CALUMET
CALUMET SUPERIOR, LLC

2407 Stinson Avenue Superior, WI 54880
Phone: 715-398-3533 Fax: 715-398-8209 www.calumetspecialty.com

April 7, 2017

John Sager
Hydrogeologist Program Coordinator
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
1701 N 4th St
Superior, WI 54880

Re: #6 Fuel Oil Release SERTS ID 20170220NO16-1

Dear Mr. Sager,

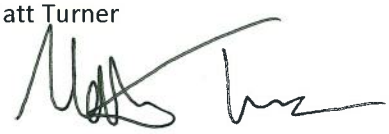
Please find the attached report regarding the immediate action taken in response to the #6 fuel oil release reported the WDNR on Monday, February 20, 2017 as required under NR 708.05(6)(a).

It should be noted that Calumet is not requesting no further action at this time. It is Calumet's intention to conduct further soil sampling at the site. Once, desired results are obtained, Calumet will then request no further action be taken.

If you have any additional questions, please feel free to contact me at (715) 398-8434.

Thank you,

Matt Turner



Environmental Engineer

NR708.05(6)(a) Immediate Action Report

708.05(6)(a) Unless par. (b) is applicable or unless otherwise directed by the department, responsible parties shall prepare and submit written documentation to the department describing the immediate actions taken at their site or facility and the outcome of those actions, within 45 days after the initial hazardous substance discharge notification is given to the department in accordance with the requirements of ch. NR 706.

1. 708.05(6)(c)1 A statement expressing the purpose of the submittal and the desired department action or response.

The purpose of this submittal is to comply with the written documentation requirements under NR 708.05(6) describing the immediate action taken following a hazardous substance discharge. Calumet requests that the department deem this report acceptable to fulfill the requirements of NR 708.05(6).

All of the visible contamination has been removed and it is Calumet's intention to conduct further soil sampling at the site. Calumet is requesting the WDNR allow the spill to remain open until adequate confirmation sampling results are obtained to ensure the site is clean. Once the immediate response action is completed, Calumet will submit the required report under NR 708.09.

2. 708.05(6)(c)2 Name, address and telephone number of the responsible parties.

Name: Calumet Superior, LLC

Address: 2407 Stinson Ave., Superior, WI 54880

Phone: (715) 398-3533

3. 708.05(6)(c)3 Location of the site or facility, or discharge incident, including street address; quarter–quarter section, township, range, and county; and the location information specified in s. NR 716.15 (5) (d); latitude and longitude, and legal description of lot, if located in platted area.

Street Address: 2407 Stinson Ave., Superior, WI 54880

Coordinates: NW ¼ of the NW¼ of Section 36, Township 49 North, Range 14 West, Superior Township of Douglas County.

WTM Coordinates: X:361,711
Y:692,928

4. 708.05(6)(c)4 Any information required under ch. NR 706 that has not been provided to the department previously.

Information required under NR 706 was supplied to the Division of Emergency Management with the Initial Discharge Notification required under NR 706.05(1)(b). To ensure all information is provided, please see attachment A for a summary of the information initially reported.

5. 708.05(6)(c)5 The type of engineering controls, treatment or both and the effluent quality of any permitted or licensed discharge.

The discharge was controlled utilizing an earthen berm required by the Spill Prevention, Control, and Countermeasure (SPCC) regulation as required by Title 40 of the Code of Federal Regulation Part 112.

Effluent stormwater is regulated under the Department of Natural Resources general permit for Tier 1 industrial Facilities (WPDES Permit No. WI-S067849-3) and under the facilities WWTP (Permit No. 0003085-08-0).

Any deviations from permitted conditions and/or limits under either permit are reported as required by the respective permit.

6. 708.05(6)(c)6 The type, total volume and final disposition of the discharged hazardous substance and contaminated materials generated as part of the immediate action, including legible copies of manifests, receipts and other relevant documents.

Type of Material Spilled:

#6 Fuel Oil

Total Volume:

400 Gallons

Final Disposition:

Calumet is currently awaiting sampling confirmation that the cleanup efforts of the area have been sufficient. Once, desired results are obtained, Calumet will then request no further action be taken.

All excavated material is stockpiled at Calumets' Solid Waste Storage Facility (License No. 4062). It is stored there until adequate quantities are reached to schedule shipment.

All recovered product is re-inserted into the refining process.

All recovered water is treated on-site at the facilities WWTP (Permit No. 0003085-08-0).

Attachment A

NR 706.05 Hazardous Substance Discharge Notification Form

NR 706.05 Hazardous Substance Discharge Notification Form

(c)(1) Person Reporting

Name:	Matt Turner
Address	2407 Stinson Ave, Superior, WI 54880
Phone:	715-398-8434

(c)(2) Owner/Discharger

Name:	Calumet Superior, LLC
Address	2407 Stinson Ave, Superior, WI 54880
Phone:	715-398-3533

(c)(3) Discharge Information

Date:	2/20/2017
Time:	9:40
Duration:	Unknown; line isolated at 10:00

(c)(3m) Discharge Location (WTM Coordinates)

X:	361,711
Y:	692,928

(c)(4) Discharge Material

Identity:	#6 Fuel Oil
Physical State:	Solid
Quantity:	400 Gallons

(c)(5) Discharge Characteristics

Physical:	Solid
Chemical:	C18 + Hydrocarbons
Hazardous:	Combustable
Toxilogical:	Low Toxicity

(c)(6) Cause

Cause:	Corrosion on the line

(c)(7) Response Action

Action Taken:	Cleaned up impacted soil and water
Contractor(s):	J.R. Jensen, WCS, In-Line

(c)(8) Movement

Source:	Discharge line from tank to Marketing terminal
Speed:	<1 MPH
Destination:	Contained within Seconday Contaiment

(c)(9) Impacts

Human Health:	None known at this time
Environmental:	Contaminated soil
Water Supplies:	None known at this time

(c)(10) Weather

Precipitation:	None
Wind Direction:	NE
Velocity	10-15 MPH

(c)(11) Other Agencies on-scene

Agencies:	N/A

CALUMET
CALUMET SUPERIOR, LLC

2407 Stinson Avenue Superior, WI 54880
Phone: 715-398-3533 Fax: 715-398-8209 www.calumetspecialty.com

October 13, 2017

John Sager
Emergency Response Coordinator / Hydrogeologist
Remediation and Redevelopment Program
Wisconsin Department of Natural Resources
1701 North 4th Street
Superior, WI 54880

Re: #6 Fuel Oil Release SERTS ID 20170220NO16-1

Dear Mr. Sager,

Please find the attached report regarding the immediate action taken in response to the #6 Fuel Oil release reported the WDNR on February 20, 2017 as required under NR 708.09(1). Based on the conclusions and recommendations of this report, we are requesting no further action for this release.

If you have any additional questions, please feel free to contact me at (715) 398-8434.

Sincerely,

Matt Turner
Environmental Engineer

Enclosure

Immediate Response Action Report

#6 Fuel Oil Release SERTS ID 20170220NO16-1

Prepared By:
Matt Turner
Calumet Superior, LLC
2407 Stinson Avenue
Superior, WI 54880
(715) 398-8434

10/13/2017

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

This report contains a summary of the immediate response actions at the Calumet Superior, LLC Superior, WI refinery in response to a #6 Fuel Oil release on February 20th, 2017. The site location is shown in Figure 1. The response was initiated on February 20th, 2017 after the release was discovered. 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 an area located east of Tank 116 inside of the tank's containment dike. The volume of the release was estimated to be 400 gallons. The release had decreased mobility due to the cold air and ground temperatures 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 is unknown due to the source of the discharge being contained inside insulation surrounding the problem pipe. It is believed that the material made its way along the inside of the pipes insulation and gradually seeped out of the seams present in the insulation before contacting the ground. The presence of shallow frost in the area prevented it from going downwards into the soil. Since it pooled in a high traffic area during normal business hours, the discharge most likely did not occur for very long prior to it being discovered.

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

As the release occurred in a low lying area inside the containment dike of the tank, the material pooled and was contained at the release site. In order to address the source of the discharge, the pipe was blocked in to prevent any further material from entering it, the remaining product in the pipe was drained out, the insulation was taken off, and the buried portions were exposed. The affected area was excavated by a combination of mechanical and hand excavation beginning on February 20th, 2017. Once the line was emptied out it was removed from the site for inspection.

5.0 Mitigation Efforts that may have Accelerated Migration of Pollution or Hazardous Substances NR 708.09(1)(d)

As contaminated soil and water were removed from the release site, it became apparent allowing contaminated water to accumulate in the excavated hole possibly contaminated soil not previously impacted. To mitigate this issue, a skimming procedure using vacuum trucks was conducted prior to each new wave of excavation to remove any floating product. Once the product was skimmed off the top of the water, the remaining standing water was then removed. After the bulk soil removal was complete, this exercise was required less and less.

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 39°F and there was a 10 mph ENE wind. There was a rain/snow mix combination that resulted in 0.61 inches of precipitation. A summary of local weather conditions from February 20th, 2017 – September 14th, 2017 is located in Appendix B.

7.0 Migration Potential of the Contamination – NR 708.09 (1)(f)

Stormwater that from the area is collected inside the tank tike before it is visually inspected for any sign of sheen. If no sheen is present, the water is allowed through a valve on the north tank dike berm and into a concrete ditch. From there it flows east as through the facility before reaching the #4 Storm Water Collection Pond. A sand dam was constructed along the northern edge of the excavation to isolate any stormwater that accumulated in the excavation from the rest of the stormwater in the tank dike bottom. The excavation was checked daily for water accumulation and any water present was removed using vacuum trucks. Based on the very low groundwater velocities and absence of any groundwater receptors, there is literally no groundwater exposure risk at the refinery. All water and oil recovered by means of vacuum truck after the release was recovered/treated in the refineries No. 1 Oil/Water Separator/WWTP.

