

# Environmental Reportable Events Summary



<b>Event Date:</b> 12/21/2022 – 12/30/2022	
<b>Event Title:</b> Various Emissions Exceedances due to Refinery Shutdown	
<b>Impacted Media</b> (air, water, or soil): Air	
<b>Operating Unit:</b> Plants 1, 2, and 3 Process Units and Utilities	
<b>Event Summary:</b>	
<p>On December 21, 2022, a cold front moved into the Denver area. The ambient temperatures dropped rapidly from a high of 51 degrees Fahrenheit (deg F) to a low of approximately -10 deg F in the early evening. The abnormally low temperatures (with a low of approximately -24 deg F being measured on December 22, 2022) persisted in the Denver area until December 24, 2022, at which time a general warming trend was observed.</p> <p>During this period of abnormally cold temperatures, Suncor encountered a series of operational issues that began on the evening of December 21, 2022, and continued for several days thereafter. During this time, critical equipment (e.g., boilers, hydrogen plant, flares, wastewater treatment) was kept running or brought back online in order to be able to safely shut down the refinery. The refinery's truck and rail fuel loading racks were also kept open to enable the sale of fuels.</p> <p>The individual events are under investigation by Suncor. Provided below is a list of reportable air emissions exceedances that were monitored in Plants 1, 2, and 3 from December 21, 2022 through December 30, 2022.</p>	
Permit Condition	Maximum Reported Value
<b>December 21, 2022</b>	
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	291 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 3 Main Plant Flare	191 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 3 Main Plant Flare
<b>December 22, 2022</b>	
162 ppm H <sub>2</sub> S in refinery fuel gas (3-hr rolling average)	300 ppm H <sub>2</sub> S in refinery fuel gas (3-hr rolling average)
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	323 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 3 Main Plant Flare	184 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 3 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare	169 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare
250 ppm SO <sub>2</sub> corrected to 0%O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	8,243 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	658 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
270 Btu/scf net heating value in the combustion zone of the Plant 1 Main Plant Flare (15-minute block average)	70 Btu/scf NHVcz (15-minute block average) at the Plant 1 Main Plant Flare
Opacity not to exceed 20% (6-minute average) from the Plant 1 Fluidized Catalytic Cracking Unit	27% opacity (6-minute average) from the Plant 1 Fluidized Catalytic Cracking Unit

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<b>December 23, 2022</b>	
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	319 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare
250 ppm SO <sub>2</sub> corrected to 0%O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	8,210 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	50 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
<b>December 24, 2022</b>	
162 ppm H <sub>2</sub> S in refinery fuel gas (3-hr rolling average)	201 ppm H <sub>2</sub> S in refinery fuel gas (3-hr rolling average)
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	318 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare	295 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare
250 ppm SO <sub>2</sub> corrected to 0%O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	8,975 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	245 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
<b>December 25, 2022</b>	
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	180 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare	279 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare
250 ppm SO <sub>2</sub> corrected to 0%O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	8,072 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
270 Btu/scf net heating value in the combustion zone of the Plant 2 Main Plant Flare (15-minute block average)	217 Btu/scf NHVcz (15-minute block average) at the Plant 2 Main Plant Flare
<b>December 26, 2022</b>	
250 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	1,866 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	36 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
<b>December 27, 2022</b>	
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 1 Main Plant Flare	195 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) from the Plant 1 Main Plant Flare
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare	195 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare

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250 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	1,736 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
15.68 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator	34 lb/hr SO <sub>2</sub> from the Plant 1 Tail Gas Incinerator
<b>December 28, 2022</b>	
162 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare	277 ppm H <sub>2</sub> S in flare gas (3-hr rolling average) at the Plant 2 Main Plant Flare
250 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	961 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
<b>December 29, 2022</b>	
250 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr rolling average from the Plant 1 Tail Gas Incinerator)	283 ppm SO <sub>2</sub> corrected to 0% O <sub>2</sub> (12-hr average from the Plant 1 Tail Gas Incinerator)
<b>December 30, 2022</b>	
270 Btu/scf net heating value in the combustion zone of the Plant 1 Main Plant Flare (15-minute block average)	235 Btu/scf NHVcz (15-minute block average)

The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.

**Event Date:** 01/04/2023 and 01/05/2023

**Event Title:** Outfall Water Permit Exceedance

**Impacted Media** (air, water, or soil): Water

**Operating Unit:** Outfall No. 020A

**Event Summary:**

As part of a weekly sampling program, water samples at an external outfall, Outfall 020A, were collected, analyzed, and found to exceed the daily maximum permit limit for benzene on January 4 and 5, 2023. It was discovered that benzene-containing hydrocarbon entered the refinery storm water system during the shutdown of the Plant 1 process units on December 24, 2022.

Results of voluntary surface water sampling in Sand Creek downstream of Outfall 020A performed on January 4 and 5, 2023, showed a benzene concentration of 1 µg/L, which is below the EPA's drinking water maximum containment level.

Upon discovering the elevated benzene concentrations, Suncor personnel isolated the affected water so it could be treated to remove benzene to below the permit limit. Results of sampling at Outfall 020A performed on January 6, 2023, showed a benzene concentration below the permit limit, indicating that these actions were successful.

Sampling at Outfall 020A performed on January 6, 2023, showed benzene concentrations below the permit limit.

