COLORADO

Department of Public Health & Environment

AIR POLLUTION CONTROL DIVISION

COMPLIANCE ORDER ON CONSENT

CASE NOS. 2019-097 & 2019-194
AIRS NO. 001-0003

IN THE MATTER OF SUNCOR ENERGY (U.S.A.) INC.

The Colorado Department of Public Health and Environment ("CDPHE"), through the Air Pollution Control Division ("Division"), issues this Compliance Order on Consent ("Consent Order"), pursuant to the Division's authority under § 25-7-115(3)(b), C.R.S. of the Colorado Air Pollution and Prevention and Control Act, §§ 25-7-101 to 1309, C.R.S. ("the Act"), and its implementing regulations, 5 C.C.R. § 1001, *et seq.* ("the Regulations") with the express consent of Suncor Energy (U.S.A.) Inc. ("Suncor"). The Division and Suncor may be referred to each individually as a "Party" and collectively as "the Parties."

I. STATEMENT OF PURPOSE

The mutual objectives of the Parties in entering into this Consent Order are:

1. To establish compliance requirements and criteria for the continued operation of the petroleum refinery located at 5801 Brighton Boulevard, Commerce City, Adams County, Colorado (Plant 1), the petroleum refinery located at 5800 Brighton Boulevard, Commerce City, Adams County, Colorado (Plant 2), and the asphalt plant located approximately at 3875 East 56th Avenue, Commerce City, Adams County, Colorado (Plant 3) (collectively, the "Refinery"); and

2. To resolve the violations of the Act cited herein and in a Compliance Advisories issued to Suncor by the Division on June 25, 2019 and December 13, 2019.

II. DIVISION'S FINDINGS OF FACT AND DETERMINATION OF VIOLATIONS

Based upon the Division's investigation into and review of the compliance issues identified herein, and in accordance with § 25-7-115(3), C.R.S., the Division has

made the following determinations regarding violations of regulatory, statutory, and/or permit requirements associated with the Refinery.

3. At all times relevant to the violations cited herein, Suncor was a Corporation in good standing and registered to conduct business in the State of Colorado.

4. Suncor owns and operates the Refinery (as defined in Paragraph 1 of this Consent Order).

5. Suncor purchased and took over operations at Plant 1 and Plant 3 in 2003 and has continuously operated since that date. Suncor purchased and took over operations at Plant 2 in 2005 and has continuously operated since that date.

6. Plant 1 (West Plant) and Plant 3 (Asphalt Unit) are subject to the terms and conditions of the following state and federal regulatory requirements, including, but not limited to:

a. Federal Consent Decree (Civil Action No. H-01-4430), lodged December 2001, entered April 2002, second amendment to Consent Decree, June 12, 2006 ("West Plant Consent Decree");
b. Colorado Operating Permit Number 96OPAD120 issued to Suncor on August 1, 2004 and last revised February 22, 2018 ("Permit 96OPAD120 2/2018");
c. 40 C.F.R. Part 60:
    i. Subpart A - General Provisions ("Subpart A");
    ii. Subpart VVa - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 ("Subpart VVa"); and
    iii. Subpart GGGa - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006 ("Subpart GGGa").

7. Plant 1 (West Plant) and Plant 3 (Asphalt Unit) were subject to the terms and conditions of the Colorado Operating Permit Number 96OPAD120 issued to Suncor on August 1, 2004 and last revised February 1, 2016 ("Permit 96OPAD120 2/2016").

8. Plant 2 (East Plant) is subject to the terms and conditions of the following state and federal regulatory requirements, including, but not limited to:

a. Federal Consent Decree (Civil Action No. SA-05-CA-0569), lodged June 16, 2005, entered November 23, 2005, non-material modification effective June 18, 2006 ("East Plant Consent Decree");

b. Colorado Operating Permit Number 95OPAD108 issued to Suncor on October 1, 2006 and last revised June 15, 2009 ("Permit 95OPAD108");
c. Colorado Construction Permit Number 09AD1422 Initial Approval issued to Suncor on May 14, 2010 ("Permit 09AD1422");
d. Colorado Construction Permit Number 09AD0961 Final Approval issued to Suncor on February 23, 2015 ("Permit 09AD0961");
e. Colorado Construction Permit Number 12AD032-3 Initial Approval Mod-2 issued to Colorado Refining Company on January 5, 1998 ("Permit 12AD032-3"); and
f. 40 C.F.R. Part 60, Subpart QQQ - Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems ("Subpart QQQ").

9. The Refinery is subject to the terms and conditions of the following state and federal regulatory requirements, including, but not limited to:

a. 40 C.F.R. Part 60:
    i. Subpart J - Standards of Performance for Petroleum Refineries ("Subpart J");
    ii. Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007 ("Subpart Ja");
    iii. Subpart VV - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006 ("Subpart VV");
    iv. Subpart GGG - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006 ("Subpart GGG");
b. 40 C.F.R. Part 63:
    i. Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries ("Subpart CC");
    ii. Subpart UUU - National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units ("Subpart UUU");
c. Colorado Air Quality Control Statutes; and
d. Colorado Air Quality Control Commission ("AQCC") Regulations.

10. On June 18-20, 2018, Jason Long, of the Division, conducted an inspection, pursuant to the Division's authority under § 25-7-111(2)(c), C.R.S., at the Refinery for the purpose of determining compliance with the state and federal regulatory requirements listed in Paragraphs 6 through 9 of this Consent Order (the

"2018 Inspection").

11. On July 18, 2018, compliance testing was performed at the outlet of the Fluid Catalytic Cracking Unit ("FCCU") (P103) regenerator located at the Refinery, Plant 1 (West Plant). The Division reviewed the test results received on August 17, 2018 to determine compliance with the particulate matter and hydrogen cyanide ("HCN") emission limits in Permit 96OPAD120 2/2018, Condition 22.

12. On April 16-18, 2019, compliance testing was performed on the vapor combustion unit associated with the Rail Loading Rack (R101) located at the Refinery, Plant 1 (West Plant). The Division reviewed the test results received on May 17, 2019 to determine compliance with federal emission standards and the emission factors requested in the June 14, 2018 minor permit modification application (*i.e.*, MM #81).

13. On May 20-22, 2019, Jason Long, of the Division, conducted an inspection, pursuant to the Division's authority under § 25-7-111(2)(c), C.R.S., at the Refinery for the purpose of determining compliance with the state and federal regulatory requirements listed in Paragraphs 6 through 9 of this Consent Order (the "2019 Inspection").

14. Suncor self-reported exceedances of applicable air emissions limits and conditions contained in its Permit 96OPAD120 2/2018 and Permit 95OPAD108 (collectively, the "Operating Permits") in its semi-annual monitoring and deviation reports covering the period from July 1, 2017 through June 30, 2019, and self-reported exceedances at its Plant 2 FCCU on December 11, 2019.

15. Based on the Division's review of the 2018 Inspection, the August 17, 2018 and May 17, 2019 test reports, and records related to the Refinery, the Division issued a Compliance Advisory to Suncor on June 25, 2019.

16. Based on the Division's review of the 2019 Inspection and records related to the Refinery, the Division issued a Compliance Advisory to Suncor on December 13, 2019.

17. On August 12, 2019, the Division and Suncor met to discuss the issues identified in the June 25, 2019 Compliance Advisory. On August 29, 2019, Suncor submitted to the Division additional information relating to the issues identified in the June 25, 2019 Compliance Advisory, Paragraph C.

18. On December 20, 2019, the Division and Suncor met to discuss the issues identified in the December 13, 2019 Compliance Advisory.

19. On January 5, 2020, Suncor submitted to the Division a summary of emission exceedances that resulted from a December 11, 2019 event at the Plant 2 FCCU. A description of the event and the associated exceedances are identified in Paragraph 22.aa, below.

20. Suncor has cooperated with the Division in good faith in working to address and resolve the exceedances and violations identified in this Consent Order.

21. Based upon a review of the Inspection Reports for the 2018 Inspection, the August 17, 2018 and May 17, 2019 test reports, records related to the Refinery, and the information provided by Suncor, the Division has determined the following:

Refinery: Plant 1 (West Plant) and Plant 3 (Asphalt Unit)

a. Pursuant to Permit 96OPAD120 2/2016, Condition 20.1, Suncor shall not exceed the sulfur dioxide ("SO_2") emission limit of 15.68 pounds per hour ("lb/hr") from the Tail Gas Unit ("TGU") Incinerator (H-25)[1]. Pursuant to Permit 96OPAD120 2/2016, Conditions 20.6.1 and 45.12.1; the West Plant Consent Decree, Paragraphs 169 and 171; and Subpart J § 60.104(a)(2)(i), Suncor shall not discharge or cause the discharge of any gases into the atmosphere from any Claus sulfur recovery plant containing in excess of, for an oxidation control system or a reduction control system followed by incineration, 250 parts per million volumetric dry ("ppmvd") of SO_2 at 0% excess air, on a 12-hr rolling average. Pursuant to Permit 96OPAD120 2/2016, Conditions 20.10 and 55.28, and Subpart UUU § 63.1568(a)(1), the sulfur recovery units ("SRUs") at the Refinery, Plant 1, are subject to Subpart J § 60.104(a)(2)(i), and therefore, the hazardous air pollutant emission limit for the SRUs is 250 ppmvd of SO_2 at 0% excess air, on a 12-hr rolling average.

    i. At approximately 12:05 hrs on August 10, 2017, the Pressure Swing Adsorption ("PSA") system of the Hydrogen Plant tripped offline due to high purge gas burner pressure. During maintenance and system testing activities, a PSA valve was inadvertently left open, and one of the purge gas drums experienced elevated pressures at the purge gas burner. This tripped the PSA system and sent PSA purge gas to the Plant 1 flare header system. The first stage of the flare gas recovery system was partially closed to minimize flaring while keeping the system online. However, the PSA purge gas was ultimately treated and recovered in the SRUs, which resulted in exceedances of the SO_2 15.68 lb/hr limit on August 10, 2017, from 13:00 hrs to 14:00 hrs.

    ii. On November 9, 2017, Suncor began shutting down the No.4 Hydrodesulfurizer ("HDS") and No. 1 SRU for a planned

[1] Emissions from SRUs and their associated sulfur pits are routed through the TGU and vented through the TGU incinerator. Therefore, emissions from the SRUs and the sulfur pits are measured at the incinerator (H-25).

maintenance outage on the No. 4 HDS. The No. 4 HDS was depressurized and purged to remove all products within the system. For a portion of the shutdown and purging process, the first stage of the flare gas recovery system had to be taken offline, and the gases were routed to the Main Plant Flare (F1). During the outage period, the Refinery was in a state of hydrogen imbalance because the No. 4 HDS was not online to consume much of the hydrogen produced in the hydrogen plant. Due to the hydrogen imbalance, excess hydrogen was routed to the Main Plant Flare (F1) and GBR Flare (F3). The extended outage and associated hydrogen flaring resulted in Suncor exceeding multiple emissions limits, as described in Paragraphs 21.a.ii, 21.b.iii, and 21.c of this Consent Order, including the SO_2 250 ppmvd (12-hr average) limit at the TGU Incinerator (H-25), from 23:00 hrs to 05:00 hrs on November 11-12, 2017.

iii. On January 16, 2018, pluggage between Tank T-98 and the TGU was causing pressure increases in the No. 2 SRU. The pluggage was caused by sulfur solidifying in the vent lines due a lack of steam supply to the steam tracing around these lines. The steam supply became restricted due to condensate building up in the steam condensate system. Once the steam flow was re-established, the restriction cleared. This resulted in a high flow of previously restricted gases to enter the TGU Incinerator (H-25) and exceedances of the SO_2 15.68 lb/hr limit, from 15:00 hrs to 16:00 hrs, on January 16, 2018, and the 250 ppmvd (12-hr average) limit, from 23:00 hrs to 02:00 hrs, on January 16-17, 2018.

On August 10, 2017 and January 16, 2018, Suncor failed to limit SO_2 emissions from the TGU Incinerator (H-25) to 15.68 lb/hr, and on November 11-12, 2017 and January 16-17, 2018, Suncor failed to limit SO_2 emissions from the TGU Incinerator (H-25) to 250 ppmvd (12-hr average), violating Permit 96OPAD120 2/2016, Conditions 20.1, 20.6.1, 20.10, 45.12.1, and 55.28; the West Plant Consent Decree, Paragraphs 169 and 171; Subpart J § 60.104(a)(2)(i); and Subpart UUU § 63.1568(a)(1).

b. Pursuant to Permit 96OPAD120 2/2016, Conditions 29.2, 29.9, 30.2, 30.10, 38.2.1, and 46.8; Subpart J § 60.104(a)(1); and Subpart Ja § 60.103a(h), Suncor shall not burn in any fuel gas combustion device or any affected flare any fuel gas that contains hydrogen sulfide ("H_2S") in excess of 162 parts per million volumetric ("ppmv") determined hourly on a 3-hr rolling average basis.

i. On August 30, 2017, operations personnel replaced a leaking water supply hose that was supplying water to the Asphalt Unit flare gas seal drum. The water supply was temporarily shut off in order to perform the replacement, which caused the seal drum level to drop just below the water discharge line on the drum. Without the water flow through this line, sour gases were allowed to back flow into the seal drum and to the Asphalt Unit Flare (F2). This resulted in exceedances of the H_2S limit at F2 on August 30, 2017 from 07:00 hrs to 09:00 hrs.

ii. At approximately 20:30 hrs on September 22, 2017, the Plant 3 flare gas recovery system tripped offline unexpectedly due to a failing oxygen analyzer providing a false high reading, which allowed H_2S-containing gases to be sent to the Asphalt Unit Flare (F2). This resulted in exceedances of the H_2S limit at F2 from 20:00 hrs on September 22, 2017 through 00:00 hrs on September 23, 2017.

iii. The event described in Paragraph 21.a.ii of this Consent Order resulted in Suncor exceeding the H_2S limit at the Main Plant Flare (F1) as follows:

Main Plant Flare (F1)
H_2S in Flare Gas (162 ppmv, 3-hour average)
Start Date and Time: 11/9/2017 17:00 hrs
End Date and Time: 11/9/2017 23:00 hrs
Start Date and Time: 11/10/2017 09:00 hrs
End Date and Time: 11/10/2017 13:00 hrs
Start Date and Time: 11/12/2017 14:00 hrs
End Date and Time: 11/13/2017 01:00 hrs

iv. On the morning of December 24, 2017, the water level controller on the Asphalt Unit Flare (F2) knockout drum froze causing the level in the knockout drum to rise. The level in the knockout drum caused pressure to build up in the flare gas recovery system, and the pressure bounce hit the Plant 1 flare gas recovery system causing it to trip offline allowing H_2S-containing gases to be sent to the Main Plant Flare (F1). This resulted in exceedances of the H_2S limit at F1 on December 24, 2017 from 02:00 hrs to 05:00 hrs.

On August 30, 2017 and September 22-23, 2017, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2), and on November 9-13, 2017 and December 24, 2017, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1), violating Permit 96OPAD120 2/2016,

Conditions 29.2, 29.9, 30.2, 30.10, 38.2.1, and 46.8; Subpart J § 60.104(a)(1); and Subpart Ja § 60.103a(h).

c. Pursuant to Permit 96OPAD120 2/2016, Conditions 31.2 and 46.3, and Subpart Ja § 60.103a(b)(2), Suncor must comply with the flare management plan, required by Subpart Ja, for the Gasoline Benzene Reduction ("GBR") Flare (F3), including the alternate baseline flow rate of 3,447.68 thousand standard cubic feet per day ("Mscf/d"). Pursuant to Permit 96OPAD120 2/2016, Condition 31.1, emissions of nitrogen oxides ("NO_x"), carbon monoxide ("CO"), and volatile organic compounds ("VOC") shall not exceed 2.9 tons per year ("tpy"), 13.2 tpy, and 25.9 tpy, respectively, from F3. Pursuant to Permit 96OPAD120 2/2016, Condition 31.6, the quantity of gases (including pilot gas) sent to F3 shall not exceed 83,479 million British thermal units per year ("MMBtu/yr"). Pursuant to Permit 96OPAD120 2/2018, Condition 31.1, emissions of NO_x, CO, and VOC shall not exceed 2.9 tpy, 11.1 tpy, and 25.9 tpy, respectively, from F3. Pursuant to Permit 96OPAD120 2/2018, Condition 31.6, the quantity of gases (including pilot gas) sent to F3 shall not exceed 83,822.636 MMBtu/yr. The event described in Paragraph 21.a.ii of this Consent Order resulted in Suncor exceeding the NO_x, CO, VOC, gas combusted, and alternate baseline flow rate limits at F3:

GBR Flare (F3)
Alternate Baseline Flow (3,447.68 Mscf/d)
Start Date and Time: 11/13/2017 14:00 hrs
End Date and Time: 12/05/2017 02:00 hrs

GBR Flare (F3) Emissions and Throughput Exceedances				
Permit Limits				
	NO_x (tpy)	**CO (tpy)**	**VOC (tpy)**	**Gases Combusted (MMBtu/yr)**
Permit 96OPAD120 2/2016	2.9	13.2	25.9	83,479
Permit 96OPAD120 2/2018	2.9	11.1	25.9	83,822.636
Rolling 12-month period ending Month-Year	**Actual Emissions and Throughput**			
Nov-17	3.12	In compliance	28.34	91,681
Dec-17	3.54	14.23	32.24	104,285

Jan-18	3.66	14.60	33.31	107,739
Feb-18	3.69	14.62	33.58	108,639
Mar-18	3.58	14.01	32.56	105,301
Apr-18	3.55	13.83	32.31	104,508
May-18	3.53	13.75	32.15	103,987
Jun-18	3.50	13.63	31.86	103,034
Jul-18	3.50	13.63	31.86	103,021
Aug-18	3.53	13.75	32.13	103,911
Sep-18	3.43	13.33	31.16	100,750
Oct-18	3.31	12.89	30.14	97,453

From November 2017 through October 2018, Suncor exceeded the NO_x, CO, VOC, gas combusted, and alternate baseline flow rate limits at the GBR Flare (F3), violating Permit 96OPAD120 2/2016, Conditions 31.1, 31.2, 31.6, and 46.3; Permit 96OPAD120 2/2018, Conditions 31.1 and 31.6; and Subpart Ja § 60.103a(b)(2)[2].

d. Pursuant to Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Conditions 34.2, 34.7, 43.8, and 47.1; Permit 96OPAD120 2/2016, Conditions 51.1, 54.15, 56, and 65; and Permit 96OPAD120 2/2018, Conditions 53.44, 55, and 64, Suncor is required to comply with the applicable equipment leak standards, including the Leak Detection and Repair ("LDAR") monitoring requirements, contained in Subpart VV § 60.482-1 to § 60.482-10; Subpart VVa § 60.482-1a to § 60.482-10a; Subpart GGG § 60.592(a); Subpart GGGa § 60.592a(a); Subpart CC § 63.648(a); and AQCC Regulation 7, §§ VIII.C. Pursuant to Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Condition 43.8.2; Permit 96OPAD120 2/2016, Condition 56.38; Permit 96OPAD120 2/2018, Condition 55.40; Subpart VVa § 60.482-6a(a)(1); and AQCC Regulation 7, § VIII.C.2.b, except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing VOCs unless the pipe or line is sealed with a second valve, a blind flange, a plug, or a cap. The sealing device may be removed only when a sample is being taken or when the valve is otherwise in use. Pursuant to Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Conditions 43.8.1 and 43.8.6.7, and AQCC Regulation 7, §§ VIII.C.2.a.(v) and VIII.C.4.a.(iii), the owner or operator of a petroleum refinery complex subject to this Regulation 7 shall

[2] On February 10, 2017 and February 6, 2018, Suncor submitted minor permit modifications (MM #71 and MM #78, respectively) for the GBR Flare (F3). The Division initially reviewed compliance with the F3 emissions and throughput limits as requested in the minor modifications. However, as Suncor failed to comply with one or more proposed limits in each of the modifications, the existing permit terms and conditions in Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018 are enforced by the Division (reference AQCC Regulation 3, Part C, § X.I).

identify all leaking components which cannot be repaired until the unit is shut down for turnaround and affix a weatherproof, readily visible tag to the leaking component that shall remain in place until the component is repaired.

i. Between July 2017 and December 2017, Suncor identified that 46 valves, 89 connectors, and 5 other components existed in the field and were subject to LDAR monitoring requirements but had not previously been included in the LDAR inspection program. Suncor was unable to determine the date these components were placed into service. These components were added to the LDAR database for continual monitoring.

ii. On March 28, 2018, Suncor identified one open secondary valve on a sample line at the Plant 1 Reformer Unit. A sample was not being taken and the primary valve was not otherwise in use. Upon discovery, Suncor immediately closed the valve.

iii. During a third party consent decree audit in June 2018, six open-ended lines were discovered and the weatherproof Delay of Repair ("DOR") field leak identification tag was missing on three DOR components. Upon discovery, Suncor immediately capped the open-ended lines and replaced the missing DOR leak identification tags.

