



DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

Permit Application Analysis
A0001383

September 1, 2015

NAME OF FIRM: Sinclair Casper Refining Company

NAME OF FACILITY: Casper Refinery

FACILITY LOCATION: Sections 5 & 6, T33N, R78W
Natrona County, Wyoming
398,500 m E; 4,745,600 m N (UTM Zone 13, NAD 27)
Approximately two (2) miles east of Casper, WY

TYPE OF OPERATION: Petroleum Refinery

RESPONSIBLE OFFICIAL: Steve Pate, Environmental Engineer

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REVIEWING ENGINEER: Nick Meeker, Air Quality Engineer

1.0 PURPOSE OF APPLICATION

Sinclair Casper Refining Company (Sinclair) submitted an application to modify operations at the Casper Refinery by installing one (1) 99.2 MMBtu/hr fuel gas fired Boiler #2 and one (1) 374 hp Olympian G230LG6 natural gas fired emergency generator, permanently removing the 53.6 MMBtu/hr Boiler #5 from service, and placing the 33.5 MMBtu/hr Boiler #6 on hot standby.

2.0 RELEVANT PERMIT HISTORY

On February 11, 2014, Sinclair was issued Air Quality Permit MD-15042, which modified operations at the Casper Refinery with the installation of one (1) 99.2 MMBtu/hr fuel gas fired Boiler #1, permanent removal of the 35.9 MMBtu/hr Boiler #4 from service and placement of the 53.6 MMBtu/hr Boiler #5 on hot standby.

Sinclair entered into a Consent Decree on June 30, 2008 with the State of Wyoming and the United States Environmental Protection Agency (Civil Action No. 08CV-020-D).

Sinclair was issued Operating Permit 30-151-1 on November 24, 2004. This permit authorized the operation of a major source under Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations (WAQSR) and incorporated all previously issued permits and waivers.

3.0 PROJECT OVERVIEW

The modification will provide an efficient, reliable source of steam and a backup source of steam with the addition of the 99.2 MMBtu/hr Boiler #2 and 374 hp Olympian G230LG6 natural gas fired emergency generator, the removal of the 53.6 MMBtu/hr Boiler #5 from service and the placement of the 33.5 MMBtu/hr Boiler #6 on hot standby. The modification will not affect production rates or emissions at any other process units because steam is not a bottleneck in the refinery. The 33.5 MMBtu/hr Boiler #6 will circulate hot water/steam to keep it warm but will only be fired in the event one of the other boilers is out of service.

4.0 ESTIMATED EMISSIONS

NO_x, CO, SO₂, and PM potential emissions from the Casper Refinery will decrease with the addition of the new 99.2 MMBtu/hr Boiler #2 and 374 hp Olympian G230LG6 natural gas fired emergency generator, the removal of the 53.6 MMBtu/hr Boiler #5 from service and the placement of the 33.5 MMBtu/hr Boiler #6 on hot standby. The decrease in emissions is due to the elimination of fuel oil, higher efficiency and an ultra low NO_x burner. VOC potential emissions will increase due to a maximum firing rate of 99.2 MMBtu/hr compared to 53.6 MMBtu/hr for the Boiler #5 that will be removed. There will be a decrease in actual emissions for all pollutants due to higher efficiency and lower fuel consumption for the new boiler.

Placing the 33.5 MMBtu/hr Boiler #6 on hot standby and only fired if one of the other boilers is out of service will result in a decrease in actual emissions but the potential emissions will not change.

Emissions for the 374 hp Olympian G230LG6 natural gas fired emergency generator were estimated using manufacture and AP-42 emission factors, a maximum non-emergency operating schedule of 100 hours per year, a full power fuel consumption rating of 2,775 scf/hr and a maximum rating of 374 hp.

