPMS. The span of the CPMS sensor and analyzer must encompass the full range of all expected values.

vi. How data outside of the span of the CPMS will be handled and the corrective action that will be taken to reduce and eliminate such occurrences in the future.

vii. Identification of the parameter detected by the parametric signal analyzer and the algorithm used to convert these values into the operating parameter monitored to demonstrate compliance, if the parameter detected is different from the operating parameter monitored.

d. Description of the data collection and reduction systems, including the information specified in paragraphs (i) through (iii) of this section.

i. A copy of the data acquisition system algorithm used to reduce the measured data into the reportable form of the standard and to calculate the applicable averages.

ii. Identification of whether the algorithm excludes data collected during CPMS breakdowns, out-of-control periods, repairs, maintenance periods, instrument adjustments or checks to maintain precision and accuracy, calibration checks, and zero (low-level), mid-level (if applicable) and high-level adjustments.

iii. If the data acquisition algorithm does not exclude data collected during CPMS breakdowns, out-of-control periods, repairs, maintenance periods, instrument adjustments or checks to maintain precision and accuracy, calibration checks, and zero (low-level), mid-level (if applicable) and high-level adjustments, a description of the procedure for excluding this data when the averages calculated as specified in paragraph C2 of this section are determined.

e. Routine quality control and assurance procedures, including descriptions of the procedures listed in paragraphs C1.(e)(i) through (vi) of this section and a schedule for conducting these procedures. The routine procedures must provide an assessment of CPMS performance.

i. Initial and subsequent calibration of the CPMS and acceptance criteria.

ii. Determination and adjustment of the calibration drift of the CPMS.

iii. Daily checks for indications that the system is responding. If the CPMS system includes an internal system check, the owner or operator may use the results to verify the system is responding, as long as the system provides an alarm to the owner or operator or the owner or operator checks the internal system results daily for proper operation and the results are recorded.

iv. Preventive maintenance of the CPMS, including spare parts inventory.

v. Data recording, calculations and reporting.

vi. Program of corrective action for a CPMS that is not operating properly.

C2. **Flare Monitoring System Requirements: Additional Requirements for Gas Chromatographs**. For monitors used to determine compositional analysis for net heating value, the gas chromatograph must also meet the requirements of paragraphs (a) through (c) of this section.

a. The quality assurance requirements are in Appendix B.

b. The calibration gases must meet one of the following options:

i. The owner or operator must use a calibration gas or multiple gases that include all of compounds listed in paragraphs (b)(i)(A) through (K) of this section that may be reasonably expected to exist in the flare gas stream and optionally include any of the compounds listed in paragraphs (b) (i)(L) through (O) of this section. All of the calibration gases may be combined in one cylinder. If multiple calibration gases are necessary to cover all compounds, the owner or operator must calibrate the instrument on all of the gases.

(A) Hydrogen.

(B) Methane.

(C) Ethane.

(D) Ethylene.

(E) Propane.

(F) Propylene.

(G) n-Butane.

(H) iso-Butane.

(I) Butene (general). It is not necessary to separately speciate butene isomers, but the net heating value of trans-butene must be used for co-eluting butene isomers.

(J) 1,3-Butadiene. It is not necessary to separately speciate butadiene isomers, but you must use the response factor and net heating value of 1,3-butadiene for co-eluting butadiene isomers.

(K) n-Pentane. Use the response factor for n-pentane to quantify all C5+ hydrocarbons.

(L) Acetylene (optional).

(M) Carbon monoxide (optional).

(N) Propadiene (optional).

(O) Hydrogen sulfide (optional).

ii. The owner or operator must use a surrogate calibration gas consisting of hydrogen and C1 through C5 normal hydrocarbons. All of the calibration gases may be combined in one cylinder. If multiple calibration gases are necessary to cover all compounds, the owner or operator must calibrate the instrument on all of the gases.

c. If the owner or operator chooses to use a surrogate calibration gas under paragraph (b)(ii) of this section, the owner or operator must comply with paragraphs (c)(i) and (ii) of this section.

i. Use the response factor for the nearest normal hydrocarbon (*i.e.*, n-alkane) in the calibration mixture to quantify unknown components detected in the analysis.

ii. Use the response factor for n-pentane to quantify unknown components detected in the analysis that elute after n-pentane.