Suncor failed to conduct LDAR monitoring on 140 components, seal seven valves at the end of a pipe or line containing VOCs, and identify and tag three components which cannot be repaired until unit shutdown, violating Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Conditions 34.2, 34.7, 43.8, 43.8.1, 43.8.2, 43.8.6.7, and 47.1; Permit 96OPAD120 2/2016, Conditions 51.1, 54.15, 56, 56.38, and 65; Permit 96OPAD120 2/2018, Conditions 53.44, 55, 55.40, and 64; Subpart VV § 60.482-1 to § 60.482-10; Subpart VVa § 60.482-1a to § 60.482-10a; Subpart VVa § 60.482-6a(a)(1); Subpart GGG § 60.592(a); Subpart GGGa § 60.592a(a); Subpart CC § 63.648(a); and AQCC Regulation 7, §§ VIII.C, VIII.C.2.a.(v), VIII.C.2.b, and VIII.C.4.a.(iii).

e. Pursuant to Permit 96OPAD120 2/2018, Condition 22.14, Suncor must limit emissions of HCN from the Plant 1 FCCU (P103) regenerator to 12.8 tpy. On July 18, 2018, Suncor conducted testing, pursuant to Permit 96OPAD120 2/2018, Condition 22.14.2, to demonstrate compliance with the HCN limit. The results of the test indicated a three-run average of 14.06 tpy of HCN emissions. From February 22, 2018 (permit issuance) October 18, 2019, Suncor failed to limit emissions of HCN from the Plant

1 FCCU (P103) regenerator to 12.8 tpy, violating Permit 96OPAD120 2/2018, Condition 22.14.

f. Pursuant to Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Condition 24.1, Suncor must limit emissions of NO_x from the Rail Loading Rack (R101) to 0.068 lb/MMBtu[3]. On April 16-18, 2019, Suncor conducted testing to demonstrate compliance with federal emission standards and the requested emission limits in MM #81. The results of the test indicated NO_x emissions of 0.146 lb/MMBtu during gasoline loading operations, which exceeds the requested NO_x limit in MM #81 of 0.12 lb/MMBtu and the permitted limit of 0.068 lb/MMBtu in Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018. From the fourth quarter of 2018 (start-up of new vapor combustor unit replacing flare at R101) to present, Suncor failed to limit emissions of NO_x from the Rail Loading Rack (R101) to 0.068 lb/MMBtu, violating Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018, Condition 24.1. On June 4, 2019, Suncor submitted a permit modification application for R101 to revise the NO_x limit based on an uncontrolled emission factor of 0.146 lb/MMBtu, as determined by the April 16-18, 2019 compliance test.

g. Pursuant to AQCC Regulation 3, Part A, § II.A, except as specifically exempted in Section II.D., no person shall allow emission of air pollutants from, or construction, modification or alteration of, any facility, process, or activity which constitutes a stationary source, except residential structures, from which air pollutants are, or are to be, emitted unless and until an Air Pollutant Emission Notice ("APEN") and the associated APEN fee has been filed with the Division with respect to such emission. Suncor failed to submit an APEN to address ethanol unloading at the Rail Loading Rack (R101), an activity that has been occurring at the Refinery since at least August 1, 2003, until June 4, 2019, violating AQCC Regulation 3, Part A, § II.A.

h. Pursuant to AQCC Regulation 3, Part A, § VI.C.2, every owner or operator of an air pollution source required to file an APEN shall pay a nonrefundable annual emissions fee as set forth in § VI.D.3 of this Part A. Suncor failed to pay the required annual fee for emissions resulting from ethanol unloading at the Rail Loading Rack (R101), an activity that has been occurring at the Refinery since at least August 1, 2003, violating AQCC Regulation 3, Part A, § VI.C.2. To date, Suncor has failed

[3] On June 14, 2018, Suncor submitted a minor permit modification (MM #81) for the Rail Loading Rack (R101). The Division initially reviewed compliance with the R101 emission limits as requested in the minor modification. However, as Suncor failed to comply with the proposed NO_x limit in the modification, the existing permit terms and conditions in Permit 96OPAD120 2/2016 and Permit 96OPAD120 2/2018 are enforced by the Division (reference AQCC Regulation 3, Part C, § X.I).

to pay backfees for emissions resulting from ethanol unloading at the R101.

i. Pursuant to AQCC Regulation 3, Part B, § II.A.1, except where specifically authorized by the terms of this Regulation 3, no person shall commence construction of any stationary source or modification of a stationary source without first obtaining or having a valid construction permit from the Division. On June 4, 2019, Suncor submitted a permit modification application for the Rail Loading Rack (R101) to address ethanol unloading, an activity that has been occurring at the Refinery since at least August 1, 2003. For calendar year 2018, Suncor reported actual controlled emissions of VOC at 5.61 tpy and actual uncontrolled emissions of NO_x and CO at 0.52 tpy and 0.44 tpy, respectively. Suncor requested a controlled VOC limit of 12.5 tpy and uncontrolled NO_x and CO limits of 5.53 tpy and 15.1 tpy, respectively. To date, Suncor has failed to obtain a permit for the ethanol unloading at the Rail Loading Rack (R101), violating AQCC Regulation 3, Part B, § II.A.1.

j. Pursuant to AQCC Regulation 7, § V.A, no person shall dispose of VOC by evaporation or spillage unless Reasonably Available Control Technology ("RACT") is utilized. On June 4, 2019, Suncor submitted a permit application to implement RACT at the Rail Loading Rack (R101) to address ethanol unloading, an activity that has been occurring at the Refinery since at least August 1, 2003. After unloading, the rail cars are depressurized to atmosphere to remove dinitrogen, which includes ethanol vapors. Suncor has been conducting this activity without utilizing RACT. In the June 4, 2019 application, Suncor has proposed RACT as routing the vapors to the rail rack vapor combustor unit. From at least August 1, 2003 through October 2, 2019, Suncor released uncontrolled VOC emissions at the Rail Loading Rack (R101) without utilizing RACT, violating AQCC Regulation 7, § V.A.

Refinery: Plant 2 (East Plant)

k. Pursuant to Permit 95OPAD108, Condition 18.2, Suncor is required to comply with the equipment leak standards, including the LDAR monitoring requirements, of AQCC Regulation 7, § VIII.C.2.a; Subpart GGG § 60.592(a); and Subpart CC § 63.648(a), as set forth in Condition 27.8.1, 30.1, and 32.16. Pursuant to Permit 95OPAD108, Condition 27.8.1, and AQCC Regulation 7, §§ VIII.C.2.a.(ii) and VIII.C.2.a.(v), Suncor is required to (1) conduct a monitoring program consistent with the provisions in § VIII.C.4.a, and (2) identify all leaking components that cannot be repaired until the unit is shut down for turnaround, and repair and retest when the unit is back on stream. Pursuant to Permit 95OPAD108, Conditions 30.1 and 32.16; Subpart GGG § 60.592(a); and Subpart CC § 63.648(a), Suncor is

required to comply with the equipment leak standards and LDAR monitoring requirements of Subpart VV § 60.482-1 to § 60.482-10. Pursuant to Subpart VV § 60.482-5(b)(2), containers that are part of a closed-purge sampling connection system must be covered or closed when not being filled or emptied. Pursuant to Permit 95OPAD108, Condition 27.8.2, and AQCC Regulation 7, § VIII.C.2.b, except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing VOCs unless the pipe or line is sealed with a second valve, a blind flange, a plug, or a cap.

i. In 2012, Suncor isolated Pump 1403 (P-1403) (*i.e.*, removed the pump from service) and placed it on DOR after multiple repair attempts were unsuccessful in fixing a leak identified during a routine LDAR inspection. On or about July 1, 2017, Suncor discovered the discharge valve of P-1403 was open and the pump contained product. The isolation on the pump had been removed without performing repairs to address the leak identified in 2012. Suncor immediately drained the pump and closed the discharge valve. The isolated status of the pump was restored on July 13, 2017.

ii. Between July 2017 and June 2018, Suncor identified six valves and 19 connectors existed in the field and were subject to LDAR monitoring requirements but had not previously been included in the LDAR inspection program. Suncor was unable to determine the date these components were placed into service. These components were tagged, inspected, and added to the LDAR database for continual monitoring.

iii. During a third party consent decree audit in June 2018, the auditor identified the following:

    1. One valve and nine connectors on a sample point near Tank 35 were not inventoried for the LDAR inspection program. Suncor was unable to determine the date these components were placed into service. These components were tagged, inspected, and added to the LDAR database for continual monitoring.

    2. One line was not sealed with a second valve, a blind flange, a plug, or a cap. Suncor sealed the open-ended line with a plug.

    3. A component at the Plant 2 Reformer (tag # 2042011) was originally incorrectly listed as a flange and monitored annually for several years. The component was correctly reclassified as

a valve in 2016. However, quarterly monitoring events did not take place during the time the component was incorrectly classified.

4. One open bucket at a sample point in the Plant 2 Reformer process unit when the bucket was not being filled or emptied. The bucket appeared to contain VOC material. Suncor drained the bucket and removed it from the location.

Suncor failed to comply with LDAR monitoring and equipment leak requirements, violating Permit 95OPAD108, Conditions 18.2, 27.8.1, 27.8.2, 30.1, and 32.16; Subpart CC § 63.648(a); Subpart GGG § 60.592(a); Subpart VV §§ 60.482-1 to 60.482-10, and § 60.482-5(b)(2); and AQCC Regulation 7, §§ VIII.C.2.a.(ii), VIII.C.2.a.(v), VIII.C.2.b, and VIII.C.4.a.

l. Pursuant to Permit 95OPAD108, Conditions 15.2, 16.3, and 23.1, and AQCC Regulation 7, § III.A, Suncor is required to operate and maintain all storage tank accesses, seals, hatches, roof drainage systems, and pressure relief valves to prevent detectable vapor loss. On December 27, 2017, Suncor found product on the roofs of Tanks 44 and 47. Tank 47 is an external floating roof reformate storage tank. On December 13, 2017, Suncor switched the Reformate rundown line up to Tank 44 from Tank 47. This resulted in reformate on the roof of Tank 44, and gas was observed leaking past the roof seals. Suncor identified open valves near the LPG Vaporizer, allowing city gas to back flow into the Reformate rundown line. The gas was exiting the tank and carrying product onto the roof. Suncor closed the open valves and removed the product on the roof via vacuum truck on the evening of December 27, 2017. On December 29, 2017, maintenance personnel entered the roof to perform clean-up efforts and remove the residual product from the roof. From 16:30 hrs on December 13, 2017 to 12:00 hrs on December 29, 2017, Suncor failed to operate and maintain accesses, seals, hatches, roof drainage systems, and pressure relief valves on Tanks 44 and 47 to prevent detectable vapor loss, violating Permit 95OPAD108, Conditions 15.2, 16.3, and 23.1, and AQCC Regulation 7, § III.A.

m. Pursuant to Permit 95OPAD108, Conditions 1.3, 2.10, 3.3, 5.11, 7.2, 8.4, and 22.5.1; Permit 09AD1422, Condition 10; and Subpart J § 60.104(a)(1), Suncor shall not burn in any fuel gas combustion device any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hr rolling average basis. At approximately 16:30 hrs on January 24, 2018, the No. 3 SRU tripped. Operational adjustments were being made to the SRU following the restart of an amine booster pump. The operator inadvertently introduced too much fuel gas to the tail gas

incinerator. This caused the incinerator and thermal reactor to trip. The loss of the thermal reactor impacted other upstream equipment, including the amine regenerator system, causing elevated H_2S concentrations in the fuel gas. The No. 3 SRU was restarted and all impacted units were lined out. On January 24, 2018, from 18:00 hrs to 22:00 hrs, Suncor exceeded the H_2S limit at the Plant 2 Main Flare and other Plant 2 fuel burning equipment, violating Permit 95OPAD108, Conditions 1.3, 2.10, 3.3, 5.11, 7.2, 8.4, and 22.5.1; Permit 09AD1422, Condition 10; and Subpart J § 60.104(a)(1).

22. Based upon a review of the Inspection Reports for the 2019 Inspection, records related to the Refinery, and the information provided by Suncor, the Division has determined the following[4]:

Refinery: Plant 1 (West Plant) and Plant 3 (Asphalt Unit)

a. Pursuant to Permit 96OPAD120, Conditions 1.3.1, 2.3, 3.2, and 39.1, and AQCC Regulation 7, § III.A, all storage tank hatches, accesses, seals, and roof drainage systems shall be maintained and operated to prevent detectable vapor loss.

   i. On September 5, 2018, Suncor identified an open gauge hatch on Tank 77 during a routine visual inspection. On September 6, 2018, a third party contractor entered the roof and closed the hatch.

   ii. On January 6, 2019, Suncor discovered gas oil on top of the floating roof at Tank 1. The product was removed from the roof on January 16, 2019.

   iii. On February 21, 2019, Suncor discovered product on the roof of Tank 775. The product had reached the roof through the gauge pole area of the tank. The product was removed from the roof on March 6, 2019.

   iv. On March 20, 2019, Suncor discovered gas oil on top of the floating roof at Tank 1. Gas oil had also drained to the ground through the roof drain. The product was removed from the roof on April 26, 2019.

   v. On March 28, 2019, Suncor discovered gas oil on the roof of Tank 58 during a routine seal inspection. The product was removed from the roof on May 1, 2019.

[4] For Paragraph 22 of this Consent Order, Permit 96OPAD120 refers to Permit 96OPAD120 2/2018.

When gas oil is stored in an external floating roof tank, as was the case in Paragraphs 22.a(ii), (iv), and (v), above, the material tends to stick to the tank walls as the floating roof descends and gets wiped onto the seal as the floating roof ascends. With rising ambient temperatures, the product on the seal becomes less viscous and flows to the roof drain. The presence of VOC product observed on the roof or in the drain, and an open hatch on a tank containing VOC product, is indicative of a detectable vapor loss. Suncor failed to maintain and operate hatches, accesses, seals, or roof drainage systems on Tank 1, Tank 58, Tank 77, and Tank 775 to prevent detectable vapor loss, violating Permit 96OPAD120, Conditions 1.3.1, 2.3, 3.2, and 39.1, and AQCC Regulation 7, § III.A.

b. Pursuant to Permit 96OPAD120, Conditions 1.2 and 53.34.1, and Subpart CC, § 63.646(f)(1), if a cover or lid is installed on an opening on a floating roof, the cover or lid shall remain closed except when the cover or lid must be open for access. Pursuant to Permit 96OPAD120, Conditions 1.3.4 and 41.2.3, and AQCC Regulation 7, § VI.B.2.c.(ii)(A)(2)(a), covers, seals, and lids shall be kept closed except when the openings are in actual use. On September 5, 2018, Suncor identified an open gauge hatch on Tank 77 during a routine visual inspection. The gauge hatch was not in use. On September 6, 2018, a third party contractor entered the roof and closed the hatch. Suncor failed to ensure the Tank 77 gauge hatch remained closed except when it must be open for access, violating Permit 96OPAD120, Conditions 1.2, 1.3.4, 41.2.3, and 53.34.1; AQCC Regulation 7, § VI.B.2.c.(ii)(A)(2)(a); and Subpart CC, § 63.646(f)(1).

c. Pursuant to Permit 96OPAD120, Conditions 29.10, 31.10, and 53.91, and Subpart CC, § 63.670(e), Suncor shall operate the Main Plant Flare (F1) and the Gasoline Benzene Reduction ("GBR") Flare (F3) to maintain the net heating value of flare combustion zone gas ("NHVcz") at or above 270 British thermal units per standard cubic feet ("Btu/scf") determined on a 15-minute block period basis when regulated material is routed to the flare for at least 15-minutes.

    i. On February 7, 2019, the Main Plant Flare (F1) NHVcz dropped below 270 Btu/scf (15-minute block period) from 04:00 hrs to 04:15 hrs. The flare flow controls were in manual mode at the time of the event due to suspected pressure swings in the city gas supply line and couldn't be adjusted soon enough to prevent the non-compliance.

    ii. On February 22, 2019, the GBR Flare (F3) NHVcz dropped below 270 Btu/scf (15-minute block period) from 02:45 hrs to 03:00 hrs.

The flare flow controls were in manual mode at the time of the event due to an unexpected shutdown of the Hydrogen Plant on February 20, 2019 and unstable conditions after re-start of the Hydrogen Plant. The controls couldn't be adjusted soon enough to prevent the non-compliance.

iii. On February 24, 2019, the Main Plant Flare (F1) NHVcz dropped below 270 Btu/scf (15-minute block period) from 07:15 hrs to 07:30 hrs. The flare flow controls were in manual mode at the time of the event due to an unexpected shutdown of the Hydrogen Plant on February 20, 2019 and unstable conditions after re-start of the Hydrogen Plant. The controls couldn't be adjusted soon enough to prevent the non-compliance.

iv. On February 27, 2019, the GBR Flare (F3) NHVcz dropped below 270 Btu/scf (15-minute block period) from 16:45 hrs to 17:15 hrs. The larger flow controller at F3 was in manual mode during the event due to prior issues with valve operation and, therefore, did not open automatically when the NHVcz dropped.

v. On March 19, 2019, the Main Plant Flare (F1) NHVcz dropped below 270 Btu/scf (15-minute block period) from 00:45 hrs to 01:00 hrs. The city gas controllers associated with F1 were placed in manual mode prior to the event due to oscillating behavior of the flare supplemental city gas flow controller, which prevented sufficient supplemental city gas flow to the flare resulting in non-compliance with the NHVcz limit.

vi. On April 10, 2019, the Main Plant Flare (F1) NHVcz dropped below 270 Btu/scf (15-minute block period) from 01:00 hrs to 01:15 hrs. On April 9, 2019 at approximately 19:11 hrs, Suncor was performing a scheduled lube oil change on the Plant 1 FCCU charge pump P-3510. When P-3510 was switched to full size spare pump P-3511, charge to the FCCU started to drop and the unit went into an upset mode. The upset lasted for close to 2.5 hours and ultimately resulted in reverse flow of the FCCU regenerator catalyst into the compressor C-16 discharge pipe. The reverse flow caused the failure of a weld in the C-16 discharge pipe. Upon noticing catalyst flowing out of the venture flow meter and out of the C-16 vent line, Suncor initiated an emergency shutdown of the Plant 1 FCCU. Suncor determined the root cause of the event was the inadvertent closure of the warm line valve on spare pump P-3511. The closed valve led to an accumulation of water in the suction side of P-3511. When Suncor placed P-3511 in service,

accumulated water flowed into the FCCU heater causing the unit upset and resulting in additional gases being sent to F1.

vii. On May 24, 2019, the GBR Flare (F3) NHVcz dropped below 270 Btu/scf (15-minute block period) from 05:15 hrs to 05:45 hrs. At the beginning of the morning shift on Plant 1, Suncor observed the presence of a large flame at F3. Suncor manually reduced the city gas flow to the flare in order to mitigate the large flame. However, this reduction lead to a drop in the NHVcz.

Suncor failed to maintain the Main Plant Flare (F1) and GBR Flare (F3) NHVcz at or above 270 Btu/scf, violating Permit 96OPAD120, Conditions 29.10, 31.10, and 53.91, and Subpart CC, § 63.670(e).

d. Pursuant to Permit 96OPAD120, Conditions 29.8 and 57.1, and Subpart A, § 60.18(c)(1), Suncor shall operate the Main Plant Flare (F1) with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours. Pursuant to Permit 96OPAD120, Conditions 29.10, 31.10, and 53.89, and Subpart CC, § 63.670(c), Suncor shall operate the Main Plant Flare (F1) and GBR Flare (F3) with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours, when regulated material is routed to the flare and the flare vent gas flow rate is less than the smokeless design capacity of the flare.

i. On February 27, 2019, from 08:35 hrs to 11:15 hrs and 14:31 hrs to 15:05 hrs, Suncor observed visible emissions at the GBR Flare (F3). The visible emissions were caused by an overhead pressure controller at the Reformer Splitter Tower. Suncor increased the steam flow but could not immediately stop the presence of visible emissions.

ii. On March 14, 2019, from 10:30 hrs to 10:38 hrs, Suncor observed visible emissions at the Main Plant Flare (F1). On March 13, 2019 at approximately 10:46 hrs, high winds associated with a winter storm at Commerce City affected Xcel Energy power supply systems, which in turn caused blips in the electric power supply to the Refinery. The blips in electric power supply shut down the recycle compressor C-18 and interrupted the feed flow to the No. 2 Hydrodesulfurizer ("HDS") and Naphtha Desulfurizer/Reformer process units. Suncor's attempts to restart C-18 and other impacted equipment were unsuccessful and, as a result, impacted units were safely shut down. The shutdown of the Reformer unit resulted in the loss of hydrogen production to the No. 3 HDS. The No. 1 Sulfur Recovery Unit ("SRU") was also shut down. The

unplanned shutdown resulted in high hydrogen sulfide ("H_2S") gases being sent to the TGU Incinerator (H-25) and F1.

iii. On April 9, 2019 at 21:22 hrs to April 10, 2019 at 01:01 hrs, Suncor observed visible emissions at the Main Plant Flare (F1). The visible emissions were a result of the event described in Paragraph 22.c.vi of this Consent Order.

iv. On April 25, 2019, Suncor began a planned startup of the Plant 1 FCCU. During the startup, there was a period of time when high volumes of gas were routed to the Main Plant Flare (F1). The first stage of the Flare Gas Recovery System had to be taken offline to prevent a system overload. High volumes of gas were routed to F1 between introduction of feed into the FCCU and startup of the Wet Gas Compressor ("WGC"). Prior to introduction of feed, there was an insufficient volume of gas to operate the WGC. Once the feed was introduced, a high volume of low pressure gas was produced, and since the WGC was not online, the gas was routed to F1 in order to control the system pressure. After introduction of feed, the FCCU structure was stabilized, the main fractionator was started up and stabilized, and then the WGC was started up. After multiple start-up attempts, due to operational issues within slurry pump around circuit, the Plant 1 FCCU was successfully started up on April 26, 2019. This event caused the following visible emissions occurrences at F1:

Start Date and Time: 4/24/2019 06:24 hrs
End Date and Time: 4/24/2019 09:35 hrs
Start Date and Time: 4/25/2019 12:51 hrs
End Date and Time: 4/25/2019 16:20 hrs
Start Date and Time: 4/26/2019 05:19 hrs
End Date and Time: 4/26/2019 06:25 hrs

v. On May 16, 2019, an upset began at the No. 3 HDS amine system. The upset was caused by hydrocarbon carryover within the amine system and ultimately lead to hydrocarbon carryover from the High Pressure Cold Separator Drum (D-339) to the No. 1 and No. 2 SRUs. The No. 1 and No. 2 SRUs tripped offline, sending acid gases to the Main Plant Flare (F1) and TGU incinerator (H-25), resulting in visible emissions at F1 on the following dates:

Start Date and Time: 5/16/2019 18:29 hrs
End Date and Time: 5/16/2019 21:00 hrs
Start Date and Time: 5/17/2019 09:04 hrs
End Date and Time: 5/17/2019 10:58 hrs

Suncor failed to operate the Main Plant Flare (F1) and GBR Flare (F3) with no visible emissions, violating Permit 96OPAD120, Conditions 29.8, 29.10, 31.10, 53.89, and 57.1; Subpart A, § 60.18(c)(1); and Subpart CC, § 63.670(c).

e. Pursuant to Permit 96OPAD120, Conditions 11.3, 12.3, 13.3, 14.3, 15.3, 16.3, 17.3, 18.3, 20.6.2, 21.3, 27.3, 28.3, 29.2, 29.9, 30.2, 30.10, 38.2.1, 46.1.1, and 46.8; Subpart J, § 60.104(a)(1); and Subpart Ja, §§ 60.102a(g)(1)(ii) and 60.103a(h), Suncor shall not burn in any fuel gas combustion device or any affected flare any fuel gas that contains H_2S in excess of 162 parts per million volumetric ("ppmv") determined hourly on a 3-hr rolling average basis.

    i. On July 3, 2018, from 16:00 hrs to 21:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). At approximately 14:30 hrs on July 3, 2018, pressure began to rise quickly in one of the catalytic reactors (W-70) in the No. 1 Catalytic Polymerization unit. The elevated pressure caused the relief valve on W-70 to lift sending gases to the flare gas recovery system. Once the relief valve reseated, the recovery system experienced a large pressure swing which caused it to trip offline at approximately 15:30 hrs. This allowed H_2S-containing gases to be sent to F1 until the recovery system could be brought back online. Suncor suspects that a water carryover event occurred from the water wash tower (W-65) to W-70 at some point prior to the event, which ultimately compromised the structural integrity of the catalyst within the reactor. This caused a flow restriction within W-70 resulting in the pressure increase. Suncor suspects that a new feed distributor design in W-65 caused the carryover during the startup process. This impacted the dispersion of the feed into the tower, which resulted in excess water carrying over into W-70 along with the feed.

    ii. On July 28, 2018, from 00:00 hrs to 20:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On July 27, 2018 at approximately 22:15 hours, Compressor 1715 (C-1715) tripped offline causing the automatic shutdown and depressurization of the No. 4 HDS. The shutdown and subsequent start-up of the No. 4 HDS caused a reduction in acid gas production leading to the No. 1 SRU, which led to elevated SO_2 emissions at the Tail Gas Incinerator (H-25). The unit depressurization also temporarily tripped the flare gas recovery compressors offline and required the first stage of the recovery compressors to be only partially operational throughout the

shutdown and start-up of the unit. This resulted in H_2S-containing gases being sent to F1. The second stage of the recovery compressors was put back online, and the first stage of the recovery compressors was placed back online to the extent possible to minimize the volume of gases sent to F1.

