

# Environmental Reportable Events Summary



<b>Event Date:</b> 10/26/2021
<b>Event Title:</b> Plant 1 Fluidized Catalytic Cracker (FCC) Unit Trip
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> #1 FCC
<b>Event Summary:</b> <p>The main compressor for the #1 FCC was shut down due to liquid being carried over into the suction drum in the unit. One of the pumps that draws down liquid in the system was not operating at full pressure which allowed liquid to be carried toward the compressor. To prevent damage, the high liquid level caused a shutdown of the compressor which also resulted in the operations personnel shutting down the rest of the unit. This issue was resolved when the pump that was not operating at full capacity was cleaned out and the unit restarted.</p> <p>This event began 10/26 at 7:00 a.m. and ended on 10/27 at 3:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of opacity not to exceed 20% (state) for a 6-minute average<ul style="list-style-type: none"><li>○ Reported at <b>77%</b> opacity for a 6-minute average (maximum value, intermittent)</li></ul></li><li>• Permit limit of opacity not to exceed 20% (federal) for a 3-hour average<ul style="list-style-type: none"><li>○ Reported at <b>33%</b> opacity for a 3-hour average (intermittent)</li></ul></li><li>• Permit limit of opacity not to exceed 30% (federal) for a 6-minute average<ul style="list-style-type: none"><li>○ Reported at <b>77%</b> opacity for a 6-minute average (intermittent)</li></ul></li><li>• Permit limit of 500 parts per million (ppm) CO at 0% O<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>○ Reported at <b>2,030 ppm</b> CO at 0% O<sub>2</sub> for a 1-hour average</li></ul></li></ul> <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> 10/27/2021
<b>Event Title:</b> Plant 1 Boiler 6 Malfunction
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Boiler #6
<b>Event Summary:</b> <p>Boiler 6 exceeded the allowable carbon monoxide (CO) permit limit for a 24-hour period due to the boiler not following the automatic control programming. Operators worked to get the CO under control. CO emissions returned to normal; no specific cause was found.</p> <p>This event began 10/27 at 6:00 p.m. and ended on 10/27 at 8:00 p.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of &lt;0.060 lb of CO per MMBtu for a 24-hour period (average)<ul style="list-style-type: none"><li>○ Reported at <b>0.061 lb</b> of CO per MMBtu for a 24-hour period (average)</li></ul></li></ul> <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> 10/29/2021
<b>Event Title:</b> H-25 SO <sub>2</sub> Exceedance
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> #1 Sulfur Recovery Unit (SRU)
<b>Event Summary:</b> <p>During normal operation, a pressure and flow spike occurred causing the reducing gas generator (RGG) to trip offline which caused unit upsets in the #1 and #2 Sulfur Recovery Unit (SRU) in Plant 1. The #1 SRU was most impacted and tripped offline. With the unit tripped, gases normally processed in the unit were sent to the incinerator to be combusted. During this period, high sulfur dioxide (SO<sub>2</sub>) generation was caused due to processing the gas stream in the incinerator. The issue was resolved by readjusting the heating on the feed line to H-25 to ensure backpressure in the unit was reduced and allowing the incinerator to work properly.</p> <p>This event began 10/29 at 4:00 a.m. and ended on 10/27 at 8:00 p.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of 15.68 lb/hr of SO<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>○ Reported at <b>29.79 lb/hr</b> of SO<sub>2</sub> for a 1-hour average</li></ul></li><li>• Permit limit of 250 ppm SO<sub>2</sub> at 0% O<sub>2</sub> for a 12-hour average<ul style="list-style-type: none"><li>○ Reported at <b>1,180 ppm</b> SO<sub>2</sub> at 0% O<sub>2</sub> for a 12-hour average</li></ul></li></ul> <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> 10/31/2021
<b>Event Title:</b> Plant 1 Boiler 6 Malfunction
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Boiler #6
<b>Event Summary:</b> <p>Boiler 6 exceeded the allowable carbon monoxide (CO) permit limits for a 24-hour period. This was caused during boiler tuning where the boiler was out of range. Operators worked to get the CO under control no specific cause was found and CO emissions returned to normal.</p> <p>This event began 10/31 at 1:00 p.m. and ended on 11/03 at 1:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of &lt;0.060 lb of CO per MMBtu for a 24-hour period (average)<ul style="list-style-type: none"><li>○ Reported at <b>0.135 lb</b> of CO per MMBtu for a 24-hour period (average)</li></ul></li></ul> <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> 11/02/2021
