

# Environmental Reportable Events Summary



<b>Event Date:</b> 08/17/2022							
<b>Event Title:</b> Internal Outfall Water Permit Exceedance							
<b>Impacted Media</b> (air, water, or soil): Water							
<b>Operating Unit:</b> Internal Outfall No. 002B							
<p><b>Event Summary:</b>                      As part of a routine sampling program, a water sample at an internal outfall, Outfall 002B, was collected, analyzed, and was found to exceed the daily maximum permit limits for benzene and total benzene, toluene, ethylbenzene, and xylene (total BTEX). At the time of sampling, there were no reported spills or other sources of contamination observed. Outfall 002B is an internal outfall and does not directly discharge to Sand Creek or any other waterway. Additionally, a sample from the external outfall that discharges to Sand Creek, Outfall 020A, was analyzed and the results were below applicable permit limits.</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>5 ug/L benzene (daily maximum)</td> <td><b>37 ug/L benzene</b></td> </tr> <tr> <td>100 ug/L total Benzene, Toluene, Ethylbenzene, and Xylene (total BTEX) (daily maximum)</td> <td><b>163 ug/L total BTEX</b></td> </tr> </tbody> </table> <p>Sampling at Outfall 002B performed on August 24, 2022, and all subsequent weekly sampling events, have showed benzene and total BTEX concentrations below the respective permit limits. Samples on the external outfall going to Sand Creek were also below the respective permit limits.</p>		Permit Term or Condition	Reported Value	5 ug/L benzene (daily maximum)	<b>37 ug/L benzene</b>	100 ug/L total Benzene, Toluene, Ethylbenzene, and Xylene (total BTEX) (daily maximum)	<b>163 ug/L total BTEX</b>
Permit Term or Condition	Reported Value						
5 ug/L benzene (daily maximum)	<b>37 ug/L benzene</b>						
100 ug/L total Benzene, Toluene, Ethylbenzene, and Xylene (total BTEX) (daily maximum)	<b>163 ug/L total BTEX</b>						
<b>Event Date:</b> 08/25/2022							
<b>Event Title:</b> Hydrogen Unit Emissions Exceedance							
<b>Impacted Media</b> (air, water, or soil): Air							
<b>Operating Unit:</b> Plant 1 Main Plant Flare, Plant 1 Hydrogen Unit							
<p><b>Event Summary:</b>                      While attempting to execute maintenance on equipment in the hydrogen unit, an equipment isolation valve failed to hold pressure causing the activation of a safety shutdown system. As a result of the safety system activation, hydrogen was routed to the flare and the flare gas recovery unit was bypassed to maintain safety and process stability.</p> <p>The hydrogen plant was restarted and returned to normal operating conditions, but the flare gas recovery unit could not be taken off bypass due to maintenance activities that were being executed in that unit. Maintenance in the flare gas recovery unit was completed as quickly as possible and the unit taken off bypass.</p> <p>This event began on 08/25/2022 at 02:00 p.m. and ended on 08/25/2022 at 04:00 p.m. when the hydrogen unit was stabilized, and the flare gas recovery skid was back on-line after maintenance was completed.</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>162 ppm H<sub>2</sub>S in flare gas for a 3-hour average</td> <td><b>224 ppm H<sub>2</sub>S in flare gas for a 3-hour average</b></td> </tr> </tbody> </table> <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. Suncor is investigating the failure, replacing the failed isolation valve, and evaluating its isolation protocols for this system to include additional isolation verification steps.</p>		Permit Term or Condition	Reported Value	162 ppm H <sub>2</sub> S in flare gas for a 3-hour average	<b>224 ppm H<sub>2</sub>S in flare gas for a 3-hour average</b>		
Permit Term or Condition	Reported Value						
162 ppm H <sub>2</sub> S in flare gas for a 3-hour average	<b>224 ppm H<sub>2</sub>S in flare gas for a 3-hour average</b>						

*\*Information in this report is based on the facts known to Suncor Energy (U.S.A.), Inc. at the time of preparation. We may update or change the information contained herein if and to the extent additional facts become available.*