Total emissions from the Casper Refinery are shown in Table 4-1.

| Table 4-1: Facility Estimated Emissions (tpy) | | | | | | | |
|--|----------------------------|------------------------|-----------------|-----------------|--------------|--------------|--------------|
| Operating Unit | Emission Source | Firing Rate (MMBtu/hr) | SO ₂ | NO _x | PM | CO | VOC |
| Existing Emissions | | | | | | | |
| Existing Emissions ¹ | | | 1,112.8 | 524.2 | 249.0 | 524.2 | 701.9 |
| Proposed Emissions | | | | | | | |
| Boiler House | Boiler #2 (Install) | 99.2 | 3.6 | 15.2 | 3.2 | 15.7 | 2.3 |
| Boiler House | Olympian G230LG6 (Install) | 2.72 ² | <0.1 | 0.1 | <0.1 | 0.2 | <0.1 |
| Boiler House | Boiler #5 (Remove) | 53.6 | -95.0 | -70.2 | -17.2 | -19.3 | -1.3 |
| Change in Emissions | | | -91.4 | -54.9 | -14.0 | -3.4 | 1.0 |
| Total Facility Emissions | | | 1,021.4 | 469.3 | 235.0 | 520.8 | 702.9 |

¹ Existing emissions from Air Quality Permit MD-16025.

² Firing rate for SO₂ and PM emissions. NO_x, CO and VOC emissions were estimated using 374 hp.

Potential emissions associated with the installation of the new 99.2 MMBtu/hr Boiler #2 and 374 hp Olympian G230LG6 natural gas fired emergency generator are listed in Table 4-2.

| Table 4-2: Potential Emissions for Installation of New Equipment (tpy) | | | | | | | |
|---|------------------------|-------------------------------|-----------------------|-----------------------|------------|-------------|------------|
| Operating Unit | Emission Source | Firing Rate (MMBtu/hr) | SO₂ | NO_x | PM | CO | VOC |
| Boiler House | Boiler #2 | 99.2 | 3.6 | 15.2 | 3.2 | 15.7 | 2.3 |
| Boiler House | Olympian G230LG6 | 2.72 ¹ | <0.1 | 0.1 | <0.1 | 0.2 | <0.1 |
| Potential Emissions | | | 3.6 | 15.3 | 3.2 | 15.9 | 2.3 |

¹ Firing rate for SO₂ and PM emissions. NO_x, CO and VOC emissions were estimated using 374 hp.

Potential emissions associated with the removal of the 53.6 MMBtu/hr for the Boiler #5 from service are listed in Table 4-3.

| Table 4-3: Potential Emissions for Removal of Boiler #5 (tpy) | | | | | | | |
|--|------------------------|-------------------------------|-----------------------|-----------------------|--------------|--------------|-------------|
| Operating Unit | Emission Source | Firing Rate (MMBtu/hr) | SO₂ | NO_x | PM | CO | VOC |
| Boiler House | Boiler #5 | 53.6 | -95.0 | -70.2 | -17.2 | -19.3 | -1.3 |
| Potential Emissions | | | -95.0 | -70.2 | -17.2 | -19.3 | -1.3 |

5.0 CHAPTER 6, SECTION 4 – PREVENTION OF SIGNIFICANT DETERIORATION (PSD) APPLICABILITY

The Casper Refinery is a major stationary source under Chapter 6, Section 4 of the WAQSR, as the facility is a named source (petroleum refinery) which emits or has the potential to emit one hundred tons per year or more of a regulated NSR pollutant. The proposed permitting action is not subject to PSD review under Chapter 6, Section 4 of the WAQSR as a physical change in or change in the method of operation at the facility does not result in a significant emission increase of a NSR regulated pollutant and a significant net emissions increase of that pollutant. The PSD applicability for the Casper Refinery is shown below.

| Table 5-1: PSD Applicability (tpy) | | | | | |
|---|-----------------------|-----------------------|--|-----------|------------|
| | SO₂ | NO_x | PM/PM₁₀/PM_{2.5} | CO | VOC |
| Project Emissions | 3.6 | 15.3 | 3.2 | 15.9 | 2.3 |
| PSD Threshold | 40 | 40 | 25/15/10 | 100 | 40 |
| PSD Review Required | NO | NO | NO | NO | NO |

6.0 CHAPTER 6, SECTION 3 – MAJOR SOURCE APPLICABILITY (TITLE V)

The Casper Refinery is a “major stationary source” as defined by Chapter 6, Section 3 of the WAQSR. Sinclair will be required to modify Operating Permit 30-151-1 per the requirements of Chapter 6, Section 3 of the WAQSR.

