IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

UNITED STATES OF AMERICA Plaintiff, v. CHEVRON PHILLIPS CHEMICAL COMPANY LP Defendant.	Civil Action No. 4:22-cv-737 Judge

CONSENT DECREE

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Table 1:

Table 2:

Concurrently with the lodging of this Consent Decree, Plaintiff, the United States of America ("United States"), on behalf of the United States Environmental Protection Agency ("EPA"), has filed a Complaint in this action seeking injunctive relief and civil penalties from the Defendant, Chevron Phillips Chemical Company LP ("Defendant"), for alleged violations of the Clean Air Act (the "CAA" or "Act"), 42 U.S.C. §§ 7401 *et seq.*, with respect to emissions of volatile organic compounds ("VOCs"), hazardous air pollutants ("HAPs"), and other pollutants at the Defendant's chemical manufacturing facilities located in or near: Cedar Bayou, Texas; Port Arthur, Texas; and Sweeny, Texas (collectively, the "Covered Plants");

WHEREAS, the Defendant owns and operates the Covered Plants, including the Flares used at the Covered Plants as safety devices and to control emissions of air pollutants generated by the manufacturing processes;

WHEREAS, the Complaint alleges that the Defendant violated one or more of the following federal Clean Air Act and/or Texas state air pollution requirements:

a. The Prevention of Significant Deterioration (PSD) requirements found in 42 U.S.C. § 7475 and in implementing regulations;

b. The Non-Attainment New Source Review (NNSR) requirements found in 42 U.S.C. §§ 7502(c)(5) and 7503(a)-(c), and in implementing regulations;

c. The New Source Performance Standards ("NSPS") promulgated at 40 C.F.R. Part 60, Subpart A, pursuant to Section 111 of the CAA, 42 U.S.C. § 7411;

d. The National Emission Standards for Hazardous Air Pollutants ("NESHAPs") promulgated at 40 C.F.R. Part 61, Subparts A, J, V, and FF and 40 C.F.R. Part 63, Subparts A, F, G, H, U, YY, and FFFF, pursuant to Section 112 of the CAA, 42 U.S.C. § 7412;

e. The Title V requirements of the CAA found at 42 U.S.C. §§ 7661a(a), 7661b(c), 7661c(a); and 40 C.F.R. §§ 70.1(b), 70.5(a) and (b), 70.6(a) and (c), and 70.7(b);

f. The federally enforceable Texas state implementation plan ("SIP") provisions that incorporate, adopt, and/or implement the federal requirements listed in a–e; and

g. The portions of the Title V permits for the Covered Plants that adopt, incorporate, or implement the provisions cited in a–f.

WHEREAS, the Defendant has undertaken actions to reduce emissions from the Flares at the Covered Plants. These actions include:

- Equipping each Covered Flare with smaller Assist Steam controls to optimize Assist Steam injection at low Waste Gas flow rates, implementing Flare stewardship metrics to reduce flaring, and optimizing process unit procedures and operations to reduce flaring;
- At the Cedar Bayou Plant, changing supplies for Flare Sweep Gas from nitrogen to plant fuel gas, resulting in reduced Supplemental Gas use and reduced emissions;
- At the Port Arthur Plant, replacing the type of catalyst used in acetylene converters, resulting in longer cycle times between regenerations and reduced emissions; and
- At the Port Arthur Plant, switching the material for multiple dryer regenerations from nitrogen to a process fluid with a higher net heating value (NHV), resulting in reduced Supplemental Gas use and reduced emissions.

WHEREAS, by entering into this Consent Decree, the Defendant commits to undertake further projects at the Covered Plants intended to reduce emissions of air pollutants from the Covered Flares;

WHEREAS, as more specifically described in Section V (Compliance Requirements), the Defendant has agreed to operate monitoring equipment and control technology, as well as undertake additional measures, at the Covered Plants that will recover and minimize Waste Gas flows to the eighteen Flares covered by this Consent Decree ("Covered Flares") and ensure proper Combustion Efficiency at the Covered Flares;

WHEREAS, implementing the Consent Decree's compliance requirements are estimated to cost approximately $118 million;

WHEREAS, between June 30, 2014, and full implementation of the Consent Decree's compliance requirements, the EPA estimates that emissions from the Covered Flares will be reduced by approximately the following amounts (in tons per year or "TPY"):

Pollutant	Amount in TPY (June 30, 2014 – through implementation)
VOCs	1,528
Carbon Dioxide Equivalents ("CO_2e")	75,242
HAPs	158
Nitrogen Oxides ("NOx")	20

WHEREAS, implementing the Consent Decree's compliance requirements will also reduce carbon monoxide ("CO") from the Covered Flares;

WHEREAS, the United States anticipates that the specific and comprehensive compliance measures set forth in this Consent Decree, which are subject to a reasonable timetable for implementation, will result in the cessation of the violations alleged in the Complaint and those resolved through Section XIII (Effect of Settlement);

WHEREAS, the Defendant denies it has violated or continues to violate any of the statutory and regulatory requirements set forth in the preceding "whereas" clauses and denies any liability to the United States arising out of the occurrences alleged in the Complaint; and

WHEREAS, the Parties recognize, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith, will avoid litigation between the Parties, and that this Consent Decree is fair, reasonable, and in the public interest.

NOW, THEREFORE, before the taking of any testimony, without the adjudication or admission of any issue of fact or law except as provided in Section I, and with the consent of the Parties, IT IS HEREBY ADJUDGED, ORDERED, AND DECREED as follows:

I. JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action, pursuant to 28 U.S.C. §§ 1331, 1345, and 1355, and Section 113(b) of the Clean Air Act, 42 U.S.C. § 7413(b). This Court has personal jurisdiction over the Parties. Venue lies in this District pursuant to Section 113(b) of the Clean Air Act, 42 U.S.C. § 7413(b), and 28 U.S.C. §§ 1391(b) and (c) and 1395(a), because the Defendant resides and is located in this judicial district, some of the violations alleged in the Complaint are alleged to have occurred in this judicial district, and the Defendant conducts business in this judicial district. The Defendant consents to this Court's jurisdiction over the Parties and this Consent Decree, over any action to enforce this Consent Decree, and to venue in this judicial district.

2. For purposes of this Consent Decree, the Defendant does not contest that the Complaint states claims upon which relief may be granted.

3. Notice of the commencement of this action has been given to the Texas Commission on Environmental Quality ("TCEQ") in accordance with Section 113(b) of the Clean Air Act, 42 U.S.C. § 7413(b).

II. APPLICABILITY

4. The obligations of this Consent Decree apply to and are binding upon the United States, and upon the Defendant and any successors, assigns, or other entities or persons otherwise bound by law.

5. At least 60 Days before a transfer of the ownership or operation of any of the Covered Plants or Covered Flares, the Defendant must provide a copy of this Consent Decree to the proposed transferee(s). At least 30 Days before any such transfer, the Defendant must provide written notice of the prospective transfer to the EPA and the United States, in accordance with Section XVI (Notices). Any attempt to transfer ownership or operation of any of the Covered Plants or Covered Flares without complying with this Paragraph constitutes a violation of this Decree.

6. If the Defendant intends to request that the United States agree to a transferee's assumption of any obligations of the Consent Decree, the Defendant must condition the transfer of the Covered Plant or Covered Flare upon the transferee's written agreement to execute a modification to the Consent Decree that makes the terms and conditions of the Consent Decree applicable to, binding upon, and enforceable against the transferee.

7. As soon as possible before the transfer, the Defendant must: (i) notify the United States of the proposed transfer and of the specific Consent Decree provisions that the Defendant proposes the transferee assume; (ii) certify that the transferee is contractually bound to assume

the ongoing compliance requirements and obligations of this Consent Decree; and (iii) require the transferee to submit to the United States both a certification that the transferee has the financial and technical ability to assume the ongoing compliance requirements and obligations of this Consent Decree and a certification that the transferee is contractually bound to assume the ongoing compliance requirements and obligations of this Consent Decree.

8. After the United States receives the notice and certifications required by the previous Paragraph, either: (i) the United States must notify the Defendant that the United States does not agree to modify the Consent Decree to make the transferee responsible for complying with the terms and conditions of the Consent Decree; or (ii) the United States, the Defendant, and the transferee must file with the Court a joint motion requesting the Court approve a modification substituting the transferee for the Defendant as the defendant responsible for complying with the terms and conditions of the Consent Decree that the Defendant intends the transferee to assume.

9. If the Defendant does not secure the agreement of the United States to a joint motion to modify the Consent Decree within a reasonable period of time, then the Defendant and the transferee may file, without the agreement of the United States, a motion requesting the Court to approve a modification substituting the transferee for the Defendant as the defendant responsible for complying with the terms and conditions of the Consent Decree that the transferee intends to assume. The United States may file an opposition to the motion. The motion to modify must be granted unless the Defendant and the transferee: (i) fail to show that the transferee has the financial and technical ability to assume the ongoing compliance requirements and obligations of the Consent Decree; (ii) fail to show that the modification language effectively

transfers the ongoing compliance requirements and obligations to the transferee; or (iii) the Court finds other good cause for denying the motion.

10. The Defendant must provide a copy of this Consent Decree to all officers whose duties might reasonably include compliance with any provision of this Decree. For all employees whose duties might reasonably include compliance with any provision of this Decree, as well as for any contractor or agent retained to perform work required under this Consent Decree, the Defendant must provide a copy of the portions of this Consent Decree that are applicable to the employee's duties or to the contractor's or agent's work. The Defendant must condition any such contract upon performance of the work in conformity with the terms of this Consent Decree.

11. In any action to enforce this Consent Decree, the Defendant shall not raise as a defense the failure by any of its officers, directors, employees, agents, or contractors to take any actions necessary to comply with the provisions of this Consent Decree.

III. DEFINITIONS

12. Terms used in this Consent Decree that are defined in the Clean Air Act or in federal or state regulations promulgated pursuant to the CAA will have the meanings assigned to them in the CAA or such regulations, unless otherwise provided in this Decree. Whenever the terms set forth below are used in this Consent Decree, the following definitions apply:

a. "Air-Assisted Flare" or "Air_{asst}" means a Flare that uses Assist Air to assist in combustion.

b. "Assist Air" means all air that is intentionally introduced before or at a Flare tip through nozzles or other hardware conveyance for the purposes of, including, but not limited to, protecting the design of the Flare tip, 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 surrounding ambient air.

c. "Assist Steam" means all steam that is intentionally introduced before or at a Flare tip through nozzles or other hardware conveyance for the purposes of, including, but not limited to, protecting the design of the Flare tip, 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.

d. "Available for Operation" means, with respect to a Compressor within a Flare Gas Recovery System ("FGRS"), that the Compressor is capable of commencing the recovery of Potentially Recoverable Gas as soon as practicable but not more than one hour after the Need for a Compressor to Operate arises. The period of time, not to exceed one hour, allowed by this definition for the startup of a Compressor will be included in the amount of time that a Compressor is Available for Operation.

e. "Backup Flare" means a Flare that is permanently installed and that receives Waste Gas only when the Waste Gas has been redirected to it from a Covered Flare.

f. "Baseload Waste Gas Flow Rate" means, for a Covered Flare, the daily average flow rate, in standard cubic feet per day ("scfd"), to that Flare, excluding all flows during periods of startup, shutdown, and Malfunction. The flow rate data period that must be used to determine Baseload Waste Gas Flow Rate is set forth in sub-Paragraph 28(a)(ii).

g. "BTU/scf" means British Thermal Unit per standard cubic foot.

h. "Calendar Quarter" means a three-month period ending on March 31, June 30, September 30, or December 31.

i. "Capable of Receiving Sweep, Supplemental, and/or Waste Gas" means, for a Flare, that the flow of Sweep Gas, Supplemental Gas, and/or Waste Gas is not prevented from being directed to the Flare by means of an isolation device such as closed valves, blinds, or stopples.

j. "Cedar Bayou Plant" means the petrochemical manufacturing plant owned and operated by the Defendant, located at 9500 I-10 East, Baytown, Texas 77521-9570.

k. "Cedar Bayou Flares" means, the following Steam-Assisted Flares and Air-Assisted Flare located at the Cedar Bayou Plant:

- CB701 (Steam-Assisted);
- CB710 (Steam-Assisted);
- FS541 (Steam-Assisted);
- FS9006 (Air-Assisted);
- X901 (Steam-Assisted);
- Z101 (Steam-Assisted);
- Z251 (Steam-Assisted); and
- Z1101 (Steam-Assisted).

l. "Combustion Efficiency" or "CE" means a Flare's efficiency in converting the organic carbon compounds found in Combustion Zone Gas to carbon dioxide. Combustion Efficiency must be determined in accordance with the NHV_{cz} calculations in Appendix 1.2.

m. "Combustion Zone" means the area of the Flare flame where the Combustion Zone Gas combines for combustion.

n. "Combustion Zone Gas" means all gases and vapors found after the Flare tip. This gas includes all Vent Gas, Pilot Gas, Total Steam, and Assist Air.

o. "Complaint" means the complaint filed by the United States in this action.

p. "Compressor" means, with respect to a FGRS, a mechanical device designed and installed to recover gas from a flare header. Types of FGRS compressors include reciprocating compressors, centrifugal compressors, liquid ring compressors, screw compressors, and liquid jet ejectors.

q. "Consent Decree" or "Decree" means this Consent Decree, including any and all tables and attached appendices.

r. "Covered Air-Assisted Flares" means each of the Covered Flares that are Air-Assisted Flares.

s. "Covered Plant" or "Covered Plants" means:

- the Cedar Bayou Plant;
- the Port Arthur Plant; and
- the Sweeny Plant.

t. "Covered Flare" or "Covered Flares" means each of the following Flares, as well as any Newly Installed Covered Flare, Portable Flare, or Backup Flare in use at a Covered Plant, provided however that once a Covered Flare is permanently taken out of service and that change is reported in the subsequent Semi-Annual Report, that Flare is no longer a Covered Flare:

- the Cedar Bayou Flares;
- the Port Arthur Flares; and
- the Sweeny Flares.

u. "Covered Steam-Assisted Flares" means each of the Covered Flares that are Steam-Assisted Flares.

v. "Date of Lodging" means the date this Consent Decree is filed for lodging with the Clerk of the Court for the United States District Court for the Southern District of Texas.

w. "Day" means a calendar day unless expressly stated to be a business day. In computing any period of time for a compliance deadline under this Consent Decree (*e.g.*, a deadline for installing a FGRS or submitting a Waste Gas Minimization Plan (WGMP)), where the last day would fall on a Saturday, Sunday, or federal or state holiday, the period will run until the close of business of the next business day.

x. "Defendant" means the Chevron Phillips Chemical Company LP.

y. "Design Capacity" means, with respect to a FGRS, the sum of the capacities, in mscf per Day, of the installed flare gas recovery Compressors, excluding the capacity of any installed Duplicate Spare Compressor or warehouse spare Compressor.

z. "Duplicate Spare Compressor" means, with respect to a Flare Gas Recovery System, an installed compressor, designed to be identical or functionally equivalent to the other compressor(s) of the FGRS. In order to qualify as a "Duplicate Spare Compressor," the compressor must be functionally interchangeable with the other FGRS compressor(s) such that the Design Capacity of the FGRS is Available for Operation while any one compressor of the FGRS is out of service.

aa. "Effective Date" shall have the definition provided in Section XVII.

bb. "EPA" means the United States Environmental Protection Agency and any of its successor departments or agencies.

cc. "External Utility Loss" means a loss in the supply of electrical power or other third-party utility to a Covered Plant that is caused by actions occurring outside the boundaries of a Covered Plant, excluding utility losses due to an interruptible utility service agreement.

dd. "Flare" means a combustion device lacking an enclosed combustion chamber that uses an uncontrolled volume of ambient air to burn gases.

ee. "Flare Gas Recovery System" or "FGRS" means a system of one or more Compressors, piping, and associated water seal, rupture disk, or other equipment used to divert gas from a Flare and direct the gas to a fuel gas system, to a combustion device other than the Flare, or to a product, co-product, by-product, or raw material recovery system.

ff. "Flare Tip Velocity" or "V_{tip}" means the velocity of gases exiting the Flare tip as defined in Paragraph 40.

gg. "In Operation," with respect to a Flare, means all times that Sweep, Supplemental, or Waste Gas is or may be vented to a Flare. A Flare that is In Operation is Capable of Receiving Sweep, Supplemental, or Waste Gas unless all Sweep, Supplemental, and Waste Gas flow is prevented by means of an isolation device such as closed valves, blinds, and/or stopples.

hh. "Malfunction" means, 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

Consent Decree involving this definition, the Defendant has the burden of proving all of the following:

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

(2) The excess emissions: (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;

(3) 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;

(4) 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 used, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

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

(6) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality;

(7) All emission monitoring systems were kept in operation if at all possible;

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

(9) The excess emissions were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(10) The owner or operator properly and promptly notified the appropriate regulatory authority.

ii. "Monitoring System Malfunction" means 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 Consent Decree involving this definition, the Defendant has the burden of proving all of the following:

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

(2) 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;

(3) To the maximum extent practicable, the instrument or monitoring system was maintained and operated in a manner consistent with good practice for minimizing emissions;

(4) 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 used, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;

(5) The amount and duration of the instrument or monitoring system downtime was minimized to the maximum extent practicable;

(6) 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

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

jj. "MMSCFD" or "mmscfd" means million standard cubic feet per Day.

kk. "MMSCFH" or "mmscfh" means million standard cubic feet per hour.

ll. "MSCFH" or "mscfh" means thousand standard cubic feet per hour.

mm. "Need for a Compressor to Operate" means:

(1) For a situation in which no Compressor within the FGRS is recovering gas: When there is Potentially Recoverable Gas flow (determined on a fifteen-minute block average) to the Covered Flare(s) serviced by the FGRS; or

(2) For a situation in which one or more Compressor within the FGRS already are recovering gas: When the Potentially Recoverable Gas flow rate (determined on a fifteen-minute block average) exceeds the capacity of the operating Compressor(s).

nn. "Net Heating Value" or "NHV" means 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.

oo. "Net Heating Value Analyzer" or "NHV Analyzer" means an instrument capable of measuring the Net Heating Value of Vent Gas in BTU/scf. The sample extraction point of a Net Heating Value Analyzer may be located upstream of the introduction of Supplemental Gas and/or Sweep Gas and/or Purge Gas if the composition and flow rate of any such Supplemental Gas and/or Sweep Gas and/or Purge Gas is known and if this known value then is used in the calculation of the Net Heating Value of the Vent Gas.

pp. "Net Heating Value of Combustion Zone Gas" or "NHV_{cz}" means the Net Heating Value, in BTU/scf, of the Combustion Zone Gas in a Flare. NHV_{cz} must be calculated in accordance with Step 3 of Appendix 1.2.

qq. "Net Heating Value of Dilution" or "NHV_{dil}" means the Net Heating Value, in BTU/ft^2, of the dilution zone gas in a Flare. NHV_{dil} must be calculated in accordance with Step 4 of Appendix 1.2.

rr. "Net Heating Value of Vent Gas" or "NHV_{vg}" means the Net Heating Value, in BTU/scf, of the Vent Gas directed to a Flare. NHV_{vg} must be calculated in accordance with Step 1 of Appendix 1.2.

ss. "New Source Review" or "NSR" means the PSD and NNSR provisions in Parts C and D of Subchapter I of the Clean Air Act, 42 U.S.C. §§ 7470-7492, 7501-7515, the

Minor NSR provisions in § 7410(a), applicable federal regulations implementing such provisions of the CAA, and the corresponding provisions of the federally enforceable SIP for the State of Texas.

tt. "Newly Installed Covered Flare(s)" means any Flare (including any Backup Flare, such as Flare 17 at the Port Arthur Plant) that is permanently installed, receives Waste Gas that has been redirected to it from an existing Covered Flare (existing as of the Effective Date), and commences operation at a Covered Plant after the Effective Date.

uu. "Non-Recoverable Waste Gas Stream(s)" means any of the following specific gas streams that are not recoverable by an FGRS:

(1) Regeneration Waste Gas Streams produced during the regeneration and subsequent nitrogen sweeping of the dryers, reactors, and other vessels at the Covered Plants. Regeneration Waste Gas Streams are high in nitrogen (typically approximately 90%) and have very low heating value (typically approximately 100 BTU/scf), thus they are not a useful fuel;

(2) Methanator Waste Gas Streams generated during the startup or shutdown of the Methanator. The Methanator Waste Gas Streams are high in nitrogen (typically approximately greater than 90% nitrogen) and have a very low heating value (typically approximately 100 BTU/scf), thus they are not a useful fuel; and

(3) Nitrogen purges at the Cedar Bayou Plant generated from process units during startup, shutdown, or a Turnaround (either partial or complete plant Turnaround) that cause the NHV of the fuel gas exiting the fuel gas drum, as

currently measured by analyzer AI_8002 (or by a subsequently installed monitor downstream of the fuel gas drum), to fall below 740 BTU/scf.

vv. "Paragraph" means a portion of this Decree identified by an Arabic numeral.

ww. "Parties" means the United States and the Defendant.

xx. "Perimeter Assist Air" means 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.

yy. "Pilot Gas" means gas introduced into a Flare tip that provides a flame to ignite the Vent Gas.

zz. "Portable Flare" means any Flare that is not permanently installed and that receives Waste Gas that has been redirected to it from a Covered Flare.

aaa. "Port Arthur Plant" means the petrochemical manufacturing plant owned and operated by the Defendant, located at 2001 South Gulfway Drive, Port Arthur, Texas 77640.

bbb. "Port Arthur Flares" means the following Steam-Assisted Flares located at the Port Arthur Plant:

- 24; and
- 40.

ccc. "Potentially Recoverable Gas" means the Sweep Gas, Supplemental Gas, and/or Waste Gas (including hydrogen, nitrogen, oxygen, carbon dioxide, carbon monoxide, and/or water) directed to a Covered Flare's or group of Covered Flares' FGRS, except that Non-

