

United States Environmental Protection Agency
Region 8
Air Program
1595 Wynkoop Street
Denver, Colorado 80202-1129
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Air Pollution Control
Prevention of Significant Deterioration (PSD)
Permit to Construct

PSD-WY-000002-2011.001

Permittee:

Sinclair Wyoming Refining Company
P.O. Box 277
Sinclair, Wyoming 82334

Permitted Facility:

Sinclair Refinery
Sinclair, Wyoming

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Table of Acronyms

BACT	Best Available Control Technology
bhp	Brake Horse Power
BSI	Benzene Saturation/Isomerization
Btu/hr	British Thermal Units per Hour
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
dscf	Dry Standard Cubic Foot
EP	Emission Point
FIP	Federal Implementation Plan
FGR	Flare Gas Recovery
FR	Federal Register
GHG	Greenhouse Gas
GCV	Gross Caloric Heating Value
gr	Grains
HHV	High Heating Value
hr	Hour
HRSG	Heat Recovery Steam Generator
lb	Pound
lbpy	Pounds Per Year
LDAR	Leak Detection and Repair
MMBtu/hr	Million British Thermal Units per Hour
N ₂ O	Nitrous Oxide
NSPS	New Source Performance Standards
NO _x	Nitrogen Oxides
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
QA/QC	Quality Assurance and/or Quality Control
RATA	Relative Accuracy Test Audit
Scf/hr	Standard Cubic Feet per Hour
SF ₆	Sulfur Hexafluoride
tpy	Tons Per Year
VOC	Volatile Organic Compounds
%	Percent

I. INTRODUCTION

This Federal PSD permit is being issued under authority of 40 CFR 52.21 (PSD) and 52.37 (FIP to issue permits under the PSD requirements to sources that emit GHG). Sinclair Wyoming Refinery Company (hereinafter the "Permittee") proposes to increase the crude refining capacity and implement other miscellaneous projects, as described below, at its Sinclair, Wyoming Petroleum refinery. The crude optimization project consists of the following: 1) removal of the 581 Crude Unit Heater firing limit rate and replacement of the 581 Crude Unit atmospheric distillation tower; 2) modification of the 583 Vacuum Tower to accommodate an increase in reduced crude feedstock from the debottlenecked 581 Crude Unit; and 3) allowing the combustion of sweetened refinery fuel gas in the Coker Flare to accommodate potential periods when the refinery may have to operate in a fuel gas imbalance condition. In addition and unrelated to the increase in crude oil refining capacity, the following projects will be covered by this permit: 1) removal of the firing limits for the #1 HDS heater, Naphtha Splitter heater and Hydrocracker H5 heater so that these units will be able to fire at their design maximum rates; 2) installation of a new Naphtha Splitter and BSI Unit to provide capacity to reduce benzene content in gasoline product to meet the specification of the February 2007 Mobile Sources Air Toxics II rule; 3) upgrade of the refinery's sour water stripping system which includes increasing the capacity of the existing system and installation of an additional sour water stripper; and 4) installation of a new emergency air compressor to supply instrument air to the refinery in the event of a power failure.

II. GENERAL PERMIT CONDITIONS

On the basis of findings set forth in Section III, Special Permit Conditions, of this permit, and pursuant to the authority (as delegated by the Administrator) of 52.21(u), EPA hereby conditionally authorizes Sinclair Wyoming Refining Company to construct or modify their petroleum refinery located in Sinclair, Wyoming. The authorization is expressly conditioned as follows:

A. PERMIT EFFECTIVE DATE AND EXPIRATION

As provided in 40 CFR 124.15(b), this PSD permit shall become effective 30 days after the service of notice of the permit decision, unless:

1. a later effective date is specified in the decision;
2. review is requested on the permit under 40 CFR 124.19; or
3. no comments requested a change in the draft permit, in which case the permit shall become effective immediately upon issuance

As provided in 40 CFR 52.21(r)(2), this PSD permit shall become invalid if construction:

1. is not commenced (as defined in 40 CFR 52.21(b)(9)) within 18 months after the approval takes effect; or
2. is discontinued for a period of 18 months or more; or
3. is not completed within a reasonable time.