7.0 CHAPTER 6, SECTION 2 – BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

Per the requirements of Chapter 6, Section 2 of the WAQSR, all facilities must demonstrate the use of BACT. Therefore, Sinclair conducted a BACT analysis for the proposed limit for NO_x in accordance with the WAQSR and demonstrated that BACT will be utilized for other pollutants.

7.1 99.2 MMBtu/hr Fuel Gas Fired Boiler #2

7.1.1 SO₂ Emissions

Sinclair has proposed to limit the fuel gas to Subpart Ja H₂S concentrations of 162 ppm_v on a 3-hour rolling average basis and 60 ppm_v on a 365-day successive calendar day rolling average for BACT for SO₂ emissions. The Division will consider the Subpart Ja H₂S concentrations of 162 ppm_v on a 3-hour rolling average basis and 60 ppm_v on a 365-day successive calendar day rolling average as being representative of BACT for SO₂.

7.1.2 NO_x Emissions

For the 99.2 MMBtu/hr Boiler #2, Sinclair evaluated the proposed limit for NO_x at 0.025 lb/MMBtu, 0.030 lb/MMBtu, and 0.035 lb/MMBtu. Sinclair performed an economic analysis to determine the additional cost to reduce emissions of Boiler #2 from 0.035 lb/MMBtu to 0.030 lb/MMBtu and 0.025 lb/MMBtu. The results of the economic analysis are listed in Tables 7-1 and 7-2. Table 7-3 show the permitted emission rates for a few emission units identified in the RACT/BACT/LAER Clearinghouse (RBLC).

| Table 7-1: Cost Effectiveness | | | |
|---|---|-------------------------------|-------------------------------|
| NO _x Emission Limit (lb/MMBtu) | Emissions at 99.2 MMBtu/hr (tpy) ¹ | Total Cost per Year (\$/year) | Cost per Ton Removed (\$/ton) |
| 0.035 | 15.20 | \$267,027 | Baseline |
| 0.030 | 13.03 | \$311,329 | \$20,416 |
| 0.025 | 10.86 | \$370,803 | \$23,912 |

¹ Based on 8,760 hours per year.

| Table 7-2: Incremental Cost Effectiveness | | | |
|--|--------------------|---------------------------|-------------------------------|
| NO _x Emission Limit (lb/MMBtu) | Tons Removed (tpy) | Additional Cost (\$/year) | Cost per Ton Removed (\$/ton) |
| 0.035 | -- | -- | Baseline |
| 0.030 | 2.17 | \$44,302 | \$20,416 |
| 0.025 | 2.17 | \$58,308 | \$27,407 |

| Table 7-3: RBLC Sources Identified | | | | | |
|--|------------------|--|-------------|--|----------|
| NO _x Emission Rate (lb/MMBtu) | Averaging Period | Unit | Permit Date | Company/Site | RBLC ID |
| <i>Results Under Process Code 12.390</i> | | | | | |
| 0.030 | 3-hour average | 233 MMBtu/hr | 10/15/2012 | Sinclair Wyoming – Sinclair Refinery | WY-0071 |
| 0.010/0.15 | annual/hourly | 355.6 MMBtu/hr furnace | 12/30/2010 | Diamond Shamrock Refining | TX-0580* |
| 0.040 | 3-hour average | 240 MMBtu/hr heater | 2/26/2010 | Valero Energy Corp – Valero Delaware City | DE-0020* |
| 0.040 | 3-hour average | Various Heaters 36 MMBtu/hr 880 MMBtu/hr 641 MMBtu/hr 108 MMBtu/hr 123 MMBtu/hr 803 MMBtu/hr 122 MMBtu/hr 803 MMBtu/hr 122 MMBtu/hr | 11/17/2009 | Valero Refining St. Charles Refinery | LA-0213 |
| 0.040 | 24-hour rolling | (2) 250 MMBtu/hr boilers | 2/27/2009 | Shintech Louisiana, LLC – Plaquemine PVC Plant | LA-0204 |
| 0.0120 | 24-hour rolling | (2) 250 MMBtu/hr boilers | 2/27/2009 | Shintech Louisiana, LLC – Plaquemine PVC Plant | LA-0204 |
| <i>Results Under Process Code 13.390</i> | | | | | |
| 0.035 & 0.030 (for 64.2 MMBtu/hr sized unit) | 3-hour average | Various Heaters 44.9 MMBtu/hr 33.4 MMBtu/hr 64.2 MMBtu/hr 46.3 MMBtu/hr | 10/15/2012 | Sinclair Wyoming – Sinclair Refinery | WY-0071 |
| 0.0720 | 30-day rolling | 198 MMBtu/hr Boiler | 12/10/2009 | Verenium – Highlands Ethanol Facility | FL-0318* |
| 0.050 | 3-hour average | 68 MMBtu/hr 90 MMBtu/hr Heaters | 11/17/2009 | Valero Refining St. Charles Refinery | LA-0213 |
| 0.050 | 3-hour average | 66 MMBtu/hr Boiler 12.5 MMBtu/hr Heater | 3/4/2009 | Medicine Bow Fuel &Power Medicine Bow IGL Plant | WY-0066 |