8.0 Nature and Scope of Immediate Action Conducted - NR 708.09 (1)(g)

The release resulted from a pinhole leak on a buried section of the discharge line running from Tank 116. The line was not properly insulated and was allowed to lay on the ground surface, which allowed it to become corroded in sections. The entire buried portion of the line has been removed. It will be replaced with a new section of piping, raised so it does not contact the ground and will receive proper insulation to prevent issues like this from occurring in the future. On February 20th, 2017 mechanical and hand excavation of the visibly contaminated soil commenced. The estimated volume of soil that was removed is 27-46 yards or 54-92 tons. The material was disposed of in two separate ways to two different TDSFs.

Soil that was excavated by hand was placed into 55 gallon steel drums, and sent to a proper TSDF for disposal. Soil that was removed via mechanical excavation was stored in our “three sided building” where it was stored before sending it to a proper TSDF for disposal. The excavation took up an area approximately 1,500 square feet in total and had a few structural impediments present. The area was excavated to a depth between six and ten inches and the product did not visibly seem to leech any deeper into the soil. 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)

Four laboratory samples were collected after the initial excavation was complete to confirm the removal of contaminated soil. All soil samples were analyzed petroleum volatile organic compounds (PVOCs). Of the initial samples sent off for analysis, one of the four locations came back below the soil-to-groundwater residual contaminant levels (RCLs) established by the WDNR. Further excavation and sampling events did not lead to the remaining three sample locations being below the soil-to-groundwater RCLs. While some analyte levels got lower with more excavation, the opposite was true for other analytes. As it stands currently, the remaining contaminated sample locations are within as much 26 parts per billion (ppb) and as little as 8ppb of being below the soil-to-groundwater RCLs. Soil sample locations are displayed in Figure 2. A summary of the analytical results is contained in Table 1. Full laboratory analytical results are included in Appendix C.

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. After the initial excavation of the bulk of the contaminated material was finished, material continued to seep into the excavation for a few days. A second round of shallow excavation seemed to account for any product that was leeching into the initial excavation. After the second round of excavation, confirmation sampling directed the need for further excavations since there was no visible contamination to remove.

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 both into several 55 gallon steel drums and in a contaminated soils building for bulk disposal. Disposal of the material in the 55 gallon drums occurred at the Clean Earth AES Environmental, LLC (EPA ID: KYD985073196) hazardous waste TSDF in Calvert City, KY. 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 dike basin in 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 #6 fuel oil released, the site conditions at the time of the release, and the confirmation sampling results, there is little chance the #6 fuel oil migrated laterally beyond what has been excavated. Confirmation samples indicate the spill has been nearly remediated to below soil-to-groundwater residual contaminant.

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

The site is located in the NW ¼ of the NW ¼ of Section 36, Township 49 North, Range 14 West, City of Superior, Douglas County, WI. The WTM coordinates for the spill site are 361772, 692906. A site vicinity map is included in Figure 1.

16.0 CONCLUSION AND RECOMMENDATIONS

Based on laboratory results indicating the presence of contaminants above the NR720 soil-to-groundwater RCL's, the spill has not been remediated to allow for clean closure. Therefore, since the remaining contaminant levels are very low, it is Calumet's recommendation that no further response action is necessary at the site and that it be added to the facility wide GIS and ERP registry.

TABLES

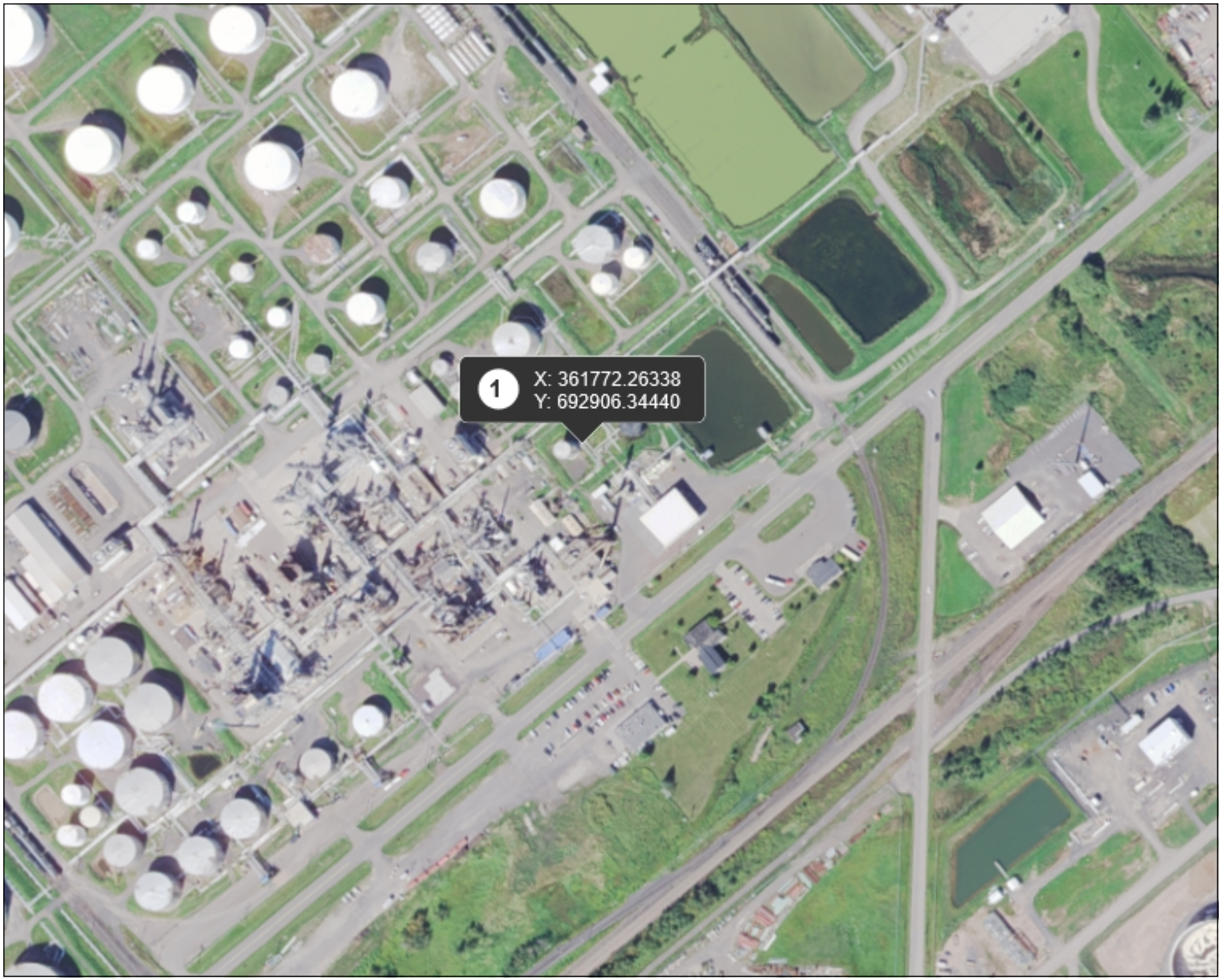
Soil Sample Results (mg/kg) collected 9/14/17				
Analyte	**S1**	**S2**	**S3**	**S4**
Benzene	0.0000	0.0000	0.0000	0.0000
Toluene	0.0000	0.0000	0.0000	0.0000
Ethylbenzene	0.0000	0.0065	0.0000	0.0000
m&p-Xylene	0.0152	0.0125	0.0000	0.0000
o-Xylene	0.0279	0.0000	0.0000	0.0106
Methyl tert-butyl ether	0.0423	0.0534	0.0000	0.0354
Naphthalene	0.3810	0.0000	0.0915	0.4930
1,3,5-Trimethylbenzene	0.0000	0.0000	0.0000	0.0000
1,2,4-Trimethylbenzene	0.0328	0.0000	0.0145	0.0000
TPH (GC/FID) Low Fraction	40.60	2.74	5.87	28.10

Amount Below RCL Level (mg/kg)				
Analyte	**S1**	**S2**	**S3**	**S4**
Benzene	0.00512	0.00512	0.00512	0.00512
Toluene	1.10720	1.10720	1.10720	1.10720
Ethylbenzene	1.57000	1.56352	1.57000	1.57000
m&p-Xylene	3.91690	3.94750	3.96000	3.94940
o-Xylene				
Methyl tert-butyl ether	-0.01528	-0.02638	0.02702	-0.00838
Naphthalene	0.27718	0.65818	0.56668	0.16518
1,3,5-Trimethylbenzene	1.34927	1.38207	1.36757	1.38207
1,2,4-Trimethylbenzene				

RCLs (mg/kg)				
Benzene	0.00512	0.00512	0.00512	0.00512
Toluene	1.10720	1.10720	1.10720	1.10720
Ethylbenzene	1.57000	1.57000	1.57000	1.57000
m&p-Xylene	3.96000	3.96000	3.96000	3.96000
o-Xylene				
Methyl tert-butyl ether	0.02702	0.02702	0.02702	0.02702
Naphthalene	0.65818	0.65818	0.65818	0.65818
1,3,5-Trimethylbenzene	1.38207	1.38207	1.38207	1.38207
1,2,4-Trimethylbenzene				