The specific permit terms or conditions exceeded for this event include:

Permit Term or Condition	Reported Value
5 µg/L benzene (daily maximum)	7 µg/L benzene
5 µg/L benzene (daily maximum)	9 µg/L benzene

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# Environmental Reportable Events Summary



<b>Event Date:</b> 01/11/2023					
<b>Event Title:</b> Plant 1 Tail Gas Incinerator Exceedance					
<b>Impacted Media</b> (air, water, or soil): Air					
<b>Operating Unit:</b> Plant 1 Tail Gas Incinerator (H-25)					
<p><b>Event Summary:</b>                  On January 11, 2023 the Plant 1 tail gas incinerator (H-25) exceeded the 250 ppm (corrected to 0% O<sub>2</sub>) 12 hour average from 1:00 am through 7:00 am. This exceedance occurred after the Plant 1 sulfur reduction plant was offline and all sulfur producing refinery process units were also offline. Small quantities of residual sulfur compounds from the sulfur storage tank and sulfur pit entered H-25, creating a low concentration of SO<sub>2</sub> exiting the stack. However, the 250 ppm SO<sub>2</sub> (corrected to 0% O<sub>2</sub>) standard is very sensitive to the oxygen concentration in the flue gas and during the time of the exceedance, the oxygen concentration in H-25 was unusually high. The high oxygen concentration in H-25 resulted in the calculated SO<sub>2</sub> ppm (corrected to 0% O<sub>2</sub>) concentration being above the permit limit.</p> <p>The specific permit terms or conditions exceeded for this event include:</p>					
<table border="1"> <thead> <tr> <th>Permit Term or Condition</th> <th>Reported Value</th> </tr> </thead> <tbody> <tr> <td>250 ppm SO<sub>2</sub> at 0% O<sub>2</sub> for a 12-hour rolling average from the tail gas incinerator (H-25)</td> <td><b>255 ppm</b> SO<sub>2</sub> at 0% O<sub>2</sub> for a 12-hour average</td> </tr> </tbody> </table>		Permit Term or Condition	Reported Value	250 ppm SO <sub>2</sub> at 0% O <sub>2</sub> for a 12-hour rolling average from the tail gas incinerator (H-25)	<b>255 ppm</b> SO <sub>2</sub> at 0% O <sub>2</sub> for a 12-hour average
Permit Term or Condition	Reported Value				
250 ppm SO <sub>2</sub> at 0% O <sub>2</sub> for a 12-hour rolling average from the tail gas incinerator (H-25)	<b>255 ppm</b> SO <sub>2</sub> at 0% O <sub>2</sub> for a 12-hour average				
<p>The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.</p>					
<b>Event Date:</b> 01/13/2023					
<b>Event Title:</b> No. 1 FCC Opacity Exceedance					
<b>Impacted Media</b> (air, water, or soil): Air					
<b>Operating Unit:</b> No. 1 FCC					
<p><b>Event Summary:</b>                  On January 13, 2023, an incident occurred at Plant 1 where the No. 1 FCCU opacity limit was exceeded during a planned maintenance event while the No. 1 FCCU unit was offline. The opacity occurred when the No. 1 FCCU regenerator air blower, C-26, was loaded into the system to enable the withdrawal of catalyst from the regenerator for maintenance activities associated with the Refinery's recovery plan.</p> <p>The event began at 7:24 p.m. on January 13, 2023, and was resolved at 7:30 p.m. when operators stabilized the compressor air flow to the No. 1 FCCU regenerator.</p> <p>The specific permit terms or conditions exceeded for this event include:</p>					
<table border="1"> <thead> <tr> <th>Permit Term or Condition</th> <th>Reported Value</th> </tr> </thead> <tbody> <tr> <td>Opacity not to exceed 20% (6-minute average)</td> <td><b>25%</b> opacity (6-minute average)</td> </tr> </tbody> </table>		Permit Term or Condition	Reported Value	Opacity not to exceed 20% (6-minute average)	<b>25%</b> opacity (6-minute average)
Permit Term or Condition	Reported Value				
Opacity not to exceed 20% (6-minute average)	<b>25%</b> opacity (6-minute average)				
<p>The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.</p>					

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# Environmental Reportable Events Summary



<b>Event Date:</b> 01/15/2023	
<b>Event Title:</b> Plant 1 Main Plant Flare Exceedance	
<b>Impacted Media</b> (air, water, or soil): Air	
<b>Operating Unit:</b> Plant 1 Main Plant Flare	
<b>Event Summary:</b> On January 15, 2023, the Plant 1 Main Plant Flare combustion zone net heating value (NHVcz) dropped below 270 Btu/scf during a shutdown of the Hydrogen Plant. The Hydrogen Plant was shut down to allow repairs to be completed as a result of an extreme cold weather event that had occurred in late December 2022.  Prior to the incident, most of the units in Plant 1 were already offline and the flow to the flare was almost entirely comprised of hydrogen coming from the Hydrogen Plant. The NHVcz value returned into compliance once operators adjusted the flow of supplemental city gas to the flare.  This event began at 11:00 p.m. on January 15, 2023 and ended at 5:30 a.m. on January 16, 2023.  The specific permit terms or conditions exceeded for this event include:	
<b>Permit Term or Condition</b>	<b>Reported Value</b>
270 Btu/scf net heating value in the combustion zone (NHVcz) of the Plant 1 Main Plant Flare (15-minute block average)	<b>133 Btu/scf</b> NHVcz (15-minute block average) at the Plant 1 Main Plant Flare
The Commerce City North Denver Air Monitoring network of sensors within a three-mile radius of the refinery did not detect any levels above the acute health reference guidelines during this event.	

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