iii. On August 15, 2018 at approximately 18:30 hrs, the No. 2 SRU tripped offline due to a Programmable Logic Controller network card failure. The No. 1 SRU remained online and was able to continue processing acid gas, but the Sour Water Stripper was vented to the Main Plant Flare (F1) flare header. The flare gas recovery system remained fully online throughout the event, which caused the fuel gas amine system to become saturated. As a result, the fuel gas contained elevated levels of H_2S, and excess fuel gas was required to be sent to F1 due to a fuel gas imbalance. The No. 2 SRU trip was initiated by a software-related failure of one of the logic controller network cards, which effectively set half the system to a fail-safe state and caused a general shutdown of the unit. No physical damage to the card or associated electronics was identified, and the card issue was able to be cleared by power cycling the system. This event resulted in the following exceedances of the fuel gas H_2S limit at the Fuel Gas System and F1:

Fuel Gas System

Start Date and Time: 8/15/2018 20:00 hrs
End Date and Time: 8/16/2018 07:00 hrs

Main Plant Flare (F1)

Start Date and Time: 8/15/2018 20:00 hrs
End Date and Time: 8/16/2018 10:00 hrs

iv. On September 19, 2018 at 18:00 hrs to September 21, 2018 at 04:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On September 19, 2018, Suncor identified a drip coming from the F1 flare gas header line. As a safety precaution, the first stage of the flare gas recovery system was taken offline at approximately 16:30 hrs to avoid oxygen ingress into the header. This allowed H_2S-containing gases to be sent to F1. Suncor determined a leak had developed on the bottom of the F1 header pipe directly on a girth weld seam and between two existing pipe shoe supports. While initial attempts to mitigate the leak were unsuccessful due to location, pipe geometry, and it being an

active leak, Suncor determined it was acceptable to bring the first stage of the recover compressor back online. A pin hole developed on the bottom of the F1 header pipe due to localized corrosion and thinning on the bottom of the line. It is likely that a slight dip in the line created a low area where liquid drop out collected and caused the pipe to corrode over time. Additionally, the weld region was likely more aggressively corroded due to the heat affected zone present near the girth weld.

v. On October 4, 2018, from 01:00 hrs to 07:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On October 3, 2018 at approximately 19:00 hrs, a power interruption occurred that shut down compressor C-18 in the No. 2 HDS. As a result, the No. 2 HDS, No. 1 NDS, Re-run Unit, and No. 1 Reformer were shut down. When Suncor began restarting the No. 1 Reformer, the flare gas recovery system experienced large pressure swings tripping the system offline and causing H_2S-containing gases to be sent to F1.

vi. On October 21, 2018, from 20:00 hrs to 21:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). At approximately 17:00 hrs on October 21, 2018, the water level in the Vacuum Overhead Accumulator (D-278) began to show erratic readings, which impacted the operation of the Vacuum Tower upstream. The Vacuum Tower was unable to maintain level and ultimately lost vacuum causing a tower upset. A surge of gas was sent to the flare header at F2, which breeched the water seal of the flare gas recovery system. This caused elevated H_2S readings in the flare gas at F2. Suncor determined the cause of the erratic level readings was corroded terminals within the level controller valve positioner. This prevented the control valve from adequately controlling the levels in D-278 causing the upset in the upstream Vacuum Tower.

vii. On November 4, 2018, the first stage of the flare gas recovery compressor was taken offline intermittently as part of the planned shutdown of the No. 1 Reformer and unit purging activities. The first stage of the compressor was placed back online while the outage work took place but was taken back offline intermittently again starting November 12, 2018 during planned start-up activities. This event resulted in the following exceedances of the fuel gas H_2S limit at the Main Plant Flare (F1):

Start Date and Time: 11/4/2018 18:00 hrs
End Date and Time: 11/4/2018 21:00 hrs

Start Date and Time: 11/5/2018 21:00 hrs
End Date and Time: 11/6/2018 03:00 hrs
Start Date and Time: 11/12/2018 10:00 hrs
End Date and Time: 11/12/2018 18:00 hrs
Start Date and Time: 11/13/2018 01:00 hrs
End Date and Time: 11/13/2018 03:00 hrs
Start Date and Time: 11/15/2018 08:00 hrs
End Date and Time: 11/15/2018 12:00 hrs

viii. On November 26, 2018 at 03:00 hrs to November 27, 2018 at 08:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On November 26, 2018, the No. 4 HDS began shutting down for a planned maintenance outage on the No. 4 HDS. The No.4 HDS was depressurized and purged to remove all products within the system. For a portion of the shutdown and purging process, the first stage of the flare gas recovery system had to be taken offline causing H_2S-containing gases to be sent to F1.

ix. On November 28, 2018, from 19:00 hrs to 20:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On November 28, 2018, Suncor was performing work within the programmable logic controller system in the No. 4 HDS. During this work, the distributed control system ("DCS") serial communications experienced a brief loss of communications. Upon restoring power to the system, several DCS alarms were triggered. One of these alarms was tied to DCS logic that shuts down hydrogen feed to the No. 3 HDS hydrogen compressor (C-53) and resulted in high compressor temperatures and shutdown of the compressor, as designed. To avoid tripping the entire recovery system offline, the first stage of the flare gas recovery system was taken offline, which allowed H_2S containing gases to be routed to F1, until the compressor could be restarted and normal operations resumed.

x. On December 5, 2018, from 06:00 hrs to 07:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). At approximately 03:45 hrs on December 5, 2018, the H_2S concentration in the Plant 3 flare gas suddenly spiked. Suncor determined the electrical heat tracing thermostat had become stuck and was no longer controlling the heat tracing line protecting the water supply line. The line froze and became plugged causing the water in the seal drum to become sour. This caused elevated H_2S readings in the flare gas at F2.

xi. On December 9, 2018, Suncor began start-up activities in various Plant 1 process units following maintenance outages. The start-up activities led to fluctuations in acid gas production and a hydrogen imbalance throughout Plant 1 and the need to have the first stage of the flare gas recovery system offline, which resulted in the following exceedances of the fuel gas H_2S limit at the Main Plant Flare (F1):

Start Date and Time: 12/11/2018 12:00 hrs
End Date and Time: 12/11/2018 21:00 hrs
Start Date and Time: 12/13/2018 19:00 hrs
End Date and Time: 12/14/2018 02:00 hrs
Start Date and Time: 12/14/2018 20:00 hrs
End Date and Time: 12/15/2018 13:00 hrs

xii. On December 16, 2018 at 20:00 hrs to December 17, 2018 at 10:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). On December 16, 2018, Suncor was conducting start-up activities at Plant 3, and at approximately 15:00 hrs that day, the Plant 3 flare gas recovery system tripped offline unexpectedly due to a high liquid level in the F2 knockout drum (D-133). Suncor immediately tried to drain the knockout drum but very quickly overwhelmed the CPI separator and, therefore, was unable to fully drain the drum. Liquid carryover occurred to F2, which also caused a brief period of visible emissions. Suncor utilized both the CPI pump and vacuum trucks to reduce the liquid level of the CPI separator as expeditiously as possible, which ultimately allowed Suncor to drop the level of the flare knockout drum and return the flare gas recovery system to service. Suncor determined the level controller on D-133 was not functioning properly, which allowed the level in the drum to carry over to the flare system.

xiii. On December 22, 2018 at 15:00 hrs to December 23, 2018 at 02:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On December 22, 2018 at approximately 13:55 hrs, the level indication on the flare gas recovery system second stage suction drum spiked high and immediately dropped to zero, which was a false reading. The initial spike tripped the flare gas recovery compressor, as designed, causing H_2S-containing gases to be sent to F1.

xiv. On December 29, 2018, from 18:00 hrs to 22:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On December 29, 2018, the pressure swing adsorption ("PSA") portion of the Hydrogen Plant tripped offline, which required the first

stage of the flare gas recovery compressor to come offline causing H_2S-containing gases to be sent to F1. Suncor suspects the PSA purge gas valves experienced freezing issues due to winterization efforts not being implemented.

xv. On December 31, 2018, Boiler 8 tripped offline causing a slump in steam supply and an upset in various process units, including the Plant 1 FCCU, No. 3 HDS, and No. 4 HDS. The cause of the Boiler 8 trip and steam supply instabilities was scaffolding constructed by a contractor. The scaffolding restricted the damper valves from opening to the required position, which ultimately caused the unit to trip due to a loss of flame. As the steam system stabilized on January 1, 2019, pressure swings occurred within the No. 3 and 4 HDS amine systems sending increased acid gas flow to the SRUs. The increased flow tripped the No. 1 SRU offline and required acid gas to be sent to the Main Plant Flare (F1). Suncor was able to restart the No. 1 SRU briefly, but it tripped again and remained down. In addition to the above events, the level controller on the Absorber Tower in the Vapor Recovery Unit began to malfunction on January 1, 2019, and therefore, was not able to maintain a proper level in the tower. Liquid hydrocarbons carried over from the tower to the Main Plant Amine System and ultimately to the No. 2 SRU. The No. 2 SRU tripped offline twice due to high liquid level in the knockout drum on January 1, 2019 resulting in additional acid gases sent to the F1. These events led to the following exceedances of the fuel gas H_2S limit at the Fuel Gas System and F1:

Fuel Gas System

Start Date and Time: 01/01/2019 04:00 hrs
End Date and Time: 01/01/2019 11:00 hrs
Start Date and Time: 01/01/2019 16:00 hrs
End Date and Time: 01/01/2019 21:00 hrs
Start Date and Time: 01/01/2019 22:00 hrs
End Date and Time: 01/02/2019 21:00 hrs
Start Date and Time: 01/08/2019 12:00 hrs
End Date and Time: 01/08/2019 15:00 hrs

Main Plant Flare (F1)

Start Date and Time: 01/01/2019 02:00 hrs
End Date and Time: 01/03/2019 16:00 hrs
Start Date and Time: 01/08/2019 11:00 hrs
End Date and Time: 01/08/2019 16:00 hrs

Start Date and Time: 01/10/2019 10:00 hrs
End Date and Time: 01/10/2019 22:00 hrs
Start Date and Time: 01/11/2019 05:00 hrs
End Date and Time: 01/11/2019 09:00 hrs
Start Date and Time: 01/11/2019 11:00 hrs
End Date and Time: 01/11/2019 14:00 hrs
Start Date and Time: 01/11/2019 19:00 hrs
End Date and Time: 01/11/2019 21:00 hrs
Start Date and Time: 01/12/2019 13:00 hrs
End Date and Time: 01/12/2019 16:00 hrs
Start Date and Time: 01/13/2019 08:00 hrs
End Date and Time: 01/13/2019 13:00 hrs
Start Date and Time: 01/13/2019 23:00 hrs
End Date and Time: 01/14/2019 12:00 hrs

xvi. On January 15, 2019, from 10:00 hrs to 12:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On January 15 2019, the No. 4 HDS began shutting down for a planned maintenance outage and repairs. Part of the unit was depressurized and purged to remove all products within the system. For a portion of the shutdown and purging process, the first stage of the flare gas recovery system had to be taken offline, and the gases were routed to F1. Additionally, the shutdown of the No. 4 HDS resulted in a hydrogen imbalance in Plant 1 causing a significant amount of hydrogen to be sent to the GBR Flare (F3) for an extended period.

xvii. On January 24, 2019, from 11:00 hrs to 15:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On January 24, 2019 at approximately 08:30 hrs, the pressure on the Xcel Energy line supplying natural gas to the Refinery suddenly dropped from 448 psig to 331 psig. The sudden drop in city gas pressure caused the Hydrogen plant to trip and shutdown. Natural gas from Xcel Energy is a feed to the Hydrogen Plant. Due to the process upset at Hydrogen Plant, the first stage of the Flare Gas Recovery System had to be taken offline to prevent a system overload by off gases, which caused H_2S-containing gases to be sent to F1.

xviii. On January 28, 2019 at 06:00 hrs to February 2, 2019 at 14:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On January 28, 2019, the No. 4 HDS, Hydrogen Plant, and No. 1 SRU at Plant 1 began starting up following a planned maintenance outage at the No. 4 HDS. During the start-up, the first stage of the flare gas recovery system had to be taken offline

causing H_2S-containing gases to be sent to F1. Additionally, on February 2, 2019, the TGU Incinerator (H-25) experienced an increase in SO_2 emissions during the planned startup of the No. 1 SRU.

xix. On February 9, 2019 at 11:00 hrs to February 12, 2019 at 04:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On February 9, 2019, the No. 1 Crude unit began shutting down for a planned maintenance outage. The unit was depressurized and purged to remove all products within the system. For a portion of the shutdown and purging process, the first stage of the flare gas recovery system had to be taken offline causing H_2S-containing gases to be sent to F1.

xx. On February 13, 2019, the NDS unit at Plant 1 was in the process of starting up following a planned maintenance outage. During the start-up, the first stage of the Flare Gas Recovery System had to be taken offline causing H_2S-containing gases to be sent to the Main Plant Flare (F1) and the following exceedances of the fuel gas H_2S limit at F1:

Start Date and Time: 02/13/2019 19:00 hrs
End Date and Time: 02/14/2019 13:00 hrs
Start Date and Time: 02/14/2019 22:00 hrs
End Date and Time: 02/15/2019 01:00 hrs

xxi. On February 20, 2019, from 17:00 hrs to 21:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On February 20 2019, one of the feed gas flow transmitters at the Hydrogen Plant malfunctioned and started displaying spurious low values. The values displayed by the malfunction transmitter caused a surge in feed gas flow to the Hydrogen Plant. The sudden increase in feed gas flow to Hydrogen Plant caused the unit to trip. As a result of the process upset, the first stage of the Flare Gas Recovery System had to be taken offline to prevent a system overload, which caused H_2S-containing gases to be sent to F1.

xxii. On February 22, 2019 at 02:00 hrs to February 23, 2019 at 10:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On February 21, 2019 at around 22:45 hrs, the Plant 1 FCCU began to experience a process upset condition. The upset occurred at the FCC converter section (W-53) where the catalyst flow between the disengager and stripper began to drop. The decrease in catalyst flow from the disengager impacted catalyst circulation and upset the unit operation. On February 22, 2019 at

approximately 00:00 hrs, Suncor shut down the Plant 1 FCCU. With the FCCU offline, the wet gas compressor in the vapor recovery unit had to be shut down, which required the first stage of the Flare Gas Recovery System to be taken offline to prevent a system overload. This allowed H_2S containing gases to be routed to F1.

xxiii. On March 12, 2019, Suncor discovered a fire under heater H-2101 and immediately shutdown the Hydrogen Plant. During shutdown, the first stage of the Flare Gas Recovery System had to be taken offline to prevent a system overload by off gases, which resulted in H_2S-containing gases to be sent to the Main Plant Flare (F1). On March 17, 2019, the No.4 HDS, previously shutdown and under pressure (not completely de-inventoried) due to Hydrogen Plant unavailability, developed leaks in at least 3 different locations. As a result of the leaks, the No.4 HDS was immediately depressurized and H_2S-containing gases were sent to F1. After the Hydrogen Plant shutdown, Suncor discovered a cracked weld at H-2101 on the 8-inch collector to transfer line. During preparation of the heater for repair work, water unexpectedly entered the Hydrogen Plant from the steam side of the mix tee in the front end of the unit. On March 24, 2019, the dry out process of the Hydrogen Plant began by utilizing four temporary burners. During the dry out process, H_2S-containing gases were sent to F1. These events resulted in the following exceedances of the fuel gas H_2S limit at F1:

Start Date and Time: 03/12/2019 09:00 hrs
End Date and Time: 03/13/2019 17:00 hrs
Start Date and Time: 03/17/2019 13:00 hrs
End Date and Time: 03/18/2019 00:00 hrs
Start Date and Time: 03/22/2019 11:00 hrs
End Date and Time: 03/23/2019 14:00 hrs
Start Date and Time: 03/24/2019 17:00 hrs
End Date and Time: 03/30/2019 00:00 hrs

xxiv. On March 14, 2019 at 12:00 hrs to March 15, 2019 at 05:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). This exceedance was a result of the event described in Paragraph 22.d.ii of this Consent Order.

xxv. The event described in Paragraph 22.c.vi of this Consent Order resulted in the following exceedances of the fuel gas H_2S limit at the Main Plant Flare (F1):

Start Date and Time: 04/09/2019 23:00 hrs
End Date and Time: 04/10/2019 09:00 hrs
Start Date and Time: 04/12/2019 17:00 hrs
End Date and Time: 04/13/2019 02:00 hrs
Start Date and Time: 04/13/2019 17:00 hrs
End Date and Time: 04/13/2019 22:00 hrs
Start Date and Time: 04/14/2019 12:00 hrs
End Date and Time: 04/14/2019 13:00 hrs

xxvi. On April 15, 2019, No. 4 HDS and Hydrogen Plant at Plant 1 began starting up following a maintenance and repair outage. During the start-up, the first stage of the Flare Gas Recovery System had to be taken offline causing H_2S-containing gases to be sent to the Main Plant Flare (F1) and the following exceedances of the fuel gas H_2S limit at F1:

Start Date and Time: 04/15/2019 02:00 hrs
End Date and Time: 04/15/2019 22:00 hrs
Start Date and Time: 04/17/2019 15:00 hrs
End Date and Time: 04/20/2019 16:00 hrs

xxvii. The event described in Paragraph 22.d.iv of this Consent Order resulted in the following exceedances of the fuel gas H_2S limit at the Main Plant Flare (F1):

Start Date and Time: 04/24/2019 08:00 hrs
End Date and Time: 04/24/2019 14:00 hrs
Start Date and Time: 04/24/2019 18:00 hrs
End Date and Time: 04/24/2019 22:00 hrs
Start Date and Time: 04/25/2019 14:00 hrs
End Date and Time: 04/26/2019 04:00 hrs
Start Date and Time: 04/26/2019 05:00 hrs
End Date and Time: 04/26/2019 10:00 hrs

xxviii. On April 28, 2019, Suncor began starting up the No. 3 HDS and No. 1 SRU at Plant 1 following a maintenance outage. During the startup, the first stage of the Flare Gas Recovery System had to be taken offline, and as a result, high H_2S gases were routed to the Main Plant Flare (F1). Suncor started the No. 1 SRU on city gas, and as a result, gases were sent directly to the TGU Incinerator (H-25) causing an exceedance of SO_2 limit (see Paragraph 22.g of this Consent Order). On May 5, 2019, Suncor began charging the No. 1 SRU with acid gases from both the No. 3 HDS and No. 4 HDS. Introduction of acid gases initially stopped the SO_2 permit limit exceedance at H-25, but eventually, SO_2

emissions increased and caused additional non-compliance with the permit limit. Suncor determined the SO_2 exceedance at H-25 was caused by a non-functional ratio analyzer on the No. 1 SRU, which was a prior known issue. This event led to the following exceedances of the fuel gas H_2S limit at F1:

Start Date and Time: 04/29/2019 00:00 hrs
End Date and Time: 04/29/2019 06:00 hrs
Start Date and Time: 04/29/2019 11:00 hrs
End Date and Time: 04/29/2019 14:00 hrs

xxix. On May 5, 2019, from 05:00 hrs to 08:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). On May 5, 2019 at approximately 03:23 hrs, the Plant 3 flare seal drum (D-002) had a breakthrough, and gases from the seal drum were routed to F2. Suncor determined the flare gas compressor (C-21) screen was plugged, and the plugging caused the breakthrough in the seal drum (D-002).

xxx. On May 6, 2019, from 18:00 hrs to 23:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). On May 6, 2019, the Plant 1 FCCU feed pumps P-3510 and P-3511 unexpectedly shutdown, and the unit went into an upset mode resulting in additional gases being sent to F1. Suncor's attempts to start the spare pump failed, and an emergency shutdown of the FCCU was initiated. Suncor determined the pumps shutdown due to a loss of feed flow into the FCCU. However, the exact reason of the feed flow loss is unknown. Suncor suspects that possible changes in the FCCU feed composition could have caused the feed pumps to shut down.

xxxi. On May 7, 2019, from 19:00 hrs to 20:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). At approximately 20:00 hrs on May 7, 2019, the Plant 3 flare seal drum (D-002) had a breakthrough due to a plugged flare gas compressor (C-21) screen, and gases from the seal drum were routed to the Asphalt Unit Flare (F2) causing the exceedance. As a corrective action measure, Suncor immediately started up Compressor C-2 and took Compressor C-21 offline.

xxxii. On May 14, 2019, at around 12:55 hrs, Suncor observed significant foaming at the amine regenerator (W-88) located at the No. 3 HDS. Suncor determined the foaming was caused by hydrocarbon carry over from the High Pressure Cold Separator Drum (D-339) at the No. 3 HDS. The hydrocarbon liquid eventually carried over

into the No. 1 SRU tripping the unit down due to a high level of hydrocarbon liquid in the Acid Gas Stop Drum (D-206). The acid gas stop drum pump (P-280) did not function during the event. During the event, in order to prevent shutdown of the No. 2 SRU, Suncor immediately diverted acid gas from the amine regenerator (W-88) to the Main Plant Flare (F1). Preventing the shutdown of the No. 2 SRU minimized the duration of acid gas flaring, as acid gases from No. 4 HDS and main plant amine regenerators were not routed to the F1. However, this event ultimately resulted in the following exceedances of the fuel gas H_2S limit at F1:

Start Date and Time: 05/14/19 17:00 hrs
End Date and Time: 05/15/19 13:00 hrs
Start Date and Time: 05/15/19 14:00 hrs
End Date and Time: 05/15/19 17:00 hrs
Start Date and Time: 05/16/19 04:00 hrs
End Date and Time: 05/16/19 06:00 hrs

xxxiii. The event described in Paragraph 22.d.v of this Consent Order resulted in the following exceedances of the fuel gas H_2S limit at the Fuel Gas System and F1:

Fuel Gas System

Start Date and Time: 05/16/19 16:00 hrs
End Date and Time: 05/17/19 04:00 hrs
Start Date and Time: 05/17/19 05:00 hrs
End Date and Time: 05/18/19 05:00 hrs
Start Date and Time: 05/18/19 23:00 hrs
End Date and Time: 05/19/19 03:00 hrs
Start Date and Time: 05/19/19 05:00 hrs
End Date and Time: 05/19/19 08:00 hrs
Start Date and Time: 05/19/19 13:00 hrs
End Date and Time: 05/19/19 17:00 hrs
Start Date and Time: 05/20/19 02:00 hrs
End Date and Time: 05/20/19 08:00 hrs
Start Date and Time: 05/20/19 15:00 hrs
End Date and Time: 05/20/19 18:00 hrs

Main Plant Flare (F1)

Start Date and Time: 05/17/19 12:00 hrs
End Date and Time: 05/18/19 01:00 hrs
Start Date and Time: 05/18/19 07:00 hrs

End Date and Time: 05/18/19 13:00 hrs

xxxiv. On June 16, 2019 at 20:00 hrs to June 17, 2019 at 00:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Asphalt Unit Flare (F2). Suncor determined the exceedance was caused by a low water level in the Plant 3 flare seal drum (D-002). However, Suncor was unable to determine the cause of the water level drop in D-002 but believes it was caused by either a significantly leaking internal weir or a non-functional drain line.

xxxv. On June 28, 2019, from 11:00 hrs to 12:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Main Plant Flare (F1). Suncor determined the exceedance was caused by a sudden pressure increase at the sweet fuel gas drum (D193). Suncor believes hot ambient temperatures around noon time on June 28, 2019 caused an increase in volume of fuel gases sent to D193. The additional fuel gas volume potentially pressured up D193 and caused the drum to vent excess fuel gas to the flare (F1). Suncor also suspects that calibration issues associated with H_2S analyzer may have contributed to this exceedance.

