



# COLORADO

## Department of Public Health & Environment

### AIR POLLUTION CONTROL DIVISION

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COMPLIANCE ADVISORY

CASE NO. 2019-194

AIRS NO. 001-0003

INSPECTION DATE: May 20-22, 2019

U.S. CERTIFIED MAIL NO. 7017 0660 0000 0139 3502

MAILING DATE: December 13, 2019

SOURCE CONTACT: Drew Leonard

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

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This Compliance Advisory provides formal notice, pursuant to § 25-7-115(2), C.R.S., of alleged violations or noncompliance discovered during the Air Pollution Control Division's ("Division") inspection and/or review of records related to Suncor Energy (U.S.A.) Inc's Refinery identified below. The Division is commencing this action because it has cause to believe that the compliance issues identified below may constitute violations of the Colorado Air Pollution Prevention and Control Act ("the Act") and its implementing regulations.

Please be aware that you are responsible for complying with applicable State air pollution requirements and that there are substantial penalties for failing to do so. Pursuant to the enforcement authority provided the Division by § 25-7-115, C.R.S., any person who violates the Act, its implementing regulations or any permit issued thereunder may be issued an order for compliance that can include permit revocation and assessment of penalties of up to \$15,000 per day of such violation in accordance with § 25-7-122, C.R.S. The issuance of this Compliance Advisory does not in any way limit or preclude the Division from pursuing additional enforcement options concerning this inspection/review. Also, this Compliance Advisory does not constitute a bar to enforcement action for violations not specifically addressed in this Compliance Advisory.



Failure to respond to this Compliance Advisory by the date indicated at the end of this Compliance Advisory may be considered by the Division in the subsequent enforcement action and the assessment of penalties. Furthermore, the Division's enforcement process contemplates a full and final resolution of the compliance issues herein addressed, and those that may result from further review, in a timely manner. If at any time throughout the process of reaching such a resolution the Division determines that the Parties cannot agree to the dispositive facts, compliance requirements and/or penalty assessments (if any) associated with this Compliance Advisory, or a resultant enforcement action, the Division may exercise its full enforcement authority allowed under the law.

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Suncor Energy (U.S.A.) Inc ("Suncor") owns and operates the Commerce City Refinery: Plant 1 (West Plant), Plant 2 (East Plant), and Plant 3 (Asphalt Unit), a petroleum refinery located at 5800 & 5801 Brighton Boulevard, Commerce City, Adams County, Colorado ("Refinery"). 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:

1. 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");
2. Colorado Operating Permit Number 96OPAD120 issued to Suncor on August 1, 2004 and last revised February 22, 2018 ("Permit 96OPAD120");
3. 40 C.F.R. Part 60:
  - a. Subpart A - General Provisions ("Subpart A");
  - b. 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
  - c. 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").

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

1. 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");
2. Colorado Operating Permit Number 95OPAD108 issued to Suncor on October 1, 2006 and last revised June 15, 2009 ("Permit 95OPAD108");

3. Colorado Construction Permit Number 09AD0961 Final Approval issued to Suncor on February 23, 2015 (“Permit 09AD0961”);
4. Colorado Construction Permit Number 12AD032-3 Initial Approval Mod-2 issued to Colorado Refining Company on January 5, 1998 (“Permit 12AD032-3”); and
5. 40 C.F.R. Part 60, Subpart QQQ - Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems (“Subpart QQQ”).

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

1. 40 C.F.R. Part 60:
  - a. Subpart J - Standards of Performance for Petroleum Refineries (“Subpart J”);
  - b. Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007 (“Subpart Ja”);
  - c. 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”);
  - d. 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”);
2. 40 C.F.R. Part 63:
  - a. Subpart CC - National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries (“Subpart CC”);
  - b. Subpart UUU - National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units (“Subpart UUU”);
3. Colorado Air Quality Control Statutes; and
4. Colorado Air Quality Control Commission (“AQCC”) Regulations.