Under 40 CFR 52.21(r)(2), EPA may extend the 18 month period upon a satisfactory showing that an extension is justified.

B. PERMIT NOTIFICATION REQUIREMENTS

The Permittee shall notify EPA in writing of:

1. the date construction is commenced, postmarked within 30 days of such date;
2. the actual date of initial startup, postmarked within 15 days of such date. Startup is defined as the setting in operation of an affected facility for any purpose;
3. the date upon which initial performance tests will commence, in accordance with the provisions of Section V., Performance Testing Requirements, of this permit, postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the performance test protocol required pursuant to Section VI.B.; and
4. other events as required elsewhere in this permit.

C. FACILITY OPERATION

At all times, including periods of startup, shutdown, and malfunction, Permittee shall maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing GHG emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPA, which may include, but is not limited to, monitoring results, review of operating maintenance procedures and inspection of the facility.

D. MALFUNCTION REPORTING

1. The Permittee shall notify EPA by mail within 2 working days following the discovery of any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner, which results in an increase in CO_{2e} emissions above the allowable emission limits stated in Condition III.A., of this permit.

2. In addition, the Permittee shall notify EPA in writing within 15 calendar days of any such failure described under Section IV. Recordkeeping Requirements. This notification shall include a description of the malfunctioning equipment or abnormal operation, the date of the initial malfunction, the period of time over which emissions were increased due to the failure, the cause of the failure, the estimated resultant emissions in excess of those allowed in Condition III.A., and the methods utilized to mitigate emissions and restore normal operations.
3. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause.

E. RIGHT OF ENTRY

EPA authorized representatives, upon the presentation of credentials, shall be permitted:

1. to enter the premises where the facility is located or where any records are required to be kept under the terms and conditions of this PSD Permit;
2. during normal business hours, to have access to and to copy any records required to be kept under the terms and conditions of this PSD Permit;
3. to inspect any equipment, operation, or method subject to requirements in this PSD Permit; and,
4. to sample materials and emissions from the source(s).

F. TRANSFER OF OWNERSHIP

In the event of any changes in control or ownership of the facilities to be constructed under this PSD permit, this PSD permit is binding on all subsequent owners and operators. The Permittee shall notify, by letter, the succeeding owner and operator of the existence of this PSD permit and its conditions. A copy of the letter shall be provided to EPA within 30 days of the letter signature. Permit transfers shall be made in accordance with 40 CFR Part 122, Subpart D.

G. SEVERABILITY

The provisions of this PSD permit are severable, and, if any provision of the PSD permit is held invalid, the remainder of this PSD permit shall not be affected.

H. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

The Permittee shall construct and operate this project in compliance with this PSD permit, the application on which this PSD permit is based, and all other applicable federal, state, and local air quality regulations. This PSD permit does not release the Permittee from any liability for compliance with other applicable federal, state and local environmental laws and regulations, including the Clean Air Act.

I. BINDING APPLICATION

This permit is issued in reliance upon the accuracy and completeness of the information set forth in the Permittee's application to EPA dated October 10, 2011, and subsequent information provided by the Permittee to EPA, as listed in the Administrative Record for issuance of this permit.

The Permittee shall abide by all representations, statements of intent and agreements contained in the permit application and subsequent submittals as listed in the Administrative Record. EPA shall be notified no less than 10 days in advance of any significant deviation from the permit application, and shall furnish any plans, specifications or supporting data regarding such deviation. The issuance of this PSD permit to Construct and Operate may be suspended or revoked if EPA determines that a significant deviation from the permit application, specifications, and supporting data furnished has been, or is to be, made.

J. ENFORCEABILITY OF PERMIT

On the effective date of this permit, the conditions herein become enforceable by EPA pursuant to any remedies it now has or may have in the future, under the Clean Air Act.

K. TREATMENT OF EMISSIONS

Emissions in excess of the limits specified in this permit shall constitute a violation.