Suncor exceeded the fuel gas H_2S limit (162 ppmv, 3-hr rolling average) at the Fuel Gas System, Main Plant Flare (F1), and Asphalt Unit Flare (F2), violating Permit 96OPAD120, Conditions 11.3, 12.3, 13.3, 14.3, 15.3, 16.3, 17.3, 18.3, 20.6.2, 21.3, 27.3, 28.3, 29.2, 29.9, 30.2, 30.10, 38.2.1, 46.1.1, and 46.8; Subpart J, § 60.104(a)(1); and Subpart Ja, §§ 60.102a(g)(1)(ii) and 60.103a(h).

f. Pursuant to Permit 96OPAD120, Conditions 29.9, 31.2, and 46.3, and Subpart Ja, § 60.103a(b)(2), Suncor must comply with the flare management plans, required by Subpart Ja, for the Main Plant Flare (F1) and the GBR Flare (F3), including the alternate baseline flow rates of 16,537.94 thousand standard cubic feet per day ("Mscf/d") for F1, and 3,447.68 Mscf/d (in effect until January 30, 2019) and 6,123 Mscf/d (effective January 30, 2019) for F3.

i. On December 9, 2018, Suncor began start-up activities in various Plant 1 process units following maintenance outages. The start-up activities led to fluctuations in acid gas production and a hydrogen imbalance throughout Plant 1 and the need to have the first stage of the flare gas recovery system offline, which resulted in the following noncompliance with the alternate baseline flow rates:

GBR Flare (F3) (3,447.68 Mscf/d)

Start Date and Time: 12/12/2018 18:00 hrs
End Date and Time: 12/13/2018 14:00 hrs

Main Plant Flare (F1) (16,537.94 Mscf/d)

Start Date and Time: 12/14/2018 09:00 hrs
End Date and Time: 12/15/2018 21:00 hrs

ii. The event described in Paragraph 22.e.xvi of this Consent Order resulted in an exceedance of the alternate baseline flow rate of 6,123 Mscf/d at the GBR Flare (F3) from January 20, 2019 at 12:00 hrs to January 23, 2019 at 22:00 hrs.

Suncor failed to comply with the Subpart Ja flare management plan alternate baseline flow rates at the Main Plant Flare (F1) and the GBR Flare (F3), violating Permit 96OPAD120, Conditions 29.9, 31.2, and 46.3, and Subpart Ja, § 60.103a(b)(2).

g. Pursuant to Permit 96OPAD120, Condition 20.1, Suncor shall not exceed the sulfur dioxide ("SO_2") emission limit of 15.68 pounds per hour ("lb/hr") from the Tail Gas Unit ("TGU") Incinerator (H-25)[5]. Pursuant to Permit 96OPAD120, Conditions 20.6.1 and 45.12.1; the West Plant Consent Decree, Paragraphs 169 and 171; and Subpart J, § 60.104(a)(2)(i), Suncor shall not discharge or cause the discharge of any gases into the atmosphere from any Claus sulfur recovery plant containing in excess of, for an oxidation control system or a reduction control system followed by incineration, 250 parts per million volumetric dry ("ppmvd") of SO_2 at 0% excess air, on a 12-hr rolling average. Pursuant to Permit 96OPAD120, Conditions 20.10 and 54.28, and Subpart UUU, § 63.1568(a)(1), the SRUs at the Refinery, Plant 1, are subject to Subpart J, § 60.104(a)(2)(i), and therefore, the hazardous air pollutant emission limit for the SRUs is 250 ppmvd of SO_2 at 0% excess air, on a 12-hr rolling average.

i. On the evening of July 13, 2018, water wash maintenance was taking place on the cooling fans in the No. 2 Sour Water Stripper ("SWS"). Maintaining water flow across the cooling fan being cleaned is essential to keep the overhead gas temperature down. The contractor performing the water wash maintenance did not maintain the flow of water throughout the entire duration of the

[5] Emissions from SRUs and their associated sulfur pits are routed through the TGU and vented through the TGU incinerator. Therefore, emissions from the SRUs and the sulfur pits are measured at the incinerator (H-25).

cleaning operation. Therefore, the temperature and pressure spiked in the No. 2 SWS tower causing a surge of gas to the No. 2 SRU resulting in an upset. Suncor was unable to stabilize the No. 2 SWS for several hours, which led to elevated SO_2 emissions at H-25. Suncor determined the cooling fan maintenance was not adequately planned and communication during the maintenance work was insufficient between the contractor and Suncor. This event resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 07/13/2018 22:00 hrs
End Date and Time: 07/14/2018 02:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 07/13/2018 22:00 hrs
End Date and Time: 07/14/2018 13:00 hrs

ii. The event described in Paragraph 22.e.ii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 07/27/2018 23:00 hrs
End Date and Time: 07/28/2018 19:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 07/27/2018 23:00 hrs
End Date and Time: 07/29/2018 06:00 hrs

iii. On August 3, 2018 at approximately 09:00 hrs, the No. 2 Sour Water Stripper (SWS) experienced an upset due to fouling/plugging of the tower. Suncor determined the fouling is related to a trip malfunction event at the No. 4 HDS that occurred on July 27-28, 2018. As a result of the No. 4 HDS trip event, the amine unit experienced hydrocarbon contamination. In order to maintain the proper operation of the No. 2 SWS, anti-foulant is injected into the amine system. However, the presence of hydrocarbon interfered with the ability of the anti-foulant to perform its function. Fouling resulted and caused unexpected level swings within the SWS tower. Therefore, the hydrocarbon contamination from the No. 4 HDS malfunction event ultimately

led to fouling of the No. 2 SWS days later, which resulted in swings at the No. 2 SRU and elevated emissions at H-25. This event resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 08/03/2018 09:00 hrs
End Date and Time: 08/03/2018 10:00 hrs
Start Date and Time: 08/05/2018 10:00 hrs
End Date and Time: 08/05/2018 12:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 08/05/2018 10:00 hrs
End Date and Time: 08/05/2018 22:00 hrs

iv. The event described in Paragraph 22.e.iii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 08/15/2018 18:00 hrs
End Date and Time: 08/16/2018 00:00 hrs
Start Date and Time: 08/16/2018 01:00 hrs
End Date and Time: 08/16/2018 04:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 08/15/2018 18:00 hrs
End Date and Time: 08/16/2018 14:00 hrs

v. On August 30, 2018 at approximately 20:22 hrs, the No. 1 SRU Tail Gas H_2S/SO_2 analyzer began to fail and read incorrectly. The analyzer output feeds back directly into the programmable logic controller for the combustion air blower supplying the No. 1 SRU thermal reactor. With the analyzer reading incorrectly, the air ratio in the thermal reactor was insufficient. This led to elevated levels of H_2S in the tail gas, which ultimately caused elevated SO_2 emissions at H-25. This event resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 08/30/2018 22:00 hrs

End Date and Time: 08/31/2018 00:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 08/31/2018 05:00 hrs
End Date and Time: 08/31/2018 09:00 hrs

vi. On December 9, 2018, Suncor began start-up activities in various Plant 1 process units following maintenance outages. The start-up activities led to fluctuations in acid gas production and a hydrogen imbalance throughout Plant 1 and the need to have the first stage of the flare gas recovery system offline, which resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 12/09/2018 19:00 hrs
End Date and Time: 12/09/2018 20:00 hrs
Start Date and Time: 12/10/2018 09:00 hrs
End Date and Time: 12/10/2018 10:00 hrs
Start Date and Time: 12/11/2018 01:00 hrs
End Date and Time: 12/13/2018 15:00 hrs
Start Date and Time: 12/14/2018 19:00 hrs
End Date and Time: 12/14/2018 20:00 hrs
Start Date and Time: 12/16/2018 11:00 hrs
End Date and Time: 12/16/2018 13:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 12/9/2018 12:00 hrs
End Date and Time: 12/10/2018 20:00 hrs
Start Date and Time: 12/11/2018 01:00 hrs
End Date and Time: 12/14/2018 08:00 hrs
Start Date and Time: 12/14/2018 16:00 hrs
End Date and Time: 12/15/2018 05:00 hrs
Start Date and Time: 12/15/2018 21:00 hrs
End Date and Time: 12/16/2018 22:00 hrs

vii. On December 22, 2018 at approximately 22:00 hrs, the tail gas analyzer in the No. 1 SRU began to trend upward until it hit its upper range. The unit began to make adjustments automatically based on the tail gas analyzer readings, which caused the unit to become off ratio. This caused elevated H_2S concentrations to be sent to the TGU and ultimately H-25. This event resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 12/22/2018 23:00 hrs
End Date and Time: 12/23/2018 00:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 12/22/2018 23:00 hrs
End Date and Time: 12/23/2018 11:00 hrs

viii. The events described in Paragraph 22.e.xv of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 01/01/2019 01:00 hrs
End Date and Time: 01/01/2019 13:00 hrs
Start Date and Time: 01/01/2019 15:00 hrs
End Date and Time: 01/01/2019 18:00 hrs
Start Date and Time: 01/01/2019 19:00 hrs
End Date and Time: 01/02/2019 08:00 hrs
Start Date and Time: 01/02/2019 09:00 hrs
End Date and Time: 01/02/2019 10:00 hrs
Start Date and Time: 01/14/2019 20:00 hrs
End Date and Time: 01/14/2019 21:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 01/01/2019 01:00 hrs
End Date and Time: 01/03/2019 07:00 hrs
Start Date and Time: 01/14/2019 20:00 hrs
End Date and Time: 01/15/2019 08:00 hrs

ix. The event described in Paragraph 22.e.xviii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 02/02/2019 04:00 hrs
End Date and Time: 02/02/2019 10:00 hrs
Start Date and Time: 02/02/2019 12:00 hrs
End Date and Time: 02/02/2019 14:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 02/02/2019 02:00 hrs
End Date and Time: 02/03/2019 01:00 hrs

x. The event described in Paragraph 22.d.ii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 03/13/2019 12:00 hrs
End Date and Time: 03/13/2019 16:00 hrs
Start Date and Time: 03/13/2019 18:00 hrs
End Date and Time: 03/14/2019 07:00 hrs
Start Date and Time: 03/14/2019 10:00 hrs
End Date and Time: 03/14/2019 13:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 03/13/2019 12:00 hrs
End Date and Time: 03/14/2019 23:00 hrs

xi. On April 23, 2019, the p-trap in drum D-7706 at the No. 1 SRU was plugged resulting in the blowers tripping and gases to be routed directly to H-25. Suncor enabled the booster blower bypass to divert TGU flow around the booster blowers. On April 24, 2019, Suncor attempted to return the D-7706 blower bypass back to "normal" state. In the SRU board display, there are options available to enable/disable individual bypasses around H-25/the TGU. There is also a common switch. Instead of utilizing the individual bypass option, Suncor inadvertently utilized the common switch to put D-7706 blower bypass back to "normal" state. When the common switch was put back to "normal" state, all the SRU gases were diverted back to H-25. This event resulted in the following exceedance of the SO_2 limit at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 04/23/2019 12:00 hrs
End Date and Time: 04/23/2019 13:00 hrs
Start Date and Time: 04/24/2019 09:00 hrs
End Date and Time: 04/24/2019 10:00 hrs

xii. The event described in Paragraph 22.e.xiii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 04/29/2019 07:00 hrs
End Date and Time: 05/01/2019 02:00 hrs
Start Date and Time: 05/01/2019 03:00 hrs
End Date and Time: 05/01/2019 07:00 hrs
Start Date and Time: 05/01/2019 08:00 hrs
End Date and Time: 05/01/2019 10:00 hrs
Start Date and Time: 05/04/2019 13:00 hrs
End Date and Time: 05/04/2019 14:00 hrs
Start Date and Time: 05/04/2019 17:00 hrs
End Date and Time: 05/04/2019 18:00 hrs
Start Date and Time: 05/05/2019 05:00 hrs
End Date and Time: 05/05/2019 06:00 hrs
Start Date and Time: 05/05/2019 08:00 hrs
End Date and Time: 05/05/2019 10:00 hrs
Start Date and Time: 05/06/2019 00:00 hrs
End Date and Time: 05/06/2019 03:00 hrs
Start Date and Time: 05/06/2019 23:00 hrs
End Date and Time: 05/07/2019 00:00 hrs
Start Date and Time: 05/07/2019 01:00 hrs
End Date and Time: 05/07/2019 02:00 hrs
Start Date and Time: 05/07/2019 06:00 hrs
End Date and Time: 05/07/2019 08:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 04/29/2019 00:00 hrs
End Date and Time: 05/01/2019 20:00 hrs
Start Date and Time: 05/04/2019 16:00 hrs
End Date and Time: 05/05/2019 19:00 hrs
Start Date and Time: 05/06/2019 01:00 hrs
End Date and Time: 05/06/2019 14:00 hrs
Start Date and Time: 05/07/2019 02:00 hrs
End Date and Time: 05/07/2019 15:00 hrs

xiii. The event described in Paragraph 22.e.xxxii of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 05/14/19 13:00 hrs
End Date and Time: 05/14/19 14:00 hrs
Start Date and Time: 05/14/19 15:00 hrs
End Date and Time: 05/14/19 17:00 hrs

Start Date and Time: 05/15/19 05:00 hrs
End Date and Time: 05/15/19 07:00 hrs
Start Date and Time: 05/15/19 08:00 hrs
End Date and Time: 05/15/19 10:00 hrs
Start Date and Time: 05/15/19 12:00 hrs
End Date and Time: 05/15/19 13:00 hrs
Start Date and Time: 05/15/19 14:00 hrs
End Date and Time: 05/15/19 15:00 hrs
Start Date and Time: 05/15/19 17:00 hrs
End Date and Time: 05/15/19 22:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 05/14/2019 13:00 hrs
End Date and Time: 05/16/2019 06:00 hrs

xiv. The event described in Paragraph 22.d.v of this Consent Order resulted in the following exceedances of the SO_2 limits at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 05/16/19 15:00 hrs
End Date and Time: 05/17/19 19:00 hrs
Start Date and Time: 05/18/19 04:00 hrs
End Date and Time: 05/18/19 05:00 hrs
Start Date and Time: 05/19/19 01:00 hrs
End Date and Time: 05/19/19 02:00 hrs
Start Date and Time: 05/19/19 05:00 hrs
End Date and Time: 05/19/19 10:00 hrs
Start Date and Time: 05/26/19 12:00 hrs
End Date and Time: 05/26/19 13:00 hrs

250 ppmvd of SO_2 at 0% excess air

Start Date and Time: 05/16/2019 15:00 hrs
End Date and Time: 05/19/2019 21:00 hrs

xv. On June 13, 2019, Suncor observed significant foaming at the amine regenerator (W-88) located at the No. 3 HDS. Suncor determined the foaming was caused by hydrocarbon carry over from High Pressure Cold Separator Drum (D-339) at the No. 3 HDS, which was a result of a malfunctioning level controller (LC 115) on drum D-339. The hydrocarbon liquid eventually carried over into the No. 1 SRU resulting in acid gases being sent to H-25. The No. 1 SRU knockout drum pumps did not function properly when the

liquid was introduced into the system. This event resulted in the following exceedance of the SO_2 limit at H-25:

15.68 lb/hr SO_2 limit

Start Date and Time: 06/19/19 19:00 hrs
End Date and Time: 06/19/19 20:00 hrs

Suncor exceeded the SO_2 limits at H-25, violating Permit 96OPAD120, Conditions 20.1, 20.6.1, 20.10, 45.12.1, and 54.28; the West Plant Consent Decree, Paragraphs 169 and 171; Subpart J, § 60.104(a)(2)(i); and Subpart UUU, § 63.1568(a)(1).

h. Pursuant to Permit 96OPAD120, Condition 20.10, and Subpart UUU, §§ 63.1568(a)(2) and (4)(iii), during periods of startup and shutdown, Suncor must send any startup or shutdown purge gases to a thermal oxidizer or incinerator operated at a minimum hourly average temperature of 1,200°F in the firebox and a minimum hourly average outlet oxygen ("O_2") concentration of 2 volume percent (dry basis). For the Plant 1 SRUs, the purge gases are sent to the TGU Incinerator (H-25).

i. On December 9, 2018, Suncor began start-up activities in various Plant 1 process units following maintenance outages. The start-up activities led to fluctuations in acid gas production and a hydrogen imbalance throughout Plant 1 and the need to have the first stage of the flare gas recovery system offline, which resulted in the following noncompliance with the operating limits at H-25:

Combustion zone temperature

Start Date and Time: 12/11/2018 01:00 hrs
End Date and Time: 12/11/2018 02:00 hrs

Outlet O_2 concentration

Start Date and Time: 12/16/2018 12:00 hrs
End Date and Time: 12/16/2018 13:00 hrs

ii. The event described in Paragraph 22.e.xviii of this Consent Order resulted in the following noncompliance with the operating limit at H-25:

Combustion zone temperature

Start Date and Time: 02/02/2019 13:00 hrs
End Date and Time: 02/02/2019 23:00 hrs

Suncor failed to meet the required operating limits (combustion zone temperature and outlet O_2 concentration) at H-25 while startup purge gases were routed to the incinerator, violating Permit 96OPAD120, Condition 20.10, and Subpart UUU, §§ 63.1568(a)(2) and (4)(iii).

i. Pursuant to Permit 96OPAD120, Condition 22.10.1, and the West Plant Consent Decree, Paragraph 49, Suncor is required to limit carbon monoxide ("CO") emissions from the Plant 1 FCCU to 500 ppmvd at 0% O_2 on a one hour average. Pursuant to Permit 96OPAD120, Conditions 22.11, 22.12, 45.2, and 54.7; Subpart J, § 60.103(a); and Subpart UUU, § 63.1565(a)(1), Suncor shall not discharge or cause the discharge into the atmosphere from any FCCU catalyst regenerator any gases that contain CO in excess of 500 ppmvd.

   i. The events described in Paragraph 22.e.xv of this Consent Order resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

   500 ppmvd at 0% O_2 1-hour average

   Start Date and Time: 12/31/2018 16:00 hrs
   End Date and Time: 1/1/2019 00:00 hrs
   Start Date and Time: 01/01/2019 00:00 hrs
   End Date and Time: 01/01/2019 05:00 hrs
   Start Date and Time: 01/01/2019 07:00 hrs
   End Date and Time: 01/01/2019 09:00 hrs
   Start Date and Time: 01/01/2019 19:00 hrs
   End Date and Time: 01/02/2019 00:00 hrs
   Start Date and Time: 01/02/2019 03:00 hrs
   End Date and Time: 01/02/2019 04:00 hrs
   Start Date and Time: 01/02/2019 11:00 hrs
   End Date and Time: 01/02/2019 12:00 hrs
   Start Date and Time: 01/02/2019 15:00 hrs
   End Date and Time: 01/02/2019 19:00 hrs
   Start Date and Time: 01/03/2019 09:00 hrs
   End Date and Time: 01/03/2019 10:00 hrs
   Start Date and Time: 01/04/2019 19:00 hrs
   End Date and Time: 01/04/2019 20:00 hrs

   500 ppmvd

Start Date and Time: 12/31/2018 16:00 hrs
End Date and Time: 12/31/2018 20:00 hrs
Start Date and Time: 12/31/2018 21:00 hrs
End Date and Time: 12/31/2018 22:00 hrs
Start Date and Time: 12/31/2018 23:00 hrs
End Date and Time: 1/1/2019 00:00 hrs
Start Date and Time: 01/01/2019 02:00 hrs
End Date and Time: 01/01/2019 05:00 hrs
Start Date and Time: 01/01/2019 07:00 hrs
End Date and Time: 01/01/2019 09:00 hrs
Start Date and Time: 01/01/2019 19:00 hrs
End Date and Time: 01/02/2019 00:00 hrs
Start Date and Time: 01/02/2019 11:00 hrs
End Date and Time: 01/02/2019 12:00 hrs
Start Date and Time: 01/02/2019 16:00 hrs
End Date and Time: 01/02/2019 18:00 hrs
Start Date and Time: 01/03/2019 09:00 hrs
End Date and Time: 01/03/2019 10:00 hrs

ii. The event described in Paragraph 22.e.xxii of this Consent Order resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

500 ppmvd at 0% O_2 1-hour average

Start Date and Time: 02/22/2019 00:00 hrs
End Date and Time: 02/22/2019 02:00 hrs
Start Date and Time: 02/22/2019 05:00 hrs
End Date and Time: 02/22/2019 18:00 hrs
Start Date and Time: 02/22/2019 23:00 hrs
End Date and Time: 02/23/2019 01:00 hrs
Start Date and Time: 02/23/2019 19:00 hrs
End Date and Time: 02/24/2019 00:00 hrs
Start Date and Time: 02/24/2019 20:00 hrs
End Date and Time: 02/25/2019 01:00 hrs

500 ppmvd

Start Date and Time: 02/22/2019 00:00 hrs
End Date and Time: 02/22/2019 02:00 hrs
Start Date and Time: 02/22/2019 06:00 hrs
End Date and Time: 02/22/2019 18:00 hrs
Start Date and Time: 02/23/2019 20:00 hrs
End Date and Time: 02/24/2019 00:00 hrs
Start Date and Time: 02/24/2019 20:00 hrs

End Date and Time: 02/25/2019 01:00 hrs

iii. The event described in Paragraph 22.c.vi of this Consent Order resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

500 ppmvd at 0% O_2 1-hour average

Start Date and Time: 04/09/2019 19:00 hrs
End Date and Time: 04/10/2019 05:00 hrs
Start Date and Time: 04/10/2019 09:00 hrs
End Date and Time: 04/10/2019 10:00 hrs
Start Date and Time: 04/10/2019 11:00 hrs
End Date and Time: 04/10/2019 16:00 hrs
Start Date and Time: 04/10/2019 18:00 hrs
End Date and Time: 04/10/2019 21:00 hrs
Start Date and Time: 04/10/2019 23:00 hrs
End Date and Time: 04/11/2019 01:00 hrs
Start Date and Time: 04/11/2019 02:00 hrs
End Date and Time: 04/11/2019 06:00 hrs
Start Date and Time: 04/11/2019 07:00 hrs
End Date and Time: 04/11/2019 08:00 hrs
Start Date and Time: 04/11/2019 09:00 hrs
End Date and Time: 04/11/2019 11:00 hrs
Start Date and Time: 04/11/2019 12:00 hrs
End Date and Time: 04/11/2019 13:00 hrs

500 ppmvd

Start Date and Time: 04/09/2019 19:00 hrs
End Date and Time: 04/10/2019 05:00 hrs

iv. The event described in Paragraph 22.d.iv of this Consent Order resulted in the following exceedances of the CO limit at the Plant 1 FCCU:

500 ppmvd at 0% O2 1-hour average

Start Date and Time: 04/22/2019 12:00 hrs
End Date and Time: 04/22/2019 15:00 hrs
Start Date and Time: 04/23/2019 04:00 hrs
End Date and Time: 04/23/2019 09:00 hrs
Start Date and Time: 04/23/2019 10:00 hrs
End Date and Time: 04/23/2019 13:00 hrs
Start Date and Time: 04/23/2019 16:00 hrs

End Date and Time: 04/23/2019 19:00 hrs
Start Date and Time: 04/24/2019 00:00 hrs
End Date and Time: 04/24/2019 08:00 hrs
Start Date and Time: 04/25/2019 02:00 hrs
End Date and Time: 04/25/2019 06:00 hrs
Start Date and Time: 04/26/2019 05:00 hrs
End Date and Time: 04/26/2019 06:00 hrs

v. The event described in Paragraph 22.e.xxx of this Consent Order resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

500 ppmvd at 0% O2 1-hour average

Start Date and Time: 05/06/2019 14:00 hrs
End Date and Time: 05/06/2019 17:00 hrs

500 ppmvd

Start Date and Time: 05/06/2019 14:00 hrs
End Date and Time: 05/06/2019 16:00 hrs