Recoverable Waste Gas Streams are not included in the definition of "Potentially Recoverable Gas."

ddd. "Prevention Measure" means an instrument, device, piece of equipment, system, process change, physical change to process equipment, procedure, or program to minimize or eliminate flaring.

eee. "Purge Gas" means the gas introduced between a Flare header's water seal and the Flare tip to prevent oxygen infiltration (backflow) into the Flare tip. For a Flare with no water seal, the function of Purge Gas is performed by Sweep Gas, and therefore, by definition, such a Flare has no Purge Gas.

fff. "Reportable Flaring Incident" means when Waste Gas equal to or greater than 500,000 scf is flared within a 24-hour period at any Covered Plant from its Covered Flare(s). For purposes of calculating whether the triggering level of Waste Gas flow has been met, the following flows may be excluded: i) the pro-rated Baseload Waste Gas Flow Rate (pro-rated on the basis of the duration of the Reportable Flaring Incident); and ii) if a Covered Plant has instrumentation capable of measuring the concentrations of hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) in the Waste Gas, the contribution of the calculated flow of the above compounds for which a concentration is measured may be excluded. A flaring event or events that have the same root cause(s) and that last(s) more than 24 hours will be considered a single Reportable Flaring Incident. When flaring occurs at more than one Covered Flare, the volume of non-excluded Waste Gas flow at each Covered Flare must be added together unless the root cause(s) of the flaring at each Covered Flare is(are) not related to each other.

ggg. "SCFD" or "scfd" means standard cubic feet per Day.

hhh. "SCFH" or "scfh" means standard cubic feet per hour.

iii. "SCFM" or "scfm" means standard cubic feet per minute.

jjj. "Section" means a portion of this Decree identified by a roman numeral.

kkk. "Semi-Annual Period" means a six-month period of the calendar year encompassing January 1 through June 30 or July 1 through December 31.

lll. "Smoke Emissions" shall have the definition set forth in Section 3.5 of Method 22 of 40 C.F.R. Part 60, Appendix A. For purposes of this Consent Decree, Smoke Emissions may be either documented by a video camera or determined by an observer knowledgeable with respect to the general procedures for determining the presence of Smoke Emissions per Method 22.

mmm. "Standard Conditions" means a temperature of 68 degrees Fahrenheit and a pressure of 1 atmosphere. Unless otherwise expressly set forth in this Consent Decree or an Appendix, Standard Conditions apply.

nnn. "Steam-Assisted Flare" means a Flare that uses Assist Steam to assist in combustion.

ooo. "Supplemental Gas" means all gas introduced to a Flare in order to improve the combustible characteristics of the Combustion Zone Gas.

ppp. "Sweep Gas" means:

(1) <u>For a Flare with an FGRS:</u> Gas intentionally introduced into a Flare header system to prevent oxygen buildup in the Flare header. Sweep Gas in these Flares is introduced prior to and recovered by the FGRS; and

(2) For a Flare without an FGRS: Gas intentionally introduced into a Flare header system to maintain a constant flow of gas through the Flare header and out the Flare tip in order to prevent oxygen building in the Flare header and to prevent infiltration (backflow) into the Flare tip.

qqq. "Sweeny Plant" means the petrochemical manufacturing plant owned and operated by the Defendant, located at 21441 Loop 410, Sweeny, Texas 77480.

rrr. "Sweeny Flares" means the following Steam-Assisted Flares and Air-Assisted Flares located at the Sweeny Plant:

- 4 (Steam-Assisted);
- 8 (Steam-Assisted);
- 9 (Steam-Assisted);
- 10 (Steam-Assisted);
- 12 (Steam-Assisted);
- 14 (Air-Assisted);
- 20 (Air-Assisted); and
- 22 (Steam-Assisted).

sss. "Total Steam" means the total of all steam that is supplied to a Flare and includes, but is not limited to, lower steam, center steam, and upper steam.

ttt. "Turnaround" means a complete shutdown of any emission unit to: (1) perform necessary cleaning and repairs; (2) perform required tests and internal inspections; and/or (3) install any modifications or additions, or make preparations necessary for a future modification or addition.

uuu. "Unassisted Flare" means a Flare that does not use Assist Steam or Assist Air.

vvv. "United States" means the United States of America, acting on behalf of EPA.

www. "Unobstructed Cross Sectional Area of the Flare Tip" or "$A_{tip\text{-}unob}$" means the open, unobstructed area of a Flare tip through which Vent Gas and center steam pass. Diagrams of four common Flare types are set forth in Appendix 1.3 together with the equations for calculating the $A_{tip\text{-}unob}$ of these four types.

xxx. "Vent Gas" means all gas found just before 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.

yyy. "Visible Emissions" means five minutes or more of Smoke Emissions during any two consecutive hours.

zzz. "VOC" or "Volatile Organic Compounds" shall have the definition set forth in 40 C.F.R. § 51.100(s).

aaaa. "Waste Gas" means the mixture of all gases from facility operations that is directed to a Flare for the purpose of disposing of the gas. "Waste Gas" does not include gas introduced to a Flare exclusively to make it operate safely and as intended; therefore, "Waste Gas" does not include Pilot Gas, Total Steam, 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 a Flare to comply with regulatory and/or enforceable permit requirements regarding the combustible characteristics of Combustion Zone Gas; therefore, "Waste Gas" does not include Supplemental Gas. Depending upon the instrumentation that monitors Waste Gas, certain compounds (hydrogen, nitrogen,

oxygen, carbon dioxide, carbon monoxide, and/or water (steam)) that are directed to a Flare for the purpose of disposing of these compounds may be excluded from calculations relating to Waste Gas flow. The circumstances in which such exclusions are permitted are specifically identified in Section V (Compliance Requirements). Appendix 1.4 to this Consent Decree depicts the meaning of "Waste Gas," together with its relation to other gases associated with Flares.

IV. CIVIL PENALTY

13. By no later than 30 Days after the Effective Date, the Defendant must pay $3,400,000 as a civil penalty.

14. The Defendant must pay the civil penalty due to the United States by FedWire Electronic Funds Transfer (EFT) to the U.S. Department of Justice account, in accordance with instructions provided to the Defendant by the Financial Litigation Unit ("FLU") of the United States Attorney's Office for the Southern District of Texas after the Effective Date. The payment instructions provided by the FLU will include a Consolidated Debt Collection System ("CDCS") number, which the Defendant must use to identify all payments required to be made in accordance with this Consent Decree. The FLU will provide the payment instructions to:

David Speaker
Managing Counsel – EHS&S
Legal & Public Affairs
Chevron Phillips Chemical Company
10001 Six Pines Drive
The Woodlands, TX 77380
speakd@cpchem.com

on behalf of the Defendant. The Defendant may change the individual to receive payment instructions on its behalf by providing written notice of such change to the United States and EPA in accordance with Section XVI (Notices).

15. At the time of payment, the Defendant must send notice that payment has been made: (i) to the United States via email and regular mail in accordance with Section XVI and (ii) to EPA via email at cinwd_acctsreceivable@epa.gov and regular mail at: EPA Cincinnati Finance Office, 26 W. Martin Luther King Drive, Cincinnati, Ohio 45268. This notice must state that the payment is for the civil penalty owed pursuant to the Consent Decree in *United States v. Chevron Phillips Chemical Company LP*, and must reference the civil action number, CDCS Number, and DOJ case number 90-5-2-1-11288.

16. The Defendant must not deduct any penalties paid under this Decree pursuant to this Section or Section IX (Stipulated Penalties) in calculating its federal, state, or local income tax.

V. COMPLIANCE REQUIREMENTS

A. Instrumentation and Monitoring Systems

17. Flare Data and Monitoring Systems and Protocol Report. By no later than the compliance date for each Covered Flare set forth in Appendix 1.1, the Defendant must submit a report, consistent with the requirements in Appendix 1.5, to EPA that includes the following for each Covered Flare:

a. The information, diagrams, and drawings specified in Paragraphs 1–7 of Appendix 1.5;

b. A detailed description of each instrument and piece of monitoring equipment, including the specific model and manufacturer, that the Defendant has installed or will install in compliance with Paragraphs 19–23 and 38 of this Consent Decree (Paragraphs 8–9 of Appendix 1.5); and

c. A narrative description of the monitoring methods and calculations that the Defendant will use to comply with the requirements of Paragraph 43 (Paragraph 10 of Appendix 1.5).

18. Installation and Operation of Monitoring and Control Systems on Covered Flares.

a. Covered Flares. By no later than the compliance dates set forth in Appendix 1.1, the Defendant must install and commence operation of the instrumentation, controls, and monitoring systems set forth in Paragraphs 19–22 at each Covered Flare except for: Newly Installed Covered Flares and Portable Flares installed after the Effective Date.

b. The Defendant must operate the instrumentation, controls, and monitoring systems for each Covered Flare in accordance with Paragraphs 24-26.

c. Newly Installed Covered Flares and Portable Flares. By no later than the date that any Newly Installed Covered Flare or Portable Flare installed after the Effective Date (or existing in the case of Port Arthur Flare 17) is In Operation and Capable of Receiving Waste, Supplemental, and/or Sweep Gas at a Covered Plant, the Defendant must have in place and commence operation of the instrumentation, controls, and monitoring systems set forth in Paragraphs 19–22, as specified for Steam-Assisted Flares and Air-Assisted Flares. The Defendant must operate the instrumentation, controls, and monitoring systems for each Newly Installed Covered Flare and Portable Flare installed after the Effective Date (or existing in the case of Port Arthur Flare 17) in accordance with Paragraphs 19–22 during all times when the Flare is In Operation and Capable of Receiving Waste, Supplemental, and/or Sweep Gas.

19. Vent Gas, Assist Steam, and Assist Air Monitoring Systems.

a. For each Covered Flare, the Defendant must install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Vent Gas in the header or headers feeding that Covered Flare. This system must also be able to continuously analyze pressure and temperature at each point of Vent Gas flow measurement. 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. Flow must be calculated in scfm.

b. For each Covered Steam-Assisted Flare, the Defendant must 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 Steam-Assisted Flare. This system must also be able to continuously analyze the pressure and temperature of Assist Steam at a representative point of steam flow measurement. Flow must be calculated in scfm.

c. For each Covered Air-Assisted Flare, the Defendant must install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the volumetric flow rate of Assist Air used with each Covered Air-Assisted Flare. If premix assist air and Perimeter Assist Air are both used, the Defendant must install, operate, calibrate, and maintain a monitoring system capable of separately continuously measuring, calculating, and recording the volumetric flow rate of premix assist air and Perimeter Assist Air used with that Flare. Continuously monitoring fan speed or power and using fan curves is an acceptable method for continuously monitoring Assist Air flow rates.

d. Each flow rate monitoring system (whether for a Steam-Assisted Flare or an Air-Assisted Flare) must be able to correct for the temperature and pressure of the system and output parameters in Standard Conditions.

e. In lieu of a monitoring system that directly measures volumetric flow rate, the Defendant 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 Assist Steam provided that the Defendant converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix 1.2;

ii. Mass flow monitors may be used for determining the volumetric flow rate of Vent Gas, provided the Defendant determines the molecular weight of such Vent Gas using compositional analysis data collected pursuant to the monitoring method specified in Paragraph 22.a and provided that the Defendant converts the mass flow rates to volumetric flow rates pursuant to the methodology in Step 2 of Appendix 1.2; 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 the Defendant complies with the methodology in Step 2 of Appendix 1.2 for calculating volumetric flow rates. For Vent Gas, the Defendant must determine molecular weight using compositional analysis data collected pursuant to the monitoring method specified in Paragraph 22.a.

20. Assist Steam Control Equipment. The Defendant must install and commence operation of equipment, including, as necessary, main and trim control valves and piping which enables the Defendant to control Assist Steam flow to each Covered Steam-Assisted Flare in a manner sufficient to ensure compliance with this Decree.

21. Video Camera. The Defendant must install and commence operation of a video camera that is capable of monitoring and recording, in digital format, the flame of and any

Smoke Emissions from each Covered Flare by no later than the compliance dates set forth in Appendix 1.1. It is not a violation of this Paragraph or Paragraph 25, however, if a Flare video camera cannot discern the Flare Combustion Zone and/or any Smoke Emissions at a Covered Flare subject to these provisions during periods of weather conditions such as fog or snow, provided that recordings are created and retained during these time periods in accordance with this Consent Decree.

22. Vent Gas Compositional Monitoring or Direct Monitoring of Net Heating Value of Vent Gas. For each Covered Flare, the Defendant must either determine the concentration of individual components in the Vent Gas or directly monitor the Net Heating Value of the Vent Gas (NHV_{vg}) in compliance with one of the methods specified in this Paragraph. The Defendant may elect to use different monitoring methods (of the methods provided in this Paragraph) 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. The Defendant must:

a. 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

b. Install, operate, calibrate, and maintain a calorimeter capable of continuously measuring (*i.e.*, at least once every 15 minutes), calculating, and recording the NHV_{vg} at Standard Conditions. If the Defendant elects this method, the Defendant may install, operate, calibrate, and maintain a monitoring system capable of continuously measuring, calculating, and recording the hydrogen concentration in the Vent Gas. The sample extraction point of the calorimeter may be located upstream of the introduction of Supplemental Gas or Sweep Gas or Purge Gas if the composition and flow rate of all such downstream gas(es) is known, and if these known values are then used in the calculation of the Net Heating Value of Vent Gas.

c. If the Defendant elects the method in Paragraph 22.b, and the Net Heating Value of the Vent Gas exceeds the upper calibrated span of the calorimeter on

> the Covered Flare, then the Defendant must use the value of the upper calibrated span of that calorimeter for calculating the NHV_{vg} at Standard Conditions until the Net Heating Value of the Vent Gas returns to within the measured calibrated span. Use of this method will not constitute instrument system downtime for the period of time that the Net Heating Value of the Vent Gas exceeds the upper calibrated span of the calorimeter.

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.

23. Instrumentation and Monitoring Systems: Optional Equipment for any Covered Flare. To continuously measure and calculate flow of all Pilot Gas to a Covered Flare in scfm, the Defendant, at its option, may either: a) install (if not already installed) an instrument, or b) use a restriction orifice and pressure measurements. The Defendant may use the data generated by this instrument or restriction orifice as part of the calculation of the Net Heating Value of the Combustion Zone Gas.

24. Instrumentation and Monitoring Systems: Specifications, Calibration, Quality Control, and Maintenance. The Defendant must comply with Paragraphs 24.a through 24.f, provided, however, the Defendant may elect instead to utilize exemptions set forth in 40 C.F.R. § 63.1103(e)(4)(i) through (ix).

a. The instrumentation and monitoring systems identified in Paragraphs 19 and 22 must:

i. Meet or exceed all applicable minimum accuracy, calibration and quality control requirements specified in Table 13 of 40 C.F.R. Part 63, Subpart CC;

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 the Defendant;

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

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

b. The Defendant must operate, maintain, and calibrate each instrument and monitoring system identified in Paragraphs 19 and 22 according to a monitoring plan that contains the information listed in 40 C.F.R. § 63.671(b)(1)-(5). However, if the Defendant is determining NHV_{cz} using a process mass spectrometer, the Defendant may use the methods established for determining NHV_{cz} in the February 5, 2018 letter to representatives of Extrel CMS, LLC and AMETEK, Energy and Process Division from Steffan M. Johnson, Group Leader, Measurement Technology Group, Office of Air Quality Planning and Standards (attached as Appendix 2.1) in lieu of complying with 40 C.F.R. § 63.671(b)(1)-(5)'s requirements for determining NHV_{cz} using Gas Chromatographs.

c. All gas chromatograph monitoring systems used to comply with Paragraph 22.a must also meet the requirements of 40 C.F.R. § 63.671(e)(1) through (3) (Additional Requirements for Gas Chromatographs) regardless of whether the Gas Chromatographs are complying with 40 C.F.R. § 63.671(e)(1)-(3) or the methods outlined in Appendix 2.1.

d. For each instrumentation and monitoring system required by Paragraphs 19 and 22 (or installed pursuant to Paragraph 23), the Defendant must comply with the out-of-control procedures described in 40 C.F.R. § 63.671(c)(1) and (2), and with the data reduction requirements specified in 40 C.F.R. § 63.671(d)(1) through (3).

e. The language in 40 C.F.R. § 63.671, Table 13 of 40 C.F.R. Part 63, Subpart CC, or in any regulatory provision cross-referenced in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, that limits the applicability of these regulatory requirements to periods when "regulated material" (as defined in 40 C.F.R. § 63.641) is routed to a Flare, is not applicable for purposes of this Consent Decree. In addition, for purposes of this Decree, the language in 40 C.F.R. § 63.671, Table 13 of 40 C.F.R. Part 63, Subpart CC, or in any regulatory provision cross-referenced in 40 C.F.R. § 63.671 or Table 13 of 40 C.F.R. Part 63, Subpart CC, that refers to a continuous parametric monitoring system will instead be read to refer to the instrumentation and monitoring systems required by Paragraphs 19 and 22.

25. Instrumentation and Monitoring Systems: Recording and Averaging Times. The instrumentation and monitoring systems identified in Paragraphs 19 and 21-23 must 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, Assist Steam Flow, Assist Air Flow, and (if installed) Pilot Gas Flow Monitoring Systems	Measure continuously and record 15-minute block averages
Vent Gas Compositional Monitoring (if using the methodology in Paragraph 22.a.)	Measure no less than once every 15 minutes and record that value
Vent Gas Net Heating Value Analyzer (if using the methodology in Paragraph 22.b.)	Measure continuously and record 15-minute block averages

Video Camera	Record at a rate of no less than 4 frames per minute

The term "continuously" means to make a measurement as often as the manufacturer's stated design capabilities of the flow monitors (for Vent Gas, Assist Steam, Assist Air, and (if installed) Pilot Gas) and the Vent Gas Net Heating Value Analyzers during each fifteen (15) minute block period, but in no case shall the flow monitors or the Vent Gas Net Heating Value Analyzers make less than one measurement in each fifteen (15) minute block period. The measurement results are then averaged and recorded to represent each fifteen (15) minute block period. Nothing in this Paragraph prohibits the Defendant 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 Consent Decree.

26. Instrumentation and Monitoring Systems: Operation. The Defendant must operate each of the instruments and monitoring systems required by Paragraphs 19 and 21-23 and collect data on a continuous basis when the Covered Flare that the instrument and/or monitoring system is associated with is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas, except for: a) the periods of Instrument Downtime specified in sub-Paragraphs 45(a)-(d) and b) for Port Arthur Flare 17, the periods of time when the Flare header valves are closed and locked with car seals in place.

B. Determining Whether a Covered Flare Is Not Receiving Potentially Recoverable Gas Flow

27. For each Covered Flare that has a water seal, if all of the following conditions are met, then the Covered Flare is not receiving Potentially Recoverable Gas flow:

a. For the water seal drum associated with the respective Covered Flare, the pressure difference between the inlet pressure and the outlet pressure is less than the water seal pressure as set by the static head of water between the opening of the dip tube in the drum and the water level in the drum;

b. For the water seal drum associated with the respective Covered Flare, the water level in the drum is: (i) at the level of the weir or (ii) if the water level in the drum is measured, the measurement indicates that the water seal is present; and

c. Downstream of the seal drum, there is no flow of Supplemental Gas directed to the Covered Flare.