III. SPECIAL PERMIT CONDITIONS

A. POINT SOURCE EMISSION LIMITS

At all times after completion of the crude optimization project, including during startup, shutdown and malfunction, the Permittee shall not allow the discharge of GHG emissions from each unit into the atmosphere, in excess of the following:

Table 1: Emission Limits

Emission Point/Equipment	Limitations lb CO _{2e} /MMBtu based on seven-day averages ton CO _{2e} /yr based on 52-week rolling averages
581 Crude Heater – 233 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 148,946 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
583 Vacuum Heater – 64.2 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 41,040 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
#1 HDS Heater – 33.4 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 21,351 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
Naphtha Splitter Heater– 46.3 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 29,598 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
Hydrocracker H5 Heater– 44.9 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 28,703 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
BSI Heater– 50.0 MMBtu/hr	<ul style="list-style-type: none"> • 146 lb CO_{2e}/MMBtu • 31,963 ton CO_{2e}/yr • No fuel oil combustion. Use of refinery fuel gas or purchased natural gas only.
Emergency Air Compressor	<ul style="list-style-type: none"> • 114.5 ton CO_{2e}/yr • Diesel fuel only • Limited to 500 hours of operation per 12 month rolling period.
Coker Unit Flare– 100.0 MMBtu/hr	<ul style="list-style-type: none"> • Minimization of flaring events through use of Flare Gas recovery System. • In event of unavoidable flaring event, maximum flare combustion efficiency will be utilized.
Fugitive Emissions and Drains	<ul style="list-style-type: none"> • Use of existing LDAR program • Addition of FGR as a source to be monitored under LDAR program

B. REQUIREMENTS FOR 581 CRUDE HEATER, 583 VACUUM HEATER, #1 HDS HEATER, NAPHTHA SPLITTER HEATER, HYDROCRACKER H5 HEATER, AND BSI HEATER

1. Compliance with lb CO_{2e}/MMBtu BACT Emission Limit

Each of the above listed emission units shall demonstrate compliance with the lb CO_{2e}/MMBtu BACT emission limit by the following equation:

Equation 1

$$W_{CO2e} \geq W_{CH4} + W_{N2O} + W_{CO2}$$

Where:

- W_{CO2e} = 146 lb CO_{2e}/MMBtu
- W_{CH4} = 0.14 lb CO_{2e}/MMBtu, assumed constant
- W_{N2O} = 0.41 lb CO_{2e}/MMBtu, assumed constant
- W_{CO2} = CO₂, lb CO_{2e}/MMBtu, as measured by Special Condition III.B.3.a.

2. Compliance with ton CO_{2e}/yr BACT Emission Limit

Each of the above listed emission units shall demonstrate compliance with the ton CO_{2e}/yr BACT emission limit by the following equation:

Equation 2

$$T_{CO2e} \geq \sum_{i=1}^{52} \frac{(W_{CH4} + W_{N2O} + W_{CO2})}{2000} \times W_{GCV} \times V_{Di}$$

Where:

- T_{CO2e} = Individual unit tonnage/yr limit in Special Condition III.A, Table 1
- W_{CH4} = 0.14 lb CO_{2e}/MMBtu
- W_{N2O} = 0.41 lb CO_{2e}/MMBtu
- W_{CO2} = CO₂ (as measured by Special Condition III.B.3.a expressed in lb CO_{2e}/MMBtu)
- W_{GCV} = GCV (MMBtu/dscf)
- V_{Di} = Seven day volumetric flow rate (dscf)

3. Work Practice and Operational Requirements

- a. To demonstrate compliance with the lb CO_{2e}/MMBtu BACT emission limits, for each emission unit, the Permittee shall calculate the lbs/MMBtu of CO₂ emitted at least once every seven days.

The Permittee shall conduct gas chromatograph testing at least once every seven days to determine the lbs/MMBtu value. Gas chromatograph testing will quantify the speciation of the refinery fuel gas and include the following:

- Hydrogen (H₂)
- Nitrogen (N₂)
- Oxygen (O₂)
- Carbon Monoxide (CO)
- Carbon Dioxide (CO₂)
- Carbon compounds with one (1) carbon atom
- Carbon compounds with two (2) carbon atoms
- Carbon compounds with three (3) carbon atoms
- Carbon compounds with four (4) carbon atoms
- Carbon compounds with five (5) carbon atoms
- Carbon compounds with six (6) or greater carbon atoms
- Gross Caloric Heating Value (GCV) in MMBtu/dscf