Suncor failed to comply with the Plant 1 FCCU CO limits, violating Permit 96OPAD120, Conditions 22.10.1, 22.11, 22.12, 45.2, and 54.7; West Plant Consent Decree, Paragraph 49; Subpart J, § 60.103(a); and Subpart UUU, § 63.1565(a)(1).

j. Pursuant to Permit 96OPAD120, Condition 22.2.1.1, and the West Plant Consent Decree, Paragraph 40, Suncor shall limit SO_2 emissions from the Plant 1 FCCU to 50 ppmvd at 0% O_2 on a 7-day rolling average. The event described in Paragraph 22.d.iv of this Consent Order resulted in an exceedance of the SO_2 limit at the Plant 1 FCCU from April 26, 2019 at 23:00 hrs to May 1, 2019 at 23:00 hrs. From April 26, 2019 to May 1, 2019, Suncor failed to comply with the SO_2 limit at the Plant 1 FCCU, violating Permit 96OPAD120, Condition 22.2.1.1, and the West Plant Consent Decree, Paragraph 40.

k. Pursuant to Permit 96OPAD120, Conditions 22.7.1, 35.1, 35.2, and General Permit Condition 16, Suncor shall comply with the opacity limits in AQCC Regulation 1. Pursuant to AQCC Regulation 1, § II.A.1, Suncor shall not allow or cause the emission into the atmosphere of any air pollutant that is in excess of 20% opacity based on 24 consecutive opacity readings taken at 15-second intervals for six minutes. Pursuant to AQCC Regulation 1, § II.A.4, Suncor shall not allow or cause to be emitted into the atmosphere any air pollutant resulting from the

building of a new fire, cleaning of fire boxes, soot blowing, start-up, any process modification, or adjustment or occasional cleaning of control equipment, which is in excess of 30% opacity for a period or periods aggregating more than six minutes in any sixty consecutive minutes. Pursuant to Permit 96OPAD120, Conditions 22.7.2, 22.7.3, 45.1.2, and 54.1.2; the West Plant Consent Decree, Paragraph 54; Subpart J, § 60.102(a)(2); and Subpart UUU, § 63.1564(a)(1), Suncor shall not discharge or cause the discharge into the atmosphere from any FCCU catalyst regenerator any gases exhibiting greater than 30% opacity, except for one six-minute average opacity reading in any one hour period. Pursuant to Subpart UUU, § 63.1564(a)(2), Suncor shall maintain the 3-hour rolling average opacity of emissions from the FCCU catalyst regenerator vent to no higher than 20%.

i. The events described in Paragraph 22.e.xv of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 12/31/2018 15:36 hrs
End Date and Time: 12/31/2018 15:54 hrs
Start Date and Time: 12/31/2018 18:54 hrs
End Date and Time: 12/31/2018 19:06 hrs
Start Date and Time: 01/01/19 01:06 hrs
End Date and Time: 01/01/19 01:12 hrs
Start Date and Time: 01/01/19 01:24 hrs
End Date and Time: 01/01/19 01:42 hrs
Start Date and Time: 01/03/19 08:30 hrs
End Date and Time: 01/03/19 08:48 hrs
Start Date and Time: 01/04/19 11:54 hrs
End Date and Time: 01/04/19 12:00 hrs

30% (State, Sandblasting operations) 6-minute average

Start Date and Time: 12/31/2018 15:38 hrs
End Date and Time: 12/31/2018 15:56 hrs
Start Date and Time: 12/31/2018 18:56 hrs
End Date and Time: 12/31/2018 19:04 hrs
Start Date and Time: 01/01/2019 01:49 hrs
End Date and Time: 01/01/2019 01:54 hrs

30% (Federal, Subpart J and Subpart UUU) 6-minute average

Start Date and Time: 12/31/2018 15:36 hrs

End Date and Time: 12/31/2018 15:54 hrs
Start Date and Time: 12/31/2018 18:54 hrs
End Date and Time: 12/31/2018 19:00 hrs

ii. The event described in Paragraph 22.e.xxii of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 02/22/19 00:36 hrs
End Date and Time: 02/22/19 02:06 hrs
Start Date and Time: 02/22/19 23:54 hrs
End Date and Time: 02/23/19 00:00 hrs
Start Date and Time: 02/23/19 00:06 hrs
End Date and Time: 02/23/19 00:18 hrs
Start Date and Time: 02/23/19 00:36 hrs
End Date and Time: 02/23/19 00:42 hrs
Start Date and Time: 02/23/19 00:48 hrs
End Date and Time: 02/23/19 02:00 hrs
Start Date and Time: 02/23/19 02:42 hrs
End Date and Time: 02/23/19 02:54 hrs
Start Date and Time: 02/23/19 04:42 hrs
End Date and Time: 02/23/19 04:48 hrs
Start Date and Time: 02/23/19 04:54 hrs
End Date and Time: 02/23/19 05:06 hrs
Start Date and Time: 02/23/19 06:42 hrs
End Date and Time: 02/23/19 06:48 hrs
Start Date and Time: 02/23/19 07:42 hrs
End Date and Time: 02/23/19 07:54 hrs
Start Date and Time: 02/23/19 08:06 hrs
End Date and Time: 02/23/19 08:18 hrs
Start Date and Time: 02/23/19 08:24 hrs
End Date and Time: 02/23/19 08:36 hrs
Start Date and Time: 02/23/19 08:42 hrs
End Date and Time: 02/23/19 08:54 hrs
Start Date and Time: 02/23/19 10:42 hrs
End Date and Time: 02/23/19 10:48 hrs
Start Date and Time: 02/23/19 12:42 hrs
End Date and Time: 02/23/19 12:48 hrs
Start Date and Time: 02/23/19 14:24 hrs
End Date and Time: 02/23/19 14:30 hrs
Start Date and Time: 02/23/19 17:24 hrs
End Date and Time: 02/23/19 17:30 hrs
Start Date and Time: 02/23/19 18:00 hrs

End Date and Time: 02/23/19 18:06 hrs
Start Date and Time: 02/23/19 19:00 hrs
End Date and Time: 02/23/19 19:06 hrs
Start Date and Time: 02/23/19 19:12 hrs
End Date and Time: 02/23/19 19:54 hrs
Start Date and Time: 02/23/19 20:00 hrs
End Date and Time: 02/23/19 20:12 hrs
Start Date and Time: 02/23/19 20:18 hrs
End Date and Time: 02/23/19 20:24 hrs
Start Date and Time: 02/23/19 21:00 hrs
End Date and Time: 02/23/19 21:06 hrs
Start Date and Time: 02/23/19 21:12 hrs
End Date and Time: 02/23/19 21:18 hrs
Start Date and Time: 02/23/19 22:00 hrs
End Date and Time: 02/23/19 22:18 hrs
Start Date and Time: 02/23/19 22:30 hrs
End Date and Time: 02/23/19 22:36 hrs
Start Date and Time: 02/23/19 23:00 hrs
End Date and Time: 02/23/19 23:24 hrs
Start Date and Time: 02/24/19 00:00 hrs
End Date and Time: 02/24/19 00:06 hrs
Start Date and Time: 02/24/19 00:48 hrs
End Date and Time: 02/24/19 00:54 hrs
Start Date and Time: 02/24/19 01:00 hrs
End Date and Time: 02/24/19 01:06 hrs
Start Date and Time: 02/24/19 02:00 hrs
End Date and Time: 02/24/19 02:06 hrs
Start Date and Time: 02/24/19 02:36 hrs
End Date and Time: 02/24/19 02:42 hrs
Start Date and Time: 02/24/19 03:00 hrs
End Date and Time: 02/24/19 03:06 hrs
Start Date and Time: 02/24/19 03:12 hrs
End Date and Time: 02/24/19 03:18 hrs
Start Date and Time: 02/24/19 04:00 hrs
End Date and Time: 02/24/19 04:06 hrs
Start Date and Time: 02/24/19 05:00 hrs
End Date and Time: 02/24/19 05:06 hrs
Start Date and Time: 02/24/19 06:00 hrs
End Date and Time: 02/24/19 06:06 hrs
Start Date and Time: 02/24/19 08:00 hrs
End Date and Time: 02/24/19 08:06 hrs
Start Date and Time: 02/24/19 09:30 hrs
End Date and Time: 02/24/19 09:36 hrs
Start Date and Time: 02/24/19 11:00 hrs
End Date and Time: 02/24/19 11:06 hrs

Start Date and Time: 02/24/19 13:00 hrs
End Date and Time: 02/24/19 13:06 hrs
Start Date and Time: 02/24/19 14:00 hrs
End Date and Time: 02/24/19 14:06 hrs
Start Date and Time: 02/24/19 15:00 hrs
End Date and Time: 02/24/19 15:06 hrs
Start Date and Time: 02/24/19 15:30 hrs
End Date and Time: 02/24/19 15:36 hrs
Start Date and Time: 02/24/19 16:00 hrs
End Date and Time: 02/24/19 16:06 hrs
Start Date and Time: 02/24/19 17:00 hrs
End Date and Time: 02/24/19 17:06 hrs
Start Date and Time: 02/24/19 18:00 hrs
End Date and Time: 02/24/19 18:06 hrs
Start Date and Time: 02/24/19 19:00 hrs
End Date and Time: 02/24/19 19:06 hrs
Start Date and Time: 02/24/19 20:00 hrs
End Date and Time: 02/24/19 20:06 hrs
Start Date and Time: 02/24/19 20:42 hrs
End Date and Time: 02/24/19 20:48 hrs
Start Date and Time: 02/24/19 21:00 hrs
End Date and Time: 02/24/19 21:36 hrs
Start Date and Time: 02/24/19 22:00 hrs
End Date and Time: 02/24/19 22:06 hrs
Start Date and Time: 02/24/19 22:12 hrs
End Date and Time: 02/24/19 22:18 hrs
Start Date and Time: 02/24/19 22:24 hrs
End Date and Time: 02/24/19 22:30 hrs
Start Date and Time: 02/24/19 23:00 hrs
End Date and Time: 02/24/19 23:06 hrs
Start Date and Time: 02/25/19 00:00 hrs
End Date and Time: 02/25/19 00:06 hrs
Start Date and Time: 02/25/19 01:00 hrs
End Date and Time: 02/25/19 01:06 hrs
Start Date and Time: 02/25/19 03:00 hrs
End Date and Time: 02/25/19 03:06 hrs
Start Date and Time: 02/25/19 04:24 hrs
End Date and Time: 02/25/19 04:30 hrs
Start Date and Time: 02/25/19 06:00 hrs
End Date and Time: 02/25/19 06:12 hrs
Start Date and Time: 02/25/19 07:00 hrs
End Date and Time: 02/25/19 07:06 hrs
Start Date and Time: 02/25/19 19:00 hrs
End Date and Time: 02/25/19 19:12 hrs
Start Date and Time: 02/26/19 08:06 hrs

End Date and Time: 02/26/19 08:24 hrs
Start Date and Time: 02/26/19 10:42 hrs
End Date and Time: 02/26/19 10:54 hrs
Start Date and Time: 02/26/19 11:36 hrs
End Date and Time: 02/26/19 11:42 hrs
Start Date and Time: 02/28/19 08:42 hrs
End Date and Time: 02/28/19 08:48 hrs
Start Date and Time: 02/28/19 10:54 hrs
End Date and Time: 02/28/19 11:06 hrs

30% (State, Sandblasting operations) 6-minute average

Start Date and Time: 02/22/2019 00:41 hrs
End Date and Time: 02/22/2019 02:05 hrs
Start Date and Time: 02/23/2019 01:27 hrs
End Date and Time: 02/23/2019 01:34 hrs
Start Date and Time: 02/23/2019 04:42 hrs
End Date and Time: 02/23/2019 04:45 hrs
Start Date and Time: 02/23/2019 06:42 hrs
End Date and Time: 02/23/2019 06:45 hrs
Start Date and Time: 02/23/2019 07:42 hrs
End Date and Time: 02/23/2019 07:45 hrs
Start Date and Time: 02/23/2019 08:44 hrs
End Date and Time: 02/23/2019 08:45 hrs
Start Date and Time: 02/23/2019 10:42 hrs
End Date and Time: 02/23/2019 10:45 hrs
Start Date and Time: 02/23/2019 17:24 hrs
End Date and Time: 02/23/2019 17:27 hrs
Start Date and Time: 02/23/2019 19:59 hrs
End Date and Time: 02/23/2019 20:05 hrs
Start Date and Time: 02/23/2019 20:21 hrs
End Date and Time: 02/23/2019 20:25 hrs
Start Date and Time: 02/23/2019 21:01 hrs
End Date and Time: 02/23/2019 21:05 hrs
Start Date and Time: 02/23/2019 22:02 hrs
End Date and Time: 02/23/2019 22:05 hrs
Start Date and Time: 02/23/2019 23:01 hrs
End Date and Time: 02/23/2019 23:05 hrs
Start Date and Time: 02/24/2019 00:59 hrs
End Date and Time: 02/24/2019 01:04 hrs
Start Date and Time: 02/24/2019 03:02 hrs
End Date and Time: 02/24/2019 03:05 hrs
Start Date and Time: 02/24/2019 03:13 hrs
End Date and Time: 02/24/2019 03:18 hrs
Start Date and Time: 02/24/2019 09:34 hrs

End Date and Time: 02/24/2019 09:38 hrs
Start Date and Time: 02/24/2019 21:04 hrs
End Date and Time: 02/24/2019 21:05 hrs
Start Date and Time: 02/24/2019 22:01 hrs
End Date and Time: 02/24/2019 22:05 hrs
Start Date and Time: 02/24/2019 23:04 hrs
End Date and Time: 02/24/2019 23:05 hrs
Start Date and Time: 02/25/2019 06:04 hrs
End Date and Time: 02/25/2019 06:05 hrs
Start Date and Time: 02/26/2019 08:12 hrs
End Date and Time: 02/26/2019 08:17 hrs
Start Date and Time: 02/27/2019 08:59 hrs
End Date and Time: 02/27/2019 09:03 hrs
Start Date and Time: 02/28/2019 10:55 hrs
End Date and Time: 02/28/2019 11:03 hrs

30% (Federal, Subpart J and Subpart UUU) 6-minute average

Start Date and Time: 02/22/2019 00:36 hrs
End Date and Time: 02/22/2019 04:00 hrs
Start Date and Time: 02/23/2019 01:24 hrs
End Date and Time: 02/23/2019 01:30 hrs
Start Date and Time: 02/23/2019 19:54 hrs
End Date and Time: 02/23/2019 20:00 hrs
Start Date and Time: 02/23/2019 20:18 hrs
End Date and Time: 02/23/2019 20:24 hrs
Start Date and Time: 02/24/2019 00:54 hrs
End Date and Time: 02/24/2019 01:00 hrs
Start Date and Time: 02/24/2019 03:12 hrs
End Date and Time: 02/24/2019 03:18 hrs
Start Date and Time: 02/24/2019 09:30 hrs
End Date and Time: 02/24/2019 09:36 hrs
Start Date and Time: 02/27/2019 08:54 hrs
End Date and Time: 02/27/2019 09:00 hrs
Start Date and Time: 02/28/2019 10:54 hrs
End Date and Time: 02/28/2019 11:00 hrs

20% (Federal, Subpart UUU) 3-hr rolling average

Start Date and Time: 02/22/2019 01:00 hrs
End Date and Time: 02/22/2019 04:00 hrs
Start Date and Time: 02/23/2019 02:00 hrs
End Date and Time: 02/23/2019 04:00 hrs
Start Date and Time: 02/23/2019 19:00 hrs
End Date and Time: 02/23/2019 23:00 hrs

Start Date and Time: 02/24/2019 22:00 hrs
End Date and Time: 02/25/2019 01:00 hrs

iii. The event described in Paragraph 22.c.vi of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 04/09/19 19:24 hrs
End Date and Time: 04/09/19 21:12 hrs
Start Date and Time: 04/09/19 21:18 hrs
End Date and Time: 04/09/19 23:48 hrs
Start Date and Time: 04/10/19 00:06 hrs
End Date and Time: 04/10/19 04:18 hrs
Start Date and Time: 04/10/19 04:30 hrs
End Date and Time: 04/10/19 05:12 hrs
Start Date and Time: 04/10/19 06:36 hrs
End Date and Time: 04/10/19 06:48 hrs
Start Date and Time: 04/10/19 07:18 hrs
End Date and Time: 04/10/19 07:24 hrs
Start Date and Time: 04/10/19 07:30 hrs
End Date and Time: 04/10/19 07:36 hrs
Start Date and Time: 04/10/19 07:54 hrs
End Date and Time: 04/10/19 08:06 hrs
Start Date and Time: 04/10/19 08:12 hrs
End Date and Time: 04/10/19 09:00 hrs
Start Date and Time: 04/10/19 09:06 hrs
End Date and Time: 04/10/19 09:18 hrs
Start Date and Time: 04/10/19 09:24 hrs
End Date and Time: 04/10/19 10:06 hrs
Start Date and Time: 04/10/19 10:12 hrs
End Date and Time: 04/12/19 01:36 hrs
Start Date and Time: 04/12/19 04:54 hrs
End Date and Time: 04/12/19 08:54 hrs
Start Date and Time: 04/12/19 09:18 hrs
End Date and Time: 04/12/19 09:36 hrs
Start Date and Time: 04/12/19 11:06 hrs
End Date and Time: 04/12/19 11:54 hrs
Start Date and Time: 04/12/19 12:06 hrs
End Date and Time: 04/12/19 12:12 hrs

30% (State, Sandblasting operations) 6-minute average

Start Date and Time: 04/09/2019 19:19 hrs

End Date and Time: 04/09/2019 19:24 hrs

30% (Federal, Subpart J and Subpart UUU) 6-minute average

Start Date and Time: 04/09/2019 19:18 hrs
End Date and Time: 04/09/2019 21:06 hrs
Start Date and Time: 04/09/2019 21:18 hrs
End Date and Time: 04/09/2019 22:00 hrs
Start Date and Time: 04/10/2019 00:30 hrs
End Date and Time: 04/10/2019 02:00 hrs
Start Date and Time: 04/10/2019 03:06 hrs
End Date and Time: 04/10/2019 03:18 hrs
Start Date and Time: 04/10/2019 10:24 hrs
End Date and Time: 04/10/2019 10:30 hrs
Start Date and Time: 04/10/2019 13:36 hrs
End Date and Time: 04/10/2019 13:48 hrs
Start Date and Time: 04/10/2019 14:00 hrs
End Date and Time: 04/10/2019 14:12 hrs
Start Date and Time: 04/10/2019 14:36 hrs
End Date and Time: 04/10/2019 15:54 hrs
Start Date and Time: 04/10/2019 16:18 hrs
End Date and Time: 04/10/2019 17:24 hrs
Start Date and Time: 04/10/2019 17:42 hrs
End Date and Time: 04/10/2019 18:30 hrs
Start Date and Time: 04/10/2019 18:42 hrs
End Date and Time: 04/10/2019 19:06 hrs
Start Date and Time: 04/10/2019 19:18 hrs
End Date and Time: 04/10/2019 19:30 hrs
Start Date and Time: 04/10/2019 21:48 hrs
End Date and Time: 04/12/2019 00:36 hrs
Start Date and Time: 04/12/2019 05:00 hrs
End Date and Time: 04/12/2019 06:00 hrs
Start Date and Time: 04/12/2019 06:18 hrs
End Date and Time: 04/12/2019 07:30 hrs
Start Date and Time: 04/12/2019 08:06 hrs
End Date and Time: 04/12/2019 08:42 hrs
Start Date and Time: 04/12/2019 11:06 hrs
End Date and Time: 04/12/2019 11:30 hrs

20% (Federal, Subpart UUU) 3-hr rolling average

Start Date and Time: 04/09/2019 19:00 hrs
End Date and Time: 04/10/2019 06:00 hrs
Start Date and Time: 04/10/2019 09:00 hrs
End Date and Time: 04/12/2019 03:00 hrs

Start Date and Time: 04/12/2019 05:00 hrs
End Date and Time: 04/12/2019 13:00 hrs

iv. The event described in Paragraph 22.d.iv of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 04/20/19 05:42 hrs
End Date and Time: 04/20/19 20:30 hrs
Start Date and Time: 04/20/19 21:06 hrs
End Date and Time: 04/20/19 21:36 hrs
Start Date and Time: 04/20/19 23:06 hrs
End Date and Time: 04/20/19 23:30 hrs
Start Date and Time: 04/22/19 06:18 hrs
End Date and Time: 04/22/19 10:30 hrs
Start Date and Time: 04/22/19 11:06 hrs
End Date and Time: 04/22/19 11:12 hrs
Start Date and Time: 04/22/19 11:36 hrs
End Date and Time: 04/22/19 13:00 hrs
Start Date and Time: 04/23/19 00:54 hrs
End Date and Time: 04/23/19 01:06 hrs
Start Date and Time: 04/24/19 07:48 hrs
End Date and Time: 04/24/19 08:00 hrs
Start Date and Time: 04/24/19 08:54 hrs
End Date and Time: 04/24/19 09:00 hrs
Start Date and Time: 04/24/19 09:06 hrs
End Date and Time: 04/24/19 09:36 hrs
Start Date and Time: 04/24/19 11:42 hrs
End Date and Time: 04/24/19 13:24 hrs
Start Date and Time: 04/24/19 14:30 hrs
End Date and Time: 04/24/19 15:00 hrs
Start Date and Time: 04/24/19 15:06 hrs
End Date and Time: 04/24/19 15:12 hrs
Start Date and Time: 04/24/19 15:18 hrs
End Date and Time: 04/24/19 15:30 hrs
Start Date and Time: 04/26/19 02:24 hrs
End Date and Time: 04/26/19 02:42 hrs
Start Date and Time: 04/26/19 07:18 hrs
End Date and Time: 04/26/19 07:24 hrs

30% (State, Sandblasting operations) 6-minute average

Start Date and Time: 04/24/2019 09:00 hrs

End Date and Time: 04/24/2019 09:06 hrs
Start Date and Time: 04/24/2019 15:00 hrs
End Date and Time: 04/24/2019 15:06 hrs

30% (Federal, Subpart J and Subpart UUU) 6-minute average

Start Date and Time: 04/20/2019 23:06 hrs
End Date and Time: 04/20/2019 23:12 hrs

20% (Federal, Subpart UUU) 3-hr rolling average

Start Date and Time: 04/20/2019 07:00 hrs
End Date and Time: 04/20/2019 22:00 hrs
Start Date and Time: 04/22/2019 07:00 hrs
End Date and Time: 04/22/2019 15:00 hrs
Start Date and Time: 04/24/2019 09:00 hrs
End Date and Time: 04/24/2019 16:00 hrs

v. The event described in Paragraph 22.e.xxx of this Consent Order resulted in the following exceedance of the opacity limit at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 05/06/19 13:36 hrs
End Date and Time: 05/06/19 13:48 hrs

vi. On May 14, 2019, the Catalyst Fines Hopper at the Plant 1 FCCU was taken offline for scheduled maintenance. When performing the scheduled maintenance, Suncor discovered internal erosion damage in the Hopper that required replacement parts for repair. The replacement parts were not immediately available, and in an effort to prevent process unit upset, the Hopper was returned to service on the same day. The unanticipated delay in completing the scheduled maintenance led to significant accumulation of catalyst at the fourth stage separator. The repair work was completed and the Hopper was placed back in service on May 15, 2019. When the Hopper was placed back in service, the accumulation of catalyst resulted in the following exceedances of the opacity limit at the Plant 1 FCCU:

20% (State) 6-minute average

Start Date and Time: 05/14/2019 17:12 hrs
End Date and Time: 05/14/2019 17:18 hrs

Start Date and Time: 05/15/2019 02:06 hrs
End Date and Time: 05/15/2019 02:12 hrs
Start Date and Time: 05/15/2019 19:00 hrs
End Date and Time: 05/15/2019 19:06 hrs

Suncor failed to comply with the Plant 1 FCCU opacity limits, violating Permit 96OPAD120, Conditions 22.7, 35.1, 35.2, 45.1.2, 54.1.2, and General Permit Condition 16; the West Plant Consent Decree, Paragraph 54; AQCC Regulation 1, §§ II.A.1 and II.A.4; Subpart J, § 60.102(a)(2); and Subpart UUU, §§ 63.1564(a)(1) and (2).

l. Pursuant to Permit 96OPAD120, Condition 38.1, and AQCC Regulation 1, § VI.B.4.e, new sources of SO_2 shall not emit or cause to be emitted SO_2 in excess of 0.3 lbs SO_2, for the sum of all SO_2 emissions from a given refinery per barrel of oil processed, averaged over a daily 24-hr period (0.3 lb/bbl oil processed/day). The events described in Paragraph 22.e.xv of this Consent Order resulted in an exceedance of the refinery-wide SO_2 limit from January 1, 2019 to January 2, 2019. From January 1-2, 2019, Suncor failed to limit the refinery-wide SO_2 emissions to 0.3 lb/bbl oil processed/day, violating Permit 96OPAD120, Condition 38.1, and AQCC Regulation 1, § VI.B.4.e.

m. Pursuant to Permit 96OPAD120, Conditions 34.2, 34.7, 43.8, 47.1, 53.44, 55, and 64, Suncor is required to comply with the applicable equipment leak standards, including the Leak Detection and Repair ("LDAR") monitoring requirements, contained in Subpart VV, § 60.482-1 to § 60.482-10; Subpart VVa, § 60.482-1a to § 60.482-10a; Subpart GGG, § 60.592(a); Subpart GGGa, § 60.592a(a); Subpart CC, § 63.648(a); and AQCC Regulation 7, § VIII.C. Pursuant to Permit 96OPAD120, Conditions 43.8.2, 55.40, and 64.38; Subpart VV, § 60.482-6(a)(1); Subpart VVa, § 60.482-6a(a)(1); and AQCC Regulation 7, § VIII.C.2.b, except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing VOCs unless the pipe or line is sealed with a second valve, a blind flange, a plug, or a cap.

    i. Between January 2019 and June 2019, Suncor identified that 8 valves, 35 connectors, and 3 other components existed in the field and were subject to LDAR monitoring requirements but had not previously been included in the LDAR inspection program. Suncor was unable to determine the date these components were placed into service. These components were added to the LDAR database for continual monitoring.

ii. On January 10, 2019, Suncor identified and plugged 4 open-ended lines at the Plant 1 wastewater treatment system API closed vent system.