C3. **Out-Of-Control Periods.** For each CPMS installed to comply with the provisions of Appendix A, except for CPMS installed for pilot flame monitoring, the owner or operator shall comply with the out-of-control procedures described in paragraphs (a) and (b) of this section.

a. A CPMS is out-of-control if the zero (low-level), mid-level (if applicable) or high-level calibration drift exceeds two times the accuracy requirement of Appendix B.

b. When the CPMS is out of control, the owner or operator shall take the necessary corrective action and repeat all necessary tests that indicate the system is out of control. The owner or operator shall take corrective action and conduct retesting until the performance requirements are below the applicable limits. The beginning of the out-of-control period is the hour a performance check (*e.g.*, calibration drift) that indicates an exceedance of the performance requirements established in this section is conducted. The end of the out-of-control period is the hour following the completion of corrective action and successful demonstration that the system is within the allowable limits. The owner or operator shall not use data recorded during periods the CPMS is out of control in data averages and calculations, used to report emissions or operating levels, as specified in paragraph C4(c) of this section.

C4. **CPMS Data Reduction.** The owner or operator shall reduce data from a CPMS installed to comply with this order as specified in paragraphs (a) through (c) of this section.

a. The owner or operator may round the data to the same number of significant digits used in that operating limit.

b. Periods of non-operation of the process unit (or portion thereof) resulting in cessation of the emissions to which the monitoring applies must not be included in the 15-minute block averages.

c. Periods when the CPMS is out of control must not be included in the 15-minute block averages.

APPENDIX D
CALCULATING NET HEATING VALUE OF THE COMBUSTION ZONE GAS (NHV_{cz})

All abbreviations, constants, and variables are defined in the Key on Page 4 of this Appendix.

Step 1: Determine the Net Heating Value of the Vent Gas (NHV_{vg})

Respondent shall determine the Net Heating Value of the Vent Gas (NHV_{vg}) based on composition monitoring data on a 15-minute block average basis according to the following requirements. If Respondent monitors separate gas streams that combine to comprise the total vent gas flow to a flare, the 15-minute block average Net Heating Value shall be determined separately for each measurement location according to the following requirements and a flow-weighted average of the gas stream Net Heating Values shall be used to determine the 15-minute block average Net Heating Value of the cumulative Vent Gas. The NHV_{vg} 15-minute block averages shall be calculated for set 15-minute time periods starting at 12 midnight to 12:15 AM, 12:15 AM to 12:30 AM and so on, concluding at 11:45 PM to midnight.

Step 1a: Equation or Output to be Used to Determine NHV_{vg} at a Measurement Location

For any gas stream for which Respondent complies with Paragraph A5 by collecting compositional analysis data in accordance with the method set forth in A5.b: Equation 1 shall be used to determine the NHV_{vg} of a specific sample by summing the Net Heating Value for each individual component by individual component volume fractions. Individual component Net Heating Values are listed in Table 1 of this Appendix.

$$NHV_{vg} = \sum_{i=1}^{n} (x_i \cdot NHV_i) \qquad \textit{Equation 1}$$

For any gas stream for which Respondent complies with Paragraph A5 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in A5.a but for which a Hydrogen Concentration Monitor is not used: Use the direct output (measured value) of the monitoring system(s) (in BTU/scf) to determine the NHV_{vg} for the sample.

For any gas stream for which Respondent complies with Paragraph A5 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in A5.a and for which a Hydrogen Concentration Monitor is also used: Equation 2 shall be used to determine the NHV_{vg} for each sample measured via the Net Heating Value monitoring system. Where hydrogen concentration data is collected, Equation 2 performs a net correction for the measured heating value of hydrogen since the theoretical Net Heating Value for hydrogen is 274 Btu/scf, but for the purposes of this CAFO, a Net Heating Value of 1,212 Btu/scf may be used (1,212 – 274 = 938 BTU/scf).

$$NHV_{vg} = NHV_{measured} + 938x_{H2} \qquad \textit{Equation 2}$$

Step 1b: Calculation Method to be Used in Applying Equation/Output to Determine NHV_{vg}

For any flare for which Respondent complies with Paragraph A5 by using a continuous monitoring system in accordance with the method set forth in A5.a or A5.b: Respondent may elect to determine the 15-minute block average NHV_{vg} using either the Feed-Forward Calculation Method or the Direct

Calculation Method (both described below). Respondent need not elect to use the same methodology at all flares with a continuous monitoring system; however, for each such flare, Respondent must elect one calculation method that will apply at all times, and use that method for all continuously monitored flare vent streams associated with that flare. If Respondent intends to change the calculation method that applies to a flare, Respondent must notify the EPA 30 days in advance of such a change.

Feed-Forward Calculation Method. When calculating NHV_{vg} for a specific 15-minute block:

1. Use the results from the first sample collected during an event (for periodic Vent Gas flow events) for the first 15-minute block associated with that event.
2. If the results from the first sample collected during an event (for periodic Vent Gas flow events) are not available until after the second 15-minute block starts, use the results from the first sample collected during an event for the second 15-minute block associated with that event.
3. For all other cases, use the results that are available from the most recent sample prior to the 15-minute block period for that 15-minute block period for all Vent Gas streams. For the purpose of this requirement, use the time that the results become available rather than the time the sample was collected. For example, if a sample is collected at 12:25 AM and the analysis is completed at 12:38 AM, the results are available at 12:38 AM and these results would be used to determine compliance during the 15-minute block period from 12:45 AM to 1:00 AM.