C. Waste Gas Minimization

28. Initial Waste Gas Minimization Plans ("Initial WGMP"). By no later than the compliance dates set forth in Appendix 1.1, for each Covered Flare, the Defendant must submit to EPA an Initial Waste Gas Minimization Plan that discusses and evaluates flaring Prevention Measures on both a facility-wide and Covered Flare-specific basis for each Covered Plant. The Initial WGMP must include but not be limited to:

a. Waste Gas Characterization and Mapping. The Defendant must characterize the Waste Gas being disposed of at each Covered Flare and determine its source as follows:

i. Volumetric (in scfm) flow rate. The Defendant must identify the volumetric flow of Waste Gas, in scfm, on a 30-Day rolling average, vented to each Covered Flare for the one-year period of time ending 180 Days before the submission of the Initial WGMP. To the extent that, for any particular Covered Flare, the Defendant has instrumentation capable of measuring and/or calculating the volumetric flow rate of hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) in the Waste Gas, the Defendant may calculate the volumetric flow of: (i) all Waste Gas flows excluding hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam); and (ii) hydrogen, nitrogen, oxygen, carbon monoxide, carbon dioxide, and/or water (steam) flows in the Waste Gas. The Defendant may use either an engineering

evaluation or measurements from monitoring or a combination to determine flow rate. In determining flow rate, except as provided in the next sentence, flows during all periods must be included (including but not limited to normal operations and periods of startup, shutdown, Malfunction, process upsets, relief valve leakages, utility losses due to an interruptible utility service agreement, and emergencies arising from events within the boundaries of the Covered Plants). Flows that could not be prevented through reasonable planning and are in anticipation of or caused by a natural disaster, act of war or terrorism, or External Utility Loss are the only flows that may be excluded from the calculation of flow rate. The Defendant must provide the date, time, and nature of the event that results in the exclusion of any flows from the calculation.

ii. Baseload Waste Gas Flow Rates. The Defendant must use flow rate data for the one-year period ending 180 Days before the submission of the Initial WGMP to determine the Baseload Waste Gas Flow Rate, in scfd, to each Covered Flare or to the set of Covered Flares that are connected on a Flare loop.

iii. Identification of Constituent Gases. The Defendant must use best efforts to identify the constituent gases within each Covered Flare's Waste Gas and the percentage contribution of each such constituent during baseload conditions. The Defendant may use an engineering evaluation, measurements from monitoring, or a combination of both to determine Waste Gas constituents.

iv. Waste Gas Mapping. Using all available information including, but not limited to, instrumentation, isotopic tracing, and/or engineering calculations, the Defendant must identify and estimate the flow from each process unit header (sometimes referred to as a "sub-header") to the main header(s) servicing each Covered Flare. Using that information, the Defendant must complete an identification of each Waste Gas tie-in to the main header(s) and process unit header(s), as applicable, consistent with Appendix 1.6. Temporary connections to the main header(s) of a Covered Flare and/or process unit header(s) are not required to be included in the mapping.

b. Reductions Previously Realized. The Defendant must describe the equipment, processes, and procedures installed or implemented to reduce flaring at the Covered Flares for the period of time between the Effective Date and 60 Days prior to the submission of

the Initial WGMP. The description must specify the date of installation or implementation and the amount of reductions (in volumetric flow of pollutants) realized.

c. Planned Reductions. The Defendant must describe any equipment, processes, or procedures the Defendant plans to install or implement to eliminate or reduce flaring from the Covered Flares. The description must specify a schedule for expeditiously installing and commencing operation of any equipment, processes, or procedures the Defendant plans to install, add, or implement to eliminate or minimize flaring. The description must also include a projection of the amount of reductions to be realized. After submitting the Initial WGMP, the Defendant may revise the installation and operation dates provided the Defendant: i) does so in writing to EPA before the First Updated Waste Gas Minimization Plan is due, and ii) provides a reasonable explanation for the revised date. In formulating this plan, the Defendant must review and evaluate the results of the Waste Gas Mapping required by sub-Paragraph 28.a.iv. Any schedule revision accompanied by a reasonable explanation and made before the First Updated Waste Gas Minimization Plan is due shall be considered part of the Initial Waste Gas Minimization Plan.

d. Taking a Covered Flare Permanently Out of Service or Converting a Covered Flare into an Unassisted Flare. The Defendant must identify any Covered Flare it intends to permanently take out of service or to convert into an Unassisted Flare, including the date for completing the decommissioning. Taking a Covered Flare "permanently out of service" means physically removing piping in the Flare header or physically isolating the piping with a welded blind so as to eliminate direct piping to the Covered Flare, and surrendering any permit to operate such Covered Flare. Converting a Covered Flare into an Unassisted Flare means

physically removing piping used to provided Assist Steam or Assist Air or physically isolating such piping with a welded blind so as to eliminate direct piping of Assist Steam or Assist Air to the Covered Flare.

e. Prevention Measures. The Defendant must describe and evaluate all Prevention Measures, including a schedule for expeditiously implementing and commencing operation of all Prevention Measures, to address the following:

i. Flaring that has occurred or may reasonably be expected to occur during planned maintenance activities, including startup and shutdown. The evaluation must include a review of flaring from the Covered Flares that has occurred during these activities in the three years prior to the Effective Date and must consider the feasibility of performing these activities without flaring; and

ii. Flaring caused by the recurrent failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. The evaluation of flaring from the Covered Flares must consider the adequacy of existing maintenance schedules and protocols for such equipment. A failure is "recurrent" if it occurs more than twice during any five-year period as a result of the same cause.

29. First Updated Waste Gas Minimization Plans ("First Updated WGMP"). By no later than the compliance dates set forth in Appendix 1.1, the Defendant must submit to EPA a First Updated WGMP that updates, if and as necessary based on any changes, the information, diagrams, and drawings required in the Flare Data and Monitoring Systems and Protocol Report required by Paragraph 17 and the information required in sub-Paragraphs 28.a–28.e for the 12-month period after the period covered by the Initial Waste Gas Minimization Plans. The First Updated WGMP must also include:

a. Updated Waste Gas Mapping. The Defendant must update the Waste Gas mapping from each process unit header (sometimes referred to as a subheader") to the main header(s) servicing each Covered Flare, if more information relevant to Waste Gas mapping becomes available. The Defendant must use this updated mapping to plan any reductions in Waste Gas flow;

b. Reductions Based on Root Cause Analysis. The Defendant must review all of the root cause analysis reports submitted under Paragraph 33 to determine if reductions in addition to the reductions achieved through any required corrective action under Paragraph 34 can be realized; and

c. Revised Schedule. To the extent the Defendant proposes to extend any schedule set forth in the Initial WGMP or Subsequent WGMP, the Defendant may do so only with good cause, the determination of which is subject to Section XI (Dispute Resolution).

30. Subsequent Updates to WGMPs ("Subsequently Updated WGMP"). On an annual basis after submitting the First Updated WGMP and continuing until Defendant has achieved compliance with all provisions of this Section V (Compliance Requirements) applicable to a Covered Plant other than the requirements of this Paragraph, the Defendant must submit an updated WGMP for a Covered Plant as part of the Semi-Annual Report required by Section VIII (Reporting Requirements) if, at that Covered Plant, the Defendant: a) commences operation of a Newly Installed Covered Flare or permanently removes a Covered Flare from service, b) connects a new Waste Gas stream to a Covered Flare, c) intentionally modifies the Baseload Waste Gas Flow Rate to a Covered Flare, d) installs additional FGRS, or e) changes the design of a Covered Flare (including, but not limited to, converting a Covered Flare into an Unassisted

Flare). Each Subsequently Updated WGMP must update, if and as necessary, the information required in sub-Paragraphs 28.a.i - 28.a.iii. Each Subsequently Updated WGMP must also update, if and as necessary, the information required in sub-Paragraphs 29.a and 29.b. To the extent the Defendant proposes to extend any schedule set forth in a previous WGMP for any of the Covered Plants (excepting schedule changes already made to the Initial Waste Gas Minimization Plan prior to the First Updated Waste Gas Minimization Plan as described in Paragraph 28.c), the Defendant may do so only with good cause, the determination of which is subject to Section XI (Dispute Resolution)).

31. Waste Gas Minimization Plan: Implementation. By no later than the dates specified in a WGMP, the Defendant must implement the actions described therein.

32. Enforceability of WGMPs. The terms of each WGMP (including the Initial, First Updated, and Subsequently Updated WGMPs) submitted under this Consent Decree are specifically enforceable.

33. Root Cause Analysis for Reportable Flaring Incidents.

a. Internal Reporting and Recordkeeping. Commencing no later than the compliance dates set forth in Appendix 1.1, except as provided in Paragraph 35, the Defendant must conduct an investigation into the root cause(s) of each Reportable Flaring Incident at any of the Covered Plants and prepare and keep as a record an internal report that contains the information listed below. The Defendant must conduct the investigation into the root cause(s) of each Reportable Flaring Incident and prepare the internal report by no later than 45 Days following the end of a Reportable Flaring Incident. The internal report must include, at a minimum, the following information:

i. The date and time that the Reportable Flaring Incident started and ended;

ii. The volume of Waste Gas flared and an estimate of the individual quantities of VOCs and HAPs that were emitted during the Reportable Flaring Incident and the calculations that were used to determine the quantities;

iii. The steps, if any, the Defendant took to limit the duration of the Reportable Flaring Incident, and to limit the quantity of VOC and HAP emissions associated with the Reportable Flaring Incident;

iv. A detailed analysis that sets forth the root cause and all contributing causes of the Reportable Flaring Incident, to the extent determinable;

v. An analysis of the measures, if any, that are available to reduce the likelihood of a recurrence of a Reportable Flaring Incident resulting from the same root cause or contributing causes. The analysis must discuss the alternatives, if any, that are available, the probable effectiveness and the cost of the alternatives, if an alternative is eliminated based on cost. Possible design, operation, and maintenance changes must be evaluated. If the Defendant concludes that corrective action(s) is (are) required under Paragraph 34, the report must include a description of the action(s) and, if not already completed, a schedule for its (their) implementation, including proposed commencement and completion dates. If the Defendant concludes that corrective action is not required under Paragraph 34, the report must explain the basis for that conclusion; and

vi. To the extent that investigations of the causes or possible corrective actions are still underway 45 Days after the Reportable Flaring Incident ended, a statement of the anticipated date by which a follow-up report fully conforming to the requirements of this Paragraph will be completed.

b. Submitting Summary of Internal Flaring Incident Reports. In each Semi-Annual Report due under Section VIII (Reporting Requirements), the Defendant must include a summary of the following items for each Reportable Flaring Incident that occurred during the six-month period that the Semi-Annual Report covers:

i. Date;

ii. Duration;

iii. Amount of VOCs and HAPs emitted;

iv. Root cause(s);

v. Corrective action(s) completed;

vi. Corrective action(s) still outstanding; and

vii. An analysis of any trends identified by the Defendant in the number of Reportable Flaring Incidents, the root causes, or the types of corrective action(s).

34. Corrective Action Implementation. In response to any Reportable Flaring Incident, the Defendant must take, as expeditiously as practicable, such interim and long-term corrective actions, if any, as are consistent with good engineering practice to minimize the likelihood of a recurrence of the root cause and all contributing causes of that Reportable Flaring Incident.

35. In lieu of preparing a new report under Paragraph 33 and analyzing and implementing corrective action under Paragraph 34 for a Reportable Flaring Incident that has as its root cause the same root cause as a previously reported Reportable Flaring Incident, the Defendant may cross-reference and use the prior report and analysis when preparing the report required by Paragraph 33.

D. Limitations on Flaring and Flare Gas Recovery.

36. Limitations on Flaring at the Port Arthur Plant and Sweeny Plant. By no later than the compliance dates set forth in Appendix 1.1, at Port Arthur Plant Flare 24, and by no later

than the Effective Date at Sweeny Plant Flares 10, 12, 14, 20, and 22, the Defendant must comply with the following limitations on flaring:

a. 365-Day Rolling Average. The Defendant may not flare more than 1.30 million scfd of Vent Gas on a 365-Day rolling average from Port Arthur Flare 24, rolled daily. The Defendant may not flare more than 2.17 million scfd of Vent Gas on a 365-Day rolling average cumulatively (*i.e.*, the total, combined amount of Vent Gas) from Sweeny Flares 10, 12, 14, 20, and 22, rolled daily. For each limit, each Day that the 365-Day rolling average limit is exceeded shall constitute one Day of violation of this Consent Decree.

b. Hourly Limit. Vent Gas flow at Port Arthur Flare 24 may not exceed 1.15 million scfh during any hour. Vent Gas flow cumulatively (*i.e.*, the total, combined amount of Vent Gas) from Sweeny Flares 10, 12, 14, 20, and 22 may not exceed 1.05 million scfh during any hour. Any hour during which Vent Gas flow equals or exceeds the applicable hourly limit shall constitute a violation of this Consent Decree unless the exceedance of either hourly limit occurred during a Turnaround or Force Majeure event. Notwithstanding the preceding sentence, exceedances of the applicable hourly limit during Turnarounds shall be a violation of this Consent Decree when a Covered Plant has exceeded its hourly limit during Turnarounds for more than 1,765 hours in a 5-year rolling period.

37. For the purposes of calculating the 365-Day rolling averages set forth in Paragraph 36.a, the following shall apply:

a. Vent Gas flows occurring in the 365-Day averaging period during an event that is determined by EPA to be a Force Majeure or to be an External Utility Loss may be excluded from the Vent Gas 365-Day rolling average calculation to the extent that the flows

were caused by the Force Majeure event or the External Utility Loss;

b. The volume of Vent Gas flows that are greater than 1.15 million scfh during any hour in the 365-Day rolling averaging period at Port Arthur Flare 24; and the volume of Vent Gas flows that are greater than 1.05 million scfh cumulatively (*i.e.*, the total, combined amount of Vent Gas) from Sweeny Flares 10, 12, 14, 20, and 22 may be excluded from the Vent Gas 365-Day rolling average calculation;

c. The volume of Vent Gas flows that are greater than 0.13 million scfh during any hour in the 365-Day rolling averaging period when a Turnaround is occurring may be excluded from the Vent Gas 365-Day rolling average calculation. Notwithstanding the preceding sentence, Turnaround hours with flows that exceed 0.13 million scfh must be included in the 365-Day rolling average calculation once Turnaround hours with greater than 0.13 million scfh in Vent Gas flow exceed, on a per-plant basis, 1,765 hours in a 5-year rolling period. During any Turnaround hours the Defendant proposes to be excluded from the 365-Day rolling average calculation, the Defendant must make best efforts to reduce Vent Gas flared and such efforts must be documented in the next Semi-Annual Report due as required in Paragraph 54.f.(5).

38. Flare Gas Recovery at the Cedar Bayou Plant.

a. FGRS Capacity and Start-Up. By no later than the date specified in Appendix 1.1, the Defendant must complete installation of and commence operation at the Cedar Bayou Plant of a 2,200 scfm FGRS consisting of two online Compressors, each with an FGRS Design Capacity of 1,100 scfm, and a Duplicate Spare Compressor with a capacity of 1,100 scfm (the "Cedar Bayou FGRS").

b. General. By no later the date specified in Appendix 1.1, the Defendant

must operate the Cedar Bayou FGRS in a manner to minimize Waste Gas to Flare CB-701 while ensuring safe chemical plant operations. The Defendant also must operate the Cedar Bayou FGRS consistent with good engineering and maintenance practices and in accordance with its design and the manufacturer's specifications. Nothing in the Paragraph will require the Defendant to recover Non-Recoverable Waste Gas Streams in the Cedar Bayou FGRS.

c. By no later the date specified in Appendix 1.1, the Cedar Bayou FGRS must have one Compressor Available for Operation or in operation 98% of the time and two Compressors Available for Operation or in operation 90% of the time. The periods provided for in sub-Paragraphs 38.d. and 38.e. below may be included in the amount of time that a Compressor is Available for Operation when determining compliance with the requirement to have one Compressor Available for Operation or in operation 98% of the time.

d. Maintenance of FGRS. Periods of maintenance on and subsequent restart of the Compressors may be included in the amount of time that a Compressor is Available for Operation when determining compliance with the requirement to have one Compressor Available for Operation or in operation 98% of the time; provided however, these periods must not exceed 1,344 hours per Compressor in a five-year rolling sum period, rolled daily. The Defendant must use best efforts to schedule maintenance activities during a Turnaround of the process units venting to the Flare served by the Cedar Bayou FGRS. To the extent it is not practicable to undertake these maintenance activities during a Turnaround of these units, the Defendant must use best efforts to minimize the generation of Waste Gas during such periods.

e. Conditions Outside the FGRS Operating Range. Periods in which the Cedar Bayou FGRS is shut down (including the subsequent restart) due to operating conditions (such as

high temperatures or large quantities of entrained liquid in the Vent Gas) outside the design operating range of the Cedar Bayou FGRS, including the associated knock-out drum(s), such that the outage is necessary for safety or to preserve the mechanical integrity of the Cedar Bayou FGRS, may be included in the amount of time that a Compressor is Available for Operation when determining compliance with the requirement to have the Compressor Available for Operation or in operation. By no later than 45 Days after any such outage, the Defendant must investigate the root cause and all contributing causes of the outage and must implement, as expeditiously as practicable, corrective action, if any, to prevent a recurrence of the cause(s). In the reports due under Section VIII (Reporting Requirements) of this Decree, the Defendant must describe each outage that occurred under the conditions identified in this sub-Paragraph, including the date, duration, cause(s), corrective action, and the status of the implementation of corrective action.

f. Period to be Used for Computing Percentage of Time. The period of time that a Compressor or group of Compressors must be Available for Operation and/or in operation, as required by sub-Paragraph 38.c, must be determined on a 8,760-hour rolling sum, rolled hourly, using only hours when Potentially Recoverable Gas was generated during all or part of the hour. Any hour when no Potentially Recoverable Gas was generated during the entire hour must be excluded in computing the 8,760-hour rolling sum. The rolling sum must include only the previous 8,760 1-hour periods when Potentially Recoverable Gas was generated during all or part of the hour, provided that the Potentially Recoverable Gas was not generated by flows that could not have been prevented through reasonable planning and were in anticipation of or caused by a natural disaster, act of war or terrorism, or External Utility Loss. Any hour may be excluded

in calculating the sum if flows occurred during the hour solely due to, or in anticipation of, a natural disaster, act of war or terrorism, or External Utility Loss and the flows could not have been prevented through reasonable planning.

E. Flare Combustion Efficiency

39. General Emission Standards Applicable to Covered Flares. By no later than the Effective Date, the Defendant must comply with the requirements set forth in this Paragraph at each Covered Flare at all times when that Covered Flare is In Operation.

a. Operation during Emissions Venting. The Defendant must operate each Covered Flare at all times when emissions may be vented to it.

b. No Visible Emissions. The Defendant must specify, as required by Appendix 1.5, the smokeless design capacity of each Covered Flare and operate with no Visible Emissions when the Covered Flare is In Operation and the Vent Gas flow is less than the smokeless design capacity of the Covered Flare. By no later than the Effective Date, the Defendant must monitor, as specified below in sub-Paragraphs 39.b.i or ii, for Visible Emissions from each Covered Flare while it is In Operation. An initial Visible Emissions demonstration must be conducted using an observation period of 2 hours using Method 22 at 40 C.F.R. Part 60, Appendix A–7. Subsequent Visible Emissions observations must be conducted using either method listed in sub-Paragraphs 39.b.i or ii. The Defendant must record and report any instances where Visible Emissions are observed for more than 5 minutes during any 2 consecutive hours as specified in 40 C.F.R. § 63.655(g)(11)(ii).

i. At least once per Day, the Defendant must conduct Visible Emissions observations using an observation period of 5 minutes using Method 22 at 40 C.F.R. Part 60, Appendix A–7.

If at any time a Defendant sees Visible Emissions, even if the minimum required daily Visible Emission monitoring has already been performed, the Defendant must immediately begin an observation period of 5 minutes using Method 22 at 40 C.F.R. Part 60, Appendix A–7. If Visible Emissions are observed for more than one continuous minute during any 5-minute observation period, the observation period using Method 22 at 40 C.F.R. Part 60, Appendix A–7 must be extended to 2 hours or until 5 minutes of Visible Emissions are observed.

ii. Alternatively, the Defendant may use a video surveillance camera to continuously record (at least one frame every 15 seconds with time and date stamps) images of the Flare flame at a reasonable distance above the Flare flame and at an angle suitable for Visible Emissions observations. The Defendant must provide real-time video surveillance camera output to the control room or other continuously staffed location where the camera images may be viewed at any time.

c. Pilot Flame Presence. The Defendant must operate each Covered Flare with a pilot flame present at all times. The Defendant must continuously monitor the presence of the pilot flame(s) using a device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor) capable of detecting that the pilot flame is present.

d. Monitoring According to Applicable Provisions. The Defendant must comply with all applicable Subparts of 40 C.F.R. Parts 60, 61, or 63 except as provided in Paragraph 43(a)(iii).

e. Good Air Pollution Control Practices. The Defendant must at all times, including during periods of startup, shutdown, and/or Malfunction, implement good air pollution control practices to minimize emissions from each Covered Flare. Nothing in this sub-Paragraph 39.e requires the Defendant to install or maintain Flare monitoring equipment in addition to or different from the equipment required by this Consent Decree.

40. Flare Tip Velocity or V_{tip}. By no later than the Effective Date, the Defendant must operate each Covered Flare in compliance with either sub-Paragraph 40.a. or 40.b. below, provided that the appropriate monitoring systems are in place, whenever the Vent Gas flow rate is less than the smokeless design capacity of the Covered Flare.

a. The actual Flare Tip Velocity (V_{tip}) must be less than 60 feet per second. The Defendant must monitor V_{tip} using the procedures specified in Appendix 1.2, or

b. V_{tip} must be less than 400 feet per second and also less than the maximum allowed Flare Tip Velocity (Vmax) as calculated according to Equation 11 in Appendix 1.2. The Defendant must monitor V_{tip} and gas composition, and must determine NHV_{vg} using the procedures specified in Appendix 1.2. The Unobstructed Cross Sectional Area of the Flare Tip must be calculated consistent with Appendix 1.3.

41. Revisions to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b). From the Effective Date until termination of this Consent Decree, if revisions are made to 40 C.F.R. §§ 60.18(b)–(f) and/or 63.11(b) that become final and effective, but are inconsistent with any of the requirements in Paragraphs 39.a–d, 40, or 43.a, the Defendant must comply with the final, effective regulations and any requirements in Paragraphs 39.a–d, or 40 , or 43.a that are not inconsistent with these final, effective regulations, except as provided in Paragraph 43.a(ii)-(iii). As used in this Paragraph, "inconsistent" means that compliance with both provisions is not possible.

42. Operation According to Design. By no later than the Effective Date, the Defendant must operate and maintain each Covered Flare in accordance with its design and the requirements of this Consent Decree.

43. Net Heating Value Standards. The Defendant must comply with the following Net Heating Value standards, except as provided in Paragraphs 45 (Standard During Instrument Downtime).

a. Net Heating Value of Vent Gas (NHV_{vg}) for all Covered Flares. The Defendant must operate each Covered Flare with an NHV_{vg} of greater than or equal to 300 BTU/scf determined on a 15-minute block period basis when Waste Gas is routed to the Covered Flare for at least 15 minutes. The Defendant must comply with this NHV_{vg} standard beginning on the Effective Date and continuing until the earlier of: (i) termination of this Consent Decree; (ii) the issuance of final regulations modifying the NHV_{vg} requirements in 40 C.F.R. §§ 60.18(c)(3)(ii) and 63.11(b)(6)(ii) (whether the modification is made in those regulations or in any regulation under 40 C.F.R. Part 60, 61, or 63 that applies to a Covered Flare); or (iii) the date the EPA approves the Alternate Means of Emission Limitation (AMEL) that the Defendant applied for on August 29, 2019 (reference number: CN600303614), if it provides that the Defendant may comply with NHV_{cz} in lieu of NHV_{vg}. The Defendant must monitor and calculate NHV_{vg} at each Covered Flare in accordance with Appendix 1.2.

b. Net Heating Value of Combustion Zone Gas (NHV_{cz}) for all Covered Flares. By no later than the Effective Date or the compliance dates set forth in Appendix 1.1, whichever is later, at any time a Covered Flare is In Operation, the Defendant must operate that Flare so as to maintain the NHV_{cz} at or above 270 BTU/scf, as determined on a 15-minute block period basis when Waste Gas is routed to the Covered Flare for at least 15 minutes. The Defendant must monitor and calculate NHV_{cz} at each Covered Flare in accordance with Appendix 1.2. The Defendant must comply with the interim requirements in Appendix 1.7 for

Cedar Bayou Flares X-901 and Z-1101 and for Port Arthur Flare 40 until the compliance deadlines for this sub-Paragraph in Appendix 1.1.

c. Dilution Operating Limits for Covered Flares with Perimeter Assist Air (NHV_{dil}). By no later than the applicable compliance deadline set forth in Appendix 1.1, while each Covered Air-Assisted Flare is In Operation, the Defendant must maintain the Net Heating Value Dilution parameter (NHV_{dil}) at or above 22 BTU/square foot determined on a 15-minute block period basis, when Waste Gas is routed to the Covered Flare for at least 15 minutes. The Defendant must monitor and calculate NHV_{dil} at each Covered Flare that is actively receiving Perimeter Assist Air in accordance with Appendix 1.2.