Suncor failed to conduct LDAR monitoring on 46 components and seal 4 valves at the end of a pipe or line containing VOCs, violating Permit 96OPAD120, Conditions 34.2, 34.7, 43.8, 43.8.2, 47.1, 53.44, 55, 55.40, 64, and 64.38; Subpart VV, § 60.482-1 to § 60.482-10; Subpart VV, § 60.482-6(a)(1); Subpart VVa, § 60.482-1a to § 60.482-10a; Subpart VVa, § 60.482-6a(a)(1); Subpart GGG, § 60.592(a); Subpart GGGa, § 60.592a(a); Subpart CC, § 63.648(a); and AQCC Regulation 7, §§ VIII.C and VIII.C.2.b.

n. Pursuant to Permit 96OPAD120, Conditions 29.10, 30.11, 31.10, 53.89, and 53.94; and Subpart CC, §§ 63.670(c) and (h)(2), on or before January 30, 2019, Suncor shall 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 and a reasonable distance above the flare flame at an angle suitable for visual emissions observations. On January 30, 2019, Suncor began monitoring flames from the Main Plant Flare (F1), Asphalt Unit Flare (F2), and GBR Flare (F3) using newly installed flare video cameras in compliance with Subpart CC. At the time of installation, Suncor configured the cameras to record video at a rate of one image every second. In April 2019, Suncor corporate security performed a configuration change to the recording system known as "video thinning." The video thinning process compresses the recorded images after a defined period of time has lapsed down in order to minimize the usage network disk space. As a result, approximately 4.5 months of recordkeeping data, from January 31, 2019 through June 20, 2019, doesn't meet the defined monitoring requirements of Subpart CC, § 63.670(h)(2). In June 2019, Suncor discovered that the video thinning decreased the recorded camera frame rate to one image every 30 seconds (half of the frequency required by Subpart CC). Suncor was not aware of the reduction in the recorded camera frame rate at the time of video thinning implementation. Upon discovery of the issue, Suncor corporate disabled the video thinning system. Suncor failed to comply with the Subpart CC visible emissions monitoring requirement for the Main Plant Flare (F1), Asphalt Unit Flare (F2), and GBR Flare (F3), violating Permit 96OPAD120, Conditions 29.10, 30.11, 31.10, 53.89, and 53.94; and Subpart CC, §§ 63.670(c) and (h)(2).

Refinery: Plant 2 (East Plant)

o. Pursuant to Permit 95OPAD108, Conditions 15.2 and 23.1, and AQCC Regulation 7, § III.A, Suncor is required to operate and maintain all

storage tank accesses, seals, hatches, roof drainage systems, and pressure relief valves to prevent detectable vapor loss. On May 25, 2019, Suncor found product on the roof of Tank 53. During start-up of the Plant 2 FCCU on May 25, 2019, a valve that transfers debut gasoline to Tank 53 was inadvertently left open. The debut gasoline flow to Tank 53 caused unstable material in that stream to vaporize in the tank and led to product on the roof of Tank 53. On May 25, 2019 at 01:30 hrs to May 26, 2019 at 00:00 hrs, Suncor failed to operate and maintain accesses, seals, hatches, roof drainage systems, and pressure relief valves on Tank 53 to prevent detectable vapor loss, violating Permit 95OPAD108, Conditions 15.2 and 23.1, and AQCC Regulation 7, § III.A.

p. Pursuant to Permit 95OPAD108, Condition 5.8, Suncor shall not discharge or cause the discharge of any gases into the atmosphere from the Claus Plant containing in excess of 1.20% by volume of SO_2 at 0% O_2 on a dry basis. Pursuant to Permit 95OPAD108, Condition 5.9, periods of excess emissions are defined as any running 12-hour period during which the average concentration of SO_2 in the gases discharged into the atmosphere exceed the limit in Condition 5.8. On February 7, 2019, the No. 3 SRU exceeded the 1.20% SO_2 (12-hr average) limit due to a malfunction of the tail gas analyzer. The malfunctioned analyzer displayed invalid data causing an upset in the No. 3 SRU operations. The root cause for the incident was a failed power supply on the Tail Gas Analyzer. The power supply failure resulted in a false indication into the Distributed Control System, which disrupted the automatic control system from keeping the unit on ratio. Suncor immediately called analyzer technicians to troubleshoot the analyzer and return it to normal operation. On February 7, 2019, from 12:00 hrs to 18:00 hrs, Suncor failed to limit SO_2 emissions in gases discharged into the atmosphere from the Claus Plant to 1.20% by volume at 0% O_2 on a dry basis, violating Permit 95OPAD108, Condition 5.8.

q. Pursuant to Permit 12AD032-3, Condition 7, and Permit 95OPAD108, Condition 5.1, emissions of CO from the No. 3 SRU shall not exceed 0.6 tpy on a rolling 12-month basis. Suncor exceeded 0.6 tpy CO from the No. 3 SRU during the rolling 12-month periods ending November 2018 through at least April 2019, as shown in the table below, violating Permit 12AD032-3, Condition 7, and Permit 95OPAD108, Condition 5.1.

No. 3 SRU CO Actual Emissions		
Month-Year	**Monthly Total (tons)**	**12-Month Rolling Total (tpy)**
November-18	0.07	**0.65**
December-18	0.07	**0.69**

January-19	0.07	**0.73**
February-19	0.06	**0.75**
March-19	0.06	**0.79**
April-19	0.05	**0.77**

r. Pursuant to Subpart CC, § 63.670(e), Suncor shall operate the Plant 2 Flare to maintain the NHVcz at or above 270 Btu/scf determined on a 15-minute block period basis when regulated material is routed to the flare for at least 15-minutes. On April 8, 2019, from 18:00 hrs to 18:15 hrs, the Plant 2 Flare NHVcz dropped below 270 Btu/scf (15-minute block period). Suncor believes the drop in NHVcz occurred due to several spikes in the waste gas flow to the flare. Large fluctuations in waste gas flow impacted the city gas flow controller at the Plant 2 Flare. On April 8, 2019, Suncor failed to maintain the Plant 2 Flare NHVcz at or above 270 Btu/scf, violating Subpart CC, § 63.670(e).

s. Pursuant to Subpart CC, § 63.670(c), Suncor shall operate the Plant 2 Flare with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours, when regulated material is routed to the flare and the flare vent gas flow rate is less than the smokeless design capacity of the flare.

    i. On February 28, 2019, from 14:19 hrs to 14:37 hrs, Suncor observed visible emissions at the Plant 2 Flare. On February 28, 2019, the Poly reactor guard case was in the process of being placed back in service. During start-up of the guard case, the vent line to the flare is typically opened to achieve stable temperature and pressure in the guard case. The guard case vent line to the Plant 2 Flare was opened during feed introduction to the Poly reactor guard case. The increased flow to the flare from the reactor guard case caused visible emissions at the flare.

    ii. On March 29, 2019, from 12:30 hrs to 12:42 hrs, Suncor observed visible emissions at the Plant 2 Flare. On March 29, 2019, Boiler B-504's main air blower 51F504 and the Plant 2 FCCU blower C-201 lost power and shut down. After the power loss to the blower, the Plant 2 FCCU process unit was immediately shutdown using the emergency shutdown procedure. The process upset and subsequent shutdown caused by the sudden loss of power at C-201 lead to exceedances of the opacity and CO limits at the FCCU, and visible emissions occurred at the Plant 2 Flare. Suncor determined the loss of power was caused by the trip of a protection relay at Sub 41 in Plant 2. The protection relay tripped because of loose sensor connections to the relay.

iii. On April 8, 2019, from 15:24 hrs to 17:18 hrs, Suncor observed visible emissions at the Plant 2 Flare. Suncor attempted to stop the visible emissions by adjusting the steam flow to the flare. The exact reason for the visible emissions is unknown.

iv. On May 1, 2019, from 14:03 hrs to 16:01 hrs, Suncor observed visible emissions at the Plant 2 Flare. On May 1, 2019, the Poly reactor (R-303) guard case was in the process of being placed back in service. During start-up of the guard case, the vent line to the flare is typically opened to achieve stable temperature and pressure in the guard case. The guard case vent line to the Plant 2 Flare was opened during feed introduction to the Poly reactor guard case. The increased flow to the flare, from the Poly reactor guard case, caused visible emissions at the flare. These emissions appear to have been avoidable by updating Poly Reactor guard case procedures to include increasing steam flow to flare prior to placing guard case back in service and additional training provided to shift teams on flare management.

Suncor failed to operate the Plant 2 Flare with no visible emissions, violating Subpart CC, § 63.670(c).

t. Pursuant to Subpart CC, § 63.670(g), Suncor shall 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(s) is present. On April 23, 2019 from 14:45 hrs to 15:00 hrs, Suncor failed to continuously monitor the presence of the pilot flame(s) at the Plant 2 Flare. On April 23, 2019, between approximately 14:54 hrs and 14:56 hrs, thermocouple monitoring data used to verify the continuous presence of a pilot flame at the flare became unavailable in Suncor's data historian (PI) server. Suncor believes the pilot flame(s) were not lost during the data gap. However, records are not available for the above mentioned period. On April 23, 2019, Suncor failed to continuously monitor the presence of the pilot flame(s) at the Plant 2 Flare, violating Subpart CC, § 63.670(g).

u. Pursuant to Subpart Ja, § 60.103a(h), Suncor shall not burn in any affected flare any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hr rolling average basis.

i. On April 3, 2019 at 02:00 hrs to April 4, 2019 at 00:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Plant 2 Flare. On March 29, 2019, the Plant 2 FCCU blower C-201 unexpectedly lost power and shut down. Following the loss of power to the blower, the Plant 2

FCCU process unit was shut down using the emergency shutdown procedure. Suncor determined the loss of power was caused by the trip of a protection relay at Sub 41 in Plant 2. In a separate incident on March 29, 2019, the level transmitter (LT303) on the stripper charge drum water boot (09V251) at the Unsaturated Gas process unit malfunctioned and started displaying random readings. The erratic readings caused the level controller at drum 09V251 to increase flow to the sour water surge drum at the No.3 SRU. The increase in flow from drum 09V251 to the No.3 SRU eventually lead to hydrocarbon carryover into the Sour Water Stripper (SWS). The hydrocarbon carryover also contaminated the No.3 SRU catalyst reactor bed. On April 2, 2019, the Plant 2 FCCU was restarted after restoring power to blower C-201 and repairing the malfunctioned level transmitter (LT303) on drum 09V251. The start-up of the unit increased acid gas feed flow to the thermal reactor at the No.3 SRU. Due to a hydrocarbon contaminated catalyst reactor bed (the March 29, 2019 event), the reactor pressure started to increase above the expected level during the start-up of the Plant 2 FCCU. In order to avoid an unsafe operating condition at the No.3 SRU, acid gas from the regenerator and SWS off-gases were required to be relieved to the Plant 2 Flare on April 2, 2019. By approximately 10:00 hrs on April 4, 2019, the unit was stabilized and acid gas flaring stopped. Suncor identified that the level transmitter on 09V251 malfunctioned, possibly due to stuck float. This increased flow from the water boot of the charge drum and eventually led to hydrocarbon carryover into the No.3 SRU. Hydrocarbon contamination typically creates abnormally high back pressure in the system and inadequate catalyst bed temperatures that restrict proper SRU operation. Suncor's response to this event was impacted by the Plant 2 FCCU shutdown process, which occurred on the same day (March 29, 2019). The root cause of the event was the mechanical failure experienced by transmitter LT303 on drum 09V251. LT303 had prior known issues.

ii. On April 4, 2019, from 16:00 hrs to 20:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Plant 2 Flare. Suncor determined the exceedance was caused by a seal leak in the inner cooler pump P252B.

iii. On April 8, 2019, three leaking intercooler pump seals (at pumps P252A, P252B, and P-253) routed high H_2S process streams to the Plant 2 Flare. This resulted in the in the following exceedances of the fuel gas H_2S limit at the Plant 2 Flare:

Start Date and Time: 04/08/2019 04:00 hrs
End Date and Time: 04/08/2019 09:00 hrs
Start Date and Time: 04/08/2019 10:00 hrs
End Date and Time: 04/08/2019 14:00 hrs

iv. On April 17, 2019 at 21:00 hrs to April 18, 2019 at 00:00 hrs, Suncor exceeded the fuel gas H_2S limit at the Plant 2 Flare. Suncor determined the exceedance was caused by intercooler pump P252B. The pump had prior known seal issues at the time of the event.

v. On May 24, 2019, Suncor began the process of bringing the No. 2 FCC slurry recycle circuit online after completion of planned maintenance. When placing the recycle circuit in service, the reactor dilute phase temperature (02TC434) and the upper riser temperature (02TI479) began to drop sharply and the Plant 2 FCCU went into an upset mode. Feed to the Plant 2 FCCU was immediately pulled out by Suncor. Suncor determined the upset was likely caused by plugging of the bottom portion of slurry settler 02V213. When the slurry recycle circuit was originally taken offline for maintenance, the slurry settler 02V213 was still in service and in a stagnant condition. The stagnant state of 02V213 likely led to the slurry settling up in the bottom of the vessel and the piping. When the slurry recycle circuit was started up, plugging caused by slurry settlement prevented flow from 02V213. Suncor made adjustments to the slurry recycle control valves/bypass and eventually unplugged the slurry settler (02V213). Upon unplugging 02V213, a surge of cold heavy material hit the riser causing a loss of heat balance and upsetting the unit. Suncor reported that due to the status of the recycle circuit, it was not able to limit the effect of the cold slurry that entered the riser. During the unit upset, the regen pressure (02PI209) reduced to a lower value, and this resulted in a higher regen velocity. A high regen velocity led to high opacity in the Plant 2 FCCU. Additionally, the Plant 2 FCCU suffered high catalyst loss when the feed was cut after the upset. This event resulted in the in the following exceedances of the fuel gas H_2S limit at the Plant 2 Flare:

Start Date and Time: 5/24/19 16:00 hrs
End Date and Time: 5/24/19 19:00 hrs
Start Date and Time: 5/25/19 06:00 hrs
End Date and Time: 5/25/19 11:00 hrs

Suncor exceeded the fuel gas H_2S limit (162 ppmv, 3-hr rolling average) at the Plant 2 Flare, violating Subpart Ja, § 60.103a(h).

v. Pursuant to Permit 95OPAD108, Conditions 2.7 and 33.19; Permit 09AD0961, Conditions 19 and 27(c); the East Plant Consent Decree, Paragraph 94; Subpart Ja, § 60.102a(b)(4); and Subpart UUU, § 63.1565(a)(1), Suncor shall not discharge or cause the discharge into the atmosphere from the Plant 2 FCCU any gases that contain CO in excess of 500 ppmvd corrected to 0 percent excess air, on an hourly average basis.

   i. On March 29, 2019, from 05:00 hrs to 06:00 hrs, Suncor exceeded the CO limit at the Plant 2 FCCU. This exceedance was a result of the event described in Paragraph 22.s.ii of this Consent Order.

   ii. On April 2, 2019, from 08:00 hrs to 16:00 hrs, Suncor exceeded the CO limit at the Plant 2 FCCU. This exceedance was a result of the event described in Paragraph 22.u.i of this Consent Order.

   iii. The event described in Paragraph 22.u.v of this Consent Order resulted in the following exceedances of the CO limit at the Plant 2 FCCU:

   Start Date and Time: 5/24/19 13:00 hrs
   End Date and Time: 5/24/19 18:00 hrs
   Start Date and Time: 5/24/19 20:00 hrs
   End Date and Time: 5/25/19 01:00 hrs

   Suncor failed to comply with the CO limit at the Plant 2 FCCU, violating Permit 95OPAD108, Conditions 2.7 and 33.19; Permit 09AD0961, Conditions 19 and 27(c); the East Plant Consent Decree, Paragraph 94; Subpart Ja, § 60.102a(b)(4); and Subpart UUU, § 63.1565(a)(1).

w. Pursuant to Permit 95OPAD108, Conditions 2.8, 4.4, and 19.1; Permit 09AD0961, Condition 3; AQCC Regulation 1, § II.A.1, Suncor shall not allow or cause the emission into the atmosphere of any air pollutant that is in excess of 20% opacity based on 24 consecutive opacity readings taken at 15-second intervals for six minutes. Pursuant to Permit 95OPAD108, Conditions 2.7 and 33.4; Permit 09AD0961, Condition 27(b); the East Plant Consent Decree, Paragraph 98; Subpart J, § 60.102(a)(2); and Subpart UUU, § 63.1564(a)(1), Suncor shall not discharge or cause the discharge into the atmosphere from any FCCU catalyst regenerator any gases exhibiting greater than 30% opacity, except for one six-minute average opacity reading in any one hour period. Pursuant to Subpart UUU, § 63.1564(a)(2), Suncor shall maintain the 3-hour rolling average

opacity of emissions from the FCCU catalyst regenerator vent to no higher than 20%.

i. On July 16, 2018, from 13:48 hrs to 13:54 hrs, Suncor failed to comply with the 20% (State) 6-minute average opacity limit at the Plant 2 Polymerization Unit. On July 16, 2018, Suncor performed a catalyst unloading event at Reactor 301 (R301), which involves pressuring up the reactor with nitrogen in order to blow the catalyst into a bag located below the vessel. During this particular unloading event, the bag ripped under the pressure resulting in higher opacity for a longer period than normally observed. Suncor evaluated the pressure indication equipment utilized during the unloading and found all of the equipment to be functioning properly. Suncor suspects one of the catalyst beds was plugged, which led to the pressure gauge not providing a representative value for the reactor pressure elsewhere in the vessel. This caused the pressure at the time of unloading to exceed the 30-40 psig called for in the procedure resulting in a ripped bag.

ii. On February 11, 2019, from 14:18 hrs to 14:24 hrs, Suncor failed to comply with the 20% (State) 6-minute average opacity limit at the Plant 2 Polymerization Unit. On February 11, 2019, during a catalyst dump at the Plant 2 Polymerization Unit reactor R-301, the catalyst blowdown bag ripped apart emitting catalyst dust to the atmosphere. Suncor determined the bag used for the process was defective.

iii. The event described in Paragraph 22.s.ii of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 2 FCCU:

20% (State) 6-minute average

Start Date and Time: 03/29/19 04:36 hrs
End Date and Time: 03/29/19 04:54 hrs
Start Date and Time: 03/29/19 05:00 hrs
End Date and Time: 03/29/19 05:54 hrs
Start Date and Time: 03/29/19 20:00 hrs
End Date and Time: 03/29/19 20:30 hrs

30% (Federal, Subpart J & Subpart UUU) 6-minute average

Start Date and Time: 03/29/2019 04:36 hrs
End Date and Time: 03/29/2019 04:48 hrs
Start Date and Time: 03/29/2019 05:18 hrs

End Date and Time: 03/29/2019 05:36 hrs

iv. The event described in Paragraph 22.u.v of this Consent Order resulted in the following exceedances of the opacity limits at the Plant 2 FCCU:

20% (State) 6-minute average

Start Date and Time: 5/24/19 13:00 hrs
End Date and Time: 5/24/19 13:06 hrs
Start Date and Time: 5/24/19 13:48 hrs
End Date and Time: 5/24/19 20:54 hrs

20% (Federal, Subpart UUU) 3-hr rolling average

Start Date and Time: 5/24/19 15:00 hrs
End Date and Time: 5/24/19 23:00 hrs

Suncor failed to comply with the opacity limits for the Plant 2 Polymerization Unit and Plant 2 FCCU, violating Permit 95OPAD108, Conditions 2.7, 2.8, 4.4, 19.1, and 33.4; Permit 09AD0961, Conditions 3 and 27(b); the East Plant Consent Decree, Paragraph 98; AQCC Regulation 1, § II.A.1; Subpart J, § 60.102(a)(2); and Subpart UUU, §§ 63.1564(a)(1) and (2).

x. Pursuant to Permit 95OPAD108, Condition 18.2, Suncor is required to comply with the equipment leak standards, including the LDAR monitoring requirements, of AQCC Regulation 7, § VIII.C.2.a; Subpart GGG, § 60.592(a); and Subpart CC, § 63.648(a), as set forth in Condition 27.8.1, 30.1, and 32.16. Pursuant to Permit 95OPAD108, Condition 27.8.1, and AQCC Regulation 7, § VIII.C.2.a.(ii), Suncor is required to conduct a monitoring program consistent with the provisions in § VIII.C.4.a. Pursuant to Permit 95OPAD108, Conditions 30.1 and 32.16; Subpart GGG, § 60.592(a); and Subpart CC, § 63.648(a), Suncor is required to comply with the equipment leak standards and LDAR monitoring requirements of Subpart VV, § 60.482-1 to § 60.482-10. Pursuant to Permit 95OPAD108, Condition 27.8.2, and AQCC Regulation 7, § VIII.C.2.b, except for safety pressure relief valves, no owner or operator of a petroleum refinery shall install or operate a valve at the end of a pipe or line containing VOCs unless the pipe or line is sealed with a second valve, a blind flange, a plug, or a cap.

i. On August 14, 2018 and August 24, 2018, Suncor identified two open-ended lines that were not capped or plugged in the OMD 2

area. Suncor sealed the open-ended lines with a plug or cap on the day of discovery.

ii. Between January 1, 2019 and June 30, 2019, Suncor identified 5 valves and 11 connectors existed in the field and were subject to LDAR monitoring requirements but had not previously been included in the LDAR inspection program. Suncor was unable to determine the date these components were placed into service. These components were tagged, inspected, and added to the LDAR database for continual monitoring.

iii. On May 10, 2019, Suncor identified one open-ended line that was not capped or plugged in the East Plant tank farm. Suncor sealed the open-ended line with a plug on the day of discovery.