# Environmental Reportable Events Summary



<b>Event Date:</b> 08/31/2022	
<b>Event Title:</b> Plant 1 Main Plant Flare and Plant 3 Flare Exceedances	
<b>Impacted Media</b> (air, water, or soil): Air	
<b>Operating Unit:</b> Plant 1 Hydrogen Unit, Plant 1 Main Plant Flare, Plant 3 Main Plant Flare	
<p><b>Event Summary:</b>                  During normal operations, the hydrogen unit unexpectedly shut down due to a spurious activation of a safety system. As a result of the shutdown, steam production was temporarily reduced, and hydrogen was routed to the flare to safely control unit pressure. The sudden loss of steam production capacity resulted in a steam system upset and subsequent curtailment of steam to the #3 crude unit to recover system pressure. The increase in hydrogen flow to the flare required bypassing of the flare gas recovery unit to maintain system stability until the hydrogen unit could be restarted.</p> <p>This event began on 08/31/2022 at 10:30 a.m. and ended on 08/31/2022 at 11:00 p.m. once the hydrogen unit was restarted and the flare gas recovery skid was no longer bypassed.</p> <p>The specific permit terms or conditions exceeded for this event include:</p>	
<b>Permit Term or Condition</b>	<b>Reported Value</b>
162 ppm H <sub>2</sub> S in flare gas for a 3-hour average (Plant 1)	<b>330 ppm</b> H <sub>2</sub> S in flare gas for a 3-hour average
162 ppm H <sub>2</sub> S in flare gas for a 3-hour average (Plant 3)	<b>242 ppm</b> H <sub>2</sub> S in flare gas for a 3-hour average
Flares shall be operated with no visible emissions except for periods not to exceed a total of 5 minutes during any 2 consecutive hours. (Plant 1 Flare)	For the duration of the event, there was a period of <b>20 minutes and 30 seconds</b> when the flare operated with visible emissions.
<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. Suncor is investigating the cause of the spurious event.</p>	

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# Environmental Reportable Events Summary



**Event Date:** 09/06/2022

**Event Title:** Plant 1 Catalytic Polymerization Unit Fuel Gas Exceedance

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

**Operating Unit:** Plant 1 Catalytic Polymerization Unit (Cat Poly)

**Event Summary:**

During startup of process equipment in the Cat Poly unit, process reaction rates were lower than normal resulting in an upset to the process. The upset required venting of gases to the fuel gas system to maintain safe operating pressures, the gases that were vented to the fuel gas system contained unexpected levels of H<sub>2</sub>S. At the flare tip hydrogen sulfide (H<sub>2</sub>S) is combusted, which results in the generation of sulfur dioxide (SO<sub>2</sub>) and water vapor.

The cause of lower-than-normal reaction rate was found to be due to a heat exchanger performance issue and the cause of the H<sub>2</sub>S in the vented gas stream was due to lower than anticipated caustic strength levels in the feed treatment section of the unit.

This event began on 09/06/2022 at 10:00 a.m. and ended on 09/06/2022 at 02:00 p.m. when caustic solution was added to the amine system and the reactor temperatures in the catalytic polymerization unit were increased to target.

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

Permit Term or Condition	Reported Value
162 ppm H <sub>2</sub> S in fuel gas for a 3-hour average	202 ppm H <sub>2</sub> S in flare gas for a 3-hour 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. Suncor performed maintenance on the heat exchanger and restored heating capacity and is evaluating its caustic strength management plan to ensure adequate protocols are in-place to maintain proper caustic strength levels.

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# Environmental Reportable Events Summary



<b>Event Date:</b> 09/15/2022	
<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 Gasoline Benzene Reduction (GBR) Unit, Plant 1 Main Plant Flare	
<b>Event Summary:</b> During normal operations, a failed level-indicating device resulted in a process upset in the Cat Poly process unit that required venting of gases to the fuel gas system to maintain safe pressure levels in the system. The sudden venting of Cat Poly gases to the fuel gas system resulted in the activation of a fuel gas system pressure protection device that failed to properly reset after the system was stabilized. The failed reset allowed fuel gas to continue to flow into the flare system exceeding the treatment capabilities of the flare gas recovery/treatment unit. Hydrogen sulfide (H <sub>2</sub> S) is combusted at the flare tip, which results in the generation of sulfur dioxide (SO <sub>2</sub> ) and water vapor.  This event began on 09/15/2022 at 10:00 p.m. and ended on 09/16/2022 at 10:00 a.m. when the Flare Gas Recovery Skid was put back online and the relief valve venting to the flare system was closed.  The specific permit terms or conditions exceeded for this event include:	
<b>Permit Term or Condition</b>	<b>Reported Value</b>
162 ppm H <sub>2</sub> S in flare gas for a 3-hour average	<b>318 ppm</b> H <sub>2</sub> S in flare gas for a 3-hour 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. Suncor has repaired the failed level-indication device and has addressed the failed reset of the pressure protection device.	

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