Direct Calculation Method. When calculating NHV_{vg} for a specific 15-minute block:

1. If the results from the first sample collected during an event (for periodic Vent Gas flow events) are not available until after the second 15-minute block starts, use the results from the first sample collected during an event for the first 15-minute block associated with that event.
2. For all other cases, use the arithmetic average of all NHV_{vg} measurement data results that become available during a 15-minute block to calculate the 15-minute block average for that period. For the purpose of this requirement, use the time that the results become available rather than the time the sample was collected. For example, if a sample is collected at 12:25 AM and the analysis is completed at 12:38 AM, the results are available at 12:38 AM and these results would be used to determine compliance during the 15-minute block period from 12:30 AM to 12:45 AM.

Step 2: Determine Volumetric Flow Rates of Gas Streams

Respondent shall determine the volumetric flow rate in standard cubic feet (scf) of vent gas, along with the volumetric flow rates (in scf) of any Supplemental Gas, assist steam, and premix assist air, over a 15-minute block average basis. The 15-minute block average volumetric flow rates shall be calculated for set 15-minute time periods starting at 12 midnight to 12:15 AM, 12:15 AM to 12:30 AM and so on, concluding at 11:45 PM to midnight.

For any gas streams for which Respondent complies with Paragraph A3 by using a monitoring system that directly records volumetric flow rate: Use the direct output (measured value) of the monitoring system(s) (in scf), as corrected for the temperature and pressure of the system to standard conditions (i.e., a temperature of 20 °C (68 °F) and a pressure of 1 atmosphere) to then calculate the average volumetric flow rate of that gas stream for the 15-minute block period.

For Vent Gas, assist steam, or premix assist air gas streams for which Respondent complies with Paragraph A3 by using a mass flow monitor to determine volumetric flow rate: Equation 3 shall be used to determine the volumetric flow rate of Vent Gas, premix assist air, or assist steam by converting

mass flow rate to volumetric flow at standard conditions (i.e., a temperature of 20 °C (68 °F) and a pressure of 1 atmosphere). Equation 3 uses the molecular weight of the gas stream as an input to the equation; therefore, if Respondent elects to use a mass flow monitor to determine volumetric flow rate of Vent Gas, Respondent must collect compositional analysis data for such Vent Gas in accordance with the method set forth in A5.b. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. The converted volumetric flow rates at standard conditions from Equation 3 shall then be used to calculate the average volumetric flow rate of that gas stream for the 15-minute block period.

$$Q_{vol} = \frac{Q_{mass} * 385.3}{MWt} \qquad \textit{Equation 3}$$

For gas streams for which the molecular weight of the gas is known and for which Respondent complies with Paragraph A3 by using continuous pressure/temperature monitoring system(s): Use appropriate engineering calculations to determine the average volumetric flow rate of that gas stream for the 15-minute block period. For assist steam, use a molecular weight of 18 pounds per pound-mole. For assist air, use a molecular weight of 29 pounds per pound-mole. For Vent Gas, molecular weight must be determined by collecting compositional analysis data for such Vent Gas in accordance with the method set forth in A5.b.

Step 3: Calculate the Net Heating Value of the Combustion Zone Gas (NHV_{cz})

For any flare at which: 1) the Feed-Forward Calculation Method is used; 2) gas composition or Net Heating Value monitoring is performed in a location representative of the cumulative vent gas stream; and 3) Supplemental Gas flow additions to the flare are directly monitored: Equation 4 shall be used to determine the 15-minute block average NHV_{cz} based on the 15-minute block average vent gas, supplemental gas, and assist gas flow rates.

$$NHV_{cz} = \frac{(Q_{vg} - Q_{NG2} + Q_{NG1}) * NHV_{vg} + (Q_{NG2} - Q_{NG1}) * NHV_{NG}}{Q_{vg} + Q_s + Q_{a,premix}} \qquad \textit{Equation 4}$$

For the first 15-minute block period of an event, Q_{NG1} shall use the volumetric flow value for the current 15-minute block period (i.e. $Q_{NG1} = Q_{NG2}$). NHV_{NG} shall be determined using one of the following methods: 1) direct compositional or Net Heating Value monitoring of the natural gas stream in accordance with Step 1; or 2) for purchased ("pipeline quality") natural gas streams, Respondent may elect to either: a) use annual or more frequent grab sampling at any one representative location; or b) assume a Net Heating Value of 920 BTU/scf.