Suncor failed to comply with LDAR monitoring and equipment leak requirements, violating Permit 95OPAD108, Conditions 18.2, 27.8.1, 27.8.2, 30.1, and 32.16; Subpart CC, § 63.648(a); Subpart GGG, § 60.592(a); Subpart VV, §§ 60.482-1 to 60.482-10; and AQCC Regulation 7, §§ VIII.C.2.a.(ii), VIII.C.2.b, and VIII.C.4.a.

y. Pursuant to Permit 95OPAD108, Conditions 10.2 and 31.16, and Subpart QQQ, § 60.692-3(b), Suncor shall operate the Upper API separator with a closed vent system. On the four occasions identified below, the high pressure relief device on the Upper API lifted and vented hydrocarbon vapors to atmosphere. Suncor believes the venting likely occurred because of sudden increases in flow to the Upper API.

Start Date and Time: 8/18/2018 23:03 hrs
End Date and Time: 8/18/2018 23:04 hrs
Start Date and Time: 8/20/2018 13:35 hrs
End Date and Time: 8/20/2018 13:36 hrs
Start Date and Time: 8/20/2018 14:52 hrs
End Date and Time: 8/20/2018 14:53 hrs
Start Date and Time: 9/5/2018 02:40 hrs
End Date and Time: 9/5/2018 02:41 hrs

On four occasions, Suncor failed operate the Upper API separator with a closed vent system, violating Permit 95OPAD108, Conditions 10.2 and 31.16, and Subpart QQQ, § 60.692-3(b).

z. Pursuant to Subpart CC, §§ 63.670(c) and (h)(2), on or before January 30, 2019, Suncor shall 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 and a reasonable distance above the flare flame at an

angle suitable for visual emissions observations. Suncor began monitoring flames from the Plant 2 Flare using newly installed flare video cameras in compliance with Subpart CC on January 30, 2019. At the time of installation, Suncor configured the cameras to record video at a rate of one image every second. In April 2019, Suncor corporate security performed a configuration change to the recording system known as "video thinning." The video thinning process compresses the recorded images after a defined period of time has lapsed down in order to minimize the usage network disk space. As a result, approximately 4.5 months of recordkeeping data, from January 31, 2019 through June 20, 2019, doesn't meet the defined monitoring requirements of Subpart CC, § 63.670(h)(2). In June 2019, Suncor discovered that the video thinning decreased the recorded camera frame rate to one image every 30 seconds (half of the frequency required by Subpart CC). Suncor reports it was not aware of the reduction in the recorded camera frame rate at the time of video thinning implementation. Upon discovery of the issue, Suncor disabled the video thinning system. Suncor failed to comply with the Subpart CC visible emissions monitoring requirement for the Plant 2 Flare, violating Subpart CC, §§ 63.670(c) and (h)(2).

aa. Pursuant to Permit 95OPAD108, Conditions 2.7 and 33.19; Permit 09AD0961, Conditions 19 and 27(c); the East Plant Consent Decree, Paragraph 94; Subpart Ja, § 60.102a(b)(4); and Subpart UUU, § 63.1565(a)(1), Suncor shall not discharge or cause the discharge into the atmosphere from the Plant 2 FCCU any gases that contain CO in excess of 500 ppmvd corrected to 0 percent excess air, on an hourly average basis. Pursuant to Permit 95OPAD108, Conditions 2.8, 4.4, and 19.1; Permit 09AD0961, Condition 3; AQCC Regulation 1, § II.A.1, Suncor shall not allow or cause the emission into the atmosphere of any air pollutant that is in excess of 20% opacity based on 24 consecutive opacity readings taken at 15-second intervals for six minutes. Pursuant to Subpart UUU, § 63.1564(a)(2), Suncor shall maintain the 3-hour rolling average opacity of emissions from the FCCU catalyst regenerator vent to no higher than 20%.

    On December 11, 2019, during start-up of the Plant 2 FCCU, a process upset caused a series of opacity exceedances of catalyst that settled in the neighboring community on cars and houses. Additionally, exceedances of the CO limit occurred. Upon investigation, Suncor determined too much torch oil was introduced to the regenerator during start-up and the start-up procedure lacked sufficient guidance in regard to adding torch oil. Suncor reported there was a lack of communication between operations personnel when the torch oil control valve bypass was opened in the field. This lack of communication was due to the roles and responsibilities not being clearly defined for who was monitoring torch oil levels. In addition, Suncor reported operations incorrectly believed once

the start-up had been initiated the process could not be stopped because environmental exceedances of CO would occur. This event resulted in the following CO and opacity exceedances:

500 ppmvd at 0% O_2 1-hour average

Start Date and Time: 12/11/2019 04:00 hrs
End Date and Time: 12/11/2019 12:00 hrs
Start Date and Time: 12/11/2019 13:00 hrs
End Date and Time: 12/11/2019 16:00 hrs

20% (State) 6-minute average

Start Date and Time: 12/11/2019 09:18 hrs
End Date and Time: 12/11/2019 10:18 hrs
Start Date and Time: 12/11/2019 10:36 hrs
End Date and Time: 12/11/2019 11:36 hrs
Start Date and Time: 12/11/2019 11:42 hrs
End Date and Time: 12/11/2019 15:18 hrs

20% (Federal, Subpart UUU) 3-hr rolling average

Start Date and Time: 12/11/2019 10:00 hrs
End Date and Time: 12/11/2019 16:00 hrs

On December 11, 2019, Suncor failed to comply with the CO and opacity limits at the Plant 2 FCCU, violating Permit 95OPAD108, Conditions 2.7, 2.8, 4.4, 19.1, and 33.19; Permit 09AD0961, Conditions 3, 19, and 27(c); the East Plant Consent Decree, Paragraph 94; AQCC Regulation 1, § II.A.1; Subpart Ja, § 60.102a(b)(4); and Subpart UUU, §§ 63.1564(a)(2) and 63.1565(a)(1).

23. The Division and Suncor entered into settlement discussions for: (i) the violations as determined by the Division in this Consent Order, Paragraphs 21 and 22, and as specifically identified as alleged violations in the Compliance Advisories issued on June 25, 2019 and December 13, 2019 and the Inspection Reports (Summary Sections) for the 2018 Inspection and 2019 Inspection; (ii) the Plant 2 FCCU violations as determined by the Division that occurred on December 11, 2019 identified in this Consent Order, Paragraph 22.aa; and (iii) for any and all Refinery air violations for which the Division has actual notice and that the Division could have asserted, but did not assert, against Suncor during the time periods identified in the Division's Inspection Reports for the 2018 Inspection and 2019 Inspection (specifically, July 1, 2017 through June 30, 2018 and July 1, 2018 through June 30, 2019) (collectively, the "Violations Addressed Herein"). The Parties reached a settlement, including of the Violations Addressed Herein, that is detailed in this Consent Order.

III. ORDER and AGREEMENT

Based on the foregoing factual and legal determinations, pursuant to its authority under § 25-7-115, C.R.S., and as a result of the Violations Addressed Herein, the Division orders Suncor to comply with all provisions of this Consent Order, including all requirements set forth below.

24. Suncor agrees to the terms and conditions of this Consent Order. Suncor agrees that this Consent Order constitutes an order issued pursuant to § 25-7-115, C.R.S., and is an enforceable requirement of Part 1 of the Act. Suncor also agrees not to challenge, in any judicial or administrative proceeding to enforce or interpret this Consent Order brought by the Division or by Suncor against the Division:

a. the issuance of this Consent Order;

b. the factual and legal determinations made by the Division herein; and

c. the Division's authority to bring, or the Colorado state court's jurisdiction to hear, any action to enforce the terms of this Consent Order under the Act.

25. Notwithstanding the above, Suncor does not admit to any of the factual or legal determinations made by the Division herein. Neither Suncor's execution of this Consent Order, nor any action undertaken by Suncor pursuant to this Consent Order, shall constitute an admission or evidence of liability or fault by Suncor, including with respect to the factual or legal determinations made by the Division in Paragraphs 21 and 22, the Violations Addressed Herein or the condition of the Refinery. Suncor expressly reserves, and does not waive, all rights, claims, and defenses, including the right to dispute or challenge the factual or legal determinations made herein in any proceeding except as otherwise set forth in this Consent Order.

A. Compliance Requirements

26. Effective immediately, and without limitation, Suncor must comply with the Act and the Regulations in the regulation and control of air pollutants from the Refinery.

27. Suncor must pay the outstanding annual emissions back fees for emissions resulting from ethanol unloading at the Plant 1 Rail Loading Rack (R101) (AIRS Point 067) for calendar years 2014 through 2018 in the amount of Eight Hundred Eighty-Two Dollars and Forty-Nine Cents ($882.49). Payment of this amount is due within thirty (30) calendar days of the Effective Date and must be paid by certified, corporate or cashier's check drawn to the order of "Colorado Department of Public

Health and Environment" and delivered to the attention of the Enforcement Unit Supervisor, Air Pollution Control Division, 4300 Cherry Creek Drive South, APCD-SS-B1, Denver, Colorado 80246-1530. Payment of the outstanding annual emissions back fees must be made separate from the Administrative Penalty in Paragraph 33, below.

28. Within thirty (30) calendar days of the Effective Date, in order to minimize or prevent a recurrence of the Violations Addressed Herein, including those relating to opacity, Suncor must:

a. Revise its safe work permit policy to include a review for scaffolding erected on or near in-service equipment as part of a post-closing job walk;
b. Add a high-level alarm to the Plant 1 FCCU upper stripper (35LI106) density level indication and disengager (35LI107) level indication to indicate a potentially abnormal catalyst level requiring investigation;
c. Revise the Plant 1 FCCU emergency shutdown procedures to indicate that emergency shutdowns or other actions should be initiated when certain specific process conditions are present such that a major Plant 1 FCCU upset could occur;
d. Revise the Plant 2 FCCU procedures to provide guidance regarding the impact of Plant 2 FCCU regenerator velocity and pressure profile on opacity.

29. Suncor must (i) implement the procedures identified in Paragraph 28 within (30) calendar days of the Effective Date, and (ii) maintain and implement such procedures until termination of this Consent Order pursuant to Paragraph 86. Suncor must also ensure that operations personnel (in the applicable Plant(s)) are trained on Suncor's operating procedures identified in Paragraph 28 within ninety (90) days of the Effective Date.

30. For a period of three (3) years from the Effective Date, Suncor must ensure that a Suncor representative oversees and observes the startup of the Plant 1 FCCU and Plant 2 FCCU after a shutdown (whether planned or unplanned) to ensure Suncor's procedures are followed to minimize or prevent excess emissions.

31. On June 4, 2019, Suncor submitted a permit modification application for the Rail Loading Rack (R101) (AIRS Point 067) to revise the NOx emission limit based on an uncontrolled emission factor of 0.146 lb/MMBtu, as determined by the April 16-18, 2019 compliance test, and to account for ethanol unloading (i.e., to account for the R101 vapor combustion unit receiving denatured ethanol vapors from railcar unloading depressurizations). Suncor must cooperate with the Division in modifying Permit 96OPAD120 2/2018 consistent with the June 4, 2019 application or with subsequent revisions to the application by Suncor based on any additional compliance testing approved by the Division. Compliance with the emission limit for NOx proposed in this permit modification application shall stand in for compliance with the existing

limit in Permit 96OPAD120 until the permit modification is issued. Cooperation must include, but not be limited to, responding to the Division's requests for information within fourteen (14) calendar days of receipt or by an alternate deadline provided by the Division.

32. All documents submitted pursuant to this Consent Order must use the same defined terms as stated in this Consent Order, and shall reference both the case number and the number of the paragraph pursuant to which the document is required. Unless otherwise specifically provided herein, the following documents submitted for Division approval by Suncor pursuant to the following Sections and Paragraphs under this Consent Order may not be implemented unless and until written approval is received from the Division: (i) proposed Contractor pursuant to Paragraph 48, (ii) proposed testing protocol pursuant to Paragraph 55, and (iii) proposed communications protocol pursuant to Section III.G. Any approval by the Division of any such document submitted under this Consent Order is effective upon receipt by Suncor. All such approved documents, including all procedures and schedules contained in the documents, are hereby incorporated into this Consent Order and shall constitute enforceable requirements under the Act, until approval of a Notice of Completion of the applicable obligations relating to such document(s) or approval of a Request to Terminate.

B. Administrative Penalty Requirements

33. Based upon the factors set forth in § 25-7-122, C.R.S., the Division has determined an administrative penalty in the amount of **One Million Dollars ($1,000,000)** against Suncor is appropriate and consistent with the Division's policies for violations of the Act and the Regulations cited in Section II of this Consent Order (the "Cash Administrative Penalty"). Payment of the Cash Administrative Penalty is due within thirty (30) calendar days of the Effective Date of this Consent Order by certified, corporate or cashier's check drawn to the order of "Colorado Department of Public Health and Environment" and delivered to the attention of the Enforcement Unit Supervisor, Air Pollution Control Division, 4300 Cherry Creek Drive South, APCD-SS-B1, Denver, Colorado 80246-1530.

34. The Refinery is a stationary source that is subject to the noncompliance penalty provisions of the Act, and Suncor is required to calculate and pay any economic benefit derived from the noncompliance issues described above. The Division has approved Suncor's calculated noncompliance and economic benefit penalty of **Four Thousand, Eight Hundred Eighty-Five Dollars ($4,885.00)**, and Suncor must pay the penalty in accordance with Paragraph 33, above, within thirty (30) calendar days of the Effective Date of this Consent Order.

C. Stipulated Penalty Requirements

35. Certain of the Violations Addressed Herein are subject to the stipulated penalty provisions in the West Plant Consent Decree and the East Plant Consent Decree. In addition to the Administrative Penalty, Suncor agrees to the payment of stipulated penalties under the West Plant Consent Decree and the East Plant Consent Decree in an aggregate amount equal to **Four Hundred and Twenty-One Thousand, Eight Hundred and Fifty Dollars ($421,850.00)** (the "Stipulated Penalties"), of which **Four Hundred Eighteen Thousand, One Hundred Dollars ($418,100.00)** (the "West Plant Stipulated Penalties") is payable under the West Plant Consent Decree and **Three Thousand, Seven Hundred Fifty Dollars ($3,750.00)** (the "East Plant Stipulated Penalties") is payable under the East Plant Consent Decree, described as follows:

Consent Order Paragraph	Violation Description	CD Citation Supporting Violation	CD Citation Supporting Stipulated Penalty Assessment and Calculation	Stipulated Penalty for Violation
West Plant Consent Decree				
21(a)	H-25 SO_2 Limit Exceedance (250 ppm)	169	256(i)(1)	$3,150.00
22(g)	H-25 SO_2 Limit Exceedance (250 ppm)	169	256(i)(1)	$362,450.00
22(i)	FCCU CO Limit Exceedance (500 ppm)	49	256(d)(1)	$27,000.00
22(j)	FCCU SO_2 Limit Exceedance (50 ppmvd)	40	256(b)(3)	$9,000.00
22(k)	FCCU Opacity Exceedances; NSPS Subpart J (30%)	54	256(e)(1)	$16,500.00
			Due to EPA:	$209,050.00
			Due to CO:	$209,050.00
East Plant Consent Decree				
22(v) & (aa)	FCCU CO Limit Exceedance (500 ppm)	94	320(f)	$3,750.00
			Due to EPA:	$1,875.00
			Due to CO:	$1,875.00
			TOTAL:	**$421,850.00**
			TOTAL TO EPA:	**$210,925.00**
			TOTAL TO CO:	**$210,925.00**

36. Consistent with West Plant Consent Decree Paragraph 257, Suncor must pay one-half of the West Plant Stipulated Penalties in the amount of Two Hundred Nine Thousand, Fifty Dollars ($209,050.00) (the "United States West Plant Stipulated Penalty") to the United States of America. Payment must be made in accordance with the current procedures provided by the Financial Litigation Unit for the United States Attorney's Office for the Southern District of Texas, referencing United States of America v. Conoco, Inc. (Civil Action No. H-01-4430) (S.D. Tex.), USAO File Number 2001 V 01872, and DOJ Case Number 90-5-2-1-07295/1. Suncor must provide notice of

payment to the Department of Justice and to United States Environmental Protection Agency ("EPA"), as provided in Paragraph 296 of the West Plant Consent Decree and referencing United States of America v. Conoco, Inc. (Civil Action No. H-01-4430) (S.D. Tex.), USAO File Number 2001 V 01872, and DOJ Case Number 90-5-2-1-07295/1.

37. Consistent with East Plant Consent Decree Paragraph 321, Suncor must pay one-half of the East Plant Stipulated Penalties in the amount of Eighteen Hundred and Seventy-Five Dollars ($1,875.00) (the "United States East Plant Stipulated Penalty") to the United States of America. Payment must be made in accordance with current procedures provided by the Financial Litigation Unit for the United States Attorney's Office for the Western District of Texas, referencing United States of America v. Valero Refining, et al. (Civil Action No. SA-05-CA-0569) (W.D. Tex.), USAO File No. and DOJ Case Number 90-5-2-1-0681111. Suncor must provide notice of payment to the Department of Justice and to EPA, as provided in Paragraph 376 of the East Plant Consent Decree, and referencing United States of America v. Valero Refining, et al. (Civil Action No. SA-05-CA-0569) (W.D. Tex.), USAO File No. and DOJ Case Number 90-5-2-1-0681111.

38. Consistent with West Plant Consent Decree Paragraph 257 and East Plant Consent Decree Paragraph 321, Suncor must pay one-half of the Stipulated Penalties in the amount of Two Hundred Ten Thousand, Nine Hundred Twenty-Five Dollars ($210,925.00) (the "Colorado Stipulated Penalties") to the Division. Suncor must pay $210,925.00 to the Division by certified, corporate or cashier's check drawn to the order of "Colorado Department of Public Health and Environment" and delivered to the attention of the Enforcement Unit Supervisor, Air Pollution Control Division, 4300 Cherry Creek Drive South, APCD-SS-B1, Denver, Colorado 80246-1530.

39. Notwithstanding any contrary provision in the West Plant Consent Decree and the East Plant Consent Decree, the Parties agree that Suncor must pay the amounts required to be paid by Suncor under Paragraphs 35 through 38 above within thirty (30) days of the Effective Date of this Consent Order.

D. Supplemental Environmental Project Requirements

40. Suncor must provide funding in the amount of Two Million Six Hundred Twenty-Four Thousand One Hundred Dollars ($2,624,100) (the "SEP Funds") for one or more third-party SEPs selected through the Community SEP Process set forth in Paragraph 41 below. The SEP Funds shall be applied on a 1:1 basis for each dollar expended for any selected third-party SEP. The Parties agree that any SEPs selected by the SEP evaluation committee are intended to secure significant environmental or public health protection and improvements.

41. Working with nearby communities, the Division will create and appoint a SEP evaluation committee, including at least one Suncor representative and the Division. The Division will identify and invite representatives of the nearby

communities to serve on the SEP evaluation committee. The SEP evaluation committee will, consistent with CDPHE's SEP policy, solicit and select one or more third-party SEP proposals within two hundred and ten (210) calendar days of the Effective Date of this Consent Order. In accordance with Paragraph 40, Suncor will fund the SEP(s) selected by the evaluation committee up to the aggregate amount of the SEP Funds. If any portion of the SEP Funds is not allocated to an approved SEP within two hundred forty (240) calendar days of the Effective Date of this Consent Order, or such later time as agreed to by the Division in writing, Suncor must pay that portion of the SEP Funds as an additional settlement amount in the manner prescribed in Paragraph 33 above and no later than two hundred seventy (270) calendar days of the Effective Date of this Consent Order.

42. Suncor hereby certifies that, as of the date of this Consent Order, it is not required to perform or develop the SEP by any federal, state or local law or regulation and it is not required to perform or develop the SEP by any agreement, grant or an injunctive relief in this or any other case. Suncor further certifies that it has not received, and is not presently negotiating to receive, credit in any other enforcement action for the SEP. Suncor shall not deduct the SEP Funds for any tax purpose or otherwise obtain any favorable tax treatment for such payment.

43. Suncor or any designated third-party SEP administrator must submit a SEP Completion Report to the Division by the date(s) agreed to by the parties in the SEP Agreement(s) with respect to applicable selected SEP(s). The SEP Completion Report must contain the following information:

a. A detailed description of the SEP as implemented;
b. A description of any operating problems encountered and the solutions thereto;
c. Itemized costs, documented by copies of purchase orders and receipts or canceled checks;
d. Certification that the SEP has been fully implemented pursuant to the provisions of this Consent Order; and
e. A description of the environmental and public health benefits resulting from implementation of the SEP (with quantification of the benefits and pollutant reductions, if feasible).

44. In the event that Suncor and not a designated third-party SEP administrator is required to submit the SEP Completion Report, Suncor agrees that failure to submit the SEP Completion Report with the required information, or any periodic report, will be deemed a violation of this Consent Order and Suncor will become liable for penalties as a violation of this Consent Order.

45. Suncor must include in any public statement, oral or written making reference to any SEP(s) selected by the SEP evaluation committee the following language: "This project was undertaken in connection with the settlement of an

enforcement action taken by the Colorado Department of Public Health and Environment, Air Pollution Control Division, for violations of air quality laws and regulations."

E. Third-Party Root Cause Investigation

46. In furtherance of settlement of this matter, Suncor must retain a qualified third party contractor ("Contractor") to perform an investigation: (i) to determine the causes of emissions exceedances in violation of the state and federal regulatory requirements and permits listed in Paragraphs 6 through 9 of this Consent Order, (collectively, the "Applicable Limits"), during the period of July 1, 2017 through June 30, 2019, including any causes relating to the design of the Refinery's equipment identified below and/or Suncor's operating or maintenance practices or procedures relating to the Refinery's equipment, and (ii) to make recommendations, which may include improvements or changes to design, operations, or maintenance, to minimize or prevent further recurrences of the emissions exceedances (including but not limited to opacity, CO, SO2, and HCN) in violation of Applicable Limits at the following equipment ("Investigation"):

a. Plant 1 FCCU (AIRS Point ID 025);
b. Plant 1 SRUs/H-25 (AIRS Point ID 100);
c. Plant 2 FCCU (AIRS Point ID 217); and
d. Plant 2 SRU (AIRS Point ID 220).

47. Within ninety (90) days of the Effective Date of this Consent Order, Suncor must submit to the Division for review a draft of its proposed scope of the Investigation, pursuant to which Suncor will retain the Contractor to perform the Investigation. Within thirty (30) days, the Division will provide Suncor any comments or proposed revisions consistent and in accordance with the scope of the Investigation set forth in Paragraph 46.