44. 98% Combustion Efficiency. By no later than the Effective Date or the applicable compliance deadline set forth in Appendix 1.1, whichever is later, the Defendant must operate each Covered Flare with a minimum of a 98% Combustion Efficiency at all times when Waste Gas is vented to it. To demonstrate continuous compliance with the 98% Combustion Efficiency, the Defendant must operate each Covered Steam-Assisted Flare in compliance with Paragraph 43.b and each Covered Air-Assisted Flare in compliance with Paragraphs 43.b and c.

45. Standard During Instrument Downtime. If one or more of the following conditions (collectively referred to as "Instrument Downtime") is present and renders the Defendant incapable of operating a Covered Flare in accordance with the applicable NHV standards in Paragraph 43, the Defendant must operate that Covered Flare in accordance with good air pollution control practices so as to minimize emissions and ensure good combustion efficiency at that Covered Flare:

a. Malfunction of an instrument needed to meet the requirement(s);

b. Repairs following Malfunction of an instrument needed to meet the requirement(s);

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

d. Quality Assurance/Quality Control activities on an instrument needed to meet the requirement(s).

Instrument Downtime must be calculated in accordance with 40 C.F.R. § 60.13(h)(2). In no event must Instrument Downtime exceed 5% of the time in a Semi-Annual Period that the Covered Flare affected by the Instrument Downtime is In Operation. For purposes of calculating the 5%, the time used for NHV Analyzer or gas chromatograph calibration and validation activities may be excluded. Nothing in this Paragraph is intended to prevent the Defendant from asserting Force Majeure as provided in Section X as the cause of any period of Instrument Downtime.

46. Recordkeeping for All Covered Flares: Timing and Substance. The Defendant must comply with the following recordkeeping requirements:

a. By no later than the compliance dates in Appendix 1.1, for each Covered Flare, the Defendant must calculate and record each of the following parameters:

i. Volumetric flow rates of all gas streams that contribute to the Vent Gas volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 19, 25, and Step 2 of Appendix 1.2);

ii. Assist Steam volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 19, 25, and Step 2 of Appendix 1.2);

iii. Assist Air volumetric flow rate (in scfm) (in 15-minute block averages and in accordance with any calculation requirements of Paragraphs 20,

26, and Step 2 of Appendix 1.2);

iv. NHV_{vg} (in BTU/scf) (in 15-minute block averages in accordance with Step 1 of Appendix 1.2);

v. NHV_{dil} (in BTU/ft^2) (in 15-minute block averages in accordance with Step 4 of Appendix 1.2); and

vi. NHV_{cz} (in BTU/scf) (in 15-minute block averages in accordance with Step 3 of Appendix 1.2).

b. By no later than the dates set forth in Appendix 1.1 for each Covered Flare, the Defendant must record the duration of all periods of Instrument Downtime for each Covered Flare that exceed 5% of the time in a Semi-Annual Period that the Covered Flare is In Operation. The Defendant must record which instrument(s) experienced the downtime, which Covered Flare was affected by the downtime, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that the Defendant took.

c. By no later than the compliance dates specified in Paragraphs 36 (Limitations on Flaring at the Port Arthur Plant and Sweeny Plant) and 38.a (FGRS Capacity and Start-Up), the Defendant must record the dates and times of any periods that the Defendant deviates from the standards in Paragraphs 36 or 38.a. The Defendant must also record the duration of the deviation, an explanation of the cause(s) of the deviation, and a description of the corrective action(s) that the Defendant took.

d. By no later than the compliance dates set forth in Column D of Appendix 1.1, at any time that the Defendant deviates from the emissions standards in Paragraphs 43 - 45 at any Covered Flare, the Defendant must record the duration of the deviation, an explanation of

the cause(s) of the deviation, and a description of the corrective action(s) that the Defendant took.

F. Fenceline Monitoring Project Requirements

47. The Defendant must install, maintain, and operate at each Covered Plant a Fenceline Monitoring Project in accordance with Appendix 2.2.

VI. PERMITS

48. Permits Needed for Compliance Obligations. The Defendant must obtain all federal, state, and local permits necessary for performing any compliance obligation under this Consent Decree, including, without limitation, permits for the construction of pollution control technology and the installation of equipment at each Covered Plant. The Defendant may seek relief under the provisions of Section X (Force Majeure) for any delay in performing any such obligation resulting from a failure to obtain, or a delay in obtaining, any permit or approval required to fulfill such obligation, provided that the Defendant has submitted timely and complete applications and has taken all other actions necessary to obtain all such permits or approvals.

49. Permits to Ensure Survival of Consent Decree Limits and Standards after Termination of Consent Decree.

a. By no later than one year after the Effective Date or one year after the applicable deadline for each compliance requirement listed in Paragraph 49.c, whichever is later, the Defendant must complete and submit to the necessary permitting authorities in the State of Texas appropriate applications to incorporate the requirements listed in sub-Paragraph 49.c for each Covered Plant, as applicable, into a non-Title V, federally enforceable permit, or request

site-specific revisions to the Texas SIP to include such requirements and limitations, such that the requirements listed in sub-Paragraph 49.c: (i) become and remain "applicable requirements" as that term is defined in 40 C.F.R. § 70.2 and (ii) survive the termination of this Consent Decree. The Defendant must submit a copy of each application for a federally enforceable permit or Texas SIP amendment, as well as a copy of any permit proposed as a result of such application, to the United States in accordance with Section XVI (Notices) to allow for timely participation in any public comment opportunity.

b. By no later than three years after the Effective Date or one year after the applicable deadline for each compliance requirement listed in Paragraph 49.c, whichever is later, the Defendant must complete and submit to the necessary permitting authorities in the State of Texas appropriate applications to modify, amend, or revise the Title V permit for each of the Covered Plants to incorporate the requirements listed in sub-Paragraph 49.c into each Covered Plant's federally enforceable Title V permit.

c. The following requirements of the Consent Decree shall survive termination: Paragraphs 18–22 (Instrumentation and Monitoring Systems), Paragraphs 24–26 (Specifications, Calibration, Quality Control, and Maintenance / Recording and Averaging Times / Operation), Paragraph 27 (Determining whether Flare has Potentially Recoverable Gas), Paragraphs 36–37 (Limitations on Flaring at the Port Arthur Plant and Sweeny Plant), Paragraph 38 (Flare Gas Recovery at the Cedar Bayou Plant), Paragraphs 39–40 (Flaring Efficiency standards), Paragraph 42 (Operation According to Design), Paragraph 43.b. and 43.c (NHV_{cz}/NHV_{dil} Standards), Paragraph 44 (98% CE), Paragraph 45 (Standard During Instrument Downtime), Paragraph 46 (Recordkeeping), and Paragraph 47 (Fenceline Program). Nothing in this Paragraph prohibits the

Defendant from seeking to incorporate Paragraph 23 (Optional Equipment) in a permit that survives termination of this Decree.

50. The permit applications and process of incorporating the requirements of this Consent Decree into Title V Permits must be in accordance with applicable state or local Title V rules, including applicable administrative amendment provisions of such rules. The Parties agree that the incorporation may be by "amendment" under 40 C.F.R. § 70.7(d) and analogous state Title V rules, where allowed by state law.

51. Following submission of the complete permit applications, the Defendant must cooperate with the TCEQ by promptly submitting all available information that the TCEQ seeks following its receipt of the permit materials.

VII. EMISSION CREDIT GENERATION

52. Prohibitions.

a. Definition. "CD Emissions Reductions" means any NOx, VOC, PM, PM_{TOTAL}, PM_{10}, $PM_{2.5}$, HAP, or CO emissions reductions that result from any projects conducted or controls used to comply with this Consent Decree.

b. The Defendant must not apply for, obtain, trade, sell, generate, or use CD Emissions Reductions:

i. As netting reductions,

ii. As emissions offsets, or

iii. For the purpose of determining whether a project would result in a significant emissions increase or significant net emissions increase in any major or minor NSR permit or permit proceeding, or for the purpose of obtaining offsets in any non-attainment NSR permit or permit proceeding. Baseline actual emissions during any 24-month period

selected by the Defendant must be adjusted downward to exclude any portion of the baseline emissions that would have been eliminated as CD Emissions Reductions (including the Waste Gas Minimization Requirements of Section V.C) had the Defendant been complying with this Consent Decree during that 24-month period.

53. Outside the Scope of the Prohibition. Nothing in this Section is intended to prohibit the Defendant from using or generating:

a. Emission reductions, netting credits, or emission offsets from: (i) process units at a Covered Plant that are not subject to an emission limitation pursuant to this Consent Decree and/or (ii) projects conducted or controls used that are entirely separate from those relied upon to comply with this Consent Decree;

b. CD Emissions Reductions for a Covered Plant's compliance with any rules or regulations designed to address regional haze or the non-attainment status of any area (excluding NSR rules, but including, for example, Reasonably Available Control Technology rules) that apply to a Covered Plant; provided, however, that the Defendant must not trade or sell any CD Emissions Reductions; and

c. CD Emissions Reductions for purposes of the State of Texas air toxics modeling programs.

VIII. REPORTING REQUIREMENTS

54. Semi-Annual Reports. By no later than March 31st and August 31st of each year after the Effective Date, until termination of this Decree pursuant to Section XX, the Defendant must submit a "Semi-Annual Report" to EPA, except that the first Semi-Annual Report shall be due 60 Days after the first full half year after the Effective Date of this Consent Decree (a "half year" runs between January 1 and June 30 and between July 1 and December 31). Each Semi-Annual Report must contain the following information for the preceding six months (*i.e.*, January through June will be addressed in the report to be submitted by August 31, and July through December will be addressed in the report submitted by March 31, except that the first Semi-

Annual Report will cover the period between the Effective Date through the end of the first full half year):

a. A description of the status of work performed and progress made toward implementing all requirements of Section V (Compliance Requirements) at the Covered Plants. This topic should describe any major milestones completed and remaining to be completed;

b. A description of any problems encountered or anticipated in meeting the requirements in Section V (Compliance Requirements) at the Covered Plants, together with implemented or proposed solutions;

c. A description of the status of any permit applications, including a summary of all permitting activity, pertaining to compliance with this Consent Decree;

d. Any updated WGMP for the Covered Plants that is required to be submitted by Paragraph 30;

e. Any summary of internal flaring incident reports as required by Paragraph 33;

f. A summary of the following, per Covered Flare per Semi-Annual Period (hours must be rounded to the nearest tenth):

(1) The total number of hours of Instrument Downtime claimed pursuant to Paragraph 45, expressed as both an absolute number and a percentage of time the Covered Flare that the instrument/equipment monitors is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas;

(2) If the total number of hours of Instrument Downtime claimed pursuant to Paragraph 45 exceeds 5% of the time in a Semi-Annual Period that the Covered Flare affected by the downtime is In

Operation, an identification of the periods of downtime by date, time, cause (including Malfunction or maintenance), and, if the cause is asserted to be a Malfunction, the corrective action taken;

(3) The total number of hours, expressed as both an absolute number of hours and a percentage of time that the Covered Flare was In Operation, in which the requirements of Paragraphs 43-44 were not applicable because the only gas or gases being vented were Pilot Gas or Purge Gas;

(4) Exceedances of Combustion Efficiency Standards.

i. The total number of hours, expressed as both an absolute number of hours and a percentage of time the Covered Flare was In Operation, of exceedances of the emissions standards in Paragraphs 43–44; provided however, that if the exceedance of these standards was less than 5% of the time in a Semi-Annual Period and was due to one or more of the exceptions set forth in Paragraph 45, the report must so note; and

ii. If the exceedance of the emissions standards in Paragraphs 43–44 was not due to one of the exceptions in Paragraph 45 (Instrument Downtime), or if the exceedance was due to one or more of the exceptions in Paragraph 45 and the total number of hours caused by the exceptions exceeds 5% of the time in a Semi-Annual Period that the Covered Flare affected by the Instrument Downtime was In Operation, an identification of each block period that exceeded the standard, by time and date; the cause of the exceedance (including startup, shutdown, maintenance, or Malfunction), and if the cause is asserted to be a Malfunction, an explanation and any corrective actions taken; and

(5) Compliance with Limitations on Flaring and FGRS Availability Requirements. Sufficient information to document compliance with the requirements of Paragraphs 36, 37, and 38.c. For any period of non-compliance, the Defendant must identify the date, cause, and corrective action taken.

g. Any additional matters that the Defendant believes should be brought to the attention of EPA.

55. Fenceline Air Monitoring Reports. The Defendant must submit Fenceline Air Monitoring Reports as part of each Semi-Annual Report. The Fenceline Air Monitoring Reports must contain the following information:

a. In spreadsheet format, the individual sample results for each monitor comprising each Fenceline Monitoring System, each bi-weekly annual average benzene concentration difference value (once annual averages are available), and the corresponding meteorological data for the relevant monitoring periods. The first two columns of each spreadsheet must be the date and time for each sample taken; and

b. A detailed description of the findings of any root cause analysis and corrective action(s) undertaken pursuant to Paragraph 3(h) of Appendix 2.2, including the known results of the corrective action(s) and the anticipated emissions reductions (in TPY per pollutant).

c. For the purpose of determining the cause of an Action Level exceedance, the Defendant may submit and discuss additional data collected by it or by third parties in the reports required pursuant to Paragraph 3.h of Appendix 2.2 and/or this Paragraph. If the Defendant concludes that an exceedance of the Action Level described in Paragraph 3.g of Appendix 2.2 of this Consent Decree was caused by an offsite source(s), such a conclusion does not relieve the Defendant of its obligation to perform the Root Cause investigation described in Paragraph 3.h of Appendix 2.2

56. Annual Emissions Data. In the Semi-Annual Report that is submitted on March 31 of each year, the Defendant must provide, for each Covered Flare, for the prior calendar year, the amount of emissions of the following compounds (in tons per year): VOCs, HAPs, NOx, CO_2, methane, and ethane.

57. Each Semi-Annual Report must also include a description of any non-compliance with the requirements of this Consent Decree not otherwise identified by Paragraph 54 along with an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, the Defendant must so state in the report. In such a case, the Defendant must investigate the cause of the violation and then submit an amendment to the report, including a full explanation of the cause of the violation, within 30 Days of the Day the Defendant becomes aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves the Defendant of its obligation to provide the notice required by Section X (Force Majeure).

58. All reports required under this Section must be submitted to the persons and in the manner designated in Section XVI (Notices).

59. Each report submitted by the Defendant under this Section must be signed by an official of each Covered Plant and include the following certification:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

60. The reporting requirements of this Consent Decree do not relieve the Defendant of any reporting obligations required by the Clean Air Act, or its implementing regulations, or by any other federal, state, or local law, regulation, permit, or other requirement.

61. Any information provided pursuant to this Consent Decree may be used by the United States in any proceeding to enforce the provisions of this Consent Decree and as otherwise permitted by law.

IX. STIPULATED PENALTIES

62. The Defendant is liable for stipulated penalties to the United States for violations of this Consent Decree as specified below, unless excused under Section X (Force Majeure). A violation includes failing to perform any obligation required by the terms of this Decree, including any work plan or schedule approved under this Decree, according to all applicable requirements of this Decree and within the specified time schedules established by or approved under this Decree.

63. Late Payment of Civil Penalty. If the Defendant fails to pay the civil penalty amounts required to be paid under Section IV (Civil Penalty) when due, the Defendant must pay a stipulated penalty of $2,500 per Day for each Day that the payment is late.

64. Failure to Meet Compliance Requirements. For the following violations of Section V (Compliance Requirements):

Violation	**Stipulated Penalty**
64.a. Violations of Paragraph 17. Failure to timely submit a Flare Data and Monitoring Systems and Protocol Report in accordance with the requirements of Paragraph 17.	Period of Delay or Noncompliance — Penalty per Day per Violation Days 1–30 — $ 300 Days 31–60 — $ 400 Days 61 and later — $ 500
64.b. Violations of Paragraphs 18-22. Failure to install the equipment and monitoring systems in accordance with Paragraphs 18-22 by the compliance date and maintain them in accordance with the respective, applicable technical specifications in those Paragraphs and Paragraphs 24–25, (except for the QA/QC requirements referenced in sub-Paragraph 24.a.i., which are covered in sub-Paragraph 64.c below).	Period of Delay or Noncompliance per Monitoring System/ Control Instrument — Penalty per Day per Monitoring System/Control Instrument Days 1–30 — $ 750 Days 31–60 — $ 1,250 Days 61 and later — $ 2,000 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
64.c. Violations of the QA/QC requirements in Paragraph 24.a.i. Failure to perform the QA/QC requirements in accordance with Paragraph 24.a.i.	Violation of a: — Penalty per Violation Daily requirement — $ 100 Quarterly requirement — $ 200 per Day late Annual requirement — $ 500 per Day late

64.d Violations of Paragraph 26. Except for 5% of the time per Semi-Annual Period, failure to operate each monitoring system required by Paragraphs 19 and 21-22 in accordance with Paragraph 26; provided however, that the Defendant will not be liable for a stipulated penalty for violation of Paragraph 26 if, during the period of downtime, the only gas(es) being sent to the Covered Flare in question is/are Purge Gas and/or Pilot Gas. For any monitoring system that serves a dual purpose, this stipulated penalty applies per instrument only.	Per Monitoring System/ Control Instrument, Number of Hours per Semi-Annual Period — Penalty per Hour per Monitoring System/ Control Instrument 0.25–100.0 — $ 250 100.25–200.0 — $ 500 Over 200.0 — $ 1,000
64.e. Violations of Paragraphs 28, 29, or 30. Failure to timely submit a WGMP in accordance with the requirements of the applicable Paragraph.	Period of Delay or Noncompliance — Penalty per Day per Violation Days 1–30 — $ 500 Days 31–60 — $ 750 Days 61 and later — $ 1,000
64.f. Violations of Paragraph 33. Failure to timely develop a root cause flaring investigation report in accordance with the requirements in sub-Paragraph 33.a; or failure to keep it as an internal record; or failure to timely submit a summary of the flaring incident reports in accordance with the requirements in sub-Paragraph 33.b.	Period of Delay or Noncompliance — Penalty per Day per Violation Days 1 – 30 — $ 800 Days 31 – 60 — $ 1,600 Days 61 and later — $ 3,000
64.g. Violations of Paragraph 34. Failure to complete any corrective action in accordance with the requirements of Paragraph 34.	Period of Delay or Noncompliance — Penalty per Day per Violation Days 1 – 30 — $ 1,000 Days 31 – 60 — $ 2,000 Days 61 and later — $ 5,000

64.h Violations of Paragraph 36(a). For failing to comply with either limitation on flaring in accordance with the requirements of Paragraph 36 (the 365-day rolling average volumetric flow limitations).	$2,500 per Day of violation.
64.i Violations of Paragraph 36(b). For exceeding either Vent Gas flow limitation set forth in Paragraph 36 in any hour.	$2,000 per hour of violation.
64.j. Violations of Paragraph 38. For failing to timely install any equipment listed in Paragraph 38 in accordance with the requirements of Paragraph 38.	Period of Delay or Noncompliance per FGRS — Penalty per Day per FGRS Days 1–30 — $ 1,250 Days 31–60 — $ 3,000 Days 61 and later — $ 5,000 or an amount equal to 1.2 times the economic benefit of delayed compliance, whichever is greater
64.k. Violations of Sub-Paragraph 38.c. For each failure to have the requisite number of FGRS Compressor Available for Operation or in operation in accordance with sub-Paragraphs 38.c	Per FGRS, $750 per hour or fraction thereof over the allowed percentage in a rolling 8,760-hour period that a Compressor required to be Available for Operation is not Available for Operation; provided however, that stipulated penalties will not apply for any hour in which a Compressor's unavailability did not result in flaring.

<table>
<tr>
<td>64.l. Violations of Paragraphs 43, 45, and Appendix 1.7. For each Covered Flare, each failure to operate the Covered Flare in accordance with the Combustion Zone Net Heating Value standard in Paragraph 43 or the Standard During Instrument Downtime in Paragraph 45, except as provided below for the interim compliance requirements in Appendix 1.7.

