

Immediate Response Action Report

#6 Fuel Oil Release SERTS ID 20190114NO16-1

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1.0 INTRODUCTION

This report contains a summary of the immediate response actions at the Superior Refining Company LLC Superior, WI refinery in response to a #6 Fuel Oil release on January 14th, 2019. The site location is shown in Figure 1. The response was initiated on January 14th, 2019 after the release occurred. The following report was prepared in accordance with Wisconsin Administrative Code NR 708 final report criteria under NR 708.09 for no further response action.

2.0 TYPE OF HAZARDOUS SUBSTANCE DISCHARGED, TOXICITY, MOBILITY AND VOLUME- NR 708.09 (1)(a)

The #6 fuel oil spill occurred in a pipe rack in the southwest corner of the Fluid Catalytic Cracking Unit (FCCU). The total volume of the released onto a pervious surface was estimated to be 15-20 gallons. The 15-20 gallon estimate was determined by visually estimating the extent of the release and thickness of the released product. It was estimated that the extent covered approximately ~120 square feet and the thickness was estimated to be roughly 1/4 inch. This results in approximately 4,320 cubic inches or 18.7 gallons. The release had decreased mobility due to the cold air temperature at the time it occurred. Weather conditions are shown in appendix B. The spill did not reach any water bodies, and did not migrate from the impacted area. A site map is included in Figure 2. Spill site conditions are depicted in the photographs which are included in Appendix A. WTM coordinates of the spill are included in section 15.0.

3.0 DURATION OF DISCHARGE – NR 708.09(1)(b)

The duration of the discharge to a pervious surface was less than one minute. When the plugged line relieved itself due to steam pressure buildup, the force of the release allowed product to overwhelm the sides of the poly containment structure being used to collect said material and spill onto a pervious surface. After the initial burst, material that left the pipe prior to steam being turned off was captured in a poly containment structure. Discharge to a pervious surface ended when steam flow through the line was turned off.

4.0 TIME DISCHARGE WAS RESPONDED TO AND PROPERLY CONTAINED– NR 708.09(1)(c)

The discharged was responded to immediately since a vacuum truck was present to remove product from the poly containment structure at the discharge end of the pipe being steamed out. Operators were also able to turn off the steam to the line rapidly. Due to the cold air temperature on the day of the spill, the material did not travel very far laterally along the snow/ice it was discharged onto. On January 14th, 2019 cleanup of the spill was initiated and completed by means of vacuum truck recovery and hand excavation.

5.0 MITIGATION EFFORTS THAT MAY HAVE ACCELERATED MIGRATION OF POLLUTION OR HAZARDOUS SUBSTANCES NR 708.09(1)(d)

Since a small volume of product made its way to a pervious surface and a vacuum truck was present during the release, cleanup of the material occurred quickly and completely in one attempt. None of the mitigation efforts used accelerated the migration of the substance. In addition, the cold air and surface temperatures as well as the ground being frozen at the time of the release slowed the movement of the product once it came into contact with the ground.

6.0 WEATHER CONDITIONS – NR 708.09 (1)(e)

Weather conditions on the day of the release were typical for that time of year. The mean temperature was 21°F, there was a 6 mph W wind, and there was no measured precipitation. A summary of local weather conditions from January 14th, 2019 is located in Appendix B.

7.0 MIGRATION POTENTIAL OF THE CONTAMINATION – NR 708.09 (1)(f)

Migration of the contamination beyond its original extent is unlikely due to the small volume that was released, cold air and surface temperatures that slowed the movement of the liquid product, and the quick and thorough cleanup effort that was undertaken to address the contamination.

8.0 NATURE AND SCOPE OF IMMEDIATE ACTION CONDUCTED - NR 708.09 (1)(g)

The release occurred as operations staff were steaming cleaning a #6 oil feed line prior to removing it as part of the Refinery's demolition project. Early in the process, it was determined that the line was plugged since steam was not coming out of the downstream end of the pipe. As the operators walked the line to identify where the plug was, the built of pressure of the steam relieved and overtook the poly spill containment present at the downstream end of the pipe meant to catch any residual product that was present. Vacuum truck operators recovered the material that spilled onto a pervious surface immediately and hand excavation of the visibly contaminated soil was both commenced and completed on the day of the release. The estimated volume of soil that was removed is 1-3 cubic feet since most of the released material landed on a thick layer of snow and ice. The excavated soil was brought to our "three-sided building" where it was stored before sending it to a proper TSDF for disposal. The area was excavated to a depth between two and three inches as the product did not leech any deeper into the soil due to it being frozen. Spill site conditions and remediation efforts are depicted in the photographs which are included in Appendix A. The area of the spill and excavation are depicted in Figure 2.

9.0 SAMPLING RESULTS - NR 708.09 (1)(h)

Soil samples were not taken to confirm that the site has been cleaned up. Since such a small volume of material was released and a vacuum truck present when the release occurred, we are confident that we were able to excavate all of the impacted soil from the site.

10.0 VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION - NR 708.09 (1)(i)

Visual and olfactory evidence of the #6 fuel oil contamination was present upon arrival to the site and during the excavation. As #6 fuel oil is black in color, the most effective means to determine the extent of contamination is visually. The initial excavation of the contaminated material was able to capture all visual signs of contamination.

11.0 ACTUAL OR POTENTIAL ENVIRONMENTAL IMPACTS - NR 708.09 (1)(j)

The contaminated material collected during the excavation of the spill area was placed into a contaminated soil storage building for bulk disposal. Disposal of the material kept in the contaminated soils building occurred at the SKB Shamrock Environmental Landfill located in Cloquet, MN. It is expected that the #6 fuel oil did not penetrate beyond the depth of the excavation due to visual observations after the release and excavation. Potential environmental impacts are minimal. The spill was contained on-site and did not run off into other areas, and was restricted to the area of the excavation; therefore, the actual or potential environmental impacts are minimal.

12.0 PROXIMITY OF CONTAMINATION TO RECEPTORS - NR 708.09 (1)(k)

Exposure via the groundwater pathway is strongly a function of the soil permeability. Groundwater velocities in the clay are on the order of 0.013 ft/yr. Petroleum compounds will also be naturally attenuated by retardation and biodegradation processes, thus will have transport velocities less than groundwater velocities. The closest groundwater receptor is Newton Creek, which is several hundred feet downgradient from the impacted area. Using a contaminant transport velocity of 0.013 ft/yr (assumes no retardation), it would take thousands of years for groundwater from this area to reach Newton Creek. In reality, the small amount of residual petroleum contaminants will very likely naturally attenuate (biodegraded or sorbed onto the aquifer matrix) as they are being transported and it is highly unlikely that any residual dissolved-phase compounds will ever reach Newton Creek. Based on the very low groundwater velocities and absence of any close proximity groundwater receptors, there is literally no groundwater exposure risk at the refinery.

13.0 PRESENT AND ANTICIPATED FUTURE LAND USE - NR 708.09 (1)(l)

The land where the release occurred is presently used as a tank perimeter dike for an oil refinery. The refinery was constructed in 1951 and has remained in the same use since that time. There is no anticipation the land will be used for another purpose in the future.

14.0 EVALUATE IF ROUTES OF EXPOSURE ARE PROTECTIVE AND ENVIRONMENT HAS BEEN RESTORED TO THE EXTENT PRACTICABLE – NR 708.09 (1)(m)

A good faith effort was undertaken to remove all newly contaminated material from the release site. No off-site receptors were impacted by the release. Given the amount of light cycle oil released and the site conditions at the time of the release, there is little chance the light cycle oil migrated laterally beyond what has been excavated.

15.0 OTHER RELEVANT INFORMATION – NR 708.09 (1)(n)

The site is located in the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 36, Township 49 North, Range 14 West, City of Superior, Douglas County, WI. The WTM coordinates for the spill site are 361560, 692724. A site vicinity map is included in Figure 1.

16.0 CONCLUSION AND RECOMMENDATIONS

Based the small amount of product that made its way to a pervious surface, the weather conditions during the release that prevented the product from penetrating the soil, and the immediate cleanup of visually impacted soil, the spill has been remediated to the extent practicable. Therefore, it is recommended that no further response action is necessary at the site and that the incident be closed. Upon closure, Husky will backfill the excavation with a sand/gravel mixture similar to the material in the surrounding area.

FIGURES

Figure 1 Site Vicinity Map

Figure 2 Site Map



Figure 1 - Site Vicinity Map



Legend

Notes

0.3 0 0.13 0.3 Miles

NAD_1983_HARN_Wisconsin_TM

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1: 7,920




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Note: Not all sites are mapped.

Figure 2 - Site Map

Superior Refinery

FCCU Release

 FCCU Stack

 Release Extent



APPENDICES

Appendix A	Photographs
Appendix B	Weather Information
Appendix C	NR 706.05 Hazardous Substance Discharge Notification Form

Appendix A - Photographs



Photo 1: Looking south at the release source and the poly spill containment. #6 fuel oil was meant to slowly drip into the spill containment and be removed with a vacuum truck.



Photo 2: Looking east at the release site while cleanup efforts are ongoing. Operators used shovels and squeegees to move the product to a vacuum truck hose so it could be recovered. The cold air temperatures thickened the product to a pudding-like consistency.



Photo 3: Looking south at the recovery efforts. Note the thick layer of ice present underneath the released #6 fuel oil.



Photo 4: Looking south at the cleanup progression. Piled snow was removed via vacuum trucks. Ice chunks and soil were brought to the contaminated soil storage building.



Photo 5: Shovels and squeegees were able to remove the majority of the released #6 fuel oil. The remaining contaminated ice (seen above) was removed with an excavator and shovels before being brought to the contaminated soil storage building.

Appendix B - Weather Information

1/14/2019

Temperature

Mean Temperature	21 °F
Max Temperature	31 °F
Min Temperature	10 °F

Moisture

Average Humidity	79%
Maximum Humidity	88%
Minimum Humidity	69%

Precipitation

Precipitation	0.00 in
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Wind

Wind Speed	6.3 mph (W)
Max Wind Speed	15 mph
Max Gust Speed	21 mph

Hazardous Substance Discharge Notification Form - NR 706.05

Superior Refining Company LLC
 2407 Stinson Ave., Superior, WI 54880
 Phone: (715) 398-3533 Fax: (715) 398-8209
 Refinery Map Coordinates: NW1/4, NW1/4, Sect. 36, T 49N, R 14N.

1) Reporting Information

Name: Matt Turner	Phone: 715-398-8434
Date: 1/14/2019	Position: Environmental Technologist

2) Discharge Information

Date: 1/14/2019	Time: 16:15
Amount Released: 20 gallons	Duration: <5 minutes
Material/Product: #6 Fuel Oil	Response Time: Immediate
Specific Location: SW of the FCCU in the stormwater conveyance ditch	
How was spill detected: Operators were in the area when it occurred and noticed it immediately	
Cause: Operators were steaming out a #6 fuel oil line in order to prep it for demolition removal. Once steam was applied and none was coming out the opposite end, it was determined that the line was plugged. As they went to locate the plug, the line relieved itself and burped product out of the spill containment setup at the discharge end of the pipe.	

If necessary, continue on back

3) Additional Information

Physical Characteristics (i.e. solid, liquid or gas):	Liquid sludge
Immediate Corrective Action/Clean-up:	Stopped steam flowing through the line; used a vacuum truck, shovels and squeegees to collect the sludgy material off of the ice/snow.
People/Companies Performing the Action:	Husky maintenance staff; WCS
Speed and Movement of Discharge (if any):	Minimal
Actual/Potential Impacts to Human Health (if any):	None
Actual/Potential Impacts to Environment (if any):	None
Weather Conditions:	21°F; 6mph W wind; no precipitation
Agencies On-Scene During Spill:	None
Further Action Needed (if any):	Scrape up affected soil, ice and snow
Amount Reaching Navigable Waters:	None
Total Oil Storage Capacity of Tanks/Lines Material was Discharged From:	24,892bbls
Secondary Containment:	Containment used for project was adequately sized for a slow trickle release (as planned) but not for the pressured discharge that occurred as the plug released.
Steps Taken to Reduce Possibility of Recurrence:	Training staff on hazard recognition
Enforcement Actions (if any):	None
Effectiveness of Monitoring Equipment (if any):	N/A

Original: Refinery Manager CC: Operations Manager, Environmental Manager