48. Within one hundred and fifty (150) days of the Effective Date of this Consent Order, Suncor will notify the Division in writing of Suncor's recommended Contractor, provide statements of qualification for the Contractor, and provide the final Investigation proposal pursuant to which the Contractor will conduct the Investigation. If the Division does not respond within thirty (30) days, Suncor's recommended Contractor and Investigation Proposal shall be deemed approved and Suncor may proceed with the Investigation. In the event the Division disapproves the proposed Contractor or Investigation proposal, the Division will state the reasons for its disapproval in writing, and the process will be repeated with Suncor having thirty (30) days from the date of disapproval to propose alternate Contractor(s), provide statements of qualification, and/or provide a revised Investigation proposal.

49. The Investigation must be completed by March 31, 2021, or later as agreed to by the Division in writing.

50. Suncor must obtain a report from the Contractor within sixty (60) days of the Contractor completing the Investigation ("Draft Report"). The Draft Report must be provided to the Division at the same time it is provided to Suncor in accordance with Section VIII of this Consent Order (Notices). While Suncor and the Contractor may communicate regarding the Investigation, Suncor will not direct the Contractor to include or remove any causes identified or recommendations made by the Contractor from the Draft Report. The Draft Report must include a description of the work performed, conclusions reached, and recommendations made to minimize or prevent future recurrences of the emissions exceedances at the applicable equipment pursuant to Paragraph 46 above. If Suncor disputes a finding or recommendation of the Contractor, Suncor will submit a detailed explanation of the basis for its dispute, the resolution of which shall not be governed by Section VII of this Consent Order. The Draft Report shall be marked "Confidential Business Information" (CBI), and the Division shall protect the Draft Report as CBI in accordance with the Colorado Open Records Act, § 24-72-201, C.R.S. *et seq.* ("CORA"), including § 24-72-204(3)(a)(IV), C.R.S. The Division will provide Suncor with any comments on the Draft Report (and Suncor's disputed finding or recommendation, if submitted) within thirty (30) days of receipt. Suncor agrees not to assert, solely as against the Division, any claim of attorney client, work product, or other privilege (including any testifying expert privilege) that it may have regarding communications between Suncor and the Contractor relating to the Investigation; provided, however, Suncor expressly reserves all such rights as against any person or party not a Party to this Consent Order.

51. Suncor must submit a final report ("Final Report") to the Division within ninety (90) days of receipt of the Division's comments on the Draft Report. The Final Report must address the Division's comments on the Draft Report and must include a detailed summary of the causes and recommendations contained in the Draft Report. The Final Report must also include Suncor's proposed implementation plan (the "Implementation Plan"). In the Implementation Plan, Suncor must identify which of the Contractor's recommendations (and/or other actions identified by Suncor) Suncor will implement to minimize or prevent future emissions exceedances in violation of Applicable Limits from the applicable equipment pursuant to Paragraph 46, along with an explanation of why and how Suncor selected those recommendations and Suncor's timetable for implementation. In the Implementation Plan, Suncor must implement the practical recommendations of the Contractor that are technologically feasible and economically reasonable subject to the resolution of any dispute as provided in Paragraph 50 above; however, Suncor shall not be obligated to spend more than five million dollars ($5,000,000.00) in aggregate in the implementation of the Implementation Plan. This amount includes only Suncor's direct expenditures/payments or Suncor's external costs (e.g., labor and equipment) and any new internal labor costs (provided Suncor provides sufficient documentation demonstrating that such additional internal labor costs incurred as a result of the Implementation Plan are new), but does not include Suncor's existing internal overhead or administrative costs. If the Division does not respond within thirty (30) days, Suncor's Implementation Plan shall be deemed approved. In the event the

Division disapproves the Implementation Plan, the Division will state the reasons for its disapproval in writing, and the process will proceed in accordance with Section VII (Dispute Resolution). Upon the Implementation Plan's approval, the Division agrees to cooperate with Suncor in its implementation of the Implementation Plan, and to promptly process any applications or requests for permits, approvals, or other actions within the Division's control in connection with the Implementation Plan.

52. The Final Report must be publicly available; provided, if there is any information in the Final Report that is CBI, it may be removed or redacted in accordance with this Paragraph, In such event, Suncor must provide two versions of the Final Report to the Division, one with and one without the CBI removed or redacted. The Final Report, protecting CBI to the extent permitted and required by CORA, will be made publicly available on the Division's website. In the event the Division receives a request to produce, or otherwise disputes the designation of any information claimed as CBI by Suncor, the Division agrees that it will provide Suncor prompt notice and a copy of the request or dispute prior to making the information publicly available or disclosing to a requestor. If the Division notifies Suncor that the information marked CBI is not confidential under the standards of CORA, Suncor may appeal the Division's determination to the Colorado District Court for the City and County of Denver or take such other action as authorized under applicable law.

53. Until three (3) years after approval of the Implementation Plan, Suncor must retain the Final Report, Implementation Plan, communications with the Contractor regarding the Investigation or Draft Report, and a written record of all actions that Suncor takes in furtherance of the Implementation Plan.

F. Monitoring Project

54. In furtherance of settlement of this matter, Suncor agrees to perform the following monitoring project in accordance with Paragraph 55 below. The monitoring is not a specific statutory or regulatory requirement.

55. Suncor must conduct emissions testing and monitoring of the Plant 1 FCCU (AIRS Point ID 025) and Plant 2 FCCU (AIRS Point ID 217) to measure Hydrogen Cyanide (HCN) emissions.

a. For eight consecutive calendar quarters, beginning in the second quarter of 2020, Suncor must conduct emissions testing at the Plant 1 FCCU (AIRS Point ID 025) and the Plant 2 FCCU (AIRS Point ID 217) to measure Hydrogen Cyanide (HCN) each calendar quarter. This quarterly testing requires the use of a temporary continuous emission monitor system ("CEMS") to measure HCN emissions for 30-days during each test. Within thirty (30) days after the Effective Date, Suncor must submit a protocol to the Division for review and approval for the 30-day quarterly testing, which shall also apply to the testing conducted during the second

quarter of 2020. Subsequent protocols are not required for the quarterly testing unless Suncor or the Division request changes. Results from the quarterly tests must be submitted to the Division within forty-five (45) days of completing each test.

b. Suncor must provide funding for and must coordinate with the Division to conduct HCN monitoring in the community surrounding the Refinery concurrent with the HCN emissions testing per Paragraph 55.a, above, that is completed during the second quarter 2020 and the third quarter 2020. Suncor agrees to provide funds up to, but not to exceed, $75,000 to support the monitoring project. Suncor must provide the Division at least thirty (30 days) notice prior to commencing the HCN testing to ensure the Division's ability to conduct the community monitoring concurrently with the HCN testing.

c. Suncor must install a temperature sensor at 2 meters above ground level on its existing 10 meter meteorological tower (and must maintain the sensor at 10 meters above ground level) to measure wind speed, wind direction, temperature and relative humidity. The meteorological tower, with the 10 meter and 2 meter sensors, must be in operation for a minimum of one year, to include the periods of HCN emissions testing required per Paragraph 55.b, above, and Suncor must make the foregoing data available to the Division for this one-year time period.

G. Community Communications

56. In furtherance of settlement of this matter, Suncor agrees to develop a communications system and/or process by which Suncor can exchange communications with, and make data available to, the Division and the community surrounding the Refinery.

57. Suncor must submit a communications proposal to the Division for review and comment by September 30, 2020. The communications proposal must identify a short-term and long-term timeline for implementation of the communications systems or processes identified.

58. Between the Effective Date and September 30, 2020, Suncor must conduct outreach to community representatives to discuss communications system and processes. Suncor must evaluate methods by which Suncor can disseminate information to the community and methods by which community members can contact Suncor, including provisions for communications in Spanish.

59. Short-term measures must be implemented by December 31, 2020. With respect to long-term measures, Suncor will submit a proposed timeframe for implementation with its proposal in Paragraph 57, which will be subject to Division

approval. Suncor must fully implement the long-term communications systems or processes no later than September 30, 2021, unless otherwise agreed to in writing by the Division.

IV. SCOPE AND EFFECT OF CONSENT ORDER

60. The Parties agree and acknowledge that this Consent Order constitutes a full and final settlement of, and resolution of liability for, the Violations Addressed Herein, and further agree not to challenge the terms and conditions of this Consent Order in any proceeding before any administrative body or any judicial forum, whether by way of direct judicial review or collateral challenge.

61. This Consent Order constitutes a final agency order upon execution by Suncor and the Division and shall be enforceable by either Party in the same manner as if the Division had entered this Consent Order without agreement by Suncor. The Parties agree that any violation of the provisions of this Consent Order by Suncor concerning the Act, or the Regulations, shall be a violation of a final order of the Division for the purposes of §§ 25-7-115, 121, and 122, C.R.S., and may result in the assessment of civil penalties of Fifteen Thousand Dollars ($15,000.00) per day for each day of such violation.

62. With respect to the Stipulated Penalties payable hereunder, Suncor hereby waives any right to a demand or notice under Paragraph 257 of the West Plant Consent Decree or Paragraph 321 of the East Plant Consent Decree, and in the alternative, the Parties agree that this Consent Order, including the Stipulated Penalties described in the "Stipulated Penalty Requirements" above, constitutes a written demand for payment of stipulated penalties on behalf of the Division, which has consulted with the EPA. The Division, by signing this Consent Order, represents that EPA has agreed to the amount of Stipulated Penalties payable by Suncor and has stated that the amount satisfies any stipulated penalty demand that EPA would make in connection with any failure by Suncor to comply with the West Plant Consent Decree and the East Plant Consent Decree with respect to the Violations Addressed Herein. Payment of the Stipulated Penalties due under this Consent Order is a full and final resolution of Suncor's stipulated penalty liability to the Division under the Consent Decrees for Civil Action H-01-4430 and Civil Action No. SA-05-CA-0569 for the Violations Addressed Herein. Suncor, by signing this Consent Order, waives any and all rights under West Plant Consent Decree Paragraph 258, West Plant Consent Decree Part XXII, East Plant Consent Decree Paragraph 322, or otherwise, to dispute the imposition of any of the Stipulated Penalties reflected in this Consent Order, provided that Suncor's payment of the Stipulated Penalties constitutes a full and final resolution of Suncor's stipulated penalty liability to the Division for the Violations Addressed Herein, and no additional stipulated penalties are demanded or payable by or to the Division for the Violations Addressed Herein.

63. The Parties' obligations under this Consent Order are limited to the matters expressly stated herein or in approved submissions required hereunder. The documents submitted for approval specifically identified in Paragraph 32 of this Consent Order are incorporated into this Consent Order and become enforceable under the terms of this Consent Order as of the date of approval by the Division until approval of a Notice of Completion of the applicable obligations relating to such document(s) or approval of a Request to Terminate.

64. The Division's approval of any submission, standard, or action under this Consent Order shall not constitute a defense to, or an excuse for, any prior violation of any requirement under the Act, the Regulations, or any subsequent violation of any requirement of this Consent Order, the Act, or the Regulations.

65. Entering into this settlement shall not constitute an admission of violation by Suncor, nor shall the Division or any third party infer it to be such an admission by Suncor in any administrative or judicial proceeding. Notwithstanding the foregoing or anything in this Consent Order to the contrary, the described Violations Addressed Herein will constitute part of Suncor's compliance history for any purpose for which such history is relevant, including considering the Violations Addressed Herein in assessing a penalty for any subsequent violations, in accordance with the provisions of § 25-7-122, C.R.S., against Suncor.

66. This Consent Order does not relieve Suncor from complying with all applicable Federal, State, and/or local laws and regulations and Suncor shall obtain all necessary approvals or permits to conduct the investigation and remedial activities required by this Consent Order and perform its obligations required hereunder. The Division makes no representation with respect to approval and permits required by Federal, State, or local laws or regulations other than those specifically referred to herein.

67. Nothing herein shall be construed as prohibiting, altering, or in any way limiting the ability of the Division to seek any other remedies or sanctions available by virtue of Suncor's violation of this Consent Order or of the statutes and regulations upon which this Consent Order is based, or for Suncor's violation of any applicable provision of law, if such violations are not Violations Addressed Herein.

V. LIMITATION RELEASES AND RESERVATION OF RIGHTS AND LIABILITY

68. Upon the Effective Date, the Division hereby releases, covenants not to sue, and agrees not to take any further administrative action against Suncor for the Violations Addressed Herein. This Consent Order does not grant any release of liability for any violations, regardless of when they occurred, that are not Violations Addressed Herein. The Division reserves the right to bring any action it deems necessary to enforce this Consent Order.

69. Nothing in this Consent Order shall preclude the Division from imposing additional requirements necessary to protect human health or the environment in accordance with applicable law.

70. Suncor reserves its rights and defenses regarding liability in any proceedings regarding the Refinery other than proceedings to enforce this Consent Order.

71. Upon the Effective Date, Suncor releases and covenants not to sue the State of Colorado as to all common law or statutory claims or counterclaims arising from, or relating to, the violations of the Act or the Regulations specifically addressed herein.

72. Suncor shall not seek to hold the State of Colorado or its employees, agents or representatives liable for any injuries or damages to persons or property resulting from acts or omissions of Suncor, or those acting for or on behalf of Suncor, including its officers, employees, agents, successors, representatives, contractors or consultants in carrying out activities pursuant to this Consent Order. Suncor shall not hold out the State of Colorado or its employees, agents or representatives as a party to any contract entered into by Suncor in carrying out activities pursuant to this Consent Order. Nothing in this Consent Order shall constitute an express or implied waiver of immunity otherwise applicable to the State of Colorado, its employees, agents, or representatives.

73. The Division reserves the right to bring any action or to seek civil or administrative penalties for any past, present, or future violations of the Act and the Regulations, other than with respect to the Violations Addressed Herein. Further, the Division has the right to bring any action to enforce this Consent Order and to seek authorized penalties for any violation of this Consent Order. Notwithstanding anything in this Consent Order to the contrary, in the event of a violation of Paragraph 26 of this Consent Order, the Division agrees that it shall only assert a violation of Paragraph 26 or a violation of the applicable Act or Regulation, and not both.

VI. FORCE MAJEURE

74. Suncor must perform the requirements of this Consent Order within the schedules and time limits set forth herein and in any approved plan unless the performance is prevented or delayed by events that constitute a force majeure. A force majeure is defined as any event arising from causes which are not reasonably foreseeable, which are beyond the control of Suncor, and which cannot be overcome by due diligence.

75. Unless otherwise provided in the Act or the Regulations, within seventy-two (72) hours of the time that Suncor knows or has reason to know of the occurrence of any event which Suncor has reason to believe may prevent Suncor from timely compliance with any requirement under this Consent Order, Suncor must provide verbal notification to the Division. Within seven (7) calendar days of the time that Suncor knows or has reason to know of the occurrence of such event, Suncor must submit to the Division a written description of the event causing the delay, the reasons for and the expected duration of the delay, and actions which will be taken to mitigate the duration of the delay.

76. The burden of proving that any delay was caused by a force majeure shall at all times rest with Suncor. If the Division agrees that a force majeure has occurred, the Division will so notify Suncor. The Division will also approve or disapprove of Suncor's proposed actions for mitigating the delay. If the Division does not agree that a force majeure has occurred, or if the Division disapproves of Suncor's proposed actions for mitigating the delay, it shall provide a written explanation of its determination to Suncor.

77. Delay in the achievement of one requirement shall not necessarily justify or excuse delay in the achievement of subsequent requirements. In the event any performance under this Consent Order is found to have been delayed by a force majeure, Suncor must perform the requirements of this Consent Order that were delayed by the force majeure with all due diligence.

VII. DISPUTE RESOLUTION

78. If the Division determines that a violation of this Consent Order has occurred, that a force majeure has not occurred, or that the actions taken by Suncor to mitigate the delay caused by a force majeure are inadequate, the Division must provide a written explanation of its determination to Suncor. Within fifteen (15) calendar days of receipt of the Division's determination, Suncor must:

a. Submit a notice of acceptance of the determination; or

b. Submit a notice of dispute of the determination.

If Suncor fails to submit either of the above notices within the specified time, it will be deemed to have accepted the Division's determination.

79. If Suncor files any notice of dispute pursuant to Paragraph 78 or 87, the notice shall specify the particular matters in the Division's determination that Suncor seeks to dispute and the basis for the dispute. Matters not identified in the notice of dispute shall be deemed accepted by Suncor.

80. The Division and Suncor shall have thirty (30) calendar days from the receipt by the Division of the notification of dispute to reach an agreement. If agreement cannot be reached on all issues within this thirty (30) day period, the Division must confirm or modify its decision within an additional fourteen (14) days, and the confirmed or modified decision shall be deemed effective and subject to appeal in accordance with the Act and the Colorado Administrative Procedure Act, Article 4, Title 24, Colorado Revised Statutes.

VIII. NOTICES

81. Unless otherwise specified, any report, notice or other communication required under the Consent Order shall be sent to:

For the Division:
Enforcement Unit Supervisor
Colorado Department of Public Health and Environment
APCD-SS-B1-1400
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

With copy to:
First Assistant Attorney General
Air Quality Unit
Colorado Department of Law
1300 Broadway, 7th Floor
Denver, CO 80203

For Suncor:
Manager – Environmental, Health and Safety
Suncor Energy (U.S.A.) Inc.
5801 Brighton Blvd.
Commerce City, CO 80022

With copy to:
Director, Legal Affairs
Suncor Energy (U.S.A.) Inc.
717 17th Street, 29th Floor
Denver, CO 80202

IX. OBLIGATIONS UNAFFECTED BY BANKRUPTCY

82. The obligations set forth herein are based on the Division's police and regulatory authority. These obligations require specific performance by Suncor of corrective actions carefully designed to prevent on-going or future harm to public health or the environment, or both. Enforcement of these obligations is not stayed by a petition in bankruptcy. Suncor agrees that the penalties set forth in this Consent Order are not in compensation of actual pecuniary loss. Further, the obligations imposed by this Consent Order are necessary for Suncor and the Refinery to achieve and maintain compliance with State law.

X. MODIFICATIONS

83. This Consent Order may be modified only upon mutual written agreement of the Parties.

XI. PERIODIC REPORTING, COMPLETED ACTIONS, AND TERMINATION

84. Within thirty (30) days of the conclusion of each semi-annual period following the Effective Date of this Consent Order (e.g. January-June 2020 and July-December 2020) and during the effectiveness of this Consent Order, Suncor will submit a Periodic Report to the Division, identifying the status of Suncor's compliance with the provisions of Section III.A and Section III.E of this Consent Order. The Periodic Report must be submitted in accordance with Section VIII of this Consent Order (Notices).

85. In the Periodic Report, Suncor may identify those provisions of Section III.A-G of this Consent Order that Suncor has completed (Notice of Completion). The Division shall either accept or reject each of Suncor's Notice(s) of Completion within thirty (30) calendar days of receipt in accordance with Paragraph 87, below.

86. Upon completion of all of the requirements of Sections III.A-G of this Consent Order (but excluding those in Paragraphs 26, 29(ii), 32, 42, and 45) (collectively, the "Applicable Requirements"), Suncor may seek to terminate this Consent Order (Request to Terminate). Even if certain ongoing requirements of the Applicable Requirements have been not been completed (e.g., implementing the Investigation Plan in Section III.E or implementing the community communication system in Section III.G, etc.), Suncor may still seek to terminate this Consent Order (Request Order); provided this Consent Order may not be terminated unless those ongoing requirements have been incorporated into another enforceable permit, compliance order, or other document. To seek termination, Suncor may submit documentation demonstrating that it has fulfilled the Applicable Requirements of this Consent Order and/or that it has incorporated any ongoing requirements, if applicable, into appropriate permits or other orders. Suncor may rely on the Division's approval of Notice(s) of Completion pursuant to Paragraph 85, above, in making this demonstration as to the provisions completed. If the Request to Terminate is incomplete, the Division will advise Suncor of the missing information within thirty (30) calendar days, and Suncor will provide the requested information within fourteen (14) calendar days. The Division shall either accept or reject a complete Request to Terminate within thirty (30) calendar days of receipt in accordance with Paragraph 87, below. This Consent Order shall terminate upon the date of the Division's acceptance of a Request to Terminate.

87. If the Division rejects any of Suncor's Notice(s) of Completion or Suncor's Request to Terminate, the Division will include in its notice a statement

identifying the requirements that the Division considers incomplete or not satisfactorily performed and a schedule for completion. Within twenty-one (21) calendar days of receipt of the Division's notice, the Parties shall meet to discuss the Division's determination and attempt to resolve any dispute. If the dispute remains unresolved, within twenty-one (21) calendar days after the meeting, Suncor will either:

a. Submit a notice of acceptance of the determination; or

b. Submit a notice of dispute pursuant to Section VII of this Consent Order (Dispute Resolution).

If Suncor fails to submit either of the above notices within the specified time, Suncor will be deemed to have accepted the Division's determination.

88. The Parties agree that Paragraphs 24, 25, 42, 45, and 68-73 of this Consent Order shall continue to survive after termination of this Consent Order.

XII. CONSTRUCTION, BINDING EFFECT, AUTHORIZATION TO SIGN AND EFFECTIVE DATE

89. This Consent Order constitutes the final and complete agreement and understanding among the Parties with respect to the settlement embodied in the Consent Order, and supersedes all prior agreements and understandings, whether oral or written, concerning the settlement embodied herein.

90. This Consent Order shall be construed fairly as to both Parties and shall not be construed in favor of or against either Party in the event of an ambiguity or other form of dispute as to its interpretation. The words "include," "includes" and "including" in this Consent Order mean "include/includes/including without limitation." The use of "or" is not intended to be exclusive.

91. Nothing in this Consent Order shall be construed to create any rights in, or grant any cause of action to, any person not a Party to this Consent Order. Each of the Parties expressly reserves any and all rights, defenses, claims, demands, and causes of action that each Party may have against any party or person not a Party to this Consent Order.

92. This Consent Order is binding upon the Parties to this Consent Order, the Parties' subsidiaries or parents, the Parties' officers, directors, employees, successors in interest, and assigns. The undersigned warrant that they are authorized to bind legally their respective principals to this Consent Order, and that the Parties have the authority to enter into this Consent Order. Suncor shall be responsible for any violation of this Consent Order caused by any agents or contractors of Suncor acting within the scope of their authorization to act on Suncor's behalf.

93. This Consent Order shall be effective upon the date signed by the last Party below (the "Effective Date"). In the event that a party does not sign this Consent Order within thirty (30) calendar days of the other party's signature, this Consent Order becomes null and void. This Consent Order may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Consent Order.

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

By: _____ **Date:** 3/6/20

Shannon McMillan
Compliance and Enforcement Program Manager
Air Pollution Control Division

SUNCOR ENERGY (U.S.A.) INC.

By: _____ **Date:** 3/5/20

NAME: DONALD AUSTIN
TITLE: VP COMMERCE CITY REFINERY

cc: Shannon McMillan, APCD
Paul Carr, APCD
Jeffrey Bishop, APCD
Garry Kaufman, APCD Director
Tom Lovell, APCD
Ben Cappa, APCD
Laurie Ostrand, EPA (Region VIII)
Michael Stovern, EPA (Region VIII)
Jason Long, APCD
Beth Pilson, APCD
Heather Wuollet, APCD
John Putnam, CDPHE Director Environmental Programs
Rachel Wilson-Roussel, DEHS
Tom Roan, Attorney General's Office
Robyn Wille, Attorney General's Office
File