When the interim compliance requirements in Appendix 1.7 are in effect for Flare X-901 and Flare Z-1101 at the Cedar Bayou Plant and for Flare 40 at the Port Arthur Plant, the stipulated penalties in this sub-Paragraph shall apply after a Flare's NHVcz is below the interim NHVcz standard (i.e., 200 BTU/scf on a 15-minute block average for Cedar Bayou Flares X-901 and Z-1101, or 260 BTU/scf on a 15-minute block average for Port Arthur Flare 40) for more than 5% of the time during a half year period as defined in Paragraph 54. After the following dates, the stipulated penalties in this sub-Paragraph apply for each failure to operate Flare X-901, Flare Z-1101, or Port Arthur Flare 40 in accordance with the Combustion Zone Net Heating Value standard in Paragraph 43 (i.e., any 15-minute period in which the NHVcz for Flare X-901, Flare Z-1101, or Port Arthur Flare 40 is below 270 BTU/scf on a 15-minute block average):

• March 31, 2022 (for Cedar Bayou Flare X-901 and Port Arthur Flare 40) and
• February 28, 2023 (for Cedar Bayou Flare Z-1101).</td>
<td>
<table>
<tr><td>On a per Covered Flare basis, Hours per Semi-Annual Period in Noncompliance</td><td>Penalty per Hour per Covered Flare</td></tr>
<tr><td>Hours 0.25–100.0</td><td>$ 50</td></tr>
<tr><td>Hours 100.25–200.0</td><td>$ 100</td></tr>
<tr><td>Hours over 200.0</td><td>$ 300</td></tr>
</table>
For purposes of calculating the number of hours of noncompliance with the NHV_{cz} standard, all 15-minute periods of violation must be added together to determine the total.
</td>
</tr>
</table>

64.m. Violations of Paragraph 46. Failure to record any information required to be recorded pursuant to Paragraph 46.	$100 per Day
64.n. Violations of Paragraph 47 (Fenceline Monitoring Requirements). For each failure to operate the Fenceline Monitoring System in accordance with any requirement of Paragraph 47 or Appendix 2.2.	Period of Delay or Noncompliance / Penalty per Day Days 1–30 / $ 500 Days 31–60 / $ 1,500 Days 61 and later / $ 3,000

65. Failure to Meet Reporting Requirements. For each failure to submit a Semi-Annual Report in accordance with the requirements of Section VIII:

Period of Delay or Noncompliance per Semi-Annual Report	Penalty per Day per Semi-Annual Report
Days 1–30	$ 300
Days 31–60	$ 1,000
Days 61 and later	$ 2,000

66. Incorporation of Consent Decree Requirements into Federally Enforceable Permits. For each failure to timely submit a complete permit application or site-specific SIP revision request to incorporate the Consent Decree requirements required by Paragraph 49 to the State of Texas:

Period of Delay or Non-Compliance		Penalty per Violation per Day
Days	1–30	$500
Days	31–60	$1,500
Day	61 and later	$3,000

67. Stipulated penalties under this Section begin to accrue on the Day after performance is due or on the Day a violation occurs, whichever is applicable, and, except as provided in Paragraph 70, will continue to accrue until performance is satisfactorily completed

or until the violation ceases. Stipulated penalties will accrue simultaneously for separate violations of this Consent Decree.

68. The Defendant must pay stipulated penalties to the United States within 60 Days of a written demand by the United States unless the demand is disputed through compliance with the requirements in Section XI (Dispute Resolution) of this Consent Decree.

69. The United States may, in the unreviewable exercise of its discretion, reduce or waive stipulated penalties otherwise due to it under this Consent Decree.

70. By no later than 60 Days after receiving a demand for stipulated penalties, the Defendant may dispute liability for any or all stipulated penalties demanded by invoking the dispute resolution procedures of Section XI of this Decree (Dispute Resolution). In the event of a dispute over stipulated penalties, stipulated penalties shall not accrue commencing on the later of either: (i) the date that, during dispute resolution under Section XI, the Plaintiff and the Defendant agree upon; or (ii) the date that the Defendant files a motion with the Court under Paragraph 84; provided however, that in order for stipulated penalties to cease accruing pursuant to either (i) or (ii), the Defendant must place the disputed amount in an interest-bearing commercial escrow account. The interest rate must be determined in accordance with 28 U.S.C. § 1961. If the dispute is resolved in the Defendant's favor, the escrowed amount plus accrued interest will be returned to the Defendant; otherwise, the United States will be entitled to the amount determined by the Court to be due, plus interest that has accrued on such amount in the escrow account.

71. The Defendant must pay stipulated penalties owing to the United States in the manner set forth and with the confirmation notices required by Paragraph 14, except that the

transmittal letter must state that the payment is for stipulated penalties and must state for which violation(s) the penalties are being paid.

72. If the Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, the Defendant is liable for interest on such penalties, as provided for in 28 U.S.C. § 1961, accruing as of the date payment became due. Nothing in this Paragraph will be construed to limit the United States from seeking any remedy otherwise provided by law for the Defendant's failure to pay any stipulated penalties.

73. The payment of penalties and interest, if any, do not alter in any way the Defendant's obligation to complete the performance of the requirements of this Consent Decree.

74. Non-Exclusivity of Remedy. Stipulated penalties are not the United States' exclusive remedy for violations of this Consent Decree. Subject to the provisions of Section XIII (Effect of Settlement/Reservation of Rights), the United States expressly reserves the right to seek any other relief it deems appropriate for the Defendant's violation of this Decree or applicable law, including but not limited to an action against any Defendant for statutory penalties, additional injunctive relief, mitigation or offset measures, and/or contempt. However, the amount of any statutory penalty assessed for a violation of this Consent Decree must be reduced by an amount equal to the amount of any stipulated penalty assessed and paid pursuant to this Consent Decree.

X. FORCE MAJEURE

75. "Force Majeure," for purposes of this Consent Decree, is defined as any event beyond the control of the Defendant, of any entity controlled by the Defendant, or of the Defendant's contractors, which delays or prevents the performance of any obligation under this

Consent Decree despite the Defendant's best efforts to fulfill the obligation. The requirement that the Defendant exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential Force Majeure and best efforts to address the effects of any potential Force Majeure: (a) as it is occurring and (b) following the potential Force Majeure, such that the delay and any adverse effects of the delay are minimized. "Force Majeure" does not include the Defendant's financial inability to perform any obligation under this Consent Decree.

76. If any event occurs or has occurred that may delay the performance of any obligation under this Consent Decree, whether or not caused by a Force Majeure, the Defendant must provide written notice to EPA in accordance with Section XVI no later than 15 Days after the date the Defendant first knew, or by the exercise of due diligence should have known, that the event might cause a delay. This notice must specifically reference this Paragraph of the Consent Decree and must provide an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementing any measures to be taken to prevent or mitigate the delay or the effect of the delay; the Defendant's rationale for attributing such delay to a Force Majeure if it intends to assert such a claim; and a statement as to whether, in the opinion of the Defendant, such event may cause or contribute to an endangerment to public health, welfare or the environment. The Defendant must include with any notice all available documentation supporting the claim that the delay was attributable to a Force Majeure. Failure to comply with the above requirements will preclude the Defendant from asserting any claim of Force Majeure for that event for the period of time of such failure to comply, and for any additional delay caused by such failure. The Defendant will be deemed to know of any circumstance of which

any Defendant, any entity controlled by a Defendant, or a Defendant's contractors knew or should have known.

77. If EPA agrees that the delay or anticipated delay is attributable to a Force Majeure, the time for performance of the obligations under this Consent Decree that are affected by the Force Majeure will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the Force Majeure will not, by itself, extend the time for performance of any other obligation. EPA will notify the Defendant in writing of the length of the extension, if any, for performing the obligations affected by the Force Majeure.

78. If EPA does not agree that the delay or anticipated delay has been or will be caused by a Force Majeure, EPA will notify the Defendant in writing of its decision.

79. If the Defendant elects to invoke the dispute resolution procedures set forth in Section XI (Dispute Resolution), it must do so no later than 45 Days after receiving EPA's notice of decision. In any such dispute resolution proceeding, the Defendant has the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a Force Majeure, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that the Defendant complied with the requirements of Paragraphs 75 and 76. If the Defendant carries this burden, the delay at issue will be deemed to not be a violation by the Defendant of the affected obligation of this Consent Decree identified to EPA and the Court.

XI. DISPUTE RESOLUTION

80. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures of this Section are the exclusive mechanism to resolve disputes arising under or with respect to this Consent Decree.

81. Informal Dispute Resolution. Any dispute subject to dispute resolution under this Consent Decree will first be the subject of informal negotiations. The dispute will be considered to have arisen when the Defendant sends the United States a written Notice of Dispute. Such Notice of Dispute must clearly state the matter in dispute. The period of informal negotiations must not exceed 60 Days from the date the dispute arises, unless that period is modified by written agreement. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States will be considered binding unless, within 45 Days after the conclusion of the informal negotiation period, the Defendant invokes formal dispute resolution procedures as set forth below.

82. Formal Dispute Resolution. The Defendant must invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by serving on the United States a written Statement of Position regarding the matter in dispute. The Statement of Position must include, but need not be limited to, any factual data, analysis, or opinion supporting the Defendant's position and any supporting documentation relied upon by the Defendant.

83. The United States must serve its Statement of Position within 45 Days of receiving the Defendant's Statement of Position. The United States' Statement of Position must include, but need not be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the United States. The United States'

Statement of Position will be binding on the Defendant, unless the Defendant files a motion for judicial review of the dispute in accordance with the following Paragraph.

84. The Defendant may seek judicial review of the dispute by filing with the Court and serving on the United States, in accordance with Section XVI (Notices), a motion requesting judicial resolution of the dispute. The motion must be filed within 45 Days of receiving the United States' Statement of Position pursuant to the preceding Paragraph. The motion must contain a written statement of the Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and must set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

85. The United States must respond to the Defendant's motion within the time period allowed by the Local Rules of this Court. The Defendant may file a reply memorandum, to the extent permitted by the Local Rules.

86. Standard of Review. In a formal dispute resolution proceeding under this Section, the Defendant bears the burden of demonstrating that its position complies with this Consent Decree and the CAA and that it is entitled to relief under applicable principles of law. The United States reserves the right to argue that its position is reviewable only on the administrative record and must be upheld unless arbitrary and capricious or otherwise not in accordance with law, and the Defendant reserves the right to argue to the contrary.

87. The invocation of dispute resolution procedures under this Section will not, by itself, extend, postpone, or affect in any way any obligation of the Defendant under this Consent Decree, unless and until final resolution of the dispute so provides. Stipulated penalties with

respect to the disputed matter will continue to accrue from the first Day of noncompliance, but payment may be stayed pending resolution of the dispute as provided in Paragraph 70. If the Defendant does not prevail on the disputed issue, stipulated penalties will be assessed and paid as provided in Section IX (Stipulated Penalties).

XII. INFORMATION COLLECTION AND RETENTION

88. The United States and its representatives, contractors, and consultants, have the right of entry into any facility covered by this Consent Decree, at all reasonable times, upon presentation of credentials, to:

a. monitor the progress of activities required under this Consent Decree;

b. verify any data or information submitted to the United States in accordance with the terms of this Consent Decree;

c. obtain samples and, upon request, splits of any samples taken by the Defendant or their representatives, contractors, or consultants;

d. obtain documentary evidence, including photographs and similar data; and

e. assess the Defendant's compliance with this Consent Decree.

89. Upon request, the Defendant must provide EPA, or their authorized representatives, splits of any samples taken by the Defendant. Upon request, EPA must provide the Defendant splits of any samples taken by EPA.

90. Notwithstanding Section XX (Termination), and except for data recorded by any video camera required pursuant to Paragraph 21, until three years after the termination of this Consent Decree, the Defendant must retain, and must instruct its contractors and agents to preserve, all non-identical copies of all documents, records, or other information (including

documents, records, or other information in electronic form) in its or its contractors' or agents' possession or control, or that come into its or its contractors' or agents' possession or control, and that relate to Defendant's performance of its obligations under this Consent Decree. This information-retention requirement applies regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United States the Defendant must provide copies of any documents, records, or other information required to be maintained under this Paragraph. The Defendant must retain the data recorded by the video cameras required pursuant to Paragraph 21 for one year from the date of recording.

91. In addition to the requirements of Paragraph 90, after the conclusion of the information-retention period provided in the preceding Paragraph, the Defendant must notify the United States at least 90 Days before the destruction of any documents, records, or other information subject to the requirements of the preceding Paragraph ("Discard Notice"). Within 90 Days after the United States receives the Discard Notice, the United States may provide the Defendant with a written request for production that: (a) identifies specific documents, records, or other information and/or (b) provides a general description of categories of documents, records, or other information, and the Defendant shall produce the requested documents, records, or information to the United States. The Defendant may destroy any documents, records, or other information not requested for production by the United States at any time after 90 Days from the date the United States receives the Discard Notice. The Defendant may assert that certain documents, records, or other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Defendant asserts such a privilege, it must provide the following: (a) the title of the document, record, or information; (b) the date of the

document, record, or information; (c) the name and title of each author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the subject of the document, record, or information; and (f) the privilege asserted by the Defendant. However, no documents, records, or other information created or generated pursuant to the requirements of this Consent Decree may be withheld on grounds of privilege.

92. Except for emissions data, the Defendant may also assert that information required to be provided under this Section is protected as Confidential Business Information ("CBI") under 40 C.F.R. Part 2. As to any information that the Defendant seeks to protect as CBI, the Defendant must follow the procedures set forth in 40 C.F.R. Part 2.

93. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States pursuant to applicable federal or state laws, regulations, or permits, nor does it limit or affect any duty or obligation of the Defendant to maintain documents, records, or other information imposed by applicable federal or state laws, regulations, or permits.

XIII. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

94. Definitions. For purposes of this Section XIII, the following definitions apply:

a. "BTU/scf Flared Gas Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(c)(3)(ii);

ii. 40 C.F.R. § 63.11(b)(6)(ii); and

iii. The provisions of 40 C.F.R. Part 60, 61, and 63 that require compliance with 40 C.F.R. § 60.18(c)(3)(ii) (for example 40 C.F.R. § 61.349(a)(2)(iii)) or 40 C.F.R. § 63.11(b)(6)(ii) (for example 40

C.F.R. § 63.113(a)(1)(i)) and are applicable requirements in a federally enforceable permit for a Covered Plant as of the Date of Lodging.

b. "General Flare Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(c)(1) and 40 C.F.R. § 63.11(b)(4) (both relate to a prohibition on Visible Emissions);

ii. 40 C.F.R. § 60.18(c)(2) and 40 C.F.R. § 63.11(b)(5) (both relate to flame presence);

iii. 40 C.F.R. § 60.18(c)(4) and 40 C.F.R. § 63.11(b)(7) (both relate to exit velocity requirements for Steam-Assisted Flares);

iv. 40 C.F.R. § 60.18(c)(5) and 40 C.F.R. § 63.11(b)(8) (both relate to exit velocity requirements for Air-Assisted Flares); and

v. 40 C.F.R. § 60.18(e) and 40 C.F.R. § 63.11(b)(3) (both relate to operation during emissions venting).

c. "Good Air Pollution Control Practice Requirements" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.11(d);

ii. 40 C.F.R. § 61.12(c); and

iii. 40 C.F.R. § 63.6(e)(1)(i).

d. "PSD/NNSR Requirements" shall mean the Prevention of Significant Deterioration and Non-Attainment New Source Review requirements found in the following:

i. 42 U.S.C. § 7475;

ii. 40 C.F.R. §§ 52.21(a)(2)(iii) and 52.21(j)–52.21(r)(5);

iii. 42 U.S.C. §§ 7502(c)(5) and 7503(a)–(c);

iv. 40 C.F.R. Part 51, Appendix S, Part IV, Conditions 1–4;

v. any applicable, federally enforceable state or local regulation that implements, adopts, or incorporates the federal provisions cited in sub-Paragraphs 94.d.i–iv; and

vi. any applicable Title V permit requirement that implements, adopts, or incorporates the federal provisions or federally enforceable state provisions cited in sub-Paragraphs 94.d.i–v.

f. "Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design" shall mean the requirements found in the following regulations:

i. 40 C.F.R. § 60.18(d);

ii. 40 C.F.R. § 63.11(b)(1); and

iii. The provisions of 40 C.F.R. Part 60, 61, and 63 that require compliance with 40 C.F.R. § 60.18(d) (for example 40 C.F.R. § 61.349(a)(2)(iii)) or 40 C.F.R. § 63.11(b)(1) (for example 40 C.F.R. § 63.113(a)(1)(i)) and are applicable requirements in a federally enforceable permit for a Covered Plant as of the Date of Lodging.

95. Entry of this Consent Decree resolves the civil claims of the United States for the violations alleged in the Complaint filed in this action and occurring through the Date of Lodging, and as noted below.

96. Resolution of Claims for Violating PSD/NNSR Requirements at the Covered Flares. With respect to emissions of VOCs, NOx, and CO from the Covered Flares, entry of this Consent Decree resolves the civil claims of the United States against the Defendant for violations of the PSD/NNSR Requirements resulting from construction or modification from the date of the pre-Lodging construction or modification through the later of the dates set forth in Appendix 1.1 columns D, J, or L .

97. Resolution of Pre-Lodging Claims at the Covered Flares for Failing to Comply with: (a) BTU/scf Flared Gas Requirements and (b) General Flare Requirements. With respect to

emissions of VOCs and HAPs from the Covered Flares, entry of this Consent Decree resolves the civil claims of the United States against the Defendant for violations of the following requirements from the date those claims accrued until the Date of Lodging: a) BTU/scf Flared Gas Requirements and b) General Flare Requirements.

98. Resolution of Claims for Failing to Comply with Requirements Related to Good Air Pollution Control Practices and Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design for all Covered Flares. With respect to emissions of VOCs and HAPs from the Covered Flares, entry of this Consent Decree resolves the civil claims of the United States against the Defendant for violations of Good Air Pollution Control Practice Requirements and Requirements Related to Monitoring, Operation, and Maintenance According to Flare Design, but only to the extent that the claims are based on the Defendant's use of too much steam in relation to Vent Gas flow. The resolution in this Paragraph extends through the compliance date for Paragraph 43.b for each Covered Flare as set forth in Appendix 1.1.

99. Resolution of Title V Violations. Entry of this Consent Decree resolves the civil claims of the United States against the Defendant for the violations of Sections 502(a), 503(c), and 504(a) of the CAA, 42 U.S.C. §§ 7661a(a), 7661b(c), 7661c(a), and of 40 C.F.R. §§ 70.1(b), 70.5(a) and (b), 70.6(a) and (c), and 70.7(b), that are based upon the violations resolved by Paragraphs 96–98 for the time frames set forth in those Paragraphs.

100. Reservation of Rights — Resolution of Liability in Paragraphs 96 and 98–99 can be Rendered Void. Notwithstanding the resolution of liability in Paragraphs 96 and 98–99, for the period of time between the Date of Lodging and the post-lodging dates specified in Paragraphs 96 and 98–99, those resolutions of liability will be rendered void if the Defendant

materially fails to comply with any of the obligations and requirements of Section V (Compliance Requirements) and Section VII (Emission Credit Generation). To the extent that a material failure involves a particular Covered Plant, the resolution of liability will be rendered void only with respect to claims involving that particular Covered Plant. The resolutions of liability in Paragraphs 96 and 98–99 will not be rendered void if the Defendant, as expeditiously as practicable, remedies such material failure and pays all stipulated penalties due as a result of such material failure.

101. The United States reserves all legal and equitable remedies available to enforce the provisions of this Consent Decree. This Consent Decree will not be construed to limit the rights of the United States to obtain penalties or injunctive relief under the Clean Air Act, or implementing regulations, or under other federal or state laws, regulations, or permit conditions, except as specified in Paragraphs 95–99. The United States further reserves all legal and equitable remedies to address any imminent and substantial endangerment to the public health or welfare or the environment arising at, or posed by, the Covered Plants, whether related to the violations addressed in this Consent Decree or otherwise.

102. In any subsequent administrative or judicial proceeding initiated by the United States for injunctive relief, civil penalties, other appropriate relief relating to a Covered Plant or the Defendant's violations, the Defendant must 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 upon any contention that the claims raised by the United States in the subsequent proceeding were or should have been brought in the

instant case, except with respect to claims that have been specifically resolved pursuant to Paragraphs 95–99.

103. This Consent Decree is not a permit, or a modification of any permit, under any federal, state, or local laws or regulations. The Defendant is responsible for achieving and maintaining compliance with all applicable federal, state, and local laws, regulations, and permits; and the Defendant's compliance with this Consent Decree is no defense to any action commenced pursuant to any such laws, regulations, or permits, except as set forth herein. The United States does not, by its consent to the entry of this Consent Decree, warrant or aver in any manner that the Defendant's compliance with any aspect of this Consent Decree will result in compliance with provisions of the Clean Air Act, 42 U.S.C. § 7401 *et seq.* or with any other provisions of federal, state, or local laws, regulations, or permits.

104. This Consent Decree does not limit or affect the rights of the Defendant or of the United States against any third parties, not party to this Consent Decree, nor does it limit the rights of third parties, not party to this Consent Decree, against the Defendant, except as otherwise provided by law.

105. This Consent Decree must not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

XIV. COSTS

106. The Parties must bear their own costs of this action, including attorneys' fees, except that the United States is entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by the Defendant.

XV. 26 U.S.C. § 162(f)(2)(A)(ii) IDENTIFICATION

107. For purposes of the identification requirement of Section 162(f)(2)(A)(ii) of the Internal Revenue Code, 26 U.S.C. § 162(f)(2)(A)(ii), and 26 C.F.R. § 162-21(b)(2), performance of Section II (Applicability), Paragraph 10; Section V (Compliance Requirements), Paragraphs 17–31 and 33–47; Section VI (Permits), Paragraphs 48–49; Section VIII (Reporting Requirements), Paragraphs 54–59; Section XII (Information Collection and Retention), Paragraphs 88-91; and related Appendices 1.2-1.7 and 2.2 is restitution, remediation, or required to come into compliance with law.

XVI. NOTICES

108. Unless otherwise specified herein, whenever notifications, submissions, statements of position, or communications are required by this Consent Decree (referred in this Paragraph as a "Notice" or "Notices"), they must be delivered electronically to the address listed below, unless such Notices are unable to be uploaded to the CDX electronic system (in the case of the EPA) or transmitted by email (in the case of any other Party). For all Notices to the EPA, the Defendant must register for the CDX electronic system and upload such Notices at: https://cdx.epa.gov. The EPA email addresses listed below are to permit the submission of additional electronic courtesy copies. Any Notice that cannot be uploaded or electronically transmitted via email (to any Party) must be provided in writing by U.S. mail or courier to the addresses below:

As to the United States by email: eescdcopy.enrd@usdoj.gov
Re: 90-5-2-1-11288

and to EPA as set forth below.

As to the United States by mail:

EES Case Management Unit
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611
Re: 90-5-2-1-11288

and to EPA as set forth below.