* These determinations are listed as being based on Other Case-by-Case (TX-0580) and RACT (DE-0020 & FL-0318).

Based on the cost effectiveness and incremental costs, Sinclair has proposed a NO_x emission limit of 0.035 lb/MMBtu, achieved with low NO_x burners (LNB) and flue gas recirculation (FGR), as representing BACT. The Division considers the cost effectiveness and incremental costs of lowering the NO_x emission limit to 0.030 lb/MMBtu or 0.025 lb/MMBtu for the 99.2 MMBtu/hr Boiler #2 to be economically unreasonable, as represented in Tables 7-1 and 7-2. The Division compared the proposed NO_x emission limit of 0.035 lb/MMBtu with other sources in the RBLC and Sinclair's limit appears to be in line with determinations made in other areas. Also, the proposed emission limit is consistent with the Division's previous BACT determination (Air Quality Permit MD-15042) for the installation of the 99.2 MMBtu/hr Boiler #1 with a NO_x emission limit of 0.035 lb/MMBtu.

7.1.3 PM/PM₁₀/PM_{2.5} Emissions

Sinclair has proposed no add-on controls for control of PM/PM₁₀/PM_{2.5} emissions from the 99.2 MMBtu/hr Boiler #2. The use of PM/PM₁₀/PM_{2.5} control devices is not typically required on gaseous fired sources which are in attainment areas. The Division considers no additional controls to represent BACT for gas fired units.

7.1.4 VOC/HAP/CO Emissions

Sinclair has proposed no add-on controls for VOC/HAP/CO emissions from the 99.2 MMBtu/hr Boiler #2. Boilers that fire refinery fuel gas are inherently designed for complete combustion, which is accomplished by ensuring high combustion zone temperatures and sufficiently long residence times in the combustion zones. This type of combustion maximizes the destruction of VOC and HAP and minimizes the formation of CO. The Division considers no additional control to represent BACT for gas fired units.

7.2 374 hp Olympian G230LG6 Natural Gas Fired Emergency Generator

The 374 hp Olympian G230LG6 natural gas fired emergency generator will be limited to 100 hours per year. The Division considers this hours limitation to represent BACT for this engine.

8.0 NEW SOURCE PERFORMANCE STANDARDS (NSPS)

The 99.2 MMBtu/hr Boiler #2 is subject to the requirements of 40 CFR part 60, subpart Dc – *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units* – as the boiler is greater than 10 MMBtu/hr but less than or equal to 100 MMBtu/hr in size. Although Boiler #2 is subject to Subpart Dc, there are no NO_x emission limits in this subpart, and no SO₂ or particulate emission limits for gas fired units.

The 99.2 MMBtu/hr Boiler #2 associated with this permitting action will be subject to the requirements of 40 CFR part 60, subpart Ja – *Standard of Performance for Petroleum Refineries for which Construction, Reconstruction, or Modification commenced after May 14, 2007*. Subpart Ja limits fuel gas H₂S concentration to 60 ppm_v on an annual basis and 162 ppm_v on a 3-hour average.