- b. If gas chromatograph testing in accordance with Special Condition III.B.3.a. is not available during any seven day period, the Permittee shall record the reason for unavailability during each seven day period of unavailability and shall conduct stack testing in accordance with Section V. Performance Testing Requirements to determine lb CO₂/MMBtu for each emission unit.
- c. Compliance with the lb CO_{2e}/MMBtu BACT emission limit shall be determined at least once every seven days.
- d. The Permittee shall compare the calculated CO_{2e} emissions from Special Condition III.B.1. to the allowable BACT CO_{2e} limit required in Special Condition III.A. for each emission unit. The calculated CO_{2e} emissions shall be less than the allowable BACT CO_{2e} limit. If the Permittee finds that the calculated CO_{2e} emissions rate is greater than the allowable BACT CO_{2e} limit, the Permittee shall review the operational performance of the emission units and monitoring instrumentation. From this review, any necessary corrective measures shall be identified and recorded by the Permittee, including the reason for the CO₂ emissions difference. The Permittee shall complete corrective measures within 48 hours of identification of a difference.
- e. The Permittee shall demonstrate compliance for each emission unit with the ton CO_{2e} /yr BACT limit on a 52-week rolling average.
- f. The Permittee shall install, maintain and operate a non-resettable elapsed flow meter, to measure the flow rate of the fuel combusted in each emission unit. Flow rate will be recorded at least once every seven days and recorded as dscf.
- g. The Permittee shall maintain and operate each emission unit to ensure the GHG emissions are continuously at or below the emissions limits specified in this permit.

C. REQUIREMENTS FOR COKER UNIT FLARE

1. The Permittee shall install, maintain and operate, at all times, a flare gas recovery system to capture all waste gases used as refinery fuel gas that would normally be sent to the Coker Unit Flare.
2. The Permittee shall use engineering calculations, company records, or similar estimates of volumetric flare gas flow to the Coker Flare.
3. Total CO_{2e} emissions from the Coker Flare shall be calculated by using the equations stated in Special Conditions III.C.4. Annual total CO_{2e} emissions shall be calculated by Equation 3.

Equation 3

$$T_{CO_2e} = CO_2 + CH_4 + N_2O$$

Where:

- TCO_{2e} = total annual emissions of CO_{2e} (ton/yr)
CO₂ = total annual emissions of CO_{2e} (ton/yr) calculated from Equation 4a, 4b, 5, or 6, below.
CH₄ = total annual emissions of CO_{2e} (ton/yr) calculated from Equation 7, below.
N₂O = total annual emissions of CO_{2e} (ton/yr) calculated from Equation 8, below.

4. If the Permittee has a continuous higher heating value monitor or gas composition monitor on the flare or if the permittee monitors these parameters at least weekly, the Permittee must use the measured heat value or carbon content value in calculating the CO₂ emissions from the flare using the applicable methods in Special Conditions III.C.4.(A) or Special Conditions III.C.4.(B) of this permit.

- a. If the Permittee monitors gas composition, the Permittee shall calculate the CO₂ emissions from the flare using either Equation 4a or Equation 4b of this section. If daily or more frequent measurement data are available, the permittee must use daily values when using Equation 4a or Equation 4b of this section; otherwise, use weekly values.

Equation 4a

$$CO_2 = 0.98 \times 0.001 \times \left(\sum_{p=0}^n \left[\frac{44}{12} \times (\text{Flare})_p \times \frac{(MW)_p}{MVC} \times (CC)_p \right] \right)$$

Where:

- CO₂ = Annual CO₂ emissions for a specific fuel type (metric tons/year)
- 0.98 = Assumed combustion efficiency of a flare
- 0.001 = Unit conversion factor (metric tons per kilogram, mt/kg)
- n = Number of measurement periods. The minimum value for n is 52 (for weekly measurements); the maximum value for n is 366 (for daily measurements during a leap year)
- p = Measurement period index
- 44 = Molecular weight of CO₂ (kg/kg-mole)
- 12 = Atomic weight of C (kg/kg-mole)
- (Flare)_p = Volume of flare gas combusted during measurement period (standard cubic feet per period, scf/period). If a mass flow meter is used, measure flare gas flow rate in kg/period and replace the term “(MW)_p/MVC” with “1”
- (MW)_p = Average molecular weight of the flare gas combusted during measurement period (kg/kg-mole). If measurements are taken more frequently than daily, use the arithmetic average of measurement values within the day to calculate a daily average
- MVC = Molar volume conversion factor (849.5 scf/kg-mole at 68 °F and 14.7 pounds per square inch absolute (psia) or 836.6 scf/kg-mole at 60 °F and 14.7 psia)
- (CC)_p = Average carbon content of the flare gas combusted during measurement period (kg C per kg flare gas). If measurements are taken more frequently than daily, use the arithmetic average of measurement values within the day to calculate a daily average

Equation 4b

$$CO_2 = \sum_{p=1}^n \left[(\text{Flare})_p \times \frac{44}{MVC} \times 0.001 \times \left(\frac{(\%CO_2)_p}{100\%} + \sum_{x=1}^y \left\{ 0.98 \times \frac{(\%C_x)_p}{100\%} \times CMN_x \right\} \right) \right]$$

Where:

- CO_2 = Annual CO_2 emissions for a specific fuel type (metric tons/year)
- n = Number of measurement periods. The minimum value for n is 52 (for weekly measurements); the maximum value for n is 366 (for daily measurements during a leap year)
- p = Measurement period index
- $(\text{Flare})_p$ = Volume of flare gas combusted during measurement period (standard cubic feet per period, scf/period). If a mass flow meter is used, the Permittee must determine the average molecular weight of the flare gas during the measurement period and convert the mass flow to a volumetric flow
- 44 = Molecular weight of CO_2 (kg/kg-mole)
- MVC = Molar volume conversion factor (849.5 scf/kg-mole at 68 °F and 14.7 psia or 836.6 scf/kg-mole at 60 °F and 14.7 psia)
- 0.001 = Unit conversion factor (metric tons per kilogram, mt/kg)
- $(\%CO_2)_p$ = Mole percent CO_2 concentration in the flare gas stream during the measurement period (mole percent = percent by volume)
- y = Number of carbon-containing compounds other than CO_2 in the flare gas stream
- x = Index for carbon-containing compounds other than CO_2
- 0.98 = Assumed combustion efficiency of a flare (mole CO_2 per mole carbon)
- $(\%C_x)_p$ = Mole percent concentration of compound “x” in the flare gas stream during the measurement period (mole percent = percent by volume)
- CMN_x = Carbon mole number of compound “x” in the flare gas stream (mole carbon atoms per mole compound). E.g., CMN for ethane (C_2H_6) is 2; CMN for propane (C_3H_8) is 3

- b. If the Permittee monitors heat content but does not monitor gas composition, the Permittee shall calculate the CO₂ emissions from the flare using Equation 5 of this section. If daily or more frequent measurement data are available, the Permittee must use daily values when using Equation 5 of this section; otherwise, use weekly values.

Equation 5

$$CO_2 = 0.98 \times 0.001 \times \sum_{p=1}^n [(Flare)_p \times (HHV)_p \times EmF]$$

Where:

- CO₂ = Annual CO₂ emissions for a specific fuel type (metric tons/year)
- 0.98 = Assumed combustion efficiency of a flare
- 0.001 = Unit conversion factor (metric tons per kilogram, mt/kg)
- n = Number of measurement periods. The minimum value for n is 52 (for weekly measurements); the maximum value for n is 366 (for daily measurements during a leap year)
- p = Measurement period index
- (Flare)_p = Volume of flare gas combusted during measurement period (million (MM) scf/period). If a mass flow meter is used, the Permittee must also measure molecular weight and convert the mass flow to a volumetric flow as follows: Flare[MMscf] = 0.000001 × Flare[kg] × MVC/(MW)_p, where MVC is the molar volume conversion factor [849.5 scf/kg-mole at 68 °F and 14.7 psia or 836.6 scf/kg-mole at 60 °F and 14.7 psia depending on the standard conditions used when determining (HHV)_p] and (MW)_p is the average molecular weight of the flare gas combusted during measurement period (kg/kg-mole).
- (HHV)_p = Higher heating value for the flare gas combusted during measurement period (British thermal units per scf, Btu/scf = MMBtu/MMscf). If measurements are taken more frequently than daily, use the arithmetic average of measurement values within the day to calculate a daily average.
- EmF = Default CO₂ emission factor of 60 kilograms CO₂/MMBtu (HHV basis)