For all other flares: Equation 5 shall be used to determine the 15-minute block average NHV_{cz} based on the 15-minute block average vent gas and assist gas flow rates. For periods when there is no Assist Steam flow or Premix Assist Air flow, $NHV_{cz} = NHV_{vg}$.

$$NHV_{cz} = \frac{Q_{vg} * NHV_{vg}}{Q_{vg} + Q_s + Q_{a,premix}} \qquad \textit{Equation 5}$$

Step 4: Ensure that during flare operation, $NHV_{cz} \geq 270$ BTU/scf

The flare must be operated to ensure that NHV_{cz} is equal to or above 270 BTU/scf, as determined for each 15-minute block period when Supplemental, Sweep, and/or Waste Gas is routed to a flare for at least 15-minutes. Equation 6 shows this relationship.

$$NHV_{cz} \geq 270\ BTU/scf \qquad \textit{Equation 6}$$

Key to the Abbreviations:

$385.3 = conversion\ factor\ (scf/lb\text{-}mol)$
$i = individual\ component\ in\ Vent\ Gas\ (unitless)$
$MWt = molecular\ weight\ of\ the\ gas\ at\ the\ flow\ monitoring\ location\ (lb/lb\text{-}mol)$
$n = number\ of\ components\ in\ Vent\ Gas\ (unitless)$
$NHV_{cz} = Net\ Heating\ Value\ of\ Combustion\ Zone\ Gas\ (BTU/scf)$
$NHV_i = Net\ Heating\ Value\ of\ component\ i\ according\ to\ Table\ 1\ of\ this\ Appendix\ (BTU/scf)$
$NHV_{measured} = Net\ Heating\ Value\ of\ Vent\ Gas\ stream\ as\ measured\ by\ monitoring\ system\ (BTU/scf)$
$NHV_{NG} = Net\ Heating\ Value\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15 - minute\ block\ period\ (BTU/scf)$
$NHV_{vg} = Net\ Heating\ Value\ of\ Vent\ Gas\ (BTU/scf)$
$Q_{a,premix} = cumulative\ vol\ flow\ of\ premix\ assist\ air\ during\ the\ 15 - minute\ block\ period\ (scf)$
$Q_{mass} = massflow\ rate\ (pounds\ per\ second)$
$Q_{NG1} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ previous\ 15 - minute\ block\ period\ (scf)$
$Q_{NG2} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15 - minute\ block\ period\ (scf)$
$Q_s = cumulative\ vol\ flow\ of\ Total\ Steam\ during\ the\ 15 - minute\ block\ period\ (scf)$
$Q_{vg} = cumulative\ vol\ flow\ of\ Vent\ Gas\ during\ the\ 15 - minute\ block\ period\ (scf)$
$Q_{vol} = volumetric\ flow\ rate\ (scf\ per\ second)$
$x_i = concentration\ of\ component\ i\ in\ Vent\ Gas\ (vol\ fraction)$
$x_{H2} = concentration\ of\ H2\ in\ Vent\ Gas\ at\ time\ sample\ was\ input\ into\ NHV\ monitoring\ system\ (vol\ fraction)$

Table 1
Individual Component Properties

Component	Molecular Formula	MW_i (pounds per pound-mole)	CMN_i (mole per mole)	NHV_i (British thermal units per standard cubic foot)	LFL_i (volume %)
Acetylene	C_2H_2	26.04	2	1,404	2.5
Benzene	C_6H_6	78.11	6	3,591	1.3
1,2-Butadiene	C_4H_6	54.09	4	2,794	2.0
1,3-Butadiene	C_4H_6	54.09	4	2,690	2.0
iso-Butane	C_4H_{10}	58.12	4	2,957	1.8
n-Butane	C_4H_{10}	58.12	4	2,968	1.8

Component	Molecular Formula	MW_i (pounds per pound-mole)	CMN_i (mole per mole)	NHV_i (British thermal units per standard cubic foot)	LFL_i (volume %)
cis-Butene	C_4H_8	56.11	4	2,830	1.6
iso-Butene	C_4H_8	56.11	4	2,928	1.8
trans-Butene	C_4H_8	56.11	4	2,826	1.7
Carbon Dioxide	CO_2	44.01	1	0	∞
Carbon Monoxide	CO	28.01	1	316	12.5
Cyclopropane	C_3H_6	42.08	3	2,185	2.4
Ethane	C_2H_6	30.07	2	1,595	3.0
Ethylene	C_2H_4	28.05	2	1,477	2.7
Hydrogen	H_2	2.02	0	1,212[A]	4.0
Hydrogen Sulfide	H_2S	34.08	0	587	4.0
Methane	CH_4	16.04	1	896	5.0
Methyl-Acetylene	C_3H_4	40.06	3	2,088	1.7
Nitrogen	N_2	28.01	0	0	∞
Oxygen	O_2	32.00	0	0	∞
Pentane+ (C5+)	C_5H_{12}	72.15	5	3,655	1.4
Propadiene	C_3H_4	40.06	3	2,066	2.16
Propane	C_3H_8	44.10	3	2,281	2.1
Propylene	C_3H_6	42.08	3	2,150	2.4
Water	H_2O	18.02	0	0	∞

[A] The theoretical Net Heating Value for hydrogen is 274 Btu/scf, but for the purposes of this Consent Decree, a Net Heating Value of 1,212 Btu/scf shall be used.