All new piping components associated with new emission units and modified emission units will be subject to the requirements of 40 CFR part 60, subpart GGGa – *Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification commenced after November 7, 2006*. This subpart establishes standards for equipment leaks at petroleum refineries for which construction, reconstruction, or modification commenced after November 7, 2006.

The 374 hp Olympian G230LG6 natural gas fired emergency generator at this facility is subject to applicable requirements of 40 CFR part 60, subpart JJJJ - *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines* based on the manufacture date of the engine.

9.0 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPs)

This project may involve the removal of asbestos and subject to the requirements of 40 CFR 61 subpart M, *National Emission Standards for Asbestos*. Sinclair has an ongoing program to manage asbestos in accordance with this standard.

The 99.2 MMBtu/hr Boiler #2 will be subject to the requirements of 40 CFR part 63, subpart DDDDD – *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters*. Subpart DDDDD limits CO emissions to 130 ppm based on a one (1) hour minimum sampling time.

Site remediation will be conducted at the refinery and will be subject to the requirements of 40 CFR part 63, subpart GGGGG – *National Emission Standards for Hazardous Air Pollutants: Site Remediation*. There is potential for contaminated soils to be excavated in conjunction with this project but these activities are expected to be exempt from this subpart because 40 CFR 63.7881(b)(3) exempts site remediation performed under a Resource Conservation and Recovery Act (RCRA) corrective action. Sinclair will follow applicable requirements of the Site Remediation MACT for any remediation associated with this project that is not performed under a RCRA corrective action.

40 CFR part 63, subpart ZZZZ applies to new or existing stationary natural gas fired engines at major or area sources of HAPs. The 374 hp Olympian G230LG6 natural gas fired emergency generator is considered a new engine under Subpart ZZZZ because the area source is constructed after June 12, 2006, and is subject to all applicable requirements of Subpart ZZZZ.

10.0 AMBIENT AIR QUALITY

10.1 NSR Criteria Pollutant

In a previous analysis done for the Casper Refinery (Air Quality Permit MD-7751), the Division conducted a full ambient impact analysis for NO_x, PM₁₀, and SO₂ emissions. The ambient impact analyses indicated that the model-predicted concentrations for NO_x, PM₁₀, and SO₂ were below the Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS), which is shown in Table 10-1. The Division assumes that all PM and PM₁₀ emissions are equivalent for this ambient impact analysis. This project will result in a decrease in potential and actual NO_x, PM, and SO₂ emissions, and therefore, the Division accepts the modeling performed for MD-7751 as representative for this application.

| Table 10-1: Casper Refinery Results of WAAQS/NAAQS for NO _x , PM ₁₀ and SO ₂ (MD-7751) | | | | | |
|---|----------------|--|---|---|----------------------------------|
| Pollutant | Averaging Time | Model Impact (µg/m ³) ¹ | Background Concentration (µg/m ³) | Total Modeled Impact (µg/m ³) | WAAQS/NAAQS (µg/m ³) |
| NO _x | Annual | 52.1 | 14 | 66.1 | 100 |
| PM ₁₀ | 24-Hour | 58.9 | 37 | 95.9 | 150 |
| | Annual | 17.5 | 18 | 35.5 | 50 |
| SO ₂ | 3-Hour | 749.2 | 61 | 810.2 | 1,300 |
| | 24-Hour | 230.4 | 25 | 255.4 | 260/365 |
| | Annual | 31.5 | 6 | 37.5 | 60/80 |

¹ The reported impacts for 3-hour and 24-hour are the highest second-high impacts.

NAAQS = National Ambient Air Quality Standards

NO_x = nitrogen oxides

PM₁₀ = particulate matter less than 10 microns in size

SO₂ = sulfur dioxide

µg/m³ = micrograms per cubic meter

WAAQS = Wyoming Ambient Air Quality Standards

10.2 PM_{2.5}

In a previous analysis for the Casper Refinery (MD-13573), Sinclair conducted air dispersion modeling for PM_{2.5}. The modeling analysis indicated that ambient concentrations are in compliance with WAAQS and NAAQS. This project will result in a decrease in potential PM_{2.5} emissions, and therefore, the Division accepts the modeling performed for MD-13573 as representative for this application.