## I. ALLEGED VIOLATIONS AND FACTS

On May 20-22, 2019, Jason Long, of the Division, inspected the Refinery. Based on the Division’s inspection, and a review of records related to the Refinery, the Division has identified the following compliance issues:

### 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.

When gas oil is stored in an external floating roof tank, as was the case in Paragraphs 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 volatile organic compound (“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 Fluidized Catalytic Cracking Unit (“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<sub>2</sub>S”) 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 C(vi) of this Compliance Advisory.
- 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub> 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<sub>2</sub>S-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<sub>2</sub>S, 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S limit at the Asphalt Unit Flare (F2). At approximately 03:45 hrs on December 5, 2018, the H<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S-containing gases to be sent to F1. Additionally, on February 2, 2019, the TGU Incinerator (H-25) experienced an increase in SO<sub>2</sub> 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S-containing gases to be sent to the Main Plant Flare (F1) and the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S-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<sub>2</sub>S-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<sub>2</sub>S-containing gases were sent to F1. These events resulted in the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S limit at the Main Plant Flare (F1).

This exceedance was a result of the event described in Paragraph D(ii) of this Compliance Advisory.

- xxv. The event described in Paragraph C(vi) of this Compliance Advisory resulted in the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S-containing gases to be sent to the Main Plant Flare (F1) and the following exceedances of the fuel gas H<sub>2</sub>S 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 D(iv) of this Compliance Advisory resulted in the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub> limit (see Paragraph G of this Compliance Advisory). 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<sub>2</sub> permit limit exceedance at H-25, but eventually, SO<sub>2</sub> emissions increased and caused additional non-compliance with the permit limit. Suncor determined the SO<sub>2</sub> 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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 D(v) of this Compliance Advisory resulted in the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S 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<sub>2</sub>S analyzer may have contributed to this exceedance.

Suncor exceeded the fuel gas H<sub>2</sub>S 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 and 6,123 Mscf/d 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 E(xvi) of this Compliance Advisory 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<sub>2</sub>”) emission limit of 15.68 pounds per hour (“lb/hr”) from the Tail Gas Unit (“TGU”) Incinerator (H-25)<sup>1</sup>. 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<sub>2</sub> 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<sub>2</sub> 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

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<sup>1</sup> 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).

contractor performing the water wash maintenance did not maintain the flow of water throughout the entire duration of the 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<sub>2</sub> 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<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 E(ii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 E(iii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub>S/SO<sub>2</sub> 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<sub>2</sub>S in the tail gas, which ultimately caused elevated SO<sub>2</sub> emissions at H-25. This event resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub>S concentrations to be sent to the TGU and ultimately H-25. This event resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 E(xv) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 E(xviii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 D(ii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> limit at H-25:

**15.68 lb/hr SO<sub>2</sub> 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 E(xiii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 E(xxxii) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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 D(v) of this Compliance Advisory resulted in the following exceedances of the SO<sub>2</sub> limits at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> limit at H-25:

**15.68 lb/hr SO<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub>”) 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<sub>2</sub> 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 E(xviii) of this Compliance Advisory 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<sub>2</sub> 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<sub>2</sub> 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 E(xv) of this Compliance Advisory resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

#### **500 ppmvd at 0% O<sub>2</sub> 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 E(xxii) of this Compliance Advisory resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

**500 ppmvd at 0% O<sub>2</sub> 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 C(vi) of this Compliance Advisory resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

**500 ppmvd at 0% O<sub>2</sub> 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 D(iv) of this Compliance Advisory resulted in the following exceedances of the CO limit at the Plant 1 FCCU:

**500 ppmvd at 0% O<sub>2</sub> 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 E(xxx) of this Compliance Advisory resulted in the following exceedances of the CO limits at the Plant 1 FCCU:

**500 ppmvd at 0% O<sub>2</sub> 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<sub>2</sub> emissions from the Plant 1 FCCU to 50 ppmvd at 0% O<sub>2</sub> on a 7-day rolling average. The event described in Paragraph D(iv) of this Compliance Advisory resulted in an exceedance of the SO<sub>2</sub> 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<sub>2</sub> 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 E(xv) of this Compliance Advisory 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 E(xxii) of this Compliance Advisory 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 C(vi) of this Compliance Advisory 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 D(iv) of this Compliance Advisory 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 E(xxx) of this Compliance Advisory 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<sub>2</sub> shall not emit or cause to be emitted SO<sub>2</sub> in excess of 0.3 lbs SO<sub>2</sub>, for the sum of all SO<sub>2</sub> 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 E(xv) of this Compliance Advisory resulted in an exceedance of the refinery-wide SO<sub>2</sub> limit from January 1, 2019 to January 2, 2019. From January 1-2, 2019, Suncor failed to limit the refinery-wide SO<sub>2</sub> 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. 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 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. 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, and as of a result, approximately 4.5 months of recordkeeping data didn’t meeting the defined monitoring requirements of Subpart CC, § 63.670(h)(2). 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 No. 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<sub>2</sub> at 0% O<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> (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<sub>2</sub> emissions in gases discharged into the atmosphere from the Claus Plant to 1.20% by volume at 0% O<sub>2</sub> 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 Table 1 below, violating

Permit 12AD032-3, Condition 7, and Permit 95OPAD108, Condition 5.1.