Note: If a component is not specified in this Table 1, the heats of combustion may be determined using any published values where the net enthalpy per mole of offgas is based on combustion at 25 °C and 1 atmosphere (or constant pressure) with offgas water in the gaseous state, but the standard temperature for determining the volume corresponding to one mole of vent gas is 20 °C.

APPENDIX E
FLIR CAMERA REVIEW PROGRAM
ENVIRONMENTAL MITIGATION PROJECT

In accordance with the requirements of Section H of the Consent Agreement and Final Order ("CAFO") and this Appendix E, Respondent will implement and secure the environmental benefit of the Environmental Mitigation Project described below at its Port Neches Operations ("PNO") facility in Port Neches, Texas.

E1. Purpose

The purpose of the Environmental Mitigation Project is to supplement Respondent's existing efforts to detect and reduce fugitive emissions, while also enhancing worker safety at the PNO facility. The monitoring requirements of this Appendix shall apply to each of the 19 blocks of the PNO facility. The repair requirements of this Appendix shall apply to: any component at the PNO facility that is regulated under 40 C.F.R. Part 60, Subpart VV, or any applicable federal, state, or local LDAR regulation ("Regulated Components"); and any other component incidentally found to have a fugitive emission by the FLIR camera ("Non-Regulated Components"). The requirements of this Appendix are in addition to, not in lieu of, the requirements of LDAR regulations that may be applicable to equipment at the PNO facility. If there is a conflict between a federal, state, or local LDAR regulation and this Appendix, Respondent shall follow the more stringent requirement.

E2. Project Requirements

a. Equipment

i. Respondent will purchase and employ one FLIR Systems Inc. infrared gas imaging camera ("FLIR camera") at its PNO facility. Respondent represents that the cost of the FLIR camera review program is $105,945, which consists of $96,500 for a model GF320 FLIR camera with an intrinsically safe fixed lens, $7,450 for a 6-degree lens, and $1,995 for a training course on the use of the camera.

b. Monitoring

i. The FLIR camera will be used to detect fugitive emissions of VOCs and HRVOCs at the PNO facility.

ii. Respondent shall use the FLIR camera to conduct a general scan of each of the 19 blocks of the entire PNO facility on a monthly basis in accordance with the following schedule:

Week 1 Monitoring Session: Blocks 4, 5, 9, 15, and 16
Week 2 Monitoring Session: Blocks 1, 3, 10, and 11
Week 3 Monitoring Session: Blocks 2, 6, 14, 17, and 19
Week 4 Monitoring Session: Blocks 7, 8, 12, 13, and 18

iii. The general scan will be conducted from a reasonably high point in each block, such as an elevated tower or sphere.

iv. If the general scan reveals potential fugitive emissions of VOCs or HRVOCs in a particular area, Respondent will use the FLIR camera to conduct one or more detailed scan(s) of that area to identify any component(s) or source(s) potentially emitting VOCs or HRVOCs. To conduct the one or more detailed scan(s), Respondent will select vantage point(s) closest to the potentially emitting component(s) or source(s) using scanning information already gathered during that monitoring session. For each monitoring session, Respondent will conduct all general and detailed scans within the same business day.

c. Repair

i. If Respondent determines that a Regulated Component is emitting VOCs or HRVOCs, then Respondent shall Repair or otherwise address the Regulated Component in accordance with the appropriate LDAR regulation including any Delay of Repair timeframes.

ii. If Respondent determines that a Non-Regulated Component is emitting VOCs or HRVOCs, Respondent shall 1) make a first attempt to Repair or otherwise address the Non-Regulated Component within thirty (30) calendar days of identifying the fugitive emission and a second attempt to Repair or otherwise address, if necessary, within sixty (60) calendar days of identifying the fugitive emission or 2) if necessary, place the Non-Regulated Component on Delay of Repair status until the next turnaround at the PNO facility.

d. Timeline

i. By no later than 180 days after the Effective date of this CAFO, Respondent will: purchase a FLIR camera and ensure that appropriate personnel have been trained on the use of the camera; and begin conducting monitoring activities at the PNO facility.

ii. Respondent will complete the Environmental Mitigation Project one (1) year after starting monitoring activities.

e. Reports

Within sixty (60) days after the date set for completion of the Environmental Mitigation Project, Respondent shall submit a Final Report that documents:

i. The dates the Mitigation Project was initiated and completed;

ii. A description of all emissions identified using the FLIR camera, any corrective actions taken to Repair or otherwise address components and sources, and the dates those components were Repaired or otherwise addressed;

iii. The results achieved by implementing the Mitigation Project, including the emissions reductions or other environmental benefits realized;

iv. The methodology and any calculations used in the derivation of such benefits, reductions, or mitigation;

v. The dollars expended by Respondent in implementing the Mitigation Project; and

vi. Certification by an authorized representative that the Mitigation Project has been completed in full satisfaction of the requirements of the CAFO and this Appendix.