FIGURES

Figure 1 - Site Vicinity Map
#6 Fuel Oil Release Site



Legend

Notes

0.1 0 0.06 0.1 Miles

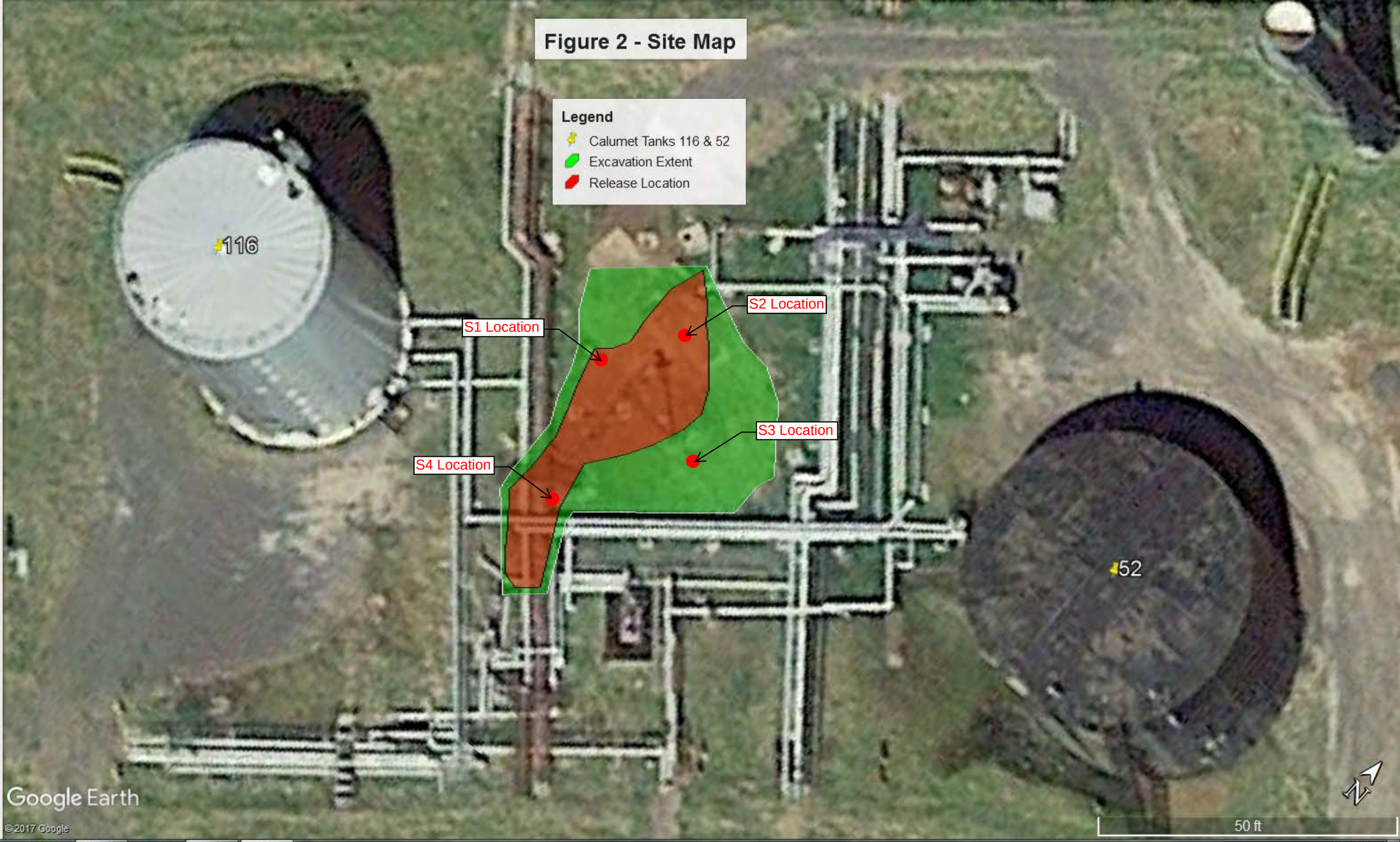
NAD_1983_HARN_Wisconsin_TM

1: 3,960

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made aregarding accuracy, applicability for a particular use, completemenss, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/org/legal/

Note: Not all sites are mapped.

Figure 2 - Site Map



APPENDICES

Appendix A	Photographs
Appendix B	Historical Weather Information (Please note that while the daily weather history and observations portion is mostly complete, some portions of the history were unavailable. A second history source yielded only temperatures and daily precipitation amounts.)
Appendix C	Laboratory Analytical Report (Please note that there are two separate reports. The first report is from the first round of confirmation sampling and indicates that one of the four sample locations were below the RCL threshold. The second report is from the final sampling event and indicates that, while progress was made, only one of the four sample locations are below the threshold.)

Appendix A – Photographs

Photo 1: Looking southwest at the release site.

Photo 2: Looking east at the northern extent of the release.

Photo 3: Looking southeast at the middle of the release.

Photo 4: Looking south at the release.

Photo 5: Looking south at the release.

Photo 6: Looking northeast at the site after first round of excavation. The pipes insulation had been removed and some product can be seen seeping into the excavation. This was removed in subsequent excavations.

Photo 7: Looking east at the release site after the initial excavation.

Photo 8: Looking south at the release site. Please note the sand dam which functions to isolate any water that accumulates in the excavation from the stormwater in the rest of the tank dike bottom. There are also a number of abandoned pipes in the area that hindered excavation in some places. Laborers can be seen conducting hand excavation of contaminated soil underneath the pipe rack.

Photo 9: Looking north at the sample location S1 after the final round of excavation.

Photo 10: Looking northeast at the sample location S2 after the final round of excavation.

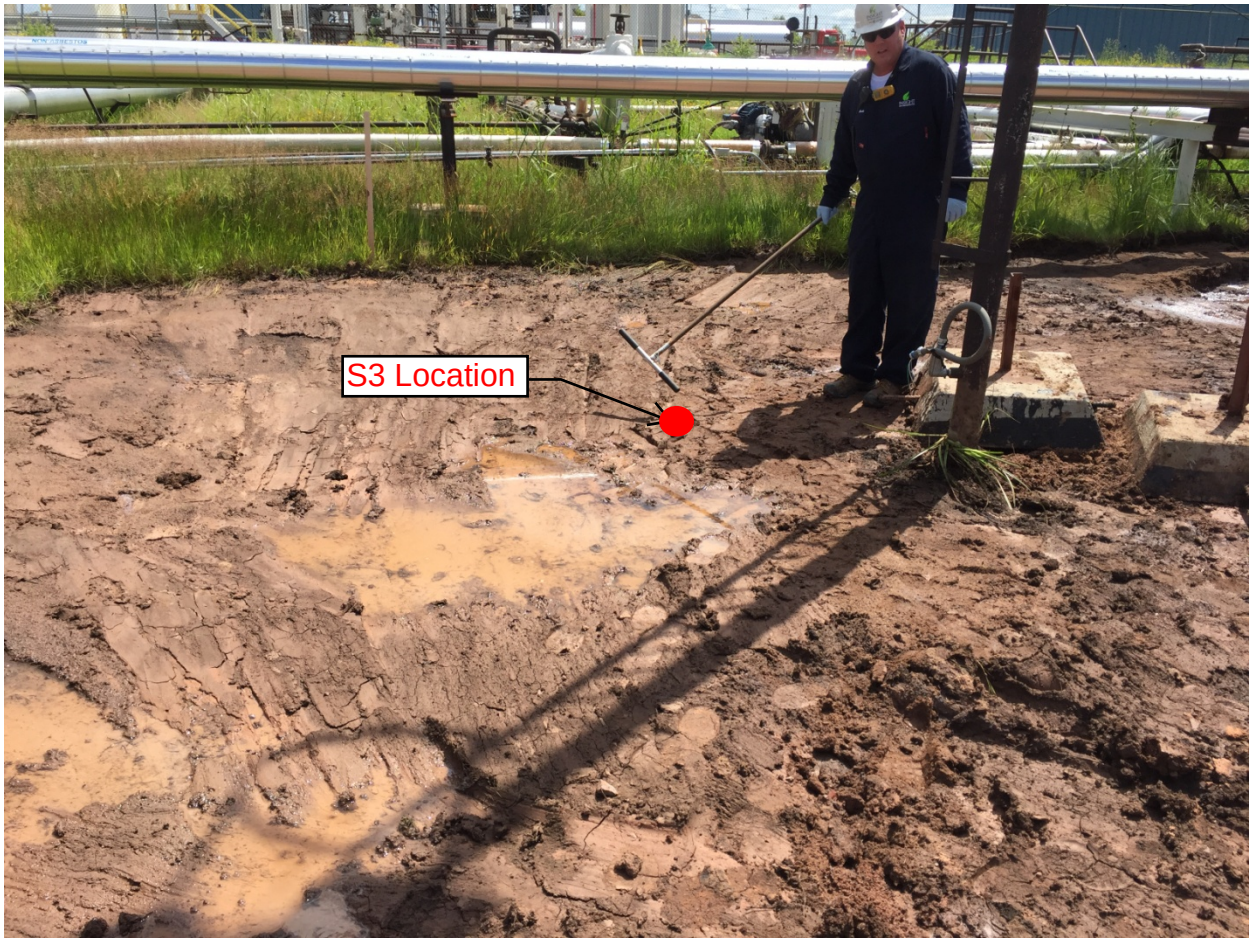


Photo 11: Looking south at the sample location S3 after the final round of excavation.

Photo 12: Looking south at the sample location S4 after the final round of excavation.