<b>Table 1 - No. 3 SRU CO Actual Emissions</b>		
<b>Month-Year</b>	<b>Monthly Total (tons)</b>	<b>12-Month Rolling Total (tpy)</b>
November-18	0.07	<b>0.65</b>
December-18	0.07	<b>0.69</b>
January-19	0.07	<b>0.73</b>
February-19	0.06	<b>0.75</b>
March-19	0.06	<b>0.79</b>
April-19	0.05	<b>0.77</b>

- 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 No. 2 FCCU blower C-201 lost power and shut down. After the power loss to the blower, the No. 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<sub>2</sub>S 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<sub>2</sub>S limit at the Plant 2 Flare. On March 29, 2019, the No. 2 FCC blower C-201 unexpectedly lost power and shut down. Following the loss of power to the blower, the No. 2 FCC 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 No.2 FCC 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 No.2 FCC. 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 No.2 FCC 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<sub>2</sub>S 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<sub>2</sub>S process streams to the Plant 2 Flare. This resulted in the in the following exceedances of the fuel gas H<sub>2</sub>S 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<sub>2</sub>S 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 No. 2 FCCU went into an upset mode. Feed to the No. 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 No. 2 FCCU. Additionally, the No. 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<sub>2</sub>S 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<sub>2</sub>S 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 S(ii) of this Compliance Advisory.
  - 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 U(i) of this Compliance Advisory.
  - iii. The event described in Paragraph U(v) of this Compliance Advisory 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 S(ii) of this Compliance Advisory 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 U(v) of this Compliance Advisory 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. 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, and as of a result, approximately 4.5 months of recordkeeping data didn’t meet the defined monitoring requirements of Subpart CC, § 63.670(h)(2). 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).

It is important to resolve the above-referenced issues as soon as possible. Therefore, the Division encourages Suncor to immediately identify those compliance issues that are not in dispute and to rectify those issues before the upcoming Compliance Advisory meeting. In accordance with § 25-7-115(3)(a), C.R.S., the Compliance Advisory meeting will be held within thirty (30) days of the Division’s issuance of the Compliance Advisory in this matter. At the upcoming meeting, the Division will confirm the actions taken to rectify the undisputed compliance issues and proceed with unresolved matters as outlined below.

If you have any questions regarding this Compliance Advisory, the Division’s enforcement processes, or any related issues, please refer to the APCD Enforcement Guide located at <https://www.colorado.gov/pacific/cdphe/inspections-and-enforcement> and/or contact the Division personnel identified below.

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## II. COMPLIANCE ADVISORY MEETING

Suncor and the Division will meet to:

- Discuss the disputed Compliance Advisory issues and answer any remaining questions you may have;

- Submit information necessary to successfully show that the deficiencies and noncompliance issues (or any portion of them) are not violations of Colorado’s air pollution laws; and
- Establish a mutually acceptable schedule and guidelines for the full and final resolution of any remaining deficiencies and noncompliance issues in a timely manner.

**Please contact the Enforcement Advisor identified below if you have any questions regarding the Compliance Advisory.**

Jen Schoennagel, Enforcement Advisor (303-692-3233)

**To ensure meaningful communication with all Coloradans, the Division offers free language services. Please let us know if we can provide an interpreter for anyone attending the Compliance Advisory meeting.**

cc: Shannon McMillan, APCD  
Paul Carr, APCD  
Heather Wuollet, APCD  
Ben Cappa, APCD  
Michael Stovern, EPA (Region VIII)  
File

Jason Long, APCD  
Beth Pilson, APCD  
Tom Lovell, APCD  
Tom Roan, Attorney General’s Office  
Robyn Wille, Attorney General’s Office