APPENDIX F
FENCE LINE MONITORING SYSTEM
SUPPLEMENTAL ENVIRONMENTAL PROJECT

F1. Purpose

a. Pursuant to Section I of the CAFO, and in accordance with the specifications and provisions in this Appendix, Respondent will install, operate, and maintain a new fence line monitoring system ("FLMS") at its Port Neches Operations ("PNO") facility in Port Neches, Texas. The new fence line monitoring system will measure and record 1,3-butadiene concentrations in the ambient air at the PNO facility's fence line. The FLMS will incorporate four (4) gas chromatographs. Respondent is not already required to perform this project under any applicable law or regulation.

b. The new fence line monitoring system will entirely replace an outdated fence line monitoring system at the PNO facility. The outdated system was installed in 2003 by the previous owner and operator of the PNO facility, Huntsman Corporation ("Huntsman"), pursuant to a 2003 agreed order with the Texas Commission on Environmental Quality ("TCEQ"). The outdated system has aided in the PNO facility's ability to reduce off-site emissions and impact to the environment. In 2007, the TCEQ determined that Huntsman had fulfilled its obligations under the agreed order, which ended requirements to operate and maintain the fence line monitoring system. While Respondent continued to operate and maintain the outdated system after 2007, Respondent intended to deactivate the outdated system prior to this enforcement action because the system's equipment is outdated. AECOM, the company that maintained the outdated system, had already indicated that it would no longer be able to service the aging equipment.

F2. Requirements

a. Within 30 days of the effective date of this CAFO, Respondent shall submit to EPA for review and approval a Fence Line Monitoring Plan which shall include, at a minimum:

   i. An identification of the locations of the two (2) meteorological stations required by this Appendix and how these locations meet this Appendix's requirements.

   ii. A Quality Assurance Project Plan ("QAPP") that describes the Quality Assurance/Quality Control procedures, specifications, and other technical activities to be implemented to ensure: (i) that the results of this FLMS SEP meet project specifications; and (ii) the accuracy, validity, representativeness, and usability of the data obtained by all monitoring equipment, including the stationary equipment and systems identified in Section F3 (Stationary Equipment Requirements) and the portable equipment such as PIDs, TVAs, and Infrared Gas-Imaging Cameras identified in Section F5 (Field Investigations/Corrective Action). The QAPP shall follow the outline and guidance in the EPA publication entitled "QA Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Quality Monitoring Program," EPA-454/B-13-003, May 2013.

   iii. A description of the implementation of the Data Posting (Paragraph F4.c) and the Field Investigations/Corrective Action (Section F5 requirements of this Appendix).

b. Within thirty (30) days of EPA's approval of the Fence Line Monitoring Plan, Respondent shall begin continuously monitoring for 1,3-butadiene concentrations as measured by the pollutant monitoring stations identified in Section F3 (Stationary Equipment Requirements).

c. Respondent may seek EPA approval to modify the Fence Line Monitoring Plan at any time between EPA approving the Fence Line Monitoring Plan and Respondent completing the SEP.

F3. Stationary Equipment Requirements

a. Overview. The FLMS shall consist of: two (2) stations to monitor meteorological parameters (Paragraph F3.b); four (4) stations to monitor air pollutants (Paragraphs F3.c-g); and a Data Acquisition System (Paragraph F3.h).

b. Instruments for Measuring and Recording Wind Speed, Wind Direction, and Ambient Temperature. Specific meteorological parameters will be continuously monitored to obtain data representative of the meteorological conditions in the immediate PNO facility area. The data set produced shall be adequate to correlate at least hourly block average conditions with pollutant measurements and transport. The meteorological data from Site 2 will be used for Sites 2 and 4. The meteorological data from Site 6 will be used for Sites 5 and 6.

   i. Continuously measured meteorological parameters shall include at least hourly block average horizontal wind speed and wind direction, the standard deviation of the horizontal wind direction (sigma theta), and air temperature. Wind speed and direction shall be measured at a height of approximately 10 meters. Temperature shall be measured at a height of 2 to 3 meters. The sensors shall, to the extent practicable, be positioned away from, or above, obstructions such as buildings and process units that may interfere with wind direction measurements.