- c. If the Permittee does not measure the higher heating value or carbon content of the flare gas at least weekly, the Permittee must determine the quantity of gas discharged to the flare separately for periods of routine flare operation and for periods of start-up, shutdown, or malfunction, and calculate the CO₂ emissions as specified in paragraphs Special Condition III.C.4.(C)(i) through (C)(iii) of this section.

- (i) For periods of start-up, shutdown, or malfunction, use engineering calculations and process knowledge to estimate the carbon content of the flared gas for each start-up, shutdown, or malfunction event exceeding 500,000 scf/day.
- (ii) For periods of normal operation, use the average heating value measured for the fuel gas for the heating value of the flare gas. If heating value is not measured, the heating value may be estimated from historic data or engineering calculations.
- (iii) Calculate the CO₂ emissions using Equation 6 of this section.

Equation 6

$$CO_2 = 0.98 \times 0.001 \times \left(Flare_{NORM} \times HHV \times EmF + \sum_{p=1}^n \left[\frac{44}{12} \times (Flare_{SSM})_p \times \frac{(MW)_p}{MVC} \times (CC)_p \right] \right)$$

Where:

- CO₂ = Annual CO₂ emissions for a specific fuel type (metric tons/year)
- 0.98 = Assumed combustion efficiency of a flare
- 0.001 = Unit conversion factor (metric tons per kilogram, mt/kg)
- Flare_{NORM} = Annual volume of flare gas combusted during normal operations from company records, (million (MM) standard cubic feet per year, MMscf/year)
- HHV = Higher heating value for fuel gas or flare gas from company records (British thermal units per scf, Btu/scf = MMBtu/MMscf)
- EmF = Default CO₂ emission factor for flare gas of 60 kilograms CO₂/MMBtu (HHV basis)
- n = Number of start-up, shutdown, and malfunction events during the reporting year exceeding 500,000 scf/day
- p = Start-up, shutdown, and malfunction event index
- 44 = Molecular weight of CO₂ (kg/kg-mole)
- 12 = Atomic weight of C (kg/kg-mole)
- (Flare_{SSM})_p = Volume of flare gas combusted during indexed start-up, shutdown, or malfunction event from engineering calculations, (scf/event)
- (MW)_p = Average molecular weight of the flare gas, from the analysis results or engineering calculations for the event (kg/kg-mole)
- MVC = Molar volume conversion factor (849.5 scf/kg-mole at 68 °F and 14.7 psia or 836.6 scf/kg-mole at 60 °F and 14.7 psia)

$(CC)_p =$ Average carbon content of the flare gas, from analysis results or engineering calculations for the event (kg C per kg flare gas)

d. Calculate CH₄ using Equation 7 of this section.

Equation 7

$$CH_4 = \left(CO_2 \times \frac{EmF_{CH_4}}{EmF} \right) + CO_2 \times \frac{0.02}{0.98} \times \frac{16}{44} \times f_{CH_4}$$

Where:

CH₄ = Annual methane emissions from flared gas (metric tons CH₄/year) expressed as CO₂e

CO₂ = Emission rate of CO₂ from flared gas calculated in Equation 4a, 4b, 5 or 6 of this section (metric tons/year)

EmF_{CH₄} = Default CH₄ emission factor for “Petroleum Products” from Table C-2 of subpart C 40 CFR Part 98 (General Stationary Fuel Combustion Sources) (kg CH₄/MMBtu)

EmF = Default CO₂ emission factor for flare gas of 60 kg CO₂/MMBtu (HHV basis).

0.02/0.98 = Correction factor for flare combustion efficiency

16/44 = Correction factor ratio of the molecular weight of CH₄ to CO₂

f_{CH₄} = Weight fraction of carbon in the flare gas prior to combustion that is contributed by methane from measurement values or engineering calculations (kg C in methane in flare gas/kg C in flare gas); default is 0.4

e. Calculate N₂O emissions using Equation 8 of this section.