10.3 Ozone

Sinclair submitted an analysis of the potential impacts of the proposed project to the local ozone levels by comparing the proposed emissions of ozone precursors, NO_x and VOC, to county wide emissions. The VOC net emission increase for this project is 1.0 tpy, and net emissions of NO_x will decrease. The county wide NO_x and VOC emissions are approximately 1,234 tpy and 857 tpy, respectively. Because the VOC emission increase resulting from this project is very small with respect to the county wide VOC emissions, and the background ozone concentrations in the vicinity of the refinery are well below the ambient standard, Sinclair does not believe this project will adversely impact the area’s compliance status with respect to the ozone standard. The Division expects that there will be no significant changes in ozone impact.

Background ozone concentrations were taken from Sinclair’s monitoring station located at the east boundary of the Casper Refinery. The ozone monitor was put in service in July 2011. The ozone concentrations reported the second highest measured values in the form of the standard based on the amount of data available since the monitor began operation in 2011. Table 10-2 summarizes the available ozone background data supporting this permit application.

| Table 10-2: Ozone Background Concentration Summary | | | | | |
|---|----------|------|------|------|------|
| Averaging Period | Standard | 2011 | 2012 | 2013 | 2014 |
| 8-hr (4 th highest value) (ppbv) | 75 | 61 | 62 | 56 | 57 |

10.4 1-hour NO₂ and SO₂

Sinclair evaluated the 1-hour NO₂ and SO₂ standards using data from the monitoring station mentioned previously. The monitoring station has been operating in its current configuration since July 2011. Attainment of the 1-hour NAAQS for NO₂ is based on the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour concentrations. Attainment of the 1-hour NAAQS for SO₂ is based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour concentrations. The concentrations reported are the 2nd highest values measured for each year, based on the amount of data available since the monitor began operation in 2011. Tables 10-3 and 10-4 summarize the available 1-hour NO₂ and SO₂ data supporting this permit application.

| Table 10-3: NO₂ Concentration Summary | | | | | |
|---|----------|------|------|------|------|
| Averaging Period | Standard | 2011 | 2012 | 2013 | 2014 |
| 1-hr (2 nd highest value) (ppbv) | 100 | 42.2 | 34.0 | 40.6 | 39.2 |

| Table 10-4: SO₂ Concentration Summary | | | | | |
|---|----------|------|------|------|------|
| Averaging Period | Standard | 2011 | 2012 | 2013 | 2014 |
| 1-hr (2 nd highest value) (ppbv) | 75 | 28.7 | 33.1 | 42.6 | 34.7 |

11. PROPOSED PERMIT CONDITIONS

The Division proposes to issue an air quality permit to Sinclair Casper Refining Company for the modification to the Casper Refinery with the following conditions:

1. That authorized representatives of the Division of Air Quality be given permission to enter and inspect any property, premise or place on or at which an air pollution source is located or is being constructed or installed for the purpose of investigating actual or potential sources of air pollution and for determining compliance or non-compliance with any rules, standards, permits or orders.
2. That all substantive commitments and descriptions set forth in the application for this permit, unless superseded by a specific condition of this permit, are incorporated herein by this reference and are enforceable as conditions of this permit.
3. That Sinclair Casper Refining Company shall file a complete application to modify their Operating Permit within twelve (12) months of commencing operation, in accordance with Chapter 6, Section 3(c)(i)(B) of the WAQSR. Where an existing operating permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.
4. That all notifications, reports, and correspondence required by this permit shall be submitted to the Stationary Source Compliance Program Manager, Air Quality Division, 122 West 25th Street, Cheyenne, WY 82002 and a copy shall be submitted to the District Engineer, Air Quality Division, 152 N. Durbin Street, Suite 100, Casper, WY 82601. Submissions may also be done electronically through <https://airimpact.wyo.gov> to satisfy requirements of this permit.
5. That written notification of the anticipated date of initial startup, in accordance with Chapter 6, Section 2(i) of the WAQSR, is required not more than sixty (60) days or less than thirty (30) days prior to such date. Notification of the actual date of startup is required within fifteen (15) days after startup.
6. That the date of commencement of construction shall be reported to the Administrator within thirty (30) days of commencement. In accordance with Chapter 6, Section 2(h) of the WAQSR, approval to construct or modify shall become invalid if construction is not commenced within twenty-four (24) months after receipt of such approval or if construction is discontinued for a period of twenty-four (24) months or more. The Administrator may extend the period based on satisfactory justification of the requested extension.
7. That performance tests be conducted, in accordance with Chapter 6, Section 2(j) of the WAQSR, within thirty (30) days of achieving a maximum design rate but not later than ninety (90) days following initial startup, and a written report of the results be submitted. The operator shall provide fifteen (15) days prior notice of the test date. If a maximum design rate is not achieved within ninety (90) days of startup, the Administrator may require testing be done at the rate achieved and again when a maximum rate is achieved.

8. Initial performance testing, as required by Condition 7 of this permit, shall be conducted on the following source:
- i. 99.2 MMBtu/hr Fuel Gas Fired Boiler #2:
 - a. NO_x Emissions: Testing is to be performed on a 24-hour rolling average using a certified CEM.
 - b. CO Emissions: Performance testing shall consist of three (3) 1-hour tests following EPA Reference Methods 1-4 and 10.

A test protocol shall be submitted for review and approval prior to testing. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to the Division within forty-five (45) days of completing the tests.

9. Effective on and after the date on which the performance test is conducted, as required by Condition 7 of this permit, emissions from the 99.2 MMBtu/hr Boiler #2 equipped with low NO_x burners shall be limited to the rates in the table below. These emission limits shall apply during all operating periods except as authorized under the applicable NSPS or NESHAP standard(s).

| Pollutant | lb/MMBtu | lb/hr | tpy |
|-----------------|-----------------------------------|---------------------------------|------|
| NO _x | 0.035 (30-day Rolling Average) | 3.5 (30-day Rolling Average) | 15.2 |
| CO | 0.036 | 3.6 | 15.7 |

10. Sinclair Casper Refining Company shall use the following in-stack continuous emission monitoring (CEM) equipment on the 99.2 MMBtu/hr Boiler #2 to demonstrate continuous compliance with the emission limits set forth in this permit:
- i. Sinclair Casper Refining Company shall install, calibrate, operate, and maintain a monitoring system and record the output, for measuring NO_x emissions discharged to the atmosphere in ppm_v, lb/MMBtu and lb/hr. The NO_x monitoring system shall consist of the following:
 - a. A continuous emission NO_x monitor located in the boiler exhaust stack.
 - b. A continuous flow monitoring system for measuring the flow of exhaust gases discharged into the atmosphere.
 - c. A continuous oxygen or carbon dioxide monitor at the location NO_x emissions are monitored.

- ii. Each continuous monitor system listed in this condition shall comply with the following:
 - a. Monitoring requirements of Chapter 5, Section 2(j) of the WAQSR including the following:
 - 1. 40 CFR part 60, Appendix B, Performance Specification 2 for NO_x and Performance Specification 3 for O₂ and CO₂. The monitoring systems must demonstrate linearity in accordance with Division requirements.
 - 2. Quality Assurance requirements of Appendix F, 40 CFR part 60 unless otherwise specified in an applicable subpart or by the Administrator.
 - 3. Sinclair Casper Refining Company shall develop and submit for the Division’s approval a Quality Assurance plan for the monitoring systems listed in this condition within ninety (90) days of initial startup.
11. Following the initial performance tests, as required by Condition 7 of this permit, compliance with the limits set forth in this permit shall be determined with data from the continuous monitoring systems required by Condition 10 of this permit as follows:

- i. Exceedance of the limits shall be defined as follows:
 - a. Any 30-day rolling average which exceeds the lb/MMBtu NO_x limit as calculated using the following formula:

$$E_{avg} = \frac{\sum_{h=1}^n (C)_h}{n}$$

Where:

E_{avg} = 30-day rolling average emission rate (lb/MMBtu).