   ii. Wind direction and sigma theta measurement data shall be auto-corrected to True North, rounded to the nearest whole degree. Wind speed data shall be reported in miles per hour, rounded to the nearest tenth.

   iii. Air temperature data shall be reported in degrees Fahrenheit or Celsius, rounded to the nearest tenth of a degree.

c. Air Pollutant Monitoring Stations: Equipment and Pollutant Measurement Capability. Respondent shall maintain four (4) pollutant monitoring stations to continuously analyze ambient air samples.

   i. Respondent shall install four (4) new Gas Chromatographs ("GCs"), one (1) per pollutant monitoring station. The automated GCs shall be operated and maintained in accordance with the manufacturer's recommendations and shall have a measurement range of 1 to 250 ppbV.

   ii. Instruments shall be capable of sampling, analyzing, and reporting the concentrations of 1,3-butadiene in air at a minimum detection level of 1 part per billion by volume (ppbV). The 1,3-butadiene data will be recorded at 15 minute intervals and each pollutant monitoring station will alarm for concentrations greater than 25 ppbV.

d. Air Pollutant Monitoring Stations: Temperature-Controlled Shelter: Each air pollutant monitoring station shall be operated inside an existing temperature-controlled equipment shelter.

   i. The temperature within each shelter shall be continuously monitored.

   ii. Each monitoring shelter has an independent air conditioning and heat system capable of maintaining a stable temperature within the range of 20 ° C to 30 ° C.

   iii. The monitoring shelters shall measure approximately 8 feet wide by 12 feet long by 8 feet high.

   iv. Each shelter shall be anchored to the ground and be electrically grounded for safety.

   v. Each shelter will be equipped with electrical service panels, interior electrical distribution circuits, lighting, and sufficient space for housing, operating and maintaining the monitoring instruments.

e. Air Pollutant Monitoring Stations: Location. The four (4) air pollutant monitoring stations shall be located as follows:

   i. Site 2: 29° 59' 3.18" N / 93° 56' 54.91" W

   ii. Site 4: 29° 58' 57.48" N / 93° 56' 42.65"W

   iii. Site 5: 29° 58' 30.19" N / 93° 56' 42.85" W

   iv. Site 6: 29° 58' 32.37" N / 93° 56' 57.68" W

f. Air Pollutant Monitoring Stations: Sampler Inlet Requirements. The sampler inlets for each monitoring station shall comply with the following requirements:

   i. The sampler inlets should be 2 to 5 meters above ground and have unrestricted airflow 270 degrees around the sample inlet or 180 degrees if the sampler is on the side of a building.

   ii. The sampler inlets should be >20 meters from the dripline of any tree(s).

   iii. The sampler inlets should be >1 meter away from supporting structures and walls.

   iv. The distance from a sampler probe to an obstacle, such as a building, should be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path.

   v. The sampler inlets should be away from minor sources, such as incineration flues, to avoid undue influences from minor sources. The separation distance is dependent on the height of the minor source's emission point (such as a flue), the type of fuel or waste burned, and the quality of the fuel.

g. Air Pollutant Monitoring Stations: Prohibition on Moving. Respondent shall not move any pollutant monitoring station to a new location without prior written approval by EPA. Movement of the pollutant monitoring station components for maintenance shall not be restricted by this Paragraph.

h. Data Acquisition System (DAS). A DAS will be used to log all numerical data generated by the air pollutant analyzers and weather instruments using a common time-stamp. The DAS outputs shall be in a file format that can be used in common spreadsheet programs.

i. Nothing in this Appendix shall preclude the use of any other, additional fence line monitoring equipment and/or of monitoring other, additional pollutants at the fence line.

F4. Operation of FLMS

a. Respondent shall operate and maintain the FLMS for at least one (1) year from the date on which Respondent begins continuously monitoring for 1,3-butadiene concentrations as measured by the pollutant monitoring stations identified in Section F3 (Stationary Equipment Requirements).

b. Quality Assurance/Quality Control (QA/QC). Respondent shall ensure that all data collected by the FLMS is subjected to the approved QA/QC procedures (as outlined in the Fence Line Monitoring Plan) on a monthly basis. The QA/QC procedures for a given month's data shall be completed by no later than the end of the month following the month within which the data were collected.

c. Data Posting. Respondent shall post the following data and information after a PNO facility source contributes to a 1,3-butadiene concentration that is 25 ppbV or greater: 1,3-butadiene concentrations; the name and location of the source; and any action taken to correct the release or reason for inaction. Respondent shall post the data and information on the following website: http://www.tpcgrp.com/tpc-group/ehs-s/environment/community-advisory-panel-193.html (Respondent Community Advisory Panel web page). Respondent shall post the data and information monthly within fifteen days of the end of the month. Respondent shall post the data and information in a manner that allows pollutant concentrations, wind speed, and wind direction to be viewed concurrently (*i.e.*, in tabular or graphical form). Respondent shall maintain the data and information collected through the FLMS on the aforementioned website at least until the SEP is complete.

F5. Field Investigations/Corrective Actions

a. Upon identifying two 1,3-butadiene concentrations—each of which is 25 ppbV or greater—during a 60-minute timeframe, Respondent shall undertake either of the following:

   i. If the source(s) of 1,3-butadiene emissions that is/are contributing to the 25 ppbV or greater concentration is/are immediately identifiable, Respondent shall immediately take action to reduce the generation of 1,3-butadiene from the PNO facility.

   ii. If the source(s) of 1,3-butadiene emissions that is/are contributing to the 25 ppbV or greater concentration is/are not immediately identifiable, Respondent shall begin a Field Investigation as soon as possible, with the goal of commencing the Field Investigation within 24 hours after identifying the elevated 1,3-butadiene

concentration unless inclement weather prevents the start of the Field Investigation within that time period.

The Field Investigation shall be informed by a review of the pollutant-wind direction correlation data from the DAS and the relevant operational data from the PNO facility in order to identify sources contributing to the elevated 1,3-butadiene concentration. If necessary, an Investigation Team shall survey potential sources of 1,3-butadiene emissions, including but not limited to process units and storage tanks, by conducting a monitoring survey using a portable PID or Infrared Gas Imaging Camera. As contributing sources are identified, Respondent will immediately take action to reduce the generation of 1,3-butadiene from that source.

b. Compliance Status Determination and Corrective Action

i. In addition to the requirements in Paragraph F5.a, by no later than 14 days after identifying an emissions source(s) that caused or contributed to two 1,3-butadiene concentrations–each of which is 25 ppbV or greater—during a 60 minute timeframe, Respondent shall determine whether the source is or was in violation of any applicable federal, state, or local regulations or permit requirements. Respondent shall implement, as soon as practicable, corrective action to address any past or present noncompliance.

ii. If the compliance status determination in Paragraph F5.b.i reveals that an identified source(s) of emissions is not in violation of any applicable regulation or permit requirement, Respondent shall evaluate the feasibility of reducing the emissions from that source in order to minimize the potential recurrence of future elevated 1,3-butadiene concentrations from that source. In the SEP Completion Report required by Paragraph 83 of the CAFO and Section F6 (Reporting Requirements) of this Appendix, Respondent shall describe the evaluation method that it took and identify any reduction measures considered, taken, and/or rejected.

F6. Reporting Requirements

a. Respondent will prepare and submit to EPA a SEP Completion Report as required by Paragraph 83 of the CAFO. In the SEP Completion Report, Respondent shall provide a detailed summary of each occurrence of a 1,3-butadiene concentration of 25 ppbV or greater that required action under Section F5, and any associated Field Investigation, the findings of the associated Compliance Status Determination, and Corrective Action taken or reason for inaction, including but not limited to the following information:

i. Measurement data collected by the FLMS that identified a 1,3-butadiene concentration of 25 ppbV or greater, and meteorological data substantiating whether the elevated concentrations came from the PNO facility or other source.

ii. A narrative description of any Field Investigation done pursuant to the Fence Line Monitoring Plan and the requirements of this Appendix, including but not limited to:

1. If an Infrared Gas Imaging Camera was used, a record of the camera operator, date, time, weather conditions, process units and tanks imaged, and a written summary of the results. A notation should be made if a planned imaging was not completed due to inclement weather or other reasons.

2. If an Infrared Gas Imaging Camera was used, the infrared recordings (10 to 30 seconds) of any emissions observed during Infrared Gas-Imaging Camera gas imaging conducted pursuant to the Fence Line Monitoring Plan and the requirements of this Appendix.

3. If a portable PID was used, a record of the PID operator, date, time, and process unit that was evaluated, as well as any portable PID data.

4. Process and operational data related to each occurrence where there was a 1,3-butadiene concentration of 25 ppbV or greater.

5. A detailed description of any actions taken by Respondent to bring sources into compliance and/or to reduce emissions in response to a 1,3-butadiene concentration of 25 ppbV or greater, or in response to the findings of a Field Investigation, along with the status of each repair or emission reduction measure identified.

iii. A summary of violations identified in the process of implementing this SEP.

iv. A summary of physical, process, and/or operational changes made as a result of implementing this SEP.

b. Respondent shall post the SEP Completion Report on the following website: http://www.tpcgrp.com/tpc-group/ehs-s/environment/community-advisory-panel-193.html (Respondent Community Advisory Panel web page), with any confidential information redacted, at the same time as the submission to EPA.