Appendix B - Weather History

	Max	Avg	Min	Sum
Temperature				
Max Temperature	91 °F	53 °F	14 °F	
Mean Temperature	70 °F	43 °F	5 °F	
Min Temperature	61 °F	33 °F	-4 °F	
Degree Days				
Heating Degree Days (base 65)	60	22	0	2795
Cooling Degree Days (base 65)	4	0	0	15
Growing Degree Days (base 50)	20	3	0	411
Dew Point				
Dew Point	68 °F	36 °F	-20 °F	
Precipitation				
Precipitation	2.14 in	0.07 in	0.00 in	8.67 in
Snowdepth	-	-	-	-
Wind				
Wind	38 mph	6 mph	0 mph	
Gust Wind	50 mph	20 mph	9 mph	
Sea Level Pressure				
Sea Level Pressure	30.70 in	30.00 in	29.04 in	

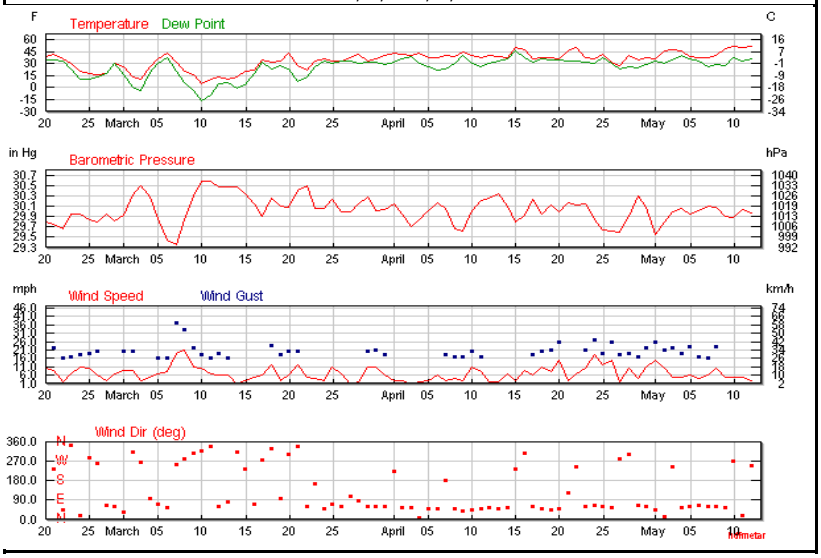
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Feb	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
20	44	39	34	44	35	33	100	96	87	29.97	29.79	29.61	10	7	1	16	10	28	0.61	Rain
21	53	42	32	39	35	32	98	85	51	29.85	29.76	29.66	10	10	7	23	9	29	0	
22	44	36	28	37	34	29	100	94	74	29.79	29.66	29.59	10	7	1	12	2	16	0.19	Rain , Snow
23	34	30	24	32	23	16	93	80	67	30.02	29.95	29.79	10	10	10	13	7	18	0	
24	24	20	16	15	11	5	74	64	56	30.01	29.94	29.89	10	10	10	15	11	20	0	
25	29	18	8	26	11	3	99	67	45	29.91	29.84	29.73	10	9	1	17	10	24	0	Snow
26	28	17	5	26	14	2	99	75	42	29.96	29.79	29.66	10	8	1	20	6	24	0.02	Snow
27	30	18	5	29	18	3	93	80	69	30	29.96	29.89	10	10	2	9	3	-	0	Snow
28	32	30	27	32	30	24	100	97	85	29.88	29.82	29.79	10	4	0	16	7	24	0.09	Snow
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Mar	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	31	26	20	23	17	8	86	71	46	30.13	29.93	29.82	10	10	10	16	9	25	0	
2	22	14	5	12	1	-9	84	55	30	30.49	30.33	30.14	10	10	10	17	9	24	0	
3	25	10	-4	7	-3	-11	90	58	31	30.57	30.5	30.44	10	10	10	9	3	-	0	
4	41	26	10	28	19	7	90	72	50	30.44	30.29	30.08	10	10	10	14	5	26	0	
5	42	36	30	33	30	25	99	83	68	30.07	29.87	29.78	10	9	5	12	7	17	0	
6	52	43	34	50	38	34	100	99	90	29.77	29.44	29.06	10	5	0	12	8	17	0.02	Fog , Rain
7	41	32	22	41	21	11	100	65	39	29.51	29.35	29.04	10	8	1	38	19	50	0.01	Snow
8	26	20	13	16	6	-1	83	55	40	30.16	29.84	29.52	10	9	2	32	21	43	0	Snow
9	27	16	6	8	-3	-16	72	45	25	30.52	30.3	30.17	10	10	10	22	11	28	0	
10	14	5	-4	-11	-16	-20	57	39	22	30.7	30.6	30.52	10	10	10	16	10	22	0	
11	21	10	-1	-2	-9	-15	64	43	30	30.67	30.6	30.55	10	10	10	12	7	16	0	
12	21	14	8	13	5	-5	76	61	48	30.55	30.47	30.39	10	9	2	14	6	22	0	Snow
13	21	10	0	14	7	-4	91	69	49	30.52	30.47	30.44	10	7	0	12	6	17	0.02	Snow
14	30	13	-4	7	-1	-8	88	59	25	30.54	30.48	30.42	10	10	10	8	1	-	0	
15	37	20	4	8	3	-3	80	48	23	30.43	30.35	30.24	10	10	10	10	3	-	0	
16	35	22	9	32	18	5	100	73	48	30.24	30.14	29.98	10	10	3	12	5	-	0.01	Snow
17	38	35	32	36	32	28	100	93	82	30.01	29.9	29.82	10	6	1	17	6	25	0.19	Snow
18	37	32	28	28	23	21	86	73	56	30.33	30.25	30.02	10	10	10	23	12	31	0	
19	45	34	22	32	28	21	99	85	52	30.32	30.1	29.94	10	10	10	13	3	18	0	
20	53	44	35	35	23	9	88	50	18	30.17	30.09	29.94	10	10	10	15	6	20	0	
21	38	28	19	24	8	1	61	46	28	30.57	30.41	30.13	10	10	10	26	12	31	0	
22	32	22	12	25	13	2	90	60	37	30.61	30.51	30.31	10	10	10	13	5	-	0	
23	38	34	29	32	26	18	100	76	57	30.3	30.07	29.87	10	8	2	13	4	20	0.06	Rain , Snow
24	39	36	32	35	33	32	100	92	78	30.25	30.07	29.9	10	6	0	9	3	-	0	Fog
25	35	34	32	33	31	29	96	90	84	30.29	30.23	30.12	10	10	10	20	11	30	0	
26	35	34	32	35	33	32	100	98	94	30.11	30	29.95	10	8	2	10	7	-	0.03	Rain
27	48	38	27	38	33	27	100	87	56	30.06	29.99	29.95	10	8	2	7	1	-	0	
28	61	42	23	35	30	23	100	75	31	30.29	30.16	30.06	10	10	7	13	2	22	0	
29	37	34	32	33	32	30	94	89	85	30.34	30.29	30.17	10	10	10	16	11	24	0	
30	39	36	33	34	32	31	95	89	74	30.17	30.02	29.94	10	10	10	21	11	29	0	
31	52	41	30	32	29	22	96	71	34	30.12	30.05	29.98	10	10	10	12	6	20	0	
2017	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Apr	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	58	43	28	39	32	23	96	71	48	30.2	30.14	30.1	10	10	10	7	3	-	0	Rain
2	53	42	31	44	36	32	100	93	59	30.11	29.95	29.78	10	6	0	16	3	20	0.1	Fog , Rain , Snow
3	46	40	34	44	39	35	100	98	88	29.79	29.71	29.65	10	3	0	8	1	-	0	Fog
4	57	44	32	40	30	24	100	64	29	29.96	29.83	29.68	10	7	0	13	2	18	0	Fog
5	49	38	27	29	26	23	87	63	41	30.07	30.01	29.93	10	10	10	8	3	-	0	
6	48	38	27	29	22	18	81	54	31	30.22	30.17	30.07	10	10	10	16	6	22	0	
7	59	40	23	32	23	18	89	59	21	30.19	30.06	29.88	10	10	10	12	3	21	0	
8	48	39	30	33	31	27	93	72	53	29.87	29.66	29.52	10	10	10	13	4	18	0	
9	59	45	32	49	40	31	95	78	55	29.71	29.63	29.51	10	10	7	14	3	18	0.1	Rain
10	48	40	32	44	31	25	85	75	65	30.19	30.01	29.72	10	10	10	20	11	28	0	Rain
11	45	38	28	30	26	19	91	67	54	30.25	30.21	30.16	10	10	10	10	8	18	0	
12	59	40	22	37	30	21	99	77	39	30.33	30.27	30.23	10	10	10	9	2	-	0	
13	53	39	25	41	34	25	100	84	63	30.39	30.34	30.28	10	9	2	12	2	-	0	
14	45	38	30	38	36	30	100	88	75	30.28	30.11	29.9	10	10	7	17	7	24	0	Rain