Equation 8

$$N_2O = \left(CO_2 \times \frac{EmF_{N_2O}}{EmF} \right)$$

Where:

$N_2O =$	Annual nitrous oxide emissions from flared gas (metric tons N_2O /year) expressed as CO_2e
$CO_2 =$	Emission rate of CO_2 from flared gas calculated in Equation 3 of this section (metric tons/year)
$EmF_{N_2O} =$	Default N_2O emission factor for “Petroleum Products” from Table C–2 of subpart C 40 CFR Part 98 (General Stationary Fuel Combustion Sources) (kg N_2O /MMBtu)
$EmF =$	Default CO_2 emission factor for flare gas of 60 kg CO_2 /MMBtu (HHV basis)

5. The Permittee shall maintain a file of all records, data measurements, reports and documents related to the operation of the flare gas recovery system associated with the Coker Unit Flare, including, but not limited to, the following: all records or reports pertaining to maintenance performed, all records relating to performance tests and monitoring, hours of operation; and all other information required by this permit recorded in a permanent form suitable for inspection. The Permittee must retain the file for not less than 5 years following the date of such measurements, maintenance, and/or reports.

D. REQUIREMENTS FOR NEW EMERGENCY AIR COMPRESSOR

1. The Permittee shall install, maintain and operate a non-resettable elapsed time meter for the New Emergency Air Compressor.
2. The Permittee shall maintain a file of all records, data measurements, reports and documents related to the operation of the New Emergency Air Compressor, including, but not limited to, the following: all records or reports pertaining to maintenance performed, all records relating to performance tests and monitoring of the New Emergency Air Compressor; for each diesel fuel oil delivery, documents from the fuel supplier, hours of operation; and all other information required by this permit recorded in a permanent form suitable for inspection. The Permittee must retain the file for not less than 5 years following the date of such measurements, maintenance, reports, and/or records.

E. FUGITIVE EMISSION SOURCES

1. Fugitive Emission Sources Work Practice and Operational Requirements

- a. For CH_4 emissions from Fugitive Emission Sources, emissions shall be calculated by the Permittee annually (calendar year). Emissions shall be calculated based on the method listed below.

(1) Use process-specific methane composition data (from measurement data or process knowledge) and any of the emission estimation procedures provided in the Protocol for Equipment Leak Emissions Estimates (EPA-453/R-95-017, NTIS PB96-175401).

b. The flare gas recovery system required by Special Condition III. C. 1. shall be included and monitored as a fugitive emission source and the emissions from the flare gas recovery system shall be included in the annual totals calculated under Special Condition III. C. 3.

2. Fugitive Emission Sources Compliance Demonstration

The Permittee shall maintain a file of all records, data measurements, reports and documents related to the fugitive emissions source including, but not limited to, the following: all records or reports pertaining to maintenance performed, equipment replacement, and all records relating to compliance with the Monitoring and Quality Assurance and Quality Control (QA/QC) procedures outlined in 40 CFR Part 98.

IV. RECORDKEEPING REQUIREMENTS

- A. Including any recordkeeping requirements specified elsewhere in this permit, the Permittee shall maintain a file of all records, data, measurements, reports, and documents related to the operation of the facility, including, but not limited to, the following: all records or reports pertaining to significant maintenance performed on any system or device at the facility; all records relating to performance tests and monitoring of auxiliary combustion equipment; and other information required by this permit recorded in a permanent form suitable for inspection. The file must be retained for not less than 5 years following the date of such measurements, maintenance, reports, and/or records.
- B. The Permittee shall maintain the following records for at least 5 years, including:
1. the occurrence and duration of any startup, shutdown, malfunction;
 2. duration of any initial shakedown period for the emission units and pollution control units;
 3. performance testing of emission units for demonstrating compliance with this permit;
 4. the time and duration of any periods that monitoring devices are not operating; and
 5. any emission data required by this permit, including a record of which equation in this permit is being used to calculate CO₂ or CO₂e emissions from the Coker Unit Flare.

- C.** The Permittee shall maintain records of any exceedance of limitations in this permit and submit a written report of all exceedances to EPA semi-annually, except when: more frequent reporting is specifically required by an applicable subpart; or the authorized representative of the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. The report is due on the 30th day following the end of each semi-annual period and shall include the following:
1. time intervals, data and magnitude of the exceedance, the nature and cause (if known), corrective actions taken and preventative measures adopted;
 2. applicable time and date of each period during which the monitoring equipment was inoperative (monitoring down-time);
 3. if no exceedances of a permit limit occurred during the reporting period or the monitoring equipment has not been inoperative, repaired or adjusted, a statement that no exceedance of that limit occurred, and/or that the monitoring equipment has not been inoperative, repaired or adjusted (as applicable), shall be submitted;
 4. any failure to conduct any required source testing, monitoring, or other compliance activities; and
 5. any violation of limitations on operation, including but not limited to restrictions on hours of operation of the emergency generator.
- D.** Exceedance shall be defined as any period in which the facility emissions or other parameter of operation exceed a maximum limit set forth in this permit.
- E.** Excess emissions indicated by GHG emission source certification testing or compliance monitoring shall be considered violations of the applicable emission limit for the purpose of this permit.
- F.** All records required by this PSD Permit shall be retained for not less than 5 years following the date of such measurements, maintenance, and reports.

V. PERFORMANCE TESTING REQUIREMENTS

- A.** Any performance tests to establish the actual quantities of CO_{2e} being emitted into the atmosphere from any emission unit and to determine compliance with the annual CO_{2e} emission limits established in this permit shall be conducted in accordance with 40 CFR 60.8 and EPA Method 3a or 3b for the concentration of CO₂. A written report of the performance testing results shall be furnished by the Permittee to the EPA. Such tests shall be conducted if requested by EPA, or if required under condition III.B.3.b.
- B.** Each source tested by the Permittee shall be at or above 90.0% of maximum load operations. Tested source load shall be identified by the Permittee in the sampling report. The Permittee shall present at the pretest meeting the manner in which stack sampling will be executed in order to demonstrate compliance with the emissions limits contained in Condition III.A.
- C.** The Permittee shall conduct performance tests under conditions that are representative of normal operation of the affected facility. The Permittee shall make available to the EPA such records as may be necessary to determine the conditions of the performance tests.
- D.** The Permittee shall provide the EPA at least 30 days prior notice of any performance test, to afford the EPA the opportunity to have an observer present, if desired, and/or to attend a pre-test meeting. If there is a delay in the original test date, the Permittee must provide at least 7 days prior notice of the rescheduled date of the performance test.
- E.** The Permittee shall provide, or cause to be provided, performance testing facilities as follows:
1. sampling ports adequate for test methods applicable to this facility;
 2. safe sampling platform(s);
 3. safe access to sampling platform(s); and
 4. utilities for sampling and testing equipment.
- F.** Unless otherwise specified, each performance test conducted by the Permittee shall consist of 3 separate runs using the applicable test method. Each run shall be conducted by the Permittee for the time, and under the conditions, specified in the applicable standard. For purposes of determining compliance with an applicable standard, the arithmetic mean of the results of the 3 runs shall apply.

VI. AGENCY NOTIFICATIONS

- A.** The Permittee shall submit GHG permit applications, permit amendments, and other applicable permit information to:

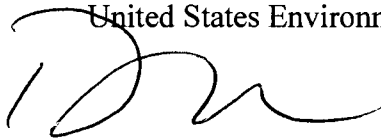
Air Program (8P-AR)
US EPA Region 8
1595 Wynkoop St.
Denver, CO 80202

- B.** The Permittee shall submit a copy of all compliance and enforcement correspondence as required by this permit to:

Air Technical Enforcement Program (8ENF-AT)
US EPA Region 8
1595 Wynkoop St.
Denver, CO 80202

- C.** For any notifications required to be delivered to EPA within a certain time frame, fulfillment of the requirement can be accomplished by delivery of the required information to EPA in writing, postmarked by such date.

Authorized By: United States Environmental Protection Agency, Region 8



Derrith R. Watchman-Moore
Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

Date: 21 March 2013