<b>Event Title:</b> Plant 2 FCC Unit Trip
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> #2 FCC
<b>Event Summary:</b> <p>While performing annual maintenance on an electrical system component, the #2 FCC blower tripped, causing the unit to shutdown. The emergency shutdown of the #2 FCC resulted in brief periods of elevated opacity emissions from the FCC regenerator stack and resulted in hydrogen sulfide (H<sub>2</sub>S) rich gases venting to the Plant 2 Flare. At the flare tip, H<sub>2</sub>S is combusted, which results in the generation of SO<sub>2</sub> and water vapor.</p> <p>This event began 11/02 at 10:30 a.m. and ended on 11/03 at 10:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of 20% opacity for a 6-minute average<ul style="list-style-type: none"><li>○ Reported at <b>43%</b> opacity for a 6-minute average (maximum value, intermittent)</li></ul></li><li>• Permit limit of 500 ppm CO at 0% O<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>○ Reported at <b>2,031 ppm</b> CO at 0% O<sub>2</sub> for a 1-hour average</li></ul></li><li>• Permit limit of 162 ppm H<sub>2</sub>S in flare gas for a 3-hour average,<ul style="list-style-type: none"><li>○ Reported at <b>300 ppm</b> H<sub>2</sub>S in flare gas for a 3-hour average</li></ul></li><li>• Flare combustion zone net heating value of 270 btu/scf for a 15-minute average<ul style="list-style-type: none"><li>○ Reported at <b>260 btu/scf</b> for a 15-minute average</li></ul></li></ul> <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> 11/04/2021
<b>Event Title:</b> Plant 1 Boiler 6 Malfunction
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> Boiler #6
<b>Event Summary:</b> <p>Boiler 6 exceeded the allowable carbon monoxide (CO) limit for a 24 hour period due to the boiler being out of proper control. During the exceedance period the issues were found to be intermittent. Operators worked to get the CO under control by troubleshooting the issue. During the troubleshooting efforts, the cause was found to likely be a regulator supplying fuel gas to the boiler. While the boiler is offline, the regulator will be worked on to resolve this issue.</p> <p>This event began 11/04 at 11:00 a.m. and was complete on 11/05 at 1:00 a.m.</p> <p>The specific permit exceedances for this event were:</p> <ul style="list-style-type: none"><li>• Permit limit of &lt;0.060 lb of CO per MMBtu for a 24-hour period (average)<ul style="list-style-type: none"><li>○ Reported at <b>0.069 lb</b> of CO per MMBtu for a 24-hour period (average)</li></ul></li></ul> <p>The Commerce City North Denver Air Monitoring network 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> 11/08/2021
<b>Event Title:</b> Plant 2 FCC Startup Exceedances – Continued Startup from 11/04
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> #2 FCC
<b>Event Summary:</b> During the startup of the #2 FCC an opacity event occurred while bringing the main air blower online.  This event began 11/08 at 7:12 p.m. and continued intermittently until the unit was brought back online.  The specific permit exceedances for this event were: <ul style="list-style-type: none"><li>• Permit limit of opacity not to exceed 20% (state) for a 6-minute average<ul style="list-style-type: none"><li>○ Reported at <b>48%</b> opacity for a 6-minute average (maximum value, intermittent)</li></ul></li></ul> 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.
<b>Event Date:</b> 11/15/2021
<b>Event Title:</b> Plant 2 FCC Startup Exceedances – Continued Startup from 11/04
<b>Impacted Media</b> (air, water, or soil): Air
<b>Operating Unit:</b> #2 FCC
<b>Event Summary:</b> During the startup of the #2 FCC an opacity event occurred while loading fresh catalyst into the unit. Catalyst is a clay-like substance that can look like dust when loaded or unloaded.  This event began 11/15 at 10:42 a.m. and ended on 11/18 at 4:00 p.m.  The specific permit exceedances for this event were: <ul style="list-style-type: none"><li>• Permit limit of 500 ppm CO at 0% O<sub>2</sub> for a 1-hour average<ul style="list-style-type: none"><li>○ Reported at <b>2,030 ppm</b> CO at 0% O<sub>2</sub> for a 1-hour average</li></ul></li><li>• Permit limit of opacity not to exceed 20% (state) for a 6-minute average<ul style="list-style-type: none"><li>○ Reported at <b>74%</b> opacity for a 6-minute average (maximum value, intermittent)</li></ul></li><li>• Permit limit of opacity not to exceed 20% for a 3-hour average<ul style="list-style-type: none"><li>○ Reported at <b>26%</b> opacity for a 3-hour average</li></ul></li></ul> 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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