15	63	51	39	55	46	37	100	86	70	29.89	29.79	29.74	10	9	1	12	3	-	0.05	Rain
16	62	48	33	51	38	31	100	75	34	30.13	29.92	29.78	10	9	0	32	9	48	0.04	Fog , Rain
17	39	36	32	34	32	28	100	90	75	30.3	30.23	30.13	10	9	2	15	6	21	0	Rain
18	43	38	32	42	36	28	100	95	84	30.22	29.94	29.73	10	7	2	17	11	26	0.79	Rain
19	42	38	35	38	35	33	96	86	76	30.21	30.12	30	10	10	10	17	8	25	0	
20	38	36	34	36	35	34	99	97	87	30.09	29.99	29.93	10	9	4	21	15	34	0.35	Rain
21	61	46	30	41	34	29	100	72	35	30.2	30.17	30.09	10	9	3	10	3	-	0	
22	69	50	31	40	34	30	95	54	28	30.21	30.13	30.02	10	10	10	21	7	28	0	
23	46	38	32	39	32	27	100	84	70	30.23	30.15	30.04	10	9	2	20	10	26	0.07	Rain , Snow
24	40	37	34	34	31	27	93	81	67	30.04	29.84	29.66	10	10	10	25	18	33	0	
25	46	42	37	40	38	35	99	90	73	29.76	29.65	29.58	10	10	3	16	12	25	0.25	Rain
26	35	32	28	36	31	25	99	93	83	29.73	29.63	29.57	10	7	2	24	15	33	0.35	Rain , Snow
27	32	28	25	25	23	21	96	78	65	29.71	29.59	29.54	10	10	4	15	2	18	0	
28	52	41	30	29	26	22	83	61	38	30.18	29.9	29.71	10	10	10	16	10	25	0	
29	48	35	23	30	25	19	99	65	33	30.39	30.31	30.19	10	10	10	14	4	18	0	
30	40	38	36	34	29	19	81	70	49	30.29	30.09	29.79	10	10	10	18	11	26	0	
2017	**Temp. (°F)**			**Dew Point (°F)**			**Humidity (%)**			**Sea Level Press. (in)**			**Visibility (mi)**			**Wind (mph)**			**Precip. (in)**	**Events**
May	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	39	36	33	37	34	29	100	89	68	29.79	29.56	29.45	10	8	2	24	15	38	0.26	Rain , Snow
2	58	46	34	33	30	26	91	58	30	29.97	29.79	29.54	10	10	10	18	10	24	0	
3	67	48	30	42	35	30	99	60	29	30.02	29.99	29.96	10	10	10	20	5	31	0	
4	58	47	36	44	40	37	100	75	51	30.1	30.06	30.01	10	9	1	16	5	23	0	
5	47	39	31	40	37	32	100	91	75	30.07	29.95	29.82	10	8	0	20	6	26	0	Fog
6	49	38	29	40	34	26	100	79	44	30.06	30.01	29.9	10	8	0	13	4	18	0	Fog
7	48	38	27	33	27	21	100	65	36	30.17	30.11	30.05	10	10	7	12	6	16	0	
8	45	40	35	33	29	23	88	64	47	30.16	30.08	30	10	10	10	20	10	31	0	
9	61	49	34	37	28	23	80	52	37	30	29.91	29.81	10	10	10	10	5	-	0	
10	73	52	31	44	38	29	96	58	36	30.01	29.88	29.83	10	10	10	16	5	24	0	
11	65	50	36	38	34	32	95	56	29	30.12	30.05	30.01	10	10	10	8	5	-	0	
12	72	52	32	42	36	32	100	63	30	30.07	29.98	29.85	10	10	10	17	3	23	0	
13	55		41																0	
14	46		42																0	
15	46		42																0.35	Rain
16	47		41																1.35	Rain
17	52		43																0.49	Rain
18	54		41																0.2	Rain
19	48		38																0	
20	43		39																0.61	Rain
21	49		39																0.17	Rain
22	57		46																0	
23	51		44																0	
24	49		45																0	
25	50		42																0	
26	49		44																0	
27	76		45																0	
28	66		52																0.3	Rain
29	61		54																0.01	Rain
30	61		48																0.01	Rain
31	72		48																0	
2017	**Temp. (°F)**			**Dew Point (°F)**			**Humidity (%)**			**Sea Level Press. (in)**			**Visibility (mi)**			**Wind (mph)**			**Precip. (in)**	**Events**
Jun	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	80		42																0	
2	80		42																0	
3	61	52	41	47	44	39	93	72	58	29.87	29.83	29.77	10	10	10	7	3	-	0	
4	83	62	41	53	46	40	100	73	22	29.95	29.82	29.75	10	10	1	20	6	28	0.01	Rain
5	62	52	38	55	47	38	100	84	60	30.12	30.05	29.95	10	6	0	16	5	21	0	Fog
6	68	51	34	47	42	34	100	70	40	30.18	30.13	30.09	10	10	0	13	3	-	0	Fog
7	72	54	36	54	45	36	100	79	50	30.13	30.1	30.01	10	9	1	7	1	-	0	
9	56	52	48	53	49	46	97	92	84	29.86	29.77	29.67	10	10	10	10	9	-	0	
10	91	70	48	68	57	45	95	69	45	29.66	29.47	29.34	10	10	10	31	8	36	0.01	Rain
11	64	56	48	60	55	48	100	91	71	29.88	29.74	29.65	10	9	1	9	3	-	0.16	Rain

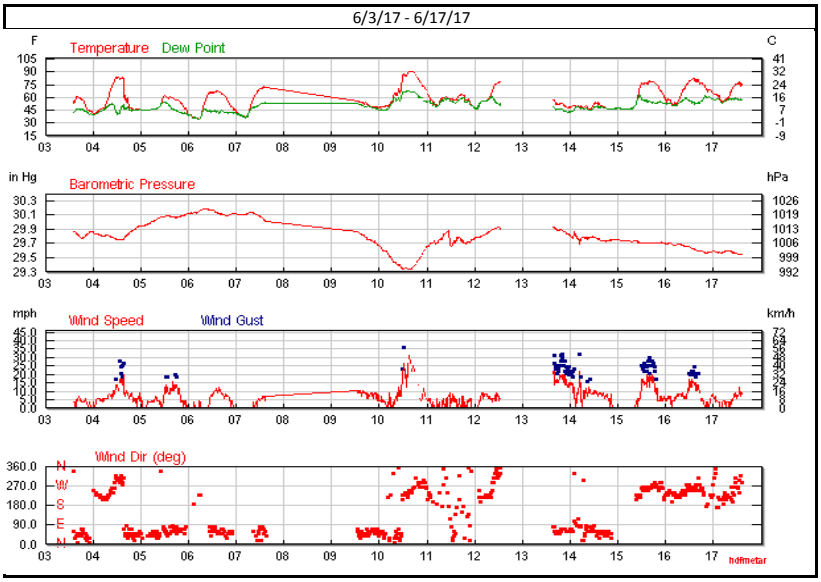
12	79	62	46	62	55	47	100	81	38	29.92	29.85	29.78	10	8	0	9	4	-	0	Fog
13	57	52	47	50	46	43	83	80	74	29.92	29.87	29.81	10	10	10	23	17	32	0	
14	54	50	46	50	47	44	100	94	80	29.86	29.77	29.69	10	7	0	22	9	32	0.44	Fog , Rain
15	79	62	46	63	53	47	100	74	42	29.75	29.72	29.7	10	6	0	20	4	30	0	Fog , Rain
16	82	66	51	63	56	50	97	67	38	29.71	29.64	29.57	10	10	10	17	7	24	0	
17	78	66	54	60	57	53	98	77	47	29.6	29.58	29.54	10	10	10	13	4	17	0	Rain
18																				
19	69		59																0.01	Rain
20	71		51																0.02	Rain
21	65		49																0	
22	80		52																0	
23	73		56																0	
24	69		56																0	
25	61		52																0	
26	70		48																0	
27	78		47																0	
28	77		47																1.49	Rain
29	78		47																0	
30	78		47																0.02	Rain
2017	**Temp. (°F)**			**Dew Point (°F)**			**Humidity (%)**			**Sea Level Press. (in)**			**Visibility (mi)**			**Wind (mph)**			**Precip. (in)**	**Events**
Jul	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	77		47																0	
2	78		47																0	
3	78		47																0	
4	62		56																0	
5	88		57																0.78	Rain
6	89		58																0.33	Rain
7	89		58																0.18	Rain
8	83		53																0	
9	75		59																0.13	Rain
10	82		56																0	
11	73		57																0	
12	58		52																0.55	Rain
13	56		52																0	
14	78		50																0	
15	83		60																0	
16	71		56																0	
17	73		54																0.39	Rain
18	80		64																0.27	Rain
19	76		57																0	
20	88		58																0	
21	77		63																0.37	Rain
22	65		57																0	
23	62		57																0	
24	65		56																0	
25	69		58																0	
26	85		56																0.2	Rain
27	85		56																0.18	Rain
28	85		56																0	
29	87		56																0	
30	87		56																0	
31	88		56																0	
2017	**Temp. (°F)**			**Dew Point (°F)**			**Humidity (%)**			**Sea Level Press. (in)**			**Visibility (mi)**			**Wind (mph)**			**Precip. (in)**	**Events**
Aug	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	86		64																0	
2	72		63																0	
3	64		56																1.44	Rain
4	75		55																0	
5	78		53																0	
6	67		53																0	
7	81		52																0	

8	84		56																0	
9	75		58																1.1	Rain
10	64		59																0.9	Rain
11	72		53																0	
12	80		52																0	
13	70		58																0.16	Rain
14	67		62																0.32	Rain
15	69	64	60	63	61	60	97	86	77	30.01	29.99	29.98	10	10	10	13	8	17	0	
16	66	63	60	62	60	57	99	93	81	30.02	29.94	29.76	10	10	4	18	9	26	0.33	Rain
17	65	62	60	63	61	58	100	95	85	29.78	29.68	29.61	10	7	2	21	13	31	0.53	Rain
18	73	62	52	66	60	52	100	89	74	29.86	29.83	29.78	10	9	1	9	4	-	0	
19	81	68	55	65	60	55	100	79	49	29.9	29.87	29.84	10	10	10	12	6	20	0	
20	80	65	51	68	60	52	100	83	55	30.02	29.9	29.84	10	8	0	14	3	18	0	Fog
21	70	58	48	62	57	49	100	90	66	30.07	29.96	29.81	10	9	2	10	3	-	0.51	Rain
22	69	60	53	57	54	50	100	79	53	30	29.93	29.84	10	10	3	20	7	26	0.01	Rain
23	68	57	46	56	51	47	100	78	51	30.1	30.06	30	10	10	10	9	4	-	0.03	Rain
24	66	54	43	55	49	43	100	80	54	30.2	30.16	30.1	10	8	0	13	3	17	0	Fog
25	67	52	38	57	49	38	100	82	65	30.24	30.21	30.18	10	10	3	10	2	-	0	
26	60	58	56	59	57	52	100	94	75	30.19	30.1	29.99	10	7	1	7	4	-	2.14	Rain
27	68	63	59	61	60	58	100	93	75	30.03	29.98	29.94	10	8	2	13	3	-	0.53	Rain
28	71	63	55	62	60	55	100	90	66	30.11	30.08	30.02	10	10	0	7	2	-	0	Fog
29	78	66	54	66	60	54	100	88	52	30.13	30.07	30	10	8	0	7	0	-	0	Fog
30	71	63	55	66	59	51	99	86	49	30.25	30.09	29.98	10	10	7	16	7	23	0.04	Rain
31	64	53	42	53	50	42	100	81	61	30.32	30.27	30.23	10	10	0	14	5	23	0	Fog
2017	**Temp. (°F)**			**Dew Point (°F)**			**Humidity (%)**			**Sea Level Press. (in)**			**Visibility (mi)**			**Wind (mph)**			**Precip. (in)**	**Events**
Sep	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	69	54	38	57	49	39	100	79	49	30.23	30.12	29.95	10	8	0	13	3	18	0.02	Fog , Rain
2	77	66	54	65	58	52	98	81	45	29.94	29.88	29.84	10	8	4	15	8	21	0.21	Rain
3	84	66	50	66	57	50	99	75	43	29.9	29.8	29.62	10	10	10	15	7	26	0	Rain
4	69	58	49	57	52	48	99	79	55	29.84	29.79	29.73	10	10	10	28	7	37	0.01	Rain
5	58	52	45	50	45	42	94	76	59	30.06	29.95	29.84	10	10	7	20	10	28	0	Rain
6	60	52	43	50	48	44	100	82	64	30.11	30.08	30.04	10	10	2	9	3	-	0	
7	59	51	44	52	48	45	100	90	68	30.12	30.01	29.98	10	10	7	8	3	-	0.01	Rain
8	62	48	35	50	44	35	100	80	58	30.35	30.28	30.12	10	10	1	14	5	22	0	
9	68	51	34	57	47	35	100	82	48	30.41	30.35	30.28	10	9	0	14	3	20	0	Fog
10	75	60	45	61	55	46	100	86	60	30.31	30.24	30.16	10	10	7	10	3	-	0.02	Rain
11	80	64	48	65	56	48	97	73	46	30.16	30.08	30.03	10	10	10	15	6	21	0	
12	81	62	43	58	52	43	100	75	33	30.05	29.94	29.79	10	10	4	9	3	-	0.03	
13	85	68	51	68	61	51	100	84	52	29.8	29.71	29.65	10	8	0	10	2	-	0	Fog
14	68	64	61	65	62	61	100	97	87	29.82	29.73	29.69	10	7	1	15	5	26	0.02	Rain