As to the United States Attorney for the Southern District of Texas by mail:

United States Attorney
Southern District of Texas
1000 Louisiana St., Suite 2300
Houston, TX 77002

As to EPA by mail:

Director, Air Enforcement Division
Office of Civil Enforcement
U.S. Environmental Protection Agency
Mail Code 2242-A
Regular Mail: 1200 Pennsylvania Ave, N.W.
William Jefferson Clinton Building
Room 1119
Washington, DC 20460-0001
Express Mail: Use same address but use 20004 as the zip code

and

Associate Director
Air, Toxics, and Inspections Coordination Branch (6 EN-A)
U.S. EPA, Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75201

As to EPA by email:

parrish.robert@epa.gov
foley.patrick@epa.gov
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As to the Defendant:

David Speaker
Managing Counsel – EHS&S
Legal & Public Affairs
Chevron Phillips Chemical Company
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109. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided above.

110. Notices submitted pursuant to this Section will be deemed submitted upon mailing, unless otherwise provided in this Consent Decree or by mutual agreement of the Parties in writing.

XVII. EFFECTIVE DATE

111. The Effective Date of this Consent Decree is the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first, as recorded on the Court's docket.

XVIII. RETENTION OF JURISDICTION

112. The Court retains jurisdiction over this case until termination of this Consent Decree, for the purpose of: a) resolving disputes arising under this Decree pursuant to Section XI, b) entering orders modifying this Decree pursuant to Section XIX, and c) effectuating or enforcing compliance with the terms of this Decree.

XIX. MODIFICATION

113. Except as otherwise allowed in Paragraphs 14 and 109 (notice recipients and addresses), the terms of this Consent Decree, including any attached appendices, may be

modified only by a subsequent written agreement signed by all the Parties. Where the modification constitutes a material change to this Decree, it will be effective only upon approval by the Court.

114. Any disputes concerning modification of this Decree must be resolved pursuant to Section XI (Dispute Resolution), provided, however, that, instead of the burden of proof provided by Paragraph 86, the Party seeking the modification bears the burden of demonstrating that it is entitled to the requested modification in accordance with Federal Rule of Civil Procedure 60(b).

XX. TERMINATION

115. Before seeking termination of the entire Consent Decree or the set of requirements applicable to one or more Covered Plants, the Defendant must:

a. Pay the civil penalty and any accrued stipulated penalties as required by this Consent Decree;

b. Satisfactorily comply with all provisions of Section V (Compliance Requirements) applicable to the Covered Plant that is subject to the termination request;

c. Operate for at least one year in satisfactory compliance with the limitations and standards set forth in Paragraphs 36 (Limitations on Flaring at the Port Arthur Plant and Sweeny Plant) and 38 (Flare Gas Recovery at the Cedar Bayou Plant), 43.b-c (NHV_{cz} and NHV_{dil} standards), and 44 (98% Combustion Efficiency) for all of the Covered Flares at the Covered Plant that is subject to the termination request;

d. Receive Non-Title V air permits in accordance with Paragraph 49.a that contain the Consent Decree limits and standards specified in Paragraph 49.c for all Covered Flares at the Covered Plant that is the subject to the termination request; and

e. Apply for a modification or amendment to the applicable Title V air permits, necessary to ensure that the Consent Decree limits and standards specified in Paragraph 49.c survive termination of this Consent Decree for all of the

Covered Flares at the Covered Plant that is subject to the termination request.

116. After the Defendant believes it has satisfied the conditions for termination set forth in the preceding Paragraph for either the entire Consent Decree or for one or more of the Covered Plants, the Defendant may submit a request for termination to the United States by certifying such compliance in accordance with the certification language in Paragraph 59 ("Request for Termination"). In the Request for Termination, the Defendant must demonstrate that it has satisfied the conditions for termination set forth in the preceding Paragraph, as well as submit all necessary supporting documentation.

117. Following receipt by the United States of the Defendant's Request for Termination, the Parties will confer informally concerning the request. If the United States agrees that the Decree may be terminated, the Parties will submit, for the Court's approval, a joint stipulation terminating the Decree.

118. If the United States does not agree that the Decree may be terminated or if the Defendant does not receive a written response from the United States within 90 Days of the Defendant's submission of the Request for Termination, the Defendant may invoke dispute resolution under Section XI.

XXI. PUBLIC PARTICIPATION

119. This Consent Decree must be lodged with the Court for a period of not less than 30 Days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments regarding the Consent Decree disclose facts or considerations indicating that the Consent Decree is inappropriate, improper, or inadequate. The Defendant consents to entry of this Consent Decree without further

notice and agrees not to withdraw from or oppose entry of this Consent Decree by the Court or to challenge any provision of the Decree, unless the United States has notified the Defendant in writing that it no longer supports entry of the Decree.

XXII. SIGNATORIES/SERVICE

120. Each undersigned representative of the Defendant and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party or Parties he or she represents to this document.

121. This Consent Decree may be signed in counterparts, and its validity cannot be challenged on that basis. The Defendant agrees to accept service of process by mail with respect to all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons.

XXIII. INTEGRATION

122. This Consent Decree constitutes the final, complete, and exclusive agreement and understanding among the Parties with respect to the settlement embodied in the Decree and supersedes all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein. Other than deliverables that are subsequently submitted and approved pursuant to this Decree, the Parties acknowledge there are no representations, agreements, or understandings relating to the settlement other than those expressly contained in this Consent Decree.

XXIV. FINAL JUDGMENT

123. Upon approval and entry of this Consent Decree by the Court, this Consent Decree constitutes a final judgment of the Court as to the United States and the Defendant.

XXV. APPENDICES

124. The Appendices listed in the Tables of Appendices are attached to and part of this Consent Decree.

Dated and entered this _____ Day of _____, 202____

_____
UNITED STATES DISTRICT JUDGE
SOUTHERN DISTRICT OF TEXAS

Subject to the notice and comment requirements of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States v. Chevron Phillips Chemical Company LP* (S.D. Tex.).

FOR THE UNITED STATES OF AMERICA

TODD KIM
Assistant Attorney General
Environment and Natural Resources Division
U.S. Department of Justice

Attorney-in-Charge:

THOMAS CARROLL Digitally signed by THOMAS CARROLL Date: 2022.03.01 09:16:02 -05'00'

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Subject to the notice and comment requirements of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States v. Chevron Phillips Chemical Company LP* (S.D. Tex.).

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LAWRENCE STARFIELD

Digitally signed by LAWRENCE STARFIELD
Date: 2022.02.24 12:40:26 -05'00'

LAWRENCE E. STARFIELD
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ROBERT PARRISH
Attorney Advisor, Air Enforcement Division
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U.S. Environmental Protection Agency
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

Subject to the notice and comment requirements of 28 C.F.R. § 50.7, THE UNDERSIGNED PARTIES enter into this Consent Decree entered in the matter of the *United States v. Chevron Phillips Chemical Company LP* (S.D. Tex.).

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 6

Cheryl D. Seager

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CHERYL SEAGER
Director - Compliance Assurance and Enforcement Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Ave.
Dallas, TX 75202-2733

THE UNDERSIGNED PARTY enters into this Consent Decree entered in the matter of the *United States v. Chevron Phillips Chemical Company LP* (S.D. Tex.).

FOR CHEVRON PHILLIPS CHEMICAL COMPANY LP

Timothy J. Hill
Sr. Vice President, Legal & Public Affairs and
General Counsel
Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, Texas 77380

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APPENDICES TO CONSENT DECREE

APPENDIX 1.1

Compliance Schedule

Appendix 1.1 Covered Flares and Applicability Dates for Certain Consent Decree Requirements											
SITE	FLARE	FLARE DATA AND MONITORING SYSTEMS PROTOCOL REPORT	MONITORING & CONTROLS SYSTEMS & SPECIFIC EMISSION STANDARDS FOR COVERED FLARES	VIDEO CAMERA VISIBLE EMISSIONS MONITORING	INITIAL WASTE GAS MINIMIZATION PLAN	FIRST UPDATED WASTE GAS MINIMIZATION PLAN	ROOT CAUSE ANALYSIS – REPORTABLE FLARING EVENTS	HOURLY FLARING LIMITS	MEET FIRST CALCULATED 365-DAY FLARING LIMITS	FLARE GAS RECOVERY SYSTEM COMMISSIONING DATE	FLARE GAS RECOVERY SYSTEM COMPLIANCE DATE
A	B	C	D	E	F	G	H	I	J	K	L
Reference Paragraphs											
		17	18-20, 22, 24-26, 43.b-c, 44	21	28	29	33	36.b	36.a, 37	38.a-b	38.c
Cedar Bayou	CB-701	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	09/30/2023	06/30/24
Cedar Bayou	FS-541	03/31/2023	03/31/2022	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	X-901	03/31/2023	03/31/2022	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	Z-101	03/31/2023	03/31/2022	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	Z-251	03/31/2023	03/31/2022	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	Z-1101	02/29/2024	02/28/2023	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	CB-710	02/29/2024	02/28/2023	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Cedar Bayou	FS-9004	02/29/2024	02/28/2023	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Port Arthur	Flare 24	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date + 365 Days	Effective Date + 730 Days	N/A	N/A
Port Arthur	Flare 40	03/31/2023	03/31/2022	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Sweeny	Flare 4	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Sweeny	Flare 8	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Sweeny	Flare 9	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	N/A	N/A	N/A	N/A
Sweeny	Flare 10	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date	Effective Date + 365 Days	N/A	N/A
Sweeny	Flare 12	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date	Effective Date + 365 Days	N/A	N/A
Sweeny	Flare 14	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date	Effective Date + 365 Days	N/A	N/A

Appendix 1.1 Covered Flares and Applicability Dates for Certain Consent Decree Requirements											
SITE	FLARE	FLARE DATA AND MONITORING SYSTEMS PROTOCOL REPORT	MONITORING & CONTROLS SYSTEMS & SPECIFIC EMISSION STANDARDS FOR COVERED FLARES	VIDEO CAMERA VISIBLE EMISSIONS MONITORING	INITIAL WASTE GAS MINIMIZATION PLAN	FIRST UPDATED WASTE GAS MINIMIZATION PLAN	ROOT CAUSE ANALYSIS – REPORTABLE FLARING EVENTS	HOURLY FLARING LIMITS	MEET FIRST CALCULATED 365-DAY FLARING LIMITS	FLARE GAS RECOVERY SYSTEM COMMISSIONING DATE	FLARE GAS RECOVERY SYSTEM COMPLIANCE DATE
A	B	C	D	E	F	G	H	I	J	K	L
Reference Paragraphs											
		17	18-20, 22, 24-26, 43.b-c, 44	21	28	29	33	36.b	36.a, 37	38.a-b	38.c
Sweeny	Flare 20	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date	Effective Date + 365 Days	N/A	N/A
Sweeny	Flare 22	Effective Date + 365 Days	Effective Date	Effective Date + 90 Days	Effective Date + 365 Days	Effective Date + 730 Days	Effective Date + 365 Days	Effective Date	Effective Date + 365 Days	N/A	N/A

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APPENDICES TO CONSENT DECREE

APPENDIX 1.2

Calculating Combustion Efficiency, Net Heating Value of the Combustion Zone Gas (NHV_{cz}), the Net Heating Value Dilution Parameter (NHV_{dil}), and Flare Tip Velocity

APPENDIX 1.2

All abbreviations, constants, and variables are defined in the Key on Page 8 of this Appendix.

Combustion Efficiency Equation:

$$CE = [CO_2]/([CO_2] + [CO] + [OC])$$

where:

$[CO_2]$ = Concentration in volume percent or ppm-meters of carbon dioxide in the combusted gas immediately above the Combustion Zone

$[CO]$ = Concentration in volume percent or ppm-meters of carbon monoxide in the combusted gas immediately above the Combustion Zone

$[OC]$ = Concentration in volume percent or ppm-meters of the sum of all organic carbon compounds in the combusted gas immediately above the Combustion Zone, counting each carbon molecule separately where the concentration of each individual compound is multiplied by the number of carbon atoms it contains before summing (*e.g.*, 0.1 volume percent ethane shall count as 0.2 percent OC because ethane has two carbon atoms)

For purposes of using the *CE* equation, the unit of measurement for CO_2, CO, and OC must be the same; that is, if "volume percent" is used for one compound, it must be used for all compounds. "Volume percent" cannot be used for one or more compounds and "ppm-meters" for the remainder.

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

The Company 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 the Company monitors separate gas streams that combine to comprise the total Vent Gas flow to a Covered 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 the Company complies with Paragraph 22 by collecting compositional analysis data in accordance with the method set forth in 22.a: 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 the Company complies with Paragraph 22 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in 22.b 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 the Company complies with Paragraph 22 by collecting direct Net Heating Value monitoring data in accordance with the method set forth in 22.b 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 Consent Decree, 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 Covered Flare for which the Company complies with Paragraph 22 by using a continuous monitoring system in accordance with the method set forth in 22.a or 22.b: The Company 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). The Company need not elect to use the same methodology at all Covered Flares with a continuous monitoring system; however, for each such Covered Flare, the Company 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 Covered Flare. If the Company intends to change the calculation method that applies to a Covered Flare, the Company 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

The Company 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 the Company complies with Paragraph 19 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 the Company complies with Paragraph 19 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, 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 the Company elects to use a mass flow monitor to determine volumetric flow rate of Vent Gas, the Company must collect

APPENDIX 1.2

compositional analysis data for such Vent Gas in accordance with the method set forth in 22.a. 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 the Company complies with Paragraph 19 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 22.a.

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

For any Covered 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, the Company 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 Covered 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, $NHV_{cz} = NHV_{vg}$.

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

APPENDIX 1.2

Step 4: Calculate the Net Heating Value Dilution Parameter (NHV_{dil})

For any Covered 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 6 shall be used to determine the 15-minute block average NHV_{dil} only during periods when Perimeter Assist Air is used. For 15-minute block periods when there is no cumulative volumetric flow of Perimeter Assist Air, the 15-minute block average NHV_{dil} parameter does not need to be calculated.

$$NHV_{dil} = \frac{\left[\left(Q_{vg} - Q_{NG2} + Q_{NG1}\right) * NHV_{vg} + \left(Q_{NG2} - Q_{NG1}\right) * NHV_{NG}\right] * Diam}{\left(Q_{vg} + Q_s + Q_{a,premix} + Q_{a,perimeter}\right)} \qquad \textit{Equation 6}$$

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, the Company 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 Covered Flares: Equation 7 shall be used to determine the 15-minute block average NHV_{dil} based on the 15-minute block average vent gas and Perimeter Assist Air flow rates, only during periods when Perimeter Assist Air is used. For 15-minute block periods when there is no cumulative volumetric flow of Perimeter Assist Air, the 15- minute block average NHV_{dil} parameter does not need to be calculated.

$$NHV_{dil} = \frac{Q_{vg} * Diam * NHV_{vg}}{\left(Q_{vg} + Q_s + Q_{a,premix} + Q_{a,perimeter}\right)} \qquad \textit{Equation 7}$$

Step 5: 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 Covered Flare for at least 15-minutes. Equation 8 shows this relationship.

$$NHV_{cz} \geq 270\ BTU/scf \qquad \textit{Equation 8}$$

Step 6: Ensure that during Flare operation, $NHV_{dil} \geq 22$ BTU/ft^2

A Flare actively receiving Perimeter Assist Air must be operated to ensure that NHV_{dil} is equal to or above 22 BTU/ft^2, as determined for each 15-minute block period when Supplemental,

APPENDIX 1.2

Sweep, and/or Waste Gas is routed to a Covered Flare for at least 15-minutes. Equation 9 shows this relationship.

$$NHV_{dil} \geq 22\ BTU/ft^2 \qquad \textit{Equation 9}$$

Calculation Method for Determining Compliance with Vtip Operating Limits.

The Company shall determine Vtip on a 15-minute Block Average basis according to the following requirements:

(a) Defendants shall use design and engineering principles and the guidance in Appendix 1.3 to determine the Unobstructed Cross Sectional Area of the Flare Tip. The Unobstructed Cross Sectional Area of the Flare Tip is the total tip area that Vent Gas can pass through. This area does not include any stability tabs, stability rings, and Upper Steam or air tubes because Vent Gas does not exit through them.

(b) Defendants shall determine the cumulative volumetric flow of Vent Gas for each 15-minute Block Average Period using the data from the continuous flow monitoring system required in Paragraph 19 according to the requirements in Step 2 above.

(c) The 15-minute Block Average Vtip shall be calculated using Equation 10.

$$Vtip = \frac{Q_{cum}}{Areax900} \qquad \textit{Equation 10}$$

(d) If Settling Defendants choose to comply with Paragraph 40.b, Defendants shall also determine the NHVvg using Step 1 above and calculate Vmax using Equation 11 in order to compare Vtip to Vmax on a 15-minute Block Average basis.

$$log_{10}(V_{max}) = \frac{NHV_{vg} + 1{,}212}{850} \qquad \textit{Equation 11}$$

APPENDIX 1.2

Key to the Abbreviations:

$385.3 = conversion\ factor\ (scf/lb\text{-}mol)$
850 = Constant
900 = Conversion factor, (seconds / 15-minute block average)
1,212 = Constant
Area = The unobstructed cross sectional area of the flare tip is the total tip area that vent gas can pass through, ft². This area does not include any stability tabs, stability rings, and upper steam or air tubes because flare vent gas does not exit through them. Use design and engineering principles to determine the unobstructed cross sectional area of the flare tip.
Diam = Effective diameter of the unobstructed area of the flare tip for flare vent gas flow, ft. Determine the diameter as $Diam = 2 * \sqrt{Area \div \pi}$
$i = individual\ component\ in\ Vent\ Gas\ (unitless)$
$MWt = molecular\ weight\ of\ the\ gas\ at\ the\ flow\ monitoring\ location\ (lb/lb\text{–}mol)$
$n = number\ of\ components\ in\ Vent\ Gas\ (unitless)$
$NHV_{cz} = Net\ Heating\ Value\ of\ Combustion\ Zone\ Gas\ (BTU/scf)$
$NHV_i = Net\ Heating\ Value\ of\ component\ i\ according\ to\ Table\ 1\ of\ this\ Appendix\ (BTU/scf)$
$NHV_{measured} = Net\ Heating\ Value\ of\ Vent\ Gas\ stream\ as\ measured\ by\ monitoring\ system\ (BTU/scf)$
$NHV_{NG} = Net\ Heating\ Value\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15-minute\ block\ period\ (BTU/scf)$
$NHV_{vg} = Net\ Heating\ Value\ of\ Vent\ Gas\ (BTU/scf)$
$Q_{a,perimeter} = cumulative\ vol\ flow\ of\ perimeter\ assist\ air\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{a,premix} = cumulative\ vol\ flow\ of\ premix\ assist\ air\ during\ the\ 15-minute\ block\ period\ (scf)$
Qcum = cumulative volumetric flow over 15-minute block average period (scf)
$Q_{mass} = massflow\ rate\ (pounds\ per\ second)$
$Q_{NG1} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ previous\ 15-minute\ block\ period\ (scf)$
$Q_{NG2} = cumulative\ vol\ flow\ of\ Supplemental\ Gas\ to\ flare\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_s = cumulative\ vol\ flow\ of\ Total\ Steam\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{vg} = cumulative\ vol\ flow\ of\ Vent\ Gas\ during\ the\ 15-minute\ block\ period\ (scf)$
$Q_{vol} = volumetric\ flow\ rate\ (scf\ per\ second)$
Vmax = Maximum allowed flare tip velocity (feet per second)
Vtip = Flare tip velocity (feet per second)
$x_i = concentration\ of\ component\ i\ in\ Vent\ Gas\ (vol\ fraction)$
$x_{H2} = concentration\ of\ H2\ in\ Vent\ Gas\ at\ time\ sample\ was\ input\ into\ NHV\ monitoring\ system\ (vol\ fraction)$

APPENDIX 1.2

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
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.