C = 1-hour average NO_x emission rate (lb/MMBtu) for hour “h” calculated using valid data (output concentration and average hourly volumetric flowrate or average hourly fuel flow) from the CEM equipment required by Condition 10. Valid data shall meet the requirements of WAQSR, Chapter 5, Section 2(j).

n = The number of unit operating hours in the last thirty (30) successive boiler operating days with valid emissions data meeting the requirements of WAQSR, Chapter 5, Section 2(j). A “boiler operating day” shall be defined as any 24-hour period between 12:00 midnight and the following midnight during which fuel is combusted at any time in the boiler.

- b. Any 30-day rolling average which exceeds the lb/hr NO_x limit as calculated using the following formula:

$$E_{avg} = \frac{\sum_{h=1}^n (C)_h}{n}$$

Where:

E_{avg} = 30-day rolling average emission rate (lb/hr).

C = 1-hour average NO_x emission rate (lb/hr) for hour “h” calculated using valid data (output concentration and average hourly volumetric flowrate or average hourly fuel flow) from the CEM equipment required by Condition 10. Valid data shall meet the requirements of WAQSR, Chapter 5, Section 2(j).

n = The number of unit operating hours in the last thirty (30) successive boiler operating days with valid emissions data meeting the requirements of WAQSR, Chapter 5, Section 2(j). A “boiler operating day” shall be defined as any 24-hour period between 12:00 midnight and the following midnight during which fuel is combusted at any time in the boiler.

- ii. Sinclair Casper Refining Company shall comply with all reporting and record keeping requirements as specified in Chapter 5, Section 2(g) of the WAQSR. Excess NO_x and CO emissions shall be reported in units of ppm_v, lb/MMBtu, and lb/hr.
12. That annually, or as otherwise specified by the Administrator, the 99.2 MMBtu/hr Boiler #2 shall be tested to verify compliance with the CO limits set forth in this permit. The first annual test is required the following calendar year after completion of the initial performance test. Testing for CO shall be conducted following EPA reference methods. A test protocol shall be submitted for review and approval prior to testing. Notification of the test date shall be provided to the Division fifteen (15) days prior to testing. Results shall be submitted to this Division within forty-five (45) days of completion.
13. That the opacity from the 99.2 MMBtu/hr Boiler #2 shall be limited to no greater than twenty percent (20%) as determined by Method 9 of 40 CFR part 60, appendix A.
14. That refinery fuel gas combusted in the 99.2 MMBtu/hr Boiler #2 shall be limited to a maximum hydrogen sulfide (H₂S) concentration of 60 ppm_v on a 365 successive calendar day rolling average and 162 ppm_v on a 3-hour average.
15. That the 374 hp Olympian G230LG6 natural gas fired emergency generator shall be limited to 100 hours of annual operation for non-emergency operation such as maintenance checks and readiness testing. Sinclair Casper Refining Company shall install and maintain a non-resettable hour meter to demonstrate compliance with the hours limit in this condition. Documentation of the hours of operation shall be kept and maintained and made available to the Division upon request.

16. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 60, subpart Dc for the 99.2 MMBtu/hr Boiler #2.
17. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 60, subpart Ja for the modification addressed in this permit.
18. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 60, subpart GGGa for the modification addressed in this permit.
19. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 61, subpart M for the modification addressed in this permit.
20. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 63, subpart GGGGG for the modification addressed in this permit.
21. Sinclair Casper Refining Company shall comply with the applicable requirements of 40 CFR part 63, subpart DDDDD for the 99.2 MMBtu/hr Boiler #2.
22. Sinclair Casper Refining Company shall comply with all applicable requirements of 40 CFR part 60, subpart JJJJ for the 374 hp Olympian G230LG6 natural gas fired emergency generator.
23. Sinclair Casper Refining Company shall comply with all applicable requirements of 40 CFR part 63, subpart ZZZZ for the 374 hp Olympian G230LG6 natural gas fired emergency generator.
24. Sinclair Casper Refining Company shall keep and maintain records as required by this permit for a period of at least five (5) years from the date such records are generated and the records shall be made available to the Division upon request.
25. Sinclair Casper Refining Company shall demonstrate that the 53.6 MMBtu/hr Boiler #5 is removed from service.
26. All conditions from previously issued permits and waivers for the Casper Refinery shall remain in effect unless superseded by a specific condition of this permit.