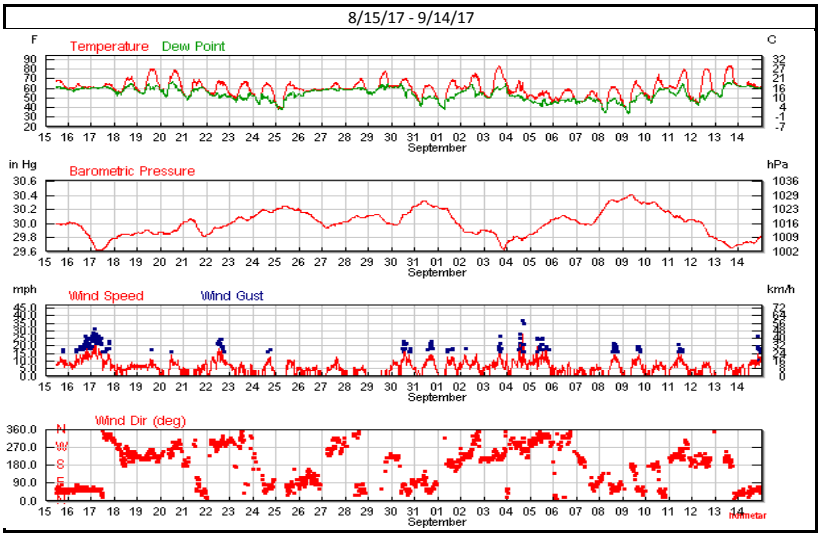
2/20/17 - 5/12/17



6/3/17 - 6/17/17



8/15/17 - 9/14/17



Appendix C - Laboratory Analytical Data

ANALYTICAL REPORT

August 04, 2017

Calumet Specialty Products

Sample Delivery Group:	L925266
Samples Received:	07/27/2017
Project Number:	
Description:	Tank 116

Report To: Matt Turner
2407 Stinson Avenue
Superior, WI 54880

Entire Report Reviewed By:

John Hawkins
Technical Service Representative

TABLE OF CONTENTS

S1 L925266-01 Solid

Collected by: Wade Olsen
Collected date/time: 07/26/17 13:24
Received date/time: 07/27/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1004346	52.5	07/26/17 13:24	07/31/17 17:13	LRL

S2 L925266-02 Solid

Collected by: Wade Olsen
Collected date/time: 07/26/17 13:28
Received date/time: 07/27/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1004346	54	07/26/17 13:28	07/31/17 17:37	LRL

S3 L925266-03 Solid

Collected by: Wade Olsen
Collected date/time: 07/26/17 13:31
Received date/time: 07/27/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1004346	52	07/26/17 13:31	07/31/17 18:00	LRL

S4 L925266-04 Solid

Collected by: Wade Olsen
Collected date/time: 07/26/17 13:38
Received date/time: 07/27/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1004346	56	07/26/17 13:38	07/31/17 18:24	LRL

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Technical Service Representative

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00602	J	0.00462	0.0154	52.5	07/31/2017 17:13	WG1004346
Toluene	U		0.00845	0.0282	52.5	07/31/2017 17:13	WG1004346
Ethylbenzene	U		0.00478	0.0159	52.5	07/31/2017 17:13	WG1004346
m&p-Xylene	0.0114	J	0.00808	0.0269	52.5	07/31/2017 17:13	WG1004346
o-Xylene	0.00596	J	0.00504	0.0168	52.5	07/31/2017 17:13	WG1004346
Methyl tert-butyl ether	U		0.00840	0.0280	52.5	07/31/2017 17:13	WG1004346
Naphthalene	U		0.0546	0.182	52.5	07/31/2017 17:13	WG1004346
1,3,5-Trimethylbenzene	U		0.00430	0.0143	52.5	07/31/2017 17:13	WG1004346
1,2,4-Trimethylbenzene	0.00778	B J	0.00562	0.0187	52.5	07/31/2017 17:13	WG1004346
TPH (GC/FID) Low Fraction	U		0.578	1.93	52.5	07/31/2017 17:13	WG1004346
(S) a,a,a-Trifluorotoluene(PID)	*98.5*			*80.0-200*		*07/31/2017 17:13*	WG1004346

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00665	J	0.00475	0.0158	54	07/31/2017 17:37	WG1004346
Toluene	U		0.00869	0.0290	54	07/31/2017 17:37	WG1004346
Ethylbenzene	U		0.00491	0.0164	54	07/31/2017 17:37	WG1004346
m&p-Xylene	0.0118	J	0.00832	0.0277	54	07/31/2017 17:37	WG1004346
o-Xylene	0.00770	J	0.00518	0.0173	54	07/31/2017 17:37	WG1004346
Methyl tert-butyl ether	U		0.00864	0.0288	54	07/31/2017 17:37	WG1004346
Naphthalene	0.175	J	0.0562	0.187	54	07/31/2017 17:37	WG1004346
1,3,5-Trimethylbenzene	U		0.00443	0.0147	54	07/31/2017 17:37	WG1004346
1,2,4-Trimethylbenzene	0.0216	B	0.00578	0.0193	54	07/31/2017 17:37	WG1004346
TPH (GC/FID) Low Fraction	13.5		0.594	1.98	54	07/31/2017 17:37	WG1004346
(S) a,a,a-Trifluorotoluene(PID)	*100*			*80.0-200*		*07/31/2017 17:37*	WG1004346

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.00458	0.0152	52	07/31/2017 18:00	WG1004346
Toluene	U		0.00837	0.0279	52	07/31/2017 18:00	WG1004346
Ethylbenzene	U		0.00473	0.0158	52	07/31/2017 18:00	WG1004346
m&p-Xylene	U		0.00801	0.0267	52	07/31/2017 18:00	WG1004346
o-Xylene	U		0.00499	0.0166	52	07/31/2017 18:00	WG1004346
Methyl tert-butyl ether	U		0.00832	0.0277	52	07/31/2017 18:00	WG1004346
Naphthalene	0.0915	J	0.0541	0.180	52	07/31/2017 18:00	WG1004346
1,3,5-Trimethylbenzene	U		0.00426	0.0142	52	07/31/2017 18:00	WG1004346
1,2,4-Trimethylbenzene	0.0145	B J	0.00556	0.0186	52	07/31/2017 18:00	WG1004346
TPH (GC/FID) Low Fraction	5.87		0.572	1.91	52	07/31/2017 18:00	WG1004346
(S) a,a,a-Trifluorotoluene(PID)	*100*			*80.0-200*		*07/31/2017 18:00*	WG1004346

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00499	J	0.00493	0.0164	56	07/31/2017 18:24	WG1004346
Toluene	U		0.00902	0.0301	56	07/31/2017 18:24	WG1004346
Ethylbenzene	U		0.00510	0.0170	56	07/31/2017 18:24	WG1004346
m&p-Xylene	0.0144	J	0.00862	0.0287	56	07/31/2017 18:24	WG1004346
o-Xylene	0.0127	J	0.00538	0.0179	56	07/31/2017 18:24	WG1004346
Methyl tert-butyl ether	U		0.00896	0.0298	56	07/31/2017 18:24	WG1004346
Naphthalene	0.661		0.0582	0.194	56	07/31/2017 18:24	WG1004346
1,3,5-Trimethylbenzene	U		0.00459	0.0153	56	07/31/2017 18:24	WG1004346
1,2,4-Trimethylbenzene	0.0534	B	0.00599	0.0200	56	07/31/2017 18:24	WG1004346
TPH (GC/FID) Low Fraction	26.3		0.616	2.06	56	07/31/2017 18:24	WG1004346
(S) a,a,a-Trifluorotoluene(PID)	*99.9*			*80.0-200*		*07/31/2017 18:24*	WG1004346

Method Blank (MB)