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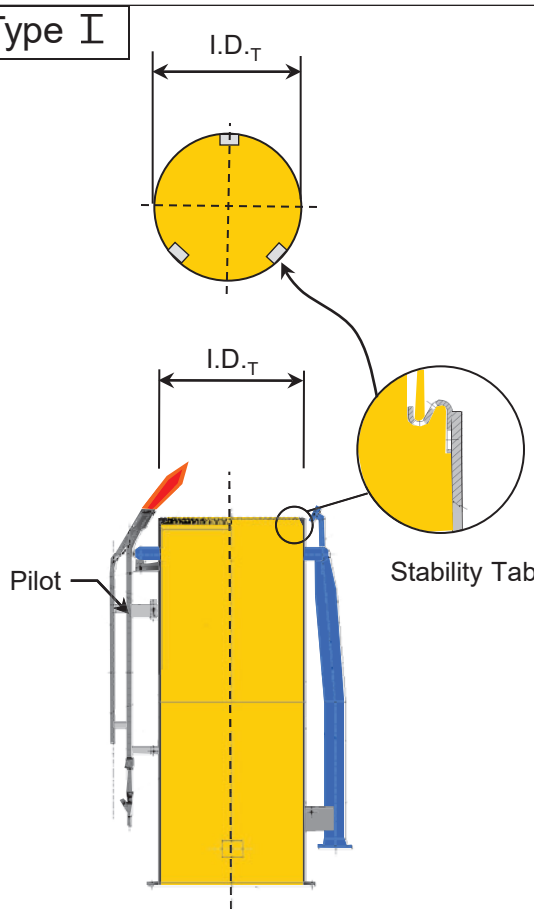
APPENDICES TO CONSENT DECREE

APPENDIX 1.3

Calculating the Unobstructed Cross Sectional Area of Various Types of Flare Tips

APPENDIX 1.3

Type I



$$A_{tip\text{-}unob} = \pi(I.D._T)^2/4 - (X_T * A_{ST})$$

Where:

- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter Flare Tip
- X_T = Number of Stability Tabs
- A_{ST} = Area of a Stability Tab

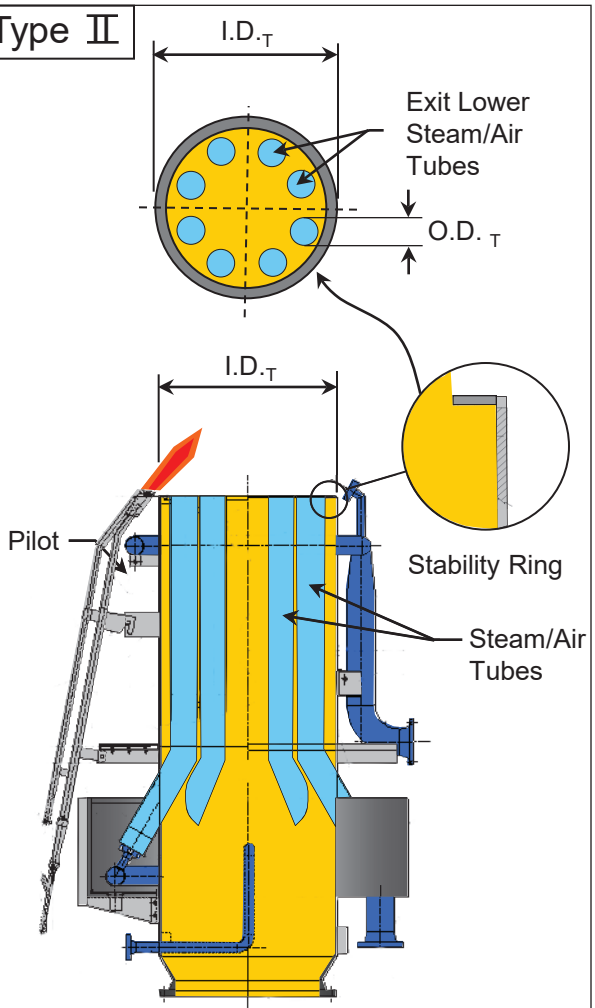
Example:

- $I.D._T$ = 41.5 inches
- X_T = 3
- A_{ST} = 3 Sq. inches

$A_{tip\text{-}unob} = \pi(41.5)^2/4 - (3 * 3)$

$A_{tip\text{-}unob}$ = 1344 Sq. inches

Type II



$$A_{tip\text{-}unob} = \pi(I.D._T)^2/4 - A_{ST} - N_T * \pi * (O.D._T)^2/4$$

Where:

- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter Flare Tip
- A_{ST} = Area of Stability Ring
- $O.D._T$ = Outside Diameter of Steam/Air Tubes
- N_T = Number of Steam/Air Tubes

Example:

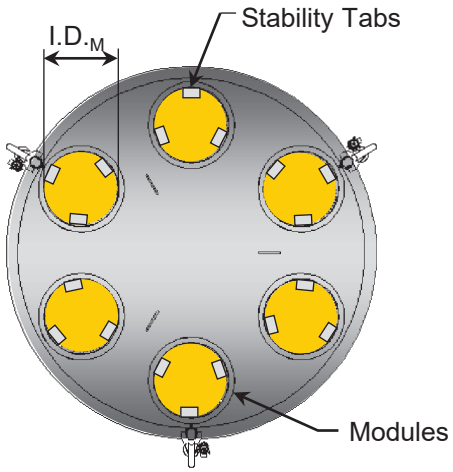
- $I.D._T$ = 47.5 inches
- A_{ST} = 100 Sq. inches
- $O.D._T$ = 6.5 inches
- N_T = 8

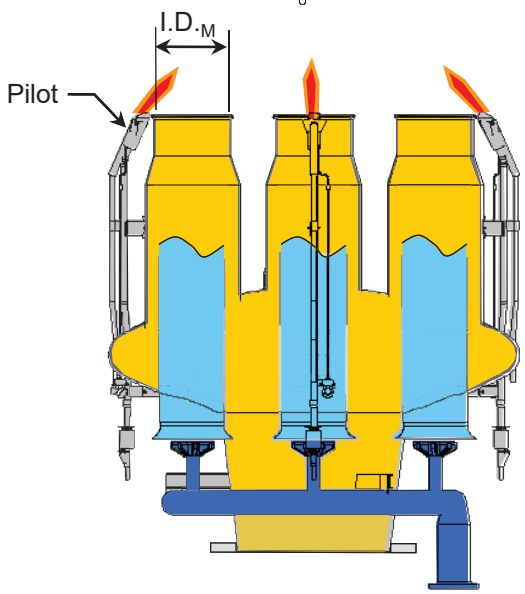
$A_{tip\text{-}unob} = \pi\ (47.5)^2/4 - 100 - 8 * \pi * (6.5)^2/4$

$A_{tip\text{-}unob}$ = 1322 Sq. inches

APPENDIX 1.3

Type III





$$A_{tip\text{-}unob} = N_M * (\pi * (I.D._M)^2/4 - X_T * A_{ST})$$

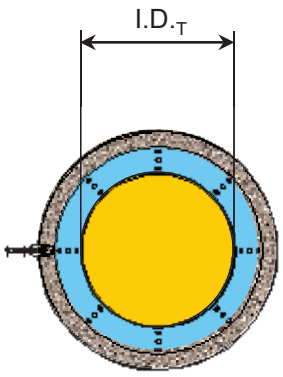
Where:
- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._M$ = Inside Diameter of One Tip Module
- N_M = Number of Modules
- X_T = Number of Stability Tabs per Module
- A_{ST} = Area of a Stability Tab

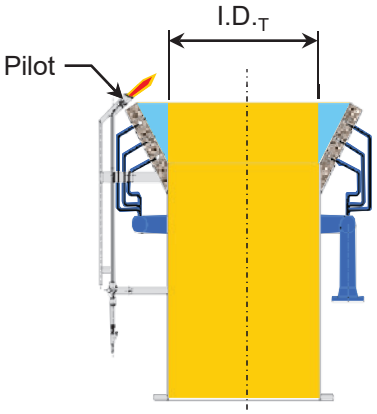
Example:
- $I.D._M$ = 17 inches
- N_M = 6
- X_T = 3
- A_{ST} = 3 Sq. inches

$$A_{tip\text{-}unob} = 6 * (\pi * (17)^2/4 - 3 * 3)$$

$$A_{tip\text{-}unob} = 1308 \text{ Sq. inches}$$

Type IV





$$A_{tip\text{-}unob} = \pi (I.D._T)^2/4$$

Where:
- $A_{tip\text{-}unob}$ = Unobstructed Cross Sectional Area of Flare Tip
- $I.D._T$ = Inside Diameter of Flare Tip

Example:
- $I.D._T$ = 41.5 inches

$$A_{tip\text{-}unob} = \pi (41.5)^2/4$$

$$A_{tip\text{-}unob} = 1353 \text{ Sq. inches}$$

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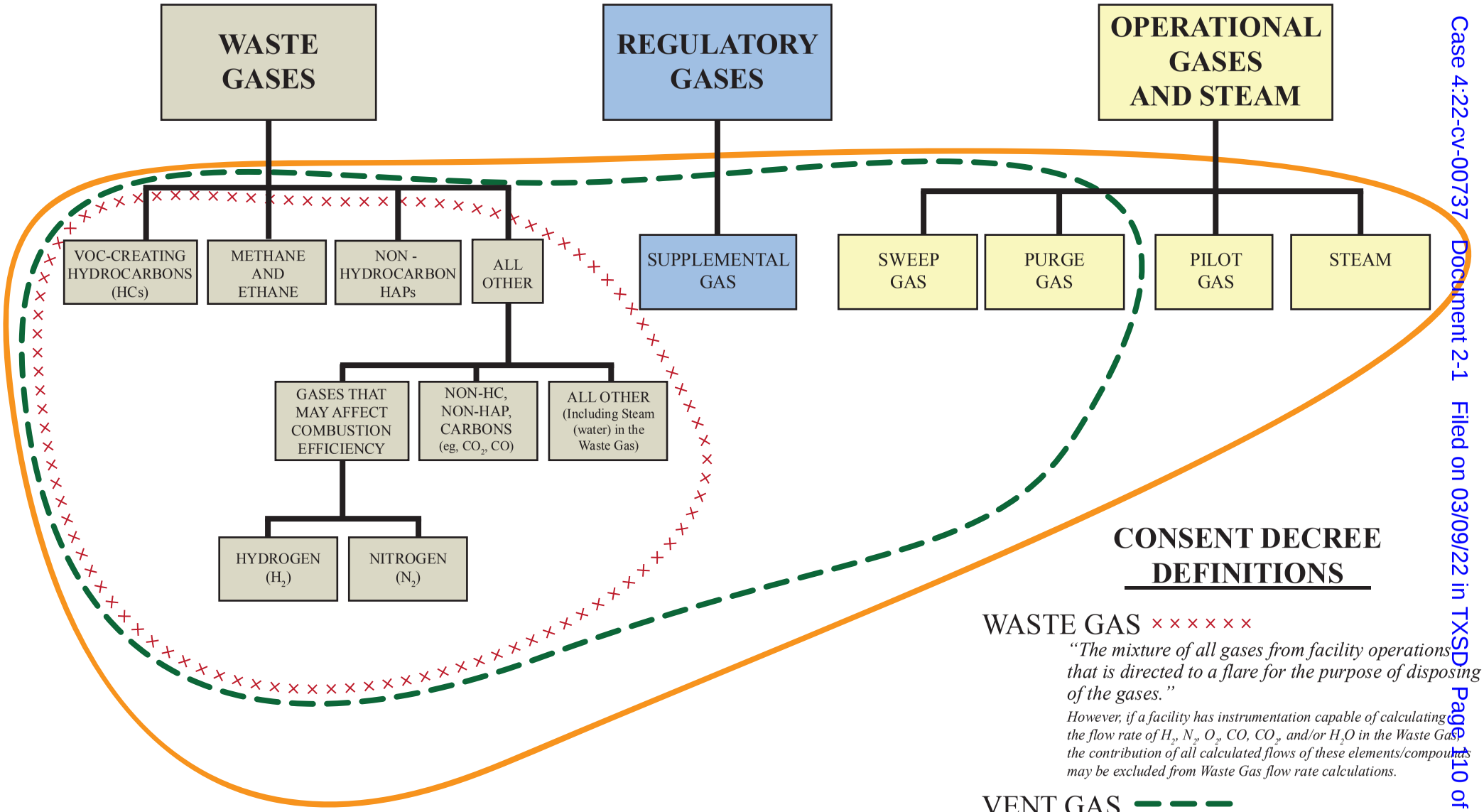
APPENDIX 1.4

Depiction of Gases Associated with Steam-Assisted Flares

DEPICTION OF GASES ASSOCIATED WITH STEAM-ASSISTED FLARES



CONSENT DECREE DEFINITIONS

WASTE GAS ××××××

"The mixture of all gases from facility operations that is directed to a flare for the purpose of disposing of the gases."

However, if a facility has instrumentation capable of calculating the flow rate of H_2, N_2, O_2, CO, CO_2, and/or H_2O in the Waste Gas, the contribution of all calculated flows of these elements/compounds may be excluded from Waste Gas flow rate calculations.

VENT GAS – – –

"The mixture of all gases found prior to the flare tip. This includes all Waste Gas, Supplemental Gas, Sweep Gas, and Purge Gas."

COMBUSTION ZONE GAS ———

"The mixture of all gases and steam found just after the flare tip. This includes all Vent Gas, Pilot Gas, and Total Steam."

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APPENDICES TO CONSENT DECREE

APPENDIX 1.5

Outline of Requirements for the Flare Data and Initial Monitoring Systems Report

APPENDIX 1.5

OUTLINE OF REQUIREMENTS FOR THE FLARE DATA AND INITIAL MONITORING SYSTEMS REPORT

1. Facility-Wide

    1.1 Facility plot plan showing the location of each Flare in relation to the general plant layout

2. General Description of Flare

    2.1 Ground or elevated
    2.2 Type of assist system
    2.3 Simple or integrated (*e.g.*, sequential, staged)
    2.4 Date first installed
    2.5 History of any physical changes to the Flare
    2.6 Whether the Flare is a Backup Flare, and if so, the duration and time periods of use
    2.7 Flare Gas Recovery System ("FGRS"), if any, and date first installed

3. Flare Components: Complete description of each major component of the Flare, except the Flare Gas Recovery System (*see* Part 5), including but not limited to:

    3.1 Flare stack (for elevated flares)
    3.2 Flare tip
        3.2.1 Date installed
        3.2.2 Manufacturer
        3.2.3 Tip Size
        3.2.4 Tip Drawing
        3.2.5 Smokeless Design Capacity
    3.3 Knockout or surge drum(s) or pot(s), including dimensions and design capacities
    3.4 Water seal(s), including dimensions and design parameters
    3.5 Flare header(s)
    3.6 Sweep Gas system
    3.7 Purge gas system
    3.8 Pilot gas system
    3.9 Supplemental gas system
    3.10 Assist system
    3.11 Ignition system

4. Simplified process diagram(s) showing the configuration of the components listed in Paragraph 3

APPENDIX 1.5

5. Cedar Bayou Flare Gas Recovery System ("FGRS")

    5.1 Complete description of each major component, including but not limited to:
        5.1.1 Compressor(s), including design capacities
        5.1.2 Water seal(s), rupture disk, or similar device to divert the flow
    5.2 Maximum actual past flow on an scfm basis and the annual average flow in scfm for the five years preceding Date of Lodging
    5.3 Simplified schematic showing the FGRS
    5.4 Process Flow Diagram that adds the FGRS to the diagrams referenced in Part 4

6. Flare Design Parameters

    6.1 Maximum Vent Gas Flow Rate and/or Mass Rate
    6.2 Maximum Sweep Gas Flow Rate and/or Mass Rate
    6.3 Maximum Purge Gas Flow and/or Mass Rate, if applicable
    6.4 Maximum Pilot Gas Flow and/or Mass Rate
    6.5 Maximum Supplemental Gas Flow Rate and/or Mass Rate
    6.6 If steam-assisted, Minimum Total Steam Rate, including all available information on how that Rate was derived

7. Gases Venting to Flare

    7.1. Sweep Gas
        7.1.1 Type of gas used
        7.1.2 Actual set operating flow rate (in scfm)
        7.1.3 Average lower heating value expected for each type of gas used
    7.2 Purge Gas, if applicable
        7.2.1 Type of gas used
        7.2.2 Actual set operating flow rate (in scfm)
        7.2.3 Average lower heating value expected for each type of gas used
    7.3 Pilot Gas
        7.3.1 Type of gas used
        7.3.2 Actual set operating flow rate (in scfm)
        7.3.3 Average lower heating value expected for each type of gas used
    7.4 Supplemental Gas
        7.4.1 Type of gas used
        7.4.2 Average lower heating value expected for each type of gas used
    7.5 Steam (if applicable)
        7.5.1 Drawing showing points of introduction of Lower, Center, Upper, and any other steam
    7.6 Simplified flow diagram that depicts the points of introduction of all gases, including Waste Gases, at the Flare (in this diagram, the detailed drawings of 7.5.1 may be simplified; in addition, detailed Waste Gas mapping is not required; a simple identification of the header(s) that carries(y) the Waste Gas to the Flare and show(s) its(their) location in relation to the location of the introduction of the other gases is all that is required)

APPENDIX 1.5

8. Existing Monitoring Systems

8.1 A brief narrative description, including manufacturer and date of installation, of all existing monitoring systems, including but not limited to:

8.1.1 Waste Gas and/or Vent Gas flow monitoring
8.1.2 Waste Gas and/or Vent Gas heat content analyzer
81.3 Sweep Gas flow monitoring
8.1.4 Purge Gas flow monitoring
8.1.5 Supplemental Gas flow monitoring
8.1.6 Steam flow monitoring
8.1.7 Waste Gas or Vent Gas molecular weight analyzer
8.1.8 Gas Chromatograph
8.1.9 Sulfur analyzer(s)
8.1.10 Video camera
8.1.11 Thermocouple

8.2 Drawing(s) showing locations of all existing monitoring systems

9. Monitoring Equipment to be Installed to Comply with Consent Decree

10. Narrative Description of the Monitoring Methods and Calculations that will be used to comply with the NHV_{CZ} Requirements in the Consent Decree

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APPENDICES TO CONSENT DECREE

APPENDIX 1.6

Waste Gas Mapping: Level of Detail Needed to Show Main Headers and Process Unit Headers

APPENDIX 1.6

WASTE GAS MAPPING:
LEVEL OF DETAIL NEEDED TO SHOW MAIN HEADERS AND PROCESS UNIT HEADERS

Purpose:

Waste Gas mapping is required in order to identify the source(s) of Waste Gas entering each Covered Flare. Waste Gas mapping can be done using instrumentation, isotopic tracing, acoustic monitoring, and/or engineering estimates for all sources entering a Flare header (e.g. pump seal purges, sample station purges, compressor seal nitrogen purges, relief valve leakage, and other sources under normal operations). This Appendix outlines what needs to be included as the Waste Gas mapping section within the Initial Waste Gas Minimization Plan ("Initial WGMP") and, as needed, later updated.

Waste Gas Mapping Criteria:

For purposes of Waste Gas mapping, a main header is defined as the last pipe segment prior to the Flare knock out drum. Process unit headers are defined as pipes from inside the battery limits of each process unit that connect to the main header. For process unit headers that are greater than or equal to six (6) inches in diameter, flow ("Q") must be identified and quantified if it is technically feasible to do so. In addition, all sources feeding each process unit header must be identified and listed in a table, but not necessarily individually quantified. For process unit headers that are less than six (6) inches in diameter, sources must be identified, but they do not need to be quantified.

Waste Gas Mapping Submission Requirements:

For each Covered Flare, the following shall be included within the Waste Gas mapping section of the Initial WGMP:

1. A simplified schematic consistent with the example schematic included on the second page of this Appendix.

2. A table of all sources connected to each Flare main header and process unit header consistent with the Table included on the third page of this Appendix.

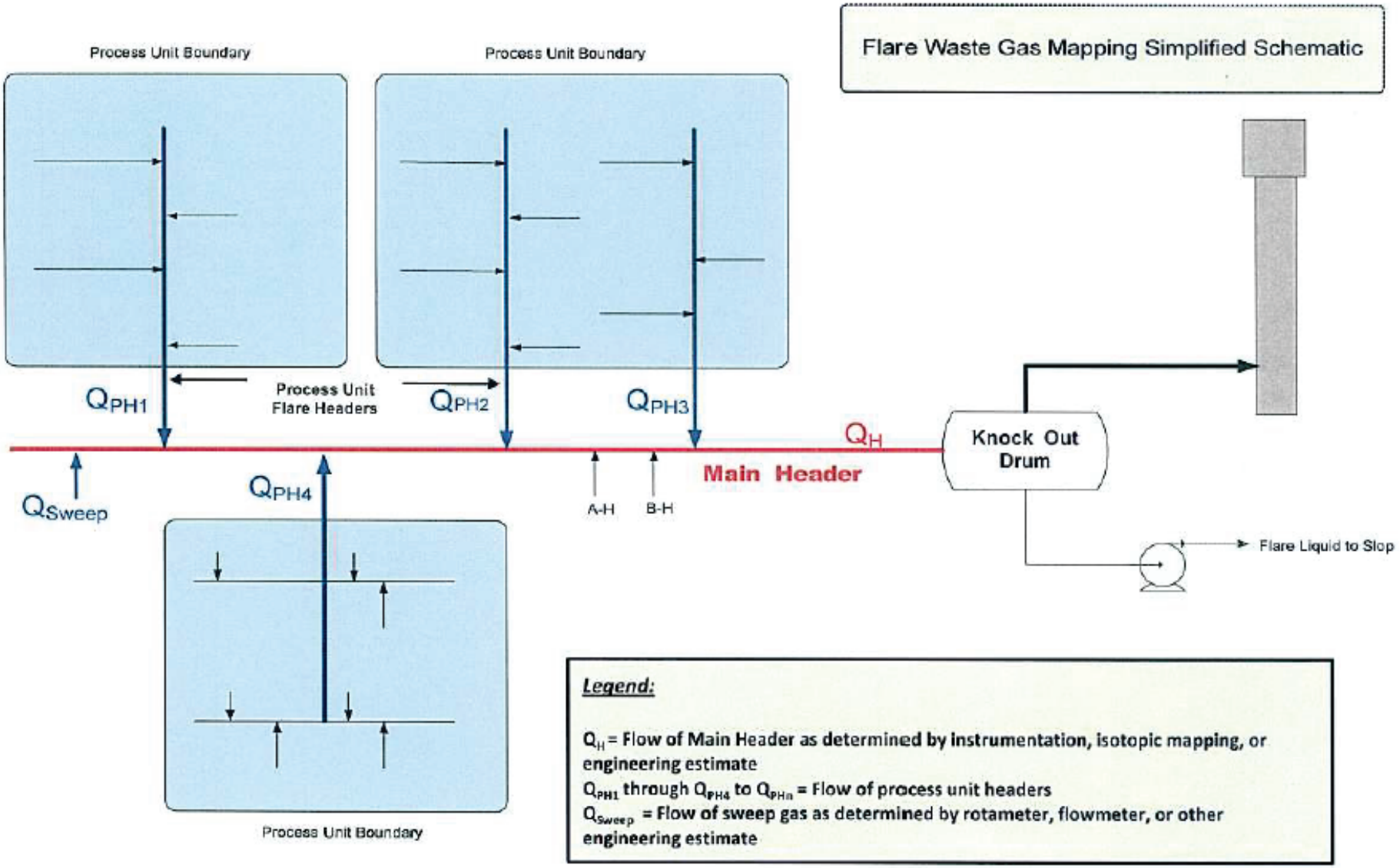

Table 1: Example of Flare Source Description Table

Process Unit Header	Sources	Detailed Source Description
Q_{PH1} (Ex: FCCU Gas Con Unit)	3 PSVs	PSV-14 on 110-D-5 Gas Con Absorber PSV-12 on 110-D-1 Amine Scrubber PSV-7 on 110-F-1 Batch Caustic Vessel
	2 Pump Seal Purges	110-G-1 LPG Pump 110-G-2 Rich Amine Pump
	1 Sample Station	110-S-1 LPG
	1 PSV	PSV 17 on 112-D-1 Main Column
	1 Pressure Control Valve	PCV 21 – Emergency Wet Gas Compressor
	1 PSV	PSV-21 on Flush Oil Drum
	1 Pump Seal Purge	110-G-23 Slurry Oil Pump
Q_{PH2} (Ex: Gas Oil Treater)	Continue same as PH1	Continue same as PH1
Q_{PH3}	Continue same as PH1	Continue same as PH1
Q_{PH4}	Continue same as PH1	Continue same as PH1
A-H	1 PSVs	PSV-17 on 109-E-42 Slurry Heat Exchanger
B-H	2 Pump Seal Purges	110-G-3 Gas Oil Feed 110-G-4 Main Column Reflux

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APPENDIX 1.7

Interim NHVcz Compliance Requirements for Cedar Bayou Flare X-901, Cedar Bayou Flare Z-1101, and Port Arthur Flare 40

1. By no later than the Effective Date and through March 31, 2022, at Flare X-901 at the Cedar Bayou Plant, the Defendant must, on a Semi-Annual Period basis, comply with an NHVcz value of no less than 200 BTU/scf on a 15-minute block period for 95% of the time that Waste Gas is sent to the Flare. Notwithstanding the preceding sentence, the Defendant must comply to the maximum extent practicable with Paragraph 43.b of this Consent Decree using the available physical capacity to add Supplemental Gas to this Flare. After March 31, 2022, the Defendant must comply with Paragraph 43.b of this Consent Decree at Flare X-901 at the Cedar Bayou Plant.