(MB) R3238007-1 07/31/17 12:35

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.0000880	0.000293
Toluene	U		0.000161	0.000537
Ethylbenzene	U		0.0000910	0.000303
m&p-Xylene	U		0.000154	0.000513
o-Xylene	U		0.0000960	0.000320
Methyl tert-butyl ether	U		0.000160	0.000533
Naphthalene	U		0.00104	0.00347
1,3,5-Trimethylbenzene	0.0000883	J	0.0000820	0.000273
1,2,4-Trimethylbenzene	0.000148	J	0.000107	0.000357
TPH (GC/FID) Low Fraction	U		0.0110	0.0367
(S) a,a,a-Trifluorotoluene(PID)	*99.9*			*80.0-200*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3238007-2 07/31/17 13:22 • (LCSD) R3238007-8 07/31/17 23:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0525	0.0519	105	104	80.0-120			1.22	20
Toluene	0.0500	0.0508	0.0501	102	100	80.0-120			1.47	20
Ethylbenzene	0.0500	0.0539	0.0529	108	106	80.0-120			1.89	20
m&p-Xylene	0.100	0.114	0.112	114	112	80.0-120			2.16	20
o-Xylene	0.0500	0.0528	0.0522	106	104	80.0-120			1.10	20
Methyl tert-butyl ether	0.0500	0.0514	0.0510	103	102	80.0-120			0.810	20
Naphthalene	0.0500	0.0519	0.0505	104	101	80.0-120			2.80	20
1,3,5-Trimethylbenzene	0.0500	0.0548	0.0536	110	107	80.0-120			2.04	20
1,2,4-Trimethylbenzene	0.0500	0.0518	0.0505	104	101	80.0-120			2.55	20
(S) a,a,a-Trifluorotoluene(PID)				*97.5*	*97.8*	*80.0-200*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3238007-3 07/31/17 13:22 • (LCSD) R3238007-9 07/31/17 23:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	0.550	0.505	0.497	91.7	90.4	80.0-120			1.50	20
(S) a,a,a-Trifluorotoluene(PID)				*97.5*	*97.8*	*80.0-200*				

L925266-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L925266-01 07/31/17 17:13 • (MS) R3238007-4 07/31/17 14:56 • (MSD) R3238007-6 07/31/17 15:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.00602	2.65	2.74	101	104	52.5	32.0-137			3.59	39
Toluene	0.0500	U	2.55	2.61	97.2	99.5	52.5	20.0-142			2.33	42
Ethylbenzene	0.0500	U	2.67	2.77	102	105	52.5	10.0-150			3.47	44
m&p-Xylene	0.100	0.0114	5.81	5.99	110	114	52.5	14.0-141			3.04	44
o-Xylene	0.0500	0.00596	2.64	2.74	100	104	52.5	10.0-157			3.59	44
Methyl tert-butyl ether	0.0500	U	2.41	2.67	91.8	102	52.5	24.0-151			10.3	37
Naphthalene	0.0500	U	2.37	2.66	90.2	101	52.5	80.0-120			11.6	20
1,3,5-Trimethylbenzene	0.0500	U	2.66	2.73	102	104	52.5	80.0-120			2.48	20
1,2,4-Trimethylbenzene	0.0500	0.00778	2.65	2.72	101	103	52.5	80.0-120			2.55	20
(S) α,α,α-Trifluorotoluene(PID)					*97.3*	*98.1*		*80.0-200*				

L925266-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L925266-01 07/31/17 17:13 • (MS) R3238007-5 07/31/17 14:56 • (MSD) R3238007-7 07/31/17 15:20

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	0.550	U	26.1	26.3	90.4	90.9	52.5	80.0-120			0.630	20
(S) α,α,α-Trifluorotoluene(PID)					*97.3*	*98.1*		*80.0-200*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

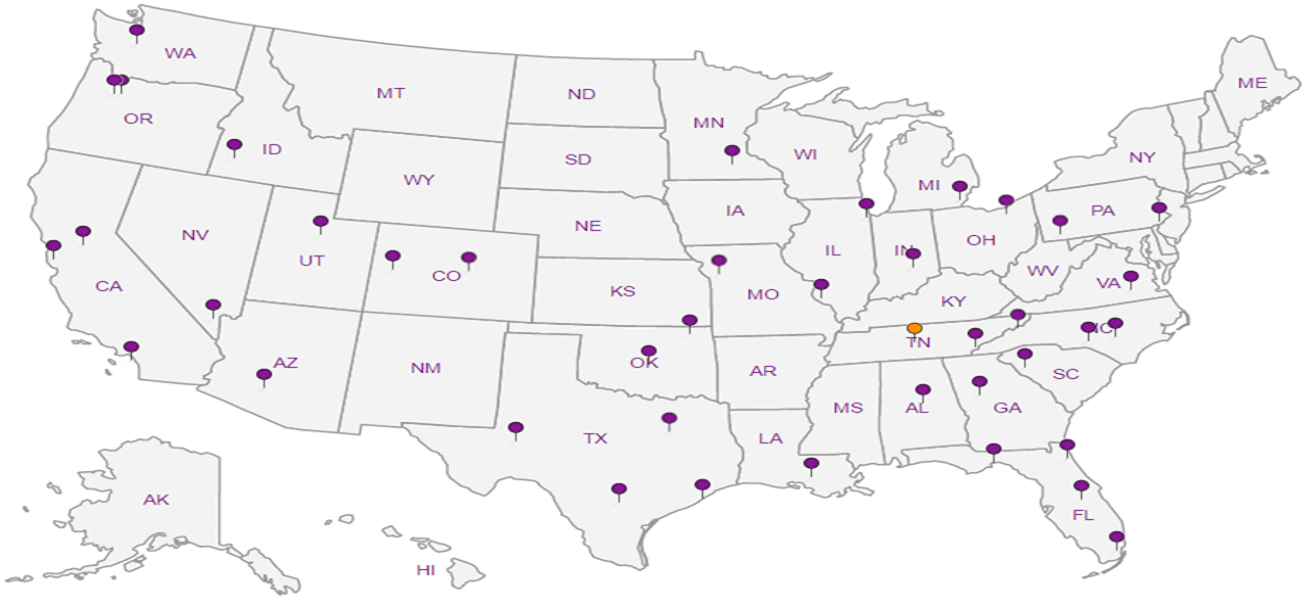
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Matt Turner
Environmental Engineer
Calumet Specialty Products Refinery
2407 Stinson Avenue
Superior, Wisconsin 54800

Billing Information:
Attn: Accounts Payable
PO Box 24359
Indianapolis, IN 46224-0139

apindy359@clmt.com

Pres Chk

Report to: **Matt Turner**

Email To: **matt.turner@calumetspecialty.com**

Project Description: **Tank 116**

City/State Collected: **Superior, WI**

Phone: ~~715-398-8434~~
Fax: **715-696-4873**

Client Project #

Lab Project #

Collected by (print): **Wade Olson**

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	PVOC	Remarks	Sample # (lab only)
S1	Grab	SS	6"	7/26/17	13:24	1	X		-01
S2	Grab	SS	6"	7/26/17	13:28	1	X		-02
S3	Grab	SS	6"	7/26/17	13:31	1	X		-03
S4	Grab	SS	6"	7/26/17	13:38	1	X		-04

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L925766
M226

Acctnum: **MUROILSWI**
Template:
Prelogin:
TSR: **John Hawkins (341)**
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP ___Y ___N
COC Signed/Accurate: ✓Y ___N
Bottles arrive intact: ✓Y ___N
Correct bottles used: ✓Y ___N
Sufficient volume sent: ✓Y ___N
If Applicable
VOA Zero Headspace: ___Y ___N
Preservation Correct/Checked: ___Y ___N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	7-26-17	14:59	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 1.4 °C Bottles Received: 4=40mL VOA

Date: 7-27-17 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Troy Dunlap

ESC Lab Sciences
Non-Conformance Form

Login #: L925266	Client: MUROILSWI	Date: 7/27/17	Evaluated by: Troy Dunlap

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	X	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Did not receive a soil jar for Total Solids. Only received a 60ml w/ MEOH for PVOCGRO.

Client informed by:		Call		Email		Voice Mail		Date: 7-28-17	Time: 8:11
TSR Initials: JVH	Client Contact:								

Login Instructions:

Run under Wet weight Pkey

ANALYTICAL REPORT

September 18, 2017

Calumet Specialty Products

Sample Delivery Group:	L936788
Samples Received:	09/15/2017
Project Number:	
Description:	Tank 116

Report To: Matt Turner
2407 Stinson Avenue
Superior, WI 54880

Entire Report Reviewed By:

John Hawkins
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

S1 L936788-01 Solid

Collected by: Wade Olson
Collected date/time: 09/14/17 14:28
Received date/time: 09/15/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1021288	51	09/14/17 14:28	09/16/17 22:16	ACG

S2 L936788-02 Solid

Collected by: Wade Olson
Collected date/time: 09/14/17 14:24
Received date/time: 09/15/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1021288	51	09/14/17 14:24	09/16/17 22:39	ACG

S4 L936788-03 Solid

Collected by: Wade Olson
Collected date/time: 09/14/17 14:18
Received date/time: 09/15/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO	WG1021288	51.5	09/14/17 14:18	09/16/17 23:03	ACG

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

John Hawkins
Technical Service Representative

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.00449	0.0149	51	09/16/2017 22:16	WG1021288
Toluene	U		0.00821	0.0274	51	09/16/2017 22:16	WG1021288
Ethylbenzene	U		0.00464	0.0155	51	09/16/2017 22:16	WG1021288
m&p-Xylene	0.0152	J	0.00785	0.0262	51	09/16/2017 22:16	WG1021288
o-Xylene	0.0279		0.00490	0.0163	51	09/16/2017 22:16	WG1021288
Methyl tert-butyl ether	0.0423		0.00816	0.0272	51	09/16/2017 22:16	WG1021288
Naphthalene	0.381	J6	0.0530	0.177	51	09/16/2017 22:16	WG1021288
1,3,5-Trimethylbenzene	U		0.00418	0.0139	51	09/16/2017 22:16	WG1021288
1,2,4-Trimethylbenzene	0.0328		0.00546	0.0182	51	09/16/2017 22:16	WG1021288
TPH (GC/FID) Low Fraction	40.6		0.561	1.87	51	09/16/2017 22:16	WG1021288
(S) a,a,a-Trifluorotoluene(PID)	*101*			*80.0-200*		*09/16/2017 22:16*	WG1021288