2. By no later than the Effective Date and through February 28, 2023, at Flare Z-1101 at the Cedar Bayou Plant, the Defendant must, on a Semi-Annual Period basis, comply with an NHVcz value of no less than 200 BTU/scf on a 15-minute block period for 95% of the time that Waste Gas is sent to the Flare. Notwithstanding the preceding sentence, the Defendant must comply to the maximum extent practicable with Paragraph 43.b of this Consent Decree using the available physical capacity to add Supplemental Gas to this Flare. After February 28, 2023, the Defendant must comply with Paragraph 43.b of this Consent Decree at Flare Z-1101 at the Cedar Bayou Plant.

3. By no later than the Effective Date and through March 31, 2022, at Flare 40 at the Port Arthur Plant, the Defendant must, on a Semi-Annual Period basis, comply with an NHVcz value of no less than 260 BTU/scf on a 15-minute block period for 95% of the time that Waste Gas is sent to the Flare. Notwithstanding the preceding sentence, the Defendant must comply to the maximum extent practicable with Paragraph 43.b of this Consent Decree using the available physical capacity to add Supplemental Gas to this Flare. After March 31, 2022, the Defendant must comply with Paragraph 43.b of this Consent Decree at Flare 40 at the Port Arthur Plant.

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APPENDICES TO CONSENT DECREE

APPENDIX 2.1

February 5, 2018, Johnson Letter

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

Mr. Chuck DeCarlo
Marketing Manager
Extrel CMS, LLC
575 Epsilon Drive, Suite 2
Pittsburg, PA 15238-2838

FEB 05 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Tony Slapikas
Product Manager for Mass Spectrometry
AMETEK, Energy & Process Division
150 Freeport Road
Pittsburgh, PA 15238

Dear Mr. DeCarlo and Mr. Slapikas,

I am writing in response to your letter dated August 18, 2017, requesting approval for use of process mass spectrometers as part of an alternative to testing procedures utilizing calorimeters or gas chromatographs to measure Net Heating Value (NHV_{VG}) in flare vent gas as required under 40 CFR Part 63, Subpart CC – National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries. The owner or operator of facilities subject to Subpart CC must measure flare vent gas composition to determine NHV_{VG} in units of British Thermal Units per standard cubic foot (BTU/SCF). This BTU/SCF determination may be performed using a calorimeter capable of continuously measuring, calculating, and recording NHV_{VG} at standard conditions (40 CFR 63.670 (j)(3)) or equipment that determines the concentration of individual components in the flare vent gas (40 CFR 63.670 (j)(1)), such as a gas chromatograph, and, if desired, may directly measure the hydrogen concentration in the flare vent gas following the methods provided in 40 CFR 63.670 (j)(4). All monitoring equipment must meet the applicable minimum accuracy, calibration and quality control requirements specified in Table 13 and §63.671 of Subpart CC.

In your letter, you propose to use a process mass spectrometer analyzer and the following measurement approach as an alternative to measure NHV_{VG}:

1) The owner or operator of the affected facility will perform a pre-survey to determine the list and concentration of components that are present in flare vent gas feed. This pre-survey will be used in part to:
   a) Determine an appropriate analysis method for the site-specific refinery flare vent gas;
   b) Create a list of vent gas components to be included in calibration gas cylinders to be used to evaluate the quality of the measurement procedure used to determine NHV_{VG};
   c) Define calibration standards to be prepared by a vendor at a certified accuracy of 2 percent and traceable to NIST; and
   d) Perform an initial calibration to identify mass fragment overlap and response factors for the target compounds.

2) The process mass spectrometer will be calibrated using calibration gas standards consisting of a mix of the compounds identified in the site specific flare gas pre-survey.
3) During flare gas analysis, compounds that are not identified during the pre-survey and that have mass fragments identical to the compounds found during the pre-survey will be included in the calculation of NHV_{VG}.
4) Calibration error (CE) for each component in the calibration blend will be calculated using the following equation:

$$CE = \frac{C_m - C_a}{C_a} \, x \, 100$$

Where :

C_m = Average instrument response, (ppm)
C_a = Cylinder gas value or tag value, (ppm)

5) The average instrument CE for each calibration compound at any calibration concentration must not differ by more than 10 percent from the cylinder gas value or tag value.
6) For each set of triplicate injections at each calibration concentration for each calibration compound, any one introduction shall not deviate more than 5 percent from the average concentration measured at that level.

Your supporting information included Method 301 calculations that showed acceptable bias and precision when you measured a mixture of gases from a vendor certified gas cylinder. Your request also includes reference to facilities needing to monitor flare gas composition continuously to effectively maintain flare efficiency while compensating for changes in the flare gas composition.

With this letter, we are approving your request to substitute continuous process mass spectrometry for continuous gas chromatography as allowed in 40 CFR 63.670 and 63.671 predicated on both your proposed use of these process mass spectrometers as described above and the additional provisos listed below:

1) You must meet the requirements in 40 CFR 63.671 (e)(1) and (2) including Table 13 requirements for Net Heating Value by Gas Chromatograph.
2) You may use the alternative sampling line temperature allowed in 40 CFR 63, Subpart CC, Table 13, under Net Heating Value by Gas Chromatograph.
3) You must meet applicable Performance Specification 9 (40 CFR part 60, appendix B) requirements for initial continuous monitoring system acceptance including, but not limited to:
    - Performing a multi-point calibration check at three concentrations following the procedure in Section 10.1; and
    - Performing periodic process mass spectrometer calibrations as directed for gas chromatographs in 40 CFR 63, Subpart CC, Table 13.
4) You may augment the minimum list of calibration gas components found in 40 CFR 63.671(e) with compounds found during the pre-survey as needed to develop a site-specific analysis method.

5) For unknown gas components that have similar analytical mass fragments to calibration compounds, you may report the unknowns as an increase in the overlapped calibration gas compound.
6) For unknown compounds that do not produce mass fragments that overlap calibration compounds, you may use the response factor for the nearest molecular weight hydrocarbon in the calibration mix to quantify the unknown component's NHV_{VG}. This requirement parallels the requirements in 40 CFR Part 63.671 (e)(3) for gas chromatographs.
7) You may use the response factor for n-pentane to quantify any unknown components detected with a higher molecular weight than n-pentane.
8) You must meet all other applicable generic requirements of §§63.670 and 63.671 for measurement of NHV_{VG} (i.e., measurement requirements not specifically targeted to gas chromatographs).
9) A copy of this approval letter must be included in the report for each testing program where these alternative testing procedures are applied.

Since this alternative test method approval under 40 CFR 63.7 (f) is appropriate for use at all facilities subject to 40 CFR 63, Subpart CC, we will announce on EPA's Web site (*https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods*) that the alternative method is broadly applicable to determination of NHV_{VG} under this subpart.

If you have any questions regarding this approval or need further assistance, please contact Ray Merrill at (919) 541-5225 or *merrill.raymond@epa.gov*, or Robin Segall at (919) 541-0893 or *segall.robin@epa.gov*.

Sincerely,

Robin R. Segall for SMJ

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc.

Gerri Garwood, EPA/OAQPS/SPPD
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EPA Regional Testing Contacts

United States

v.

Chevron Phillips Chemical Company LP

APPENDICES TO CONSENT DECREE

APPENDIX 2.2

Fenceline Monitoring Requirements

Appendix 2.2

FENCELINE MONITORING REQUIREMENTS

1. **Applicability.** The requirements of this Fenceline Monitoring Project apply to the Cedar Bayou Plant, the Port Arthur Plant, and the Sweeny Plant ("Covered Plants").

(a) The Cedar Bayou Plant and the Port Arthur Plant must install Fenceline Monitoring Systems in accordance with Paragraphs 2-3 of this Appendix.

(b) The Sweeny Plant is co-located with a third-party refinery ("Refinery"). The Refinery currently operates a Fenceline Monitoring System (hereafter, "The Refinery's Fenceline Monitoring System.") in accordance with Methods 325A and 325B of Appendix A to 40 C.F.R. Part 63 (Test Methods – Pollutant Measurement Methods From Various Waste Media) (hereafter "Rule Appendix A"). The Sweeny Plant's benzene emissions are captured by the Refinery's Fenceline Monitoring System, which encompasses the Defendant's Sweeny Plant property. The Sweeny Plant must comply with Paragraphs 2 and 3 of this Appendix using the data generated by the Refinery's Fenceline Monitoring System (prior to any adjustments for off-site or non-refinery sources) except for the data from the monitors around the Refinery's Stabilization Pond (monitors 9 through 13.5). However, if the Sweeny Plant is unable to use/gain access to the data from the Refinery's Fenceline Monitoring System, the Sweeny Plant will install and operate monitors in accordance with Paragraphs 2 and 3 of this Appendix to comply with this Appendix.

2. **Timing and Public Transparency.** No later than 270 Days after the Effective Date, the Defendant must submit in writing to EPA a report: a) showing the location of all monitors at each Covered Plant that will be utilized to comply with the Monitoring Requirements of Paragraph 3 below; b) providing an active/live/not password protected URL to a mockup of the publicly available website to be used to report monitoring data pursuant to this Fenceline Monitoring Project; and c) a statement indicating that the website is properly indexed (including, but not limited to the following search terms, "benzene," "fenceline monitoring," and the Plant name and location) with the major search engines (*e.g.,* Google, Bing, Yahoo) to allow the public to easily find the website.

   The Fenceline Monitoring Systems described in the Paragraph 3 below must commence collecting data no later than 365 Days after the Effective Date (Effective Date is defined at Section XVII of the Consent Decree).

   The Defendant must post to a publicly available website each individual sample result for each monitor, including at the Sweeny Plant, each biweekly annual average concentration difference value (once annual averages are available), and any corrective action plan submitted to EPA pursuant to Paragraph 3(h) (corrective action plans posted to the website may be redacted to protect confidential business information). The Defendant must post each individual sample result for each monitor within 30 Days of the end of the bi-weekly sampling period or within 30 Days after sampling collected pursuant to the "alternative sampling frequency for burden reduction" requirements set forth in Paragraph 3(f)(3) below. The Defendant must post each annual average difference value within 45 Days of the

sampling period that allows the creation of a new annual average difference value. The data must be presented in a tabular format.

3. **Monitoring Requirements.**

(a) The Defendant must commence sampling along the property boundary of each of the Covered Plants. The Defendant must collect and analyze the samples in accordance with Methods 325A and 325B of Rule Appendix A and sub-Paragraphs 3(a) through 3(i).

(b) The target analyte for the Fenceline Monitoring Systems is benzene.

(c) Siting of monitors. The Defendant must determine the passive monitor locations comprising each Fenceline Monitoring System in accordance with Section 8.2 of Method 325A of Rule Appendix A, with the exception of the number of duplicates and blanks, which will be determined pursuant to 40 C.F.R. § 63.658(c)(3).

(1) As it pertains to this Fenceline Monitoring Project, known sources of VOCs, as used in Section 8.2.1.3 in Method 325A of Rule Appendix A for siting passive monitors means a wastewater treatment unit, process unit, or any emission source requiring HAP control according to the requirements of any state or federal air permit applicable to the Covered Plant, including marine vessel loading operations. For marine vessel loading operations that are located offshore, one passive monitor should be sited on the shoreline adjacent to the dock. For purposes of this Appendix, an additional monitor is not required if the only emission sources within 50 meters of the monitoring boundary are equipment leak sources satisfying all of the requirements in 40 C.F.R. § 63.658(c)(1)(i) through (iv).

(2) If there are 19 or fewer monitoring locations, the Defendant shall collect at least one co-located duplicate sample per sampling period and at least one field blank per sampling period. If there are 20 or more monitoring locations, the Defendant shall collect at least two co-located duplicate samples per sampling period and at least one field blank per sampling period. The co-located duplicates may be collected at any one of the perimeter sampling locations.

(3) The Defendant must follow the procedure in Section 9.6 of Method 325B of Rule Appendix A to determine the detection limit of benzene for each sampler used to collect samples and co-located samples and blanks. Each monitor used to conduct sampling in accordance with this Appendix must have a detection limit that is at least an order of magnitude lower than the benzene action level.

(4) With respect to Section 8.2.3 in Method 325A of Rule Appendix A, the Port Arthur Plant will include property owned by a third-party refinery in its Fenceline Monitoring System. Additionally, the Defendant will install one monitor at the Port Arthur Hydrocarbon Vapor Recovery Unit (HVRU).

(d) Defendant may submit and discuss additional data collected by it or by third parties in the reports required pursuant to Paragraph 3.h of this Appendix and/or Paragraph 54 of this Consent Decree. If the Defendant concludes that an exceedance of the Action Level described in Paragraph 3.g is caused by an offsite source(s), such a conclusion does not relieve the Defendant of its obligation to perform the Root Cause investigation described in Paragraph 3.h.

(e) Collection of meteorological data. The Defendant must collect and record meteorological data according to the applicable requirements in sub-Paragraphs 3(e)(1)and 3(e)(2).

(1) The Defendant must collect and record the average temperature and barometric pressure during each sampling period using either an on-site meteorological station in accordance with Section 8.3 of Method 325A of Rule Appendix A or, alternatively, using data from a United States Weather Service (USWS) meteorological station provided the USWS meteorological station is within 40 kilometers (25 miles) of the applicable Covered Plant.

(2) If an on-site meteorological station is used, the Defendant must follow the calibration and standardization procedures for meteorological measurements in EPA-454/B-08-002 and at:

http://www3.epa.gov/ttnamti1/files/ambient/met/Volume_IV_Meteorological_Measurements.pdf

(f) Sampling Frequency. The Defendant must use a sampling period and sampling frequency as specified in this sub-Paragraph 3(f).

(1) Sampling period. A 14-Day sampling period must be used, unless a shorter sampling period is determined to be necessary under Paragraph 3(h). A sampling period is defined as the period during which a sampling tube is deployed at a specific sampling location with the diffusive sampling end cap in-place. The sampling period does not include the time required to analyze the sample. For the purpose of this sub-Paragraph, a 14-Day sampling period may be no shorter than 13 calendar days and no longer than 15 calendar days, but the routine sampling period must be 14 calendar days.

(2) Base sampling frequency. Except as provided in Paragraph 3(f)(3), the frequency of sample collection must be once each contiguous 14-Day sampling period, such that the next 14-Day sampling period begins immediately upon the completion of the previous 14-Day sampling period.

(3) Alternative sampling frequency for burden reduction. When an individual monitor consistently, as defined in sub-Paragraph 3(f)(3)(i) through (v), yields results at or below 0.9 micrograms per cubic meter ($\mu g/m^3$), the Defendant may elect to use the applicable minimum sampling frequency specified in Paragraph 3(f)(3)(i) through (v), for that individual monitoring site. When calculating Δc (as defined in Paragraph 3(g)) for the monitoring period when using this alternative for burden reduction, zero must be

substituted for the sample result for the monitoring site for any period where a sample is not taken.

(i) If every sample at an individual monitoring site is at or below 0.9 μg/m^3 for 2 years (52 consecutive samples), every other sampling period can be skipped for that individual monitoring site, i.e., sampling can occur approximately once per month.

(ii) If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3(f)(3)(i) is at or below 0.9 μg/m^3 for 2 years (i.e., 26 consecutive "monthly" samples), five 14-Day sampling periods can be skipped for that individual monitoring site following each period of sampling, i.e., sampling will occur approximately once per quarter.

(iii)If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3(f)(3)(ii) is at or below 0.9 μg/m^3 for 2 years (i.e., 8 consecutive quarterly samples), twelve 14-Day sampling periods can be skipped for that individual monitoring site following each period of sampling, i.e., sampling will occur twice a year.

(iv)If every sample at an individual monitoring site that is monitored at the frequency specified in Paragraph 3(f)(3)(iii) is at or below 0.9 μg/m^3 for 2 years (i.e., 4 consecutive semi-annual samples), only one sample per year is required for that individual monitoring site. For yearly sampling, samples must occur at least 10 months but no more than 14 months apart.

(v) If at any time a sample for an individual monitoring site that is monitored at the frequency specified in Paragraphs 3(f)(3)(i) through (iv) returns a result that is above 0.9 μg/m^3, that sampling site must return to the original sampling requirements of contiguous 14-Day sampling periods with no skip periods for one quarter (six 14-Day sampling periods). If every sample collected during this quarter is at or below 0.9 μg/m^3, the Defendants may revert back to the reduced monitoring frequency applicable for that individual monitoring site immediately prior to the sample reading exceeding 0.9 μg/m^3. If any sample collected during this quarter is above 0.9 μg/m^3, that individual monitoring site must return to the original sampling requirements of contiguous 14-Day sampling periods with no skip periods for a minimum of two years. The burden reduction requirements can be used again for that monitoring site once the requirements of Paragraph 3(f)(3)(i) are met again, i.e., after 52 contiguous 14-Day samples with no results above 0.9 μg/m^3.

(g) Action Level. Within 45 Days of completion of each sampling period, the Defendant, including at the Sweeny Plant, must determine whether the results are above or below the action level as follows:

(1) Calculation of the Δc. The Defendant must determine the benzene difference concentration (Δc) for each 14-Day sampling period by determining the highest and lowest

sample results for benzene concentrations from the sample pool and calculating the Δc as the difference in these concentrations. The Defendant must adhere to the following procedures when one or more samples for the sampling period are below the method detection limit for benzene:

(i) If the lowest detected value of benzene is below detection, the Defendant must use zero as the lowest sample result when calculating Δc.

(ii) If all sample results are below the method detection limit, the Defendant must use the method detection limit as the highest sample result.

(2) The Defendant must calculate the annual average Δc based on the average of the 26 most recent 14-Day sampling periods. The Defendant must update this annual average value after receiving the results of each subsequent 14-Day sampling period (i.e., on a "rolling" basis).

(3) The action level for benzene is 9 $\mu g/m^3$ on an annual average basis. If the annual average Δc value for benzene is less than or equal to 9 $\mu g/m^3$, the concentration is below the action level. If the annual average Δc value for benzene is greater than 9 $\mu g/m^3$, the concentration is above the action level, and the Defendant must conduct a root cause analysis and corrective action in accordance with Paragraph 3(h)

(h) Root Cause Analysis and Corrective Action. Within 5 Days of determining that the action level has been exceeded for any annual average Δc and no longer than 50 Days after completion of the sampling period, the Defendant, including at the Sweeny Plant, must initiate a root cause analysis to determine the cause of such exceedance and to determine appropriate corrective action, such as those described in Paragraphs 3(h)(1) through (4). The root cause analysis and initial corrective action analysis must be completed and initial corrective actions taken no later than 45 Days after determining there is an exceedance. Root cause analysis and corrective action may include, but is not limited to:

(1) Leak inspection using Method 21 of 40 C.F.R. Part 60, Appendix A-7 and repairing any leaks found.

(2) Leak inspection using optical gas imaging and repairing any leaks found.

(3) Visual inspection to determine the cause of the high benzene emissions and implementing repairs to reduce the level of emissions.

(4) Employing progressively more frequent sampling, analysis and meteorology (e.g., using shorter sampling periods for Methods 325A and 325B of Appendix A of 40 C.F.R. Part 63, or using active sampling techniques).

If, after completing the corrective action analysis and corrective actions such as those described in Paragraph 3(h), the Δc value for the next 14-Day sampling period for which the sampling start

time begins after the completion of the corrective actions is greater than 9 $\mu g/m^3$ or if all corrective action measures identified require more than 45 Days to implement, the Defendant must develop a corrective action plan that describes the corrective action(s) completed to date, additional measures that the Defendant proposes to employ to reduce fenceline benzene concentrations below the action level, and a schedule for completion of these measures. The Defendant must submit the corrective action plan to EPA within 60 Days after receiving the analytical results indicating that the Δc value for the 14-Day sampling period following the completion of the initial corrective action is greater than 9 $\mu g/m^3$ or, if no initial corrective actions were identified, no later than 60 Days following the completion of the corrective action analysis required in Paragraph 3(h). Corrective action plans generated pursuant to this Sub-Paragraph are enforceable pursuant to this Consent Decree.

(i) The Defendant may submit for review and approval pursuant to this Consent Decree a request to use an alternative test method as provided in 40 C.F.R. § 63.658(k).