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.00449	0.0149	51	09/16/2017 22:39	WG1021288
Toluene	U		0.00821	0.0274	51	09/16/2017 22:39	WG1021288
Ethylbenzene	0.00648	J	0.00464	0.0155	51	09/16/2017 22:39	WG1021288
m&p-Xylene	0.0125	J	0.00785	0.0262	51	09/16/2017 22:39	WG1021288
o-Xylene	U		0.00490	0.0163	51	09/16/2017 22:39	WG1021288
Methyl tert-butyl ether	0.0534		0.00816	0.0272	51	09/16/2017 22:39	WG1021288
Naphthalene	U		0.0530	0.177	51	09/16/2017 22:39	WG1021288
1,3,5-Trimethylbenzene	U		0.00418	0.0139	51	09/16/2017 22:39	WG1021288
1,2,4-Trimethylbenzene	U		0.00546	0.0182	51	09/16/2017 22:39	WG1021288
TPH (GC/FID) Low Fraction	2.74		0.561	1.87	51	09/16/2017 22:39	WG1021288
(S) a,a,a-Trifluorotoluene(PID)	*101*			*80.0-200*		*09/16/2017 22:39*	WG1021288

Volatile Organic Compounds (GC) by Method 8021B/WI(95) GRO

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.00453	0.0151	51.5	09/16/2017 23:03	WG1021288
Toluene	U		0.00829	0.0277	51.5	09/16/2017 23:03	WG1021288
Ethylbenzene	U		0.00469	0.0156	51.5	09/16/2017 23:03	WG1021288
m&p-Xylene	U		0.00793	0.0264	51.5	09/16/2017 23:03	WG1021288
o-Xylene	0.0106	J	0.00494	0.0165	51.5	09/16/2017 23:03	WG1021288
Methyl tert-butyl ether	0.0354		0.00824	0.0274	51.5	09/16/2017 23:03	WG1021288
Naphthalene	0.493		0.0536	0.179	51.5	09/16/2017 23:03	WG1021288
1,3,5-Trimethylbenzene	U		0.00422	0.0141	51.5	09/16/2017 23:03	WG1021288
1,2,4-Trimethylbenzene	U		0.00551	0.0184	51.5	09/16/2017 23:03	WG1021288
TPH (GC/FID) Low Fraction	28.1		0.566	1.89	51.5	09/16/2017 23:03	WG1021288
(S) a,a,a-Trifluorotoluene(PID)	*101*			*80.0-200*		*09/16/2017 23:03*	WG1021288

Method Blank (MB)

(MB) R3249881-3 09/16/17 20:54

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.0000880	0.000293
Toluene	U		0.000161	0.000537
Ethylbenzene	U		0.0000910	0.000303
m&p-Xylene	U		0.000154	0.000513
o-Xylene	U		0.0000960	0.000320
Methyl tert-butyl ether	U		0.000160	0.000533
Naphthalene	U		0.00104	0.00347
1,3,5-Trimethylbenzene	U		0.0000820	0.000273
1,2,4-Trimethylbenzene	U		0.000107	0.000357
TPH (GC/FID) Low Fraction	U		0.0110	0.0367
(S) a,a,a-Trifluorotoluene(PID)	*101*			*80.0-200*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3249881-1 09/16/17 20:07 • (LCSD) R3249881-8 09/17/17 12:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	0.0453	0.0469	90.5	93.8	80.0-120			3.55	20
Toluene	0.0500	0.0453	0.0473	90.6	94.7	80.0-120			4.45	20
Ethylbenzene	0.0500	0.0468	0.0487	93.7	97.5	80.0-120			4.00	20
m&p-Xylene	0.100	0.0963	0.101	96.3	101	80.0-120			4.39	20
o-Xylene	0.0500	0.0451	0.0475	90.3	94.9	80.0-120			5.03	20
Methyl tert-butyl ether	0.0500	0.0439	0.0443	87.7	88.7	80.0-120			1.08	20
Naphthalene	0.0500	0.0428	0.0448	85.7	89.5	80.0-120			4.40	20
1,3,5-Trimethylbenzene	0.0500	0.0476	0.0493	95.2	98.6	80.0-120			3.48	20
1,2,4-Trimethylbenzene	0.0500	0.0481	0.0499	96.1	99.8	80.0-120			3.74	20
(S) a,a,a-Trifluorotoluene(PID)				*99.1*	*98.1*	*80.0-200*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3249881-2 09/16/17 20:07 • (LCSD) R3249881-9 09/17/17 12:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	0.550	0.498	0.546	90.6	99.2	80.0-120			9.12	20
(S) a,a,a-Trifluorotoluene(PID)				*99.1*	*98.1*	*80.0-200*				

L936788-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L936788-01 09/16/17 22:16 • (MS) R3249881-4 09/16/17 23:27 • (MSD) R3249881-6 09/16/17 23:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.0500	U	2.43	2.50	95.2	98.0	51	32.0-137			2.91	39
Toluene	0.0500	U	2.42	2.49	94.8	97.6	51	20.0-142			2.85	42
Ethylbenzene	0.0500	U	2.50	2.58	97.9	101	51	10.0-150			3.30	44
m&p-Xylene	0.100	0.0152	5.10	5.23	99.6	102	51	14.0-141			2.64	44
o-Xylene	0.0500	0.0279	2.40	2.47	93.2	95.6	51	10.0-157			2.53	44
Methyl tert-butyl ether	0.0500	0.0423	2.27	2.31	87.3	89.1	51	24.0-151			2.03	37
Naphthalene	0.0500	0.381	2.02	2.09	64.1	66.8	51	80.0-120	J6	J6	3.42	20
1,3,5-Trimethylbenzene	0.0500	U	2.23	2.29	87.3	89.8	51	80.0-120			2.87	20
1,2,4-Trimethylbenzene	0.0500	0.0328	2.42	2.48	93.7	96.0	51	80.0-120			2.36	20
(S) a,a,a-Trifluorotoluene(PID)					*98.7*	*98.9*		*80.0-200*				

L936788-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L936788-01 09/16/17 22:16 • (MS) R3249881-5 09/16/17 23:27 • (MSD) R3249881-7 09/16/17 23:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	0.550	40.6	69.4	69.7	103	104	51	80.0-120			0.340	20
(S) a,a,a-Trifluorotoluene(PID)					*98.7*	*98.9*		*80.0-200*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

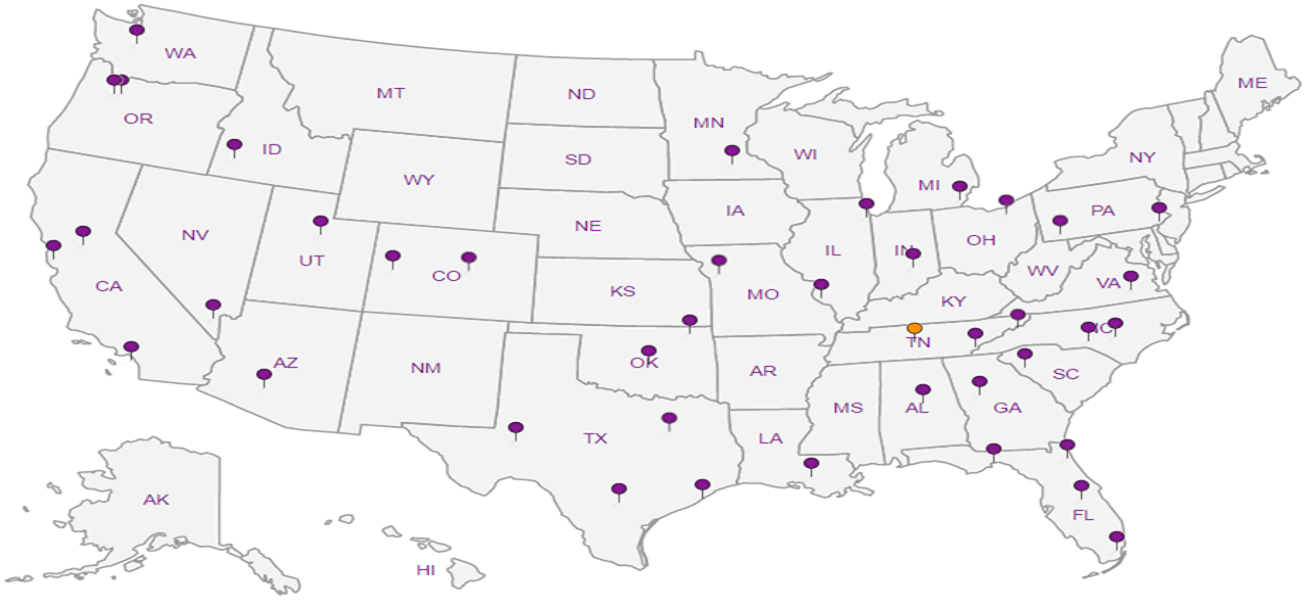
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Matt Turner
Environmental Engineer
Calumet Specialty Products Refinery
2407 Stinson Avenue
Superior, Wisconsin 54800

Billing Information:
Attn: Accounts Payable
PO Box 24359
Indianapolis, IN 46224-0139

apindy359@clmt.com

Pres Chk

Report to: **Matt Turner**

Email To: **matt.turner@calumetspecialty.com**

Project Description: **Tank 116**

City/State Collected: **Superior, WI**

Phone: **715-398-8434**
Fax: **715-696-4873**

Client Project #

Lab Project #

Collected by (print): **Wade Olson**

Site/Facility ID #

P.O. #

Collected by (signature):

Quote #

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

No of Cntrs

Analysis / Container / Preservative

PVOC

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	PVOC	Remarks	Sample # (lab only)
S1	Grab	SS	6"	9/14/17	14:28	1	X		-01
S2	Grab	SS	6"	9/14/17	14:24	1	X		02
S4	Grab	SS	6"	9/14/17	14:18	1	X		03

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9-14-17	15:18	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 4.2 °C Bottles Received: 3-60ML WET

Date: 9-15-17 Time: 0845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L936788

E191

Acctnum: MUROILSWI

Template:

Prelogin:

TSR: John Hawkins (341)

PB:

Shipped Via: