CALUMET
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June 22, 2017

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

Re: K051 (API Separator Sludge) Release SERTS ID 20170320NO16-1

Dear Mr. Sager,

Please find the attached report regarding the immediate action taken in response to the K051 (API Separator Sludge) release reported the WDNR on March 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

K051 (API Separator Sludge) Release SERTS ID 20170320NO16-1

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

6/22/2017

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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 K051 (API separator sludge from the petroleum refining industry) release on March 20th, 2017. The site location is shown in Figure 1. The response was initiated on March 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 K051 spill occurred in an area located between the northern concrete foundation of the Waste Water Treatment Plant (WWTP) and the southern edge of the concrete foundation of containment for two (2) aboveground storage tanks. The volume of the release was estimated to be 400 gallons. The release had very little mobility due to the viscosity of the product released and weather conditions at the time of the release. 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; however, based on the last time the site where the release occurred was visibly free of product and when the release was discovered, it is estimated to be no more than 14.5 hours.

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

As the release occurred between three cement structures and in a low lying area, the material pooled and was contained at the release site. In order to eliminate the source of the discharge, the leaking tank was emptied on March 20th, 2017. On March 20th, 2017, cleanup of the spill was initiated by means of vacuum trucks to recover any free product and both mechanical and hand excavation.

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 this was causing potentially contaminated water to leach deeper into soil that was most likely not previously contaminated.

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 44°F, there was a 6 mph NW wind, and there was no measured precipitation. However, rain later in the week reduced the ability to remediate the release. A summary of local weather conditions from March 20th, 2017 – April 10th, 2017 is located in Appendix B.

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

All visually impacted soil and free product was removed from the site. Samples taken after cleanup indicated results below the soil-to-groundwater RCLs established by the WDNR. Stormwater from the release area is drained to the ditch along Stinson Avenue through outfall 003. Outfall 003 is regulated under WPDES permit No. WI-0003085-08-0.

Because of the relatively impermeable surficial clay at the refinery, releases tend to migrate more horizontally along the ground surface. 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 corrosion in the bottom of an on ground mix tank used for the on-site WWTP at the refinery. In order to determine the exact location of the release, the tank was drained, sandblasted, and inspected to find where the material could have moved out of the tank. The initial inspection conducted on March 27th, 2017 identified a hole in the bottom of the tank.

On March 20th, 2017 a mini excavator was brought into the release area. Excavation work was completed by the mini excavator and shoveling by hand. That effort continued until April 10th, 2017. A total of 27,940 pounds of soil were removed, placed into a 25 yard roll-off box with a canvas roll tarp and poly plastic liner, and sent to a proper TSDF for disposal.

The excavation was broken up into two adjoining areas. The first was approximately 35 feet by 6 feet and was excavated to a depth between six and twelve inches. The second was approximately 10 feet by 34 feet and was excavated to a depth between four and six inches. 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)

Five laboratory samples were collected after the initial excavation was complete to confirm the removal of contaminated soil. All soil samples were analyzed for toxicity characteristic leaching procedure (TCLP) Resource Conservation and Recovery Act (RCRA) metals, TCLP RCRA volatile organic compounds (VOC), TCLP RCRA semi-volatile organic compounds (SVOC), polycyclic aromatic hydrocarbons (PAH), and cyanide. All five samples came back under the soil-to-groundwater residual contaminant levels (RCLs) established by the WDNR.

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 K051 contamination was present upon arrival to the site and during the excavation. Some residual visual sheen was present at the site after excavation, but this was mitigated by vacuuming up the water and treating it at the #1 Oil/Water Separator and WWTP. The visual extent of contamination was excavated. As K051 sludge is black in color, the most effective means to determine the extent of contamination is visually. It would have been unnecessary and unsafe to excavate further for risk of undermining the concrete foundations for the WWTP building and the tank containment foundations.

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 25 yard roll-off box with a canvas roll tarp and poly plastic liner. Disposal of this material ultimately occurred at the US Ecology Michigan (EPA ID: MID000724831) hazardous waste landfill in Belleville, MI. It is expected that the K051 sludge did not penetrate beyond the depth of the excavation due to visual observations after the release as well as confirmation sample results. 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 is presently used as a waste water treatment plant 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 K051 sludge released, the site conditions at the time of the release, and the confirmation sampling results, there is little chance the K051 sludge penetrated below the excavation depth. Confirmation samples indicate the spill has been remediated to below soil-to-groundwater residual contaminant levels. Based on limited exposure routes, the site has been adequately remediated to the extent practicable.

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 362032, 693202. A site vicinity map is included in Figure 1.

16.0 CONCLUSION AND RECOMMENDATIONS

Based on visual observations following cleanup activities and laboratory results indicating no contaminants above the NR720 soil-to-groundwater RCL's, 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. It is also Calumet's intention to install a concrete "cap" with containment walls on top of the area to ensure that this does not occur again. This cap will also serve as additional containment for the various tanks in the area by plumbing them to each other.

TABLES

SVOCs (GC/MS) by Method 8270C-SIM				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Anthracene	0.0000	0.0100	196.9491525	196.9492
Acenaphthene	0.0000	0.0100		
Acenaphthylene	0.0000	0.0100		
Benzo(a)anthracene	0.0635	0.0100		
Benzo(a)pyrene	0.0257	0.0100	0.47	0.4443
Benzo(b)fluoranthene	0.0000	0.0100	0.479300292	0.4793
Benzo(g,h,i)perylene	0.0335	0.0100		
Benzo(k)fluoranthene	0.0000	0.0100		
Chrysene	0.0000	0.0100	0.144606414	0.1446
Dibenz(a,h)anthracene	0.0000	0.0100		
Fluoranthene	0.0000	0.0100	88.87780549	88.8778
Fluorene	0.0000	0.0100	14.82993197	14.8299
Indeno(1,2,3-cd)pyrene	0.0000	0.0100		
Naphthalene	0.0000	0.0334	0.658181818	0.6582
Phenanthrene	0.0118	0.0100		
Pyrene	0.0487	0.0100	54.54545455	54.4968
1-Methylnaphthalene	0.0000	0.0334		
2-Methylnaphthalene	0.0000	0.0334		
2-Chloronaphthalene	0.0000	0.0334		

Note: All values of "0" in the Results column were reported as non-detect (ND). A value of 0 was input to accommodate for math purposes.

Note: Any cells without a value in the RCL column does not have an established Soil-to-Ground Water standard for that analyte.

SVOCs (GC/MS) by Method 8270C				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
1,4-Dichlorobenzene	0.000	0.100	1.168	1.168
2,4-Dinitrotoluene	0.000	0.100	0.000135443	0.000135443
Hexachlorobenzene	0.000	0.100	0.0252	0.0252
Hexachloro-1,3-butadiene	0.000	0.100		
Hexachloroethane	0.000	0.100		
Nitrobenzene	0.000	0.100		
Pyridine	0.000	0.100	0.006868687	0.007
3&4-Methyl Phenol	0.000	0.100		
2-Methylphenol	0.000	0.100		
Pentachlorophenol	0.000	0.100	0.00276	0.00276
2,4,5-Trichlorophenol	0.000	0.100		
2,4,6-Trichlorophenol	0.000	0.100		

Volatile Organic Compounds (GC/MS) by Method 8260B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Benzene	0.0000	0.0500	0.00512	0.00512
Carbon tetrachloride	0.0000	0.0500	0.00388	0.00388
Chlorobenzene	0.0000	0.0500		
Chloroform	0.0000	0.2500	0.00333	0.00333
1,2-Dichloroethane	0.0000	0.0500	0.00284	0.00284
1,1-Dichloroethene	0.0000	0.0500	0.483418182	0.483418182
2-Butanone (MEK)	0.0000	0.5000		
Tetrachloroethene	0.0000	0.0500		
Trichloroethene	0.0000	0.0500		
Vinyl chloride	0.0000	0.0500	0.000138	0.000138

Metals (ICO) by Method 6010B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Arsenic	0.000	0.100	0.584	0.584
Barium	0.110	0.100	164.8	164.69
Cadmium	0.000	0.100	0.752	0.752
Chromium	0.000	0.100	360000	360000
Lead	0.000	0.100	27	27
Selenium	0.000	0.100	0.52	0.52
Silver	0.000	0.100	0.849096706	0.849096706

Wet Chemistry by Method 9012B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Cyanide	0.000	0.130	4.04	4.04

Mercury by Method 7470A				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Mercury	0.0000	0.0100	0.208	0.208

Total Solids by Method 2540 G-2011	
Analyte	Results (mg/kg)
Total Solids	93.30%

SVOCs (GC/MS) by Method 8270C-SIM				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Anthracene	0.0000	0.0100	196.9491525	196.9492
Acenaphthene	0.1200	0.0100		
Acenaphthylene	0.0000	0.0100		
Benzo(a)anthracene	0.0266	0.0100		
Benzo(a)pyrene	0.0284	0.0100	0.47	0.4416
Benzo(b)fluoranthene	0.0000	0.0100	0.479300292	0.4793
Benzo(g,h,i)perylene	0.0276	0.0100		
Benzo(k)fluoranthene	0.0000	0.0100		
Chrysene	0.0597	0.0100	0.144606414	0.0849
Dibenz(a,h)anthracene	0.0000	0.0100		
Fluoranthene	0.0618	0.0100	88.87780549	88.8160
Fluorene	0.2050	0.0100	14.82993197	14.6249
Indeno(1,2,3-cd)pyrene	0.0000	0.0100		
Naphthalene	0.0000	0.0334	0.658181818	0.6582
Phenanthrene	0.1460	0.0100		
Pyrene	0.2130	0.0100	54.54545455	54.3325
1-Methylnaphthalene	0.0000	0.0334		
2-Methylnaphthalene	0.0000	0.0334		
2-Chloronaphthalene	0.0000	0.0334		

SVOCs (GC/MS) by Method 8270C				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
1,4-Dichlorobenzene	0.000	0.100	1.168	1.168
2,4-Dinitrotoluene	0.000	0.100	0.000135443	0.000135443
Hexachlorobenzene	0.000	0.100	0.0252	0.0252
Hexachloro-1,3-butadiene	0.000	0.100		
Hexachloroethane	0.000	0.100		
Nitrobenzene	0.000	0.100		
Pyridine	0.000	0.100	0.006868687	0.007
3&4-Methyl Phenol	0.000	0.100		
2-Methylphenol	0.000	0.100		
Pentachlorophenol	0.000	0.100	0.00276	0.00276
2,4,5-Trichlorophenol	0.000	0.100		
2,4,6-Trichlorophenol	0.000	0.100		

Volatile Organic Compounds (GC/MS) by Method 8260B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Benzene	0.0000	0.0500	0.00512	0.00512
Carbon tetrachloride	0.0000	0.0500	0.00388	0.00388
Chlorobenzene	0.0000	0.0500		
Chloroform	0.0000	0.2500	0.00333	0.00333
1,2-Dichloroethane	0.0000	0.0500	0.00284	0.00284
1,1-Dichloroethene	0.0000	0.0500	0.483418182	0.483418182
2-Butanone (MEK)	0.0000	0.5000		
Tetrachloroethene	0.0000	0.0500		
Trichloroethene	0.0000	0.0500		
Vinyl chloride	0.0000	0.0500	0.000138	0.000138

Metals (ICO) by Method 6010B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Arsenic	0.000	0.100	0.584	0.584
Barium	0.000	0.100	164.8	164.8
Cadmium	0.000	0.100	0.752	0.752
Chromium	0.000	0.100	360000	360000
Lead	0.000	0.100	27	27
Selenium	0.000	0.100	0.52	0.52
Silver	0.000	0.100	0.849096706	0.849096706

Wet Chemistry by Method 9012B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Cyanide	0.000	0.130	4.04	4.04

Mercury by Method 7470A				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Mercury	0.0000	0.0100	0.208	0.208

Total Solids by Method 2540 G-2011	
Analyte	Results (mg/kg)
Total Solids	95.00%

Note: All values of "0" in the Results column were reported as non-detect (ND). A value of 0 was input to accommodate for math purposes.

Note: Any cells without a value in the RCL column does not have an established Soil-to-Ground Water standard for that analyte.

SVOCs (GC/MS) by Method 8270C-SIM				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Anthracene	0.00000	0.00400	196.9491525	196.94915
Acenaphthene	0.03580	0.00400		
Acenaphthylene	0.00000	0.00400		
Benzo(a)anthracene	0.00776	0.00400		
Benzo(a)pyrene	0.01010	0.00400	0.47	0.45990
Benzo(b)fluoranthene	0.00000	0.00400	0.479300292	0.47930
Benzo(g,h,i)perylene	0.00989	0.00400		
Benzo(k)fluoranthene	0.00000	0.00400		
Chrysene	0.01710	0.00400	0.144606414	0.12751
Dibenz(a,h)anthracene	0.00000	0.00400		
Fluoranthene	0.01880	0.00400	88.87780549	88.85901
Fluorene	0.06410	0.00400	14.82993197	14.76583
Indeno(1,2,3-cd)pyrene	0.00000	0.00400		
Naphthalene	0.00000	0.01330	0.658181818	0.65818
Phenanthrene	0.08990	0.00400		
Pyrene	0.07490	0.00400	54.54545455	54.47055
1-Methylnaphthalene	0.07080	0.01330		
2-Methylnaphthalene	0.04220	0.01330		
2-Chloronaphthalene	0.00000	0.01330		

SVOCs (GC/MS) by Method 8270C				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
1,4-Dichlorobenzene	0.000	0.100	1.168	1.168
2,4-Dinitrotoluene	0.000	0.100	0.000135443	0.000135443
Hexachlorobenzene	0.000	0.100	0.0252	0.0252
Hexachloro-1,3-butadiene	0.000	0.100		
Hexachloroethane	0.000	0.100		
Nitrobenzene	0.000	0.100		
Pyridine	0.000	0.100	0.006868687	0.007
3&4-Methyl Phenol	0.000	0.100		
2-Methylphenol	0.000	0.100		
Pentachlorophenol	0.000	0.100	0.00276	0.00276
2,4,5-Trichlorophenol	0.000	0.100		
2,4,6-Trichlorophenol	0.000	0.100		

Volatile Organic Compounds (GC/MS) by Method 8260B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Benzene	0.0000	0.0500	0.00512	0.00512
Carbon tetrachloride	0.0000	0.0500	0.00388	0.00388
Chlorobenzene	0.0000	0.0500		
Chloroform	0.0000	0.2500	0.00333	0.00333
1,2-Dichloroethane	0.0000	0.0500	0.00284	0.00284
1,1-Dichloroethene	0.0000	0.0500	0.483418182	0.483418182
2-Butanone (MEK)	0.0000	0.5000		
Tetrachloroethene	0.0000	0.0500		
Trichloroethene	0.0000	0.0500		
Vinyl chloride	0.0000	0.0500	0.000138	0.000138

Metals (ICO) by Method 6010B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Arsenic	0.000	0.100	0.584	0.584
Barium	0.000	0.100	164.8	164.8
Cadmium	0.000	0.100	0.752	0.752
Chromium	0.000	0.100	360000	360000
Lead	0.000	0.100	27	27
Selenium	0.000	0.100	0.52	0.52
Silver	0.000	0.100	0.849096706	0.849096706

Wet Chemistry by Method 9012B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Cyanide	0.000	0.130	4.04	4.04

Mercury by Method 7470A				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Mercury	0.0000	0.0100	0.208	0.208

Total Solids by Method 2540 G-2011	
Analyte	Results (mg/kg)
Total Solids	89.50%

Note: All values of "0" in the Results column were reported as non-detect (ND). A value of 0 was input to accommodate for math purposes.

Note: Any cells without a value in the RCL column does not have an established Soil-to-Ground Water standard for that analyte.

SVOCs (GC/MS) by Method 8270C-SIM				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Anthracene	0.00000	0.00200	196.9491525	196.94915
Acenaphthene	0.00000	0.00200		
Acenaphthylene	0.00000	0.00200		
Benzo(a)anthracene	0.00284	0.00200		
Benzo(a)pyrene	0.00000	0.00200	0.47	0.47000
Benzo(b)fluoranthene	0.00000	0.00200	0.479300292	0.47930
Benzo(g,h,i)perylene	0.00346	0.00200		
Benzo(k)fluoranthene	0.00000	0.00200		
Chrysene	0.00475	0.00200	0.144606414	0.13986
Dibenz(a,h)anthracene	0.00000	0.00200		
Fluoranthene	0.00574	0.00200	88.87780549	88.87207
Fluorene	0.00000	0.00200	14.82993197	14.82993
Indeno(1,2,3-cd)pyrene	0.00000	0.00200		
Naphthalene	0.00000	0.00667	0.658181818	0.65818
Phenanthrene	0.02130	0.00200		
Pyrene	0.02290	0.00200	54.54545455	54.52255
1-Methylnaphthalene	0.00847	0.00667		
2-Methylnaphthalene	0.00000	0.00667		
2-Chloronaphthalene	0.00000	0.00667		

SVOCs (GC/MS) by Method 8270C				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
1,4-Dichlorobenzene	0.000	0.100	1.168	1.168
2,4-Dinitrotoluene	0.000	0.100	0.000135443	0.000135443
Hexachlorobenzene	0.000	0.100	0.0252	0.0252
Hexachloro-1,3-butadiene	0.000	0.100		
Hexachloroethane	0.000	0.100		
Nitrobenzene	0.000	0.100		
Pyridine	0.000	0.100	0.006868687	0.007
3&4-Methyl Phenol	0.000	0.100		
2-Methylphenol	0.000	0.100		
Pentachlorophenol	0.000	0.100	0.00276	0.00276
2,4,5-Trichlorophenol	0.000	0.100		
2,4,6-Trichlorophenol	0.000	0.100		

Volatile Organic Compounds (GC/MS) by Method 8260B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Benzene	0.0000	0.0500	0.00512	0.00512
Carbon tetrachloride	0.0000	0.0500	0.00388	0.00388
Chlorobenzene	0.0000	0.0500		
Chloroform	0.0000	0.2500	0.00333	0.00333
1,2-Dichloroethane	0.0000	0.0500	0.00284	0.00284
1,1-Dichloroethene	0.0000	0.0500	0.483418182	0.483418182
2-Butanone (MEK)	0.0000	0.5000		
Tetrachloroethene	0.0000	0.0500		
Trichloroethene	0.0000	0.0500		
Vinyl chloride	0.0000	0.0500	0.000138	0.000138

Metals (ICO) by Method 6010B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Arsenic	0.000	0.100	0.584	0.584
Barium	0.000	0.100	164.8	164.8
Cadmium	0.000	0.100	0.752	0.752
Chromium	0.000	0.100	360000	360000
Lead	0.000	0.100	27	27
Selenium	0.000	0.100	0.52	0.52
Silver	0.000	0.100	0.849096706	0.849096706

Wet Chemistry by Method 9012B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Cyanide	0.000	0.130	4.04	4.04

Mercury by Method 7470A				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Mercury	0.0000	0.0100	0.208	0.208

Total Solids by Method 2540 G-2011	
Analyte	Results (mg/kg)
Total Solids	93.30%

Note: All values of "0" in the Results column were reported as non-detect (ND). A value of 0 was input to accommodate for math purposes.

Note: Any cells without a value in the RCL column does not have an established Soil-to-Ground Water standard for that analyte.

SVOCs (GC/MS) by Method 8270C-SIM				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Anthracene	0.00000	0.00400	196.9491525	196.94915
Acenaphthene	0.08240	0.00400		
Acenaphthylene	0.01180	0.00400		
Benzo(a)anthracene	0.02160	0.00400		
Benzo(a)pyrene	0.02080	0.00400	0.47	0.44920
Benzo(b)fluoranthene	0.02160	0.00400	0.479300292	0.45770
Benzo(g,h,i)perylene	0.02070	0.00400		
Benzo(k)fluoranthene	0.00000	0.00400		
Chrysene	0.03790	0.00400	0.144606414	0.10671
Dibenz(a,h)anthracene	0.00000	0.00400		
Fluoranthene	0.03340	0.00400	88.87780549	88.84441
Fluorene	0.08240	0.00400	14.82993197	14.74753
Indeno(1,2,3-cd)pyrene	0.00684	0.00400		
Naphthalene	0.05170	0.0133	0.658181818	0.60648
Phenanthrene	0.16600	0.00400		
Pyrene	0.11500	0.00400	54.54545455	54.43045
1-Methylnaphthalene	0.13900	0.0133		
2-Methylnaphthalene	0.06730	0.0133		
2-Chloronaphthalene	0.00000	0.0133		

SVOCs (GC/MS) by Method 8270C				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
1,4-Dichlorobenzene	0.000	0.100	1.168	1.168
2,4-Dinitrotoluene	0.000	0.100	0.000135443	0.000135443
Hexachlorobenzene	0.000	0.100	0.0252	0.0252
Hexachloro-1,3-butadiene	0.000	0.100		
Hexachloroethane	0.000	0.100		
Nitrobenzene	0.000	0.100		
Pyridine	0.000	0.100	0.006868687	0.0068687
3&4-Methyl Phenol	0.000	0.100		
2-Methylphenol	0.000	0.100		
Pentachlorophenol	0.000	0.100	0.00276	0.00276
2,4,5-Trichlorophenol	0.000	0.100		
2,4,6-Trichlorophenol	0.000	0.100		

Volatile Organic Compounds (GC/MS) by Method 8260B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Benzene	0.0000	0.0500	0.00512	0.00512
Carbon tetrachloride	0.0000	0.0500	0.00388	0.00388
Chlorobenzene	0.0000	0.0500		
Chloroform	0.0000	0.2500	0.00333	0.00333
1,2-Dichloroethane	0.0000	0.0500	0.00284	0.00284
1,1-Dichloroethene	0.0000	0.0500	0.483418182	0.483418182
2-Butanone (MEK)	0.0000	0.5000		
Tetrachloroethene	0.0000	0.0500		
Trichloroethene	0.0000	0.0500		
Vinyl chloride	0.0000	0.0500	0.000138	0.000138

Metals (ICO) by Method 6010B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Arsenic	0.000	0.100	0.584	0.584
Barium	0.000	0.100	164.8	164.8
Cadmium	0.000	0.100	0.752	0.752
Chromium	0.000	0.100	360000	360000
Lead	0.000	0.100	27	27
Selenium	0.000	0.100	0.52	0.52
Silver	0.000	0.100	0.849096706	0.849096706

Wet Chemistry by Method 9012B				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Cyanide	0.000	0.130	4.04	4.04

Mercury by Method 7470A				
Analyte	Results (mg/kg)	Lab Detection Limit (mg/kg)	RCL Levels (mg/kg)	Amount Below RCL (mg/kg)
Mercury	0.0000	0.0100	0.208	0.208

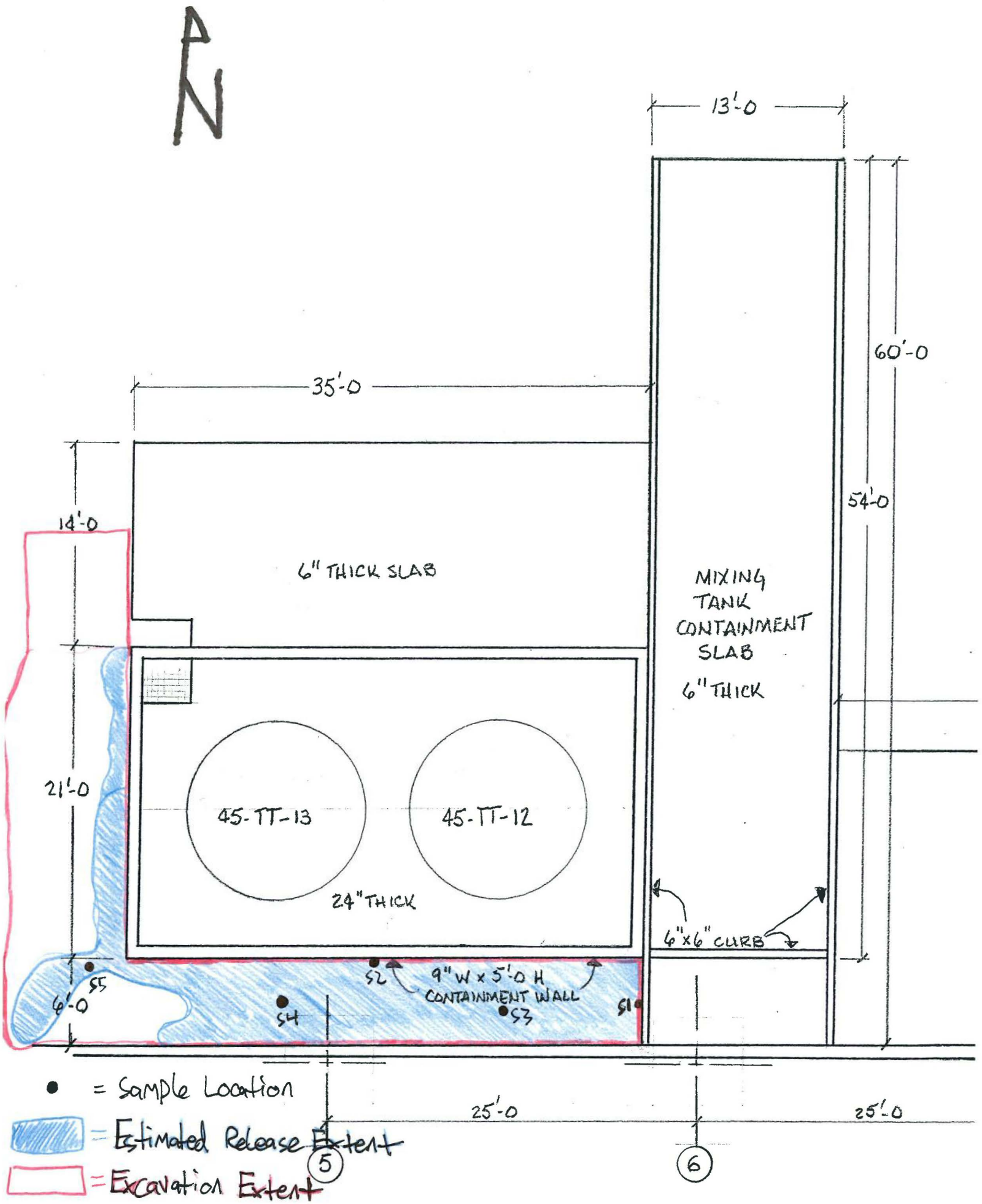
Total Solids by Method 2540 G-2011	
Analyte	Results (mg/kg)
Total Solids	92.70%

Note: All values of "0" in the Results column were reported as non-detect (ND). A value of 0 was input to accommodate for math purposes.

Note: Any cells without a value in the RCL column does not have an established Soil-to-Ground Water standard for that analyte.

FIGURES


Figure 1 - Site Vicinity Map
K051 Release Site
1
X: 362032.07226
Y: 693202.98203


N
13'-0
60'-0
35'-0
54'-0
14'-0
6" THICK SLAB
MIXING TANK CONTAINMENT SLAB 6" THICK
21'-0
45-TT-13
45-TT-12
24" THICK
6"x6" CURB
9" W x 5'-0 H CONTAINMENT WALL
S1
S2
S3
S4
S5
6'-0
= Sample Location
= Estimated Release Extent
= Excavation Extent
25'-0
25'-0
5
6

APPENDICES

Appendix A	Photographs
Appendix B	Historical Weather Information
Appendix C	Laboratory Analytical Reports (please note that there were more samples than S1-S5 sent in for analysis in the same shipment, the results of which will also be present in the lab's report)

Appendix A - Photographs

Photo 1: Looking west at the release area.

Photo 2: Looking southeast at the release area.

Photo 3: Looking east at the release area.

Photo 4: Looking southeast at the release area.

Photo 5: Looking south at the release area.

Photo 6: Looking southeast at the excavation.

Photo 7: Looking east at the excavation.

Photo 8: Looking east at the excavation.

Photo 9: Looking east at the excavation and the sample locations for S1, S2, S3, and S4 (red dots).

Photo 10: Looking northwest at the excavation and sample location of S5 (red dot).

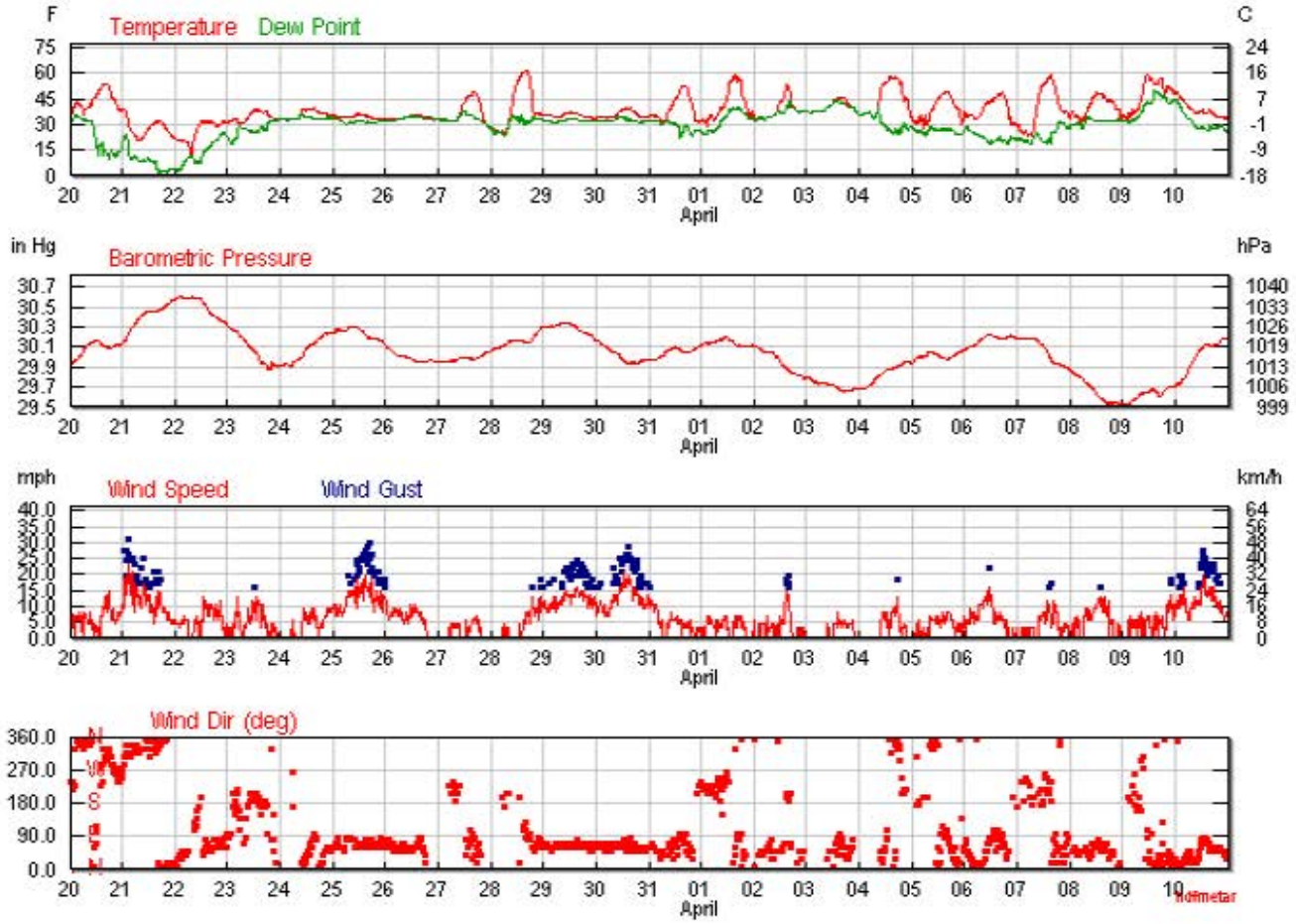
Appendix B - Historical Weather Information

	Max	Avg	Min	Sum
Temperature				
Max Temperature	61 °F	47 °F	32 °F	
Mean Temperature	45 °F	38 °F	22 °F	
Min Temperature	35 °F	29 °F	12 °F	
Degree Days				
Heating Degree Days (base 65)	44	27	20	603
Cooling Degree Days (base 65)	0	0	0	0
Growing Degree Days (base 50)	0	0	0	0
Dew Point				
Dew Point	49 °F	29 °F	1 °F	
Precipitation				
Precipitation	0.10 in	0.01 in	0.00 in	0.29 in
Snowdepth	-	-	-	-
Wind				
Wind	26 mph	5 mph	0 mph	
Gust Wind	31 mph	19 mph	12 mph	
Sea Level Pressure				
Sea Level Pressure	30.61 in	30.05 in	29.51 in	

Weather History & Observations

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	
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

Custom Weather History Graph



ANALYTICAL REPORT

April 21, 2017

Calumet Specialty Products

Sample Delivery Group:	L901839
Samples Received:	04/11/2017
Project Number:	
Description:	WWTP K051; Sulfur Roll-off Box; Carbon Vent Drum Sampling
Report To:	Matt Turner 2407 Stinson Avenue Superior, WI 54880

Entire Report Reviewed By:

Jason Romer
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

S-1 L901839-01 Solid

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG970239	1	04/13/17 15:33	04/13/17 15:48	MLW
Wet Chemistry by Method 9012B	WG969949	1	04/12/17 09:34	04/12/17 15:38	DR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG970328	5	04/14/17 23:38	04/16/17 10:11	FMB

S-1 L901839-02 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971213	1	04/18/17 12:42	04/18/17 15:28	TRB
Metals (ICP) by Method 6010B	WG971208	1	04/17/17 14:58	04/17/17 19:30	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 19:51	04/18/17 19:51	LRL
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 09:15	JF

S-2 L901839-03 Solid

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG970239	1	04/13/17 15:33	04/13/17 15:48	MLW
Wet Chemistry by Method 9012B	WG969949	1	04/12/17 09:34	04/12/17 15:41	DR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG970328	5	04/14/17 23:38	04/16/17 10:32	FMB

S-2 L901839-04 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971213	1	04/18/17 12:42	04/18/17 15:34	TRB
Metals (ICP) by Method 6010B	WG971208	1	04/17/17 14:58	04/17/17 19:41	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 20:13	04/18/17 20:13	LRL
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 10:25	JF

S-3 L901839-05 Solid

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG970239	1	04/13/17 15:33	04/13/17 15:48	MLW
Wet Chemistry by Method 9012B	WG971215	1	04/17/17 11:49	04/17/17 15:00	DR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG970328	2	04/14/17 23:38	04/16/17 09:30	FMB

S-3 L901839-06 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971214	1	04/18/17 12:40	04/18/17 14:26	TRB
Metals (ICP) by Method 6010B	WG971202	1	04/17/17 14:57	04/17/17 20:33	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 20:34	04/18/17 20:34	LRL

S-3 L901839-06 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:15 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 10:49	JF

S-4 L901839-07 Solid

Collected by: Wade Olson | Collected date/time: 04/10/17 11:22 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG970240	1	04/13/17 14:47	04/13/17 15:19	MLW
Wet Chemistry by Method 9012B	WG971215	1	04/17/17 11:49	04/17/17 15:01	DR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG970328	1	04/14/17 23:38	04/16/17 08:48	FMB

S-4 L901839-08 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:22 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971214	1	04/18/17 12:40	04/18/17 14:53	TRB
Metals (ICP) by Method 6010B	WG971202	1	04/17/17 14:57	04/17/17 20:36	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 20:56	04/18/17 20:56	LRL
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 11:12	JF

S-5 L901839-09 Solid

Collected by: Wade Olson | Collected date/time: 04/10/17 11:22 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG970240	1	04/13/17 14:47	04/13/17 15:19	MLW
Wet Chemistry by Method 9012B	WG971215	1	04/17/17 11:49	04/17/17 15:02	DR
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG970328	2	04/14/17 23:38	04/16/17 09:51	FMB

S-5 L901839-10 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 11:22 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971214	1	04/18/17 12:40	04/18/17 14:56	TRB
Metals (ICP) by Method 6010B	WG971202	1	04/17/17 14:57	04/17/17 20:38	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 21:18	04/18/17 21:18	LRL
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 11:35	JF

SULFUR BOX L901839-11 Waste

Collected by: Wade Olson | Collected date/time: 04/10/17 13:11 | Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Wet Chemistry by Method 9034-9030B	WG970005	1	04/13/17 19:35	04/13/17 19:35	KK
Mercury by Method 7470A	WG971213	1	04/18/17 12:42	04/18/17 15:37	TRB
Metals (ICP) by Method 6010B	WG971208	1	04/17/17 14:58	04/17/17 19:44	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/18/17 21:40	04/18/17 21:40	LRL
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	1	04/17/17 20:16	04/18/17 11:59	JF

CARBON VENT DRUM L901839-12 Waste

Collected by: Wade Olson
Collected date/time: 04/10/17 13:25
Received date/time: 04/11/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1311	WG970857	1	04/15/17 19:52	04/15/17 19:52	LJN
Preparation by Method 1311	WG971143	1	04/17/17 15:22	04/17/17 15:22	LJN
Mercury by Method 7470A	WG971214	1	04/18/17 12:40	04/18/17 14:58	TRB
Metals (ICP) by Method 6010B	WG971202	1	04/17/17 14:57	04/17/17 20:41	ST
Volatile Organic Compounds (GC/MS) by Method 8260B	WG971492	1	04/19/17 14:46	04/19/17 14:46	KMC
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG971250	20	04/17/17 20:16	04/18/17 18:37	JF

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.

Jason Romer
Technical Service Representative

Project Narrative

All Reactive Sulfide results reported in the attached report were determined as totals using method 9034/9030B.

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.3		1	04/13/2017 15:48	WG970239

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.130	1	04/12/2017 15:38	WG969949

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.0100	5	04/16/2017 10:11	WG970328
Acenaphthene	ND		0.0100	5	04/16/2017 10:11	WG970328
Acenaphthylene	ND		0.0100	5	04/16/2017 10:11	WG970328
Benzo(a)anthracene	0.0635		0.0100	5	04/16/2017 10:11	WG970328
Benzo(a)pyrene	0.0257		0.0100	5	04/16/2017 10:11	WG970328
Benzo(b)fluoranthene	ND		0.0100	5	04/16/2017 10:11	WG970328
Benzo(g,h,i)perylene	0.0335		0.0100	5	04/16/2017 10:11	WG970328
Benzo(k)fluoranthene	ND		0.0100	5	04/16/2017 10:11	WG970328
Chrysene	ND		0.0100	5	04/16/2017 10:11	WG970328
Dibenz(a,h)anthracene	ND		0.0100	5	04/16/2017 10:11	WG970328
Fluoranthene	ND		0.0100	5	04/16/2017 10:11	WG970328
Fluorene	ND		0.0100	5	04/16/2017 10:11	WG970328
Indeno(1,2,3-cd)pyrene	ND		0.0100	5	04/16/2017 10:11	WG970328
Naphthalene	ND		0.0334	5	04/16/2017 10:11	WG970328
Phenanthrene	0.0118		0.0100	5	04/16/2017 10:11	WG970328
Pyrene	0.0487		0.0100	5	04/16/2017 10:11	WG970328
1-Methylnaphthalene	ND		0.0334	5	04/16/2017 10:11	WG970328
2-Methylnaphthalene	ND		0.0334	5	04/16/2017 10:11	WG970328
2-Chloronaphthalene	ND		0.0334	5	04/16/2017 10:11	WG970328
(S) p-Terphenyl-d14	*77.0*		*23.0-120*		*04/16/2017 10:11*	WG970328
(S) Nitrobenzene-d5	*106*		*14.0-149*		*04/16/2017 10:11*	WG970328
(S) 2-Fluorobiphenyl	*87.1*		*34.0-125*		*04/16/2017 10:11*	WG970328

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	2		4/15/2017 7:52:18 PM	WG970857
Initial pH	7.34		4/15/2017 7:52:18 PM	WG970857
Final pH	5.64		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 15:28	WG971213

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 19:30	WG971208
Barium	0.110		0.100	100	1	04/17/2017 19:30	WG971208
Cadmium	ND		0.100	1	1	04/17/2017 19:30	WG971208
Chromium	ND		0.100	5	1	04/17/2017 19:30	WG971208
Lead	ND		0.100	5	1	04/17/2017 19:30	WG971208
Selenium	ND		0.100	1	1	04/17/2017 19:30	WG971208
Silver	ND		0.100	5	1	04/17/2017 19:30	WG971208

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 19:51	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 19:51	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 19:51	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 19:51	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 19:51	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 19:51	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 19:51	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 19:51	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 19:51	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 19:51	WG971492
(S) Toluene-d8	*107*		*80.0-120*	*120*		*04/18/2017 19:51*	WG971492
(S) Dibromofluoromethane	*116*		*76.0-123*	*123*		*04/18/2017 19:51*	WG971492
(S) α,α,α-Trifluorotoluene	*101*		*80.0-120*	*120*		*04/18/2017 19:51*	WG971492
(S) 4-Bromofluorobenzene	*101*		*80.0-120*	*120*		*04/18/2017 19:51*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 09:15	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 09:15	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 09:15	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 09:15	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 09:15	WG971250
Nitrobenzene	ND		0.100	2	1	04/18/2017 09:15	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 09:15	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 09:15	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 09:15	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 09:15	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 09:15	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 09:15	WG971250
(S) 2-Fluorophenol	*40.5*		*10.0-120*	*120*		*04/18/2017 09:15*	WG971250
(S) Phenol-d5	*31.2*		*10.0-120*	*120*		*04/18/2017 09:15*	WG971250
(S) Nitrobenzene-d5	*60.6*		*10.0-126*	*126*		*04/18/2017 09:15*	WG971250
(S) 2-Fluorobiphenyl	*67.0*		*22.0-127*	*127*		*04/18/2017 09:15*	WG971250
(S) 2,4,6-Tribromophenol	*59.4*		*10.0-153*	*153*		*04/18/2017 09:15*	WG971250
(S) p-Terphenyl-d14	*76.0*		*29.0-141*	*141*		*04/18/2017 09:15*	WG971250

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	95.0		1	04/13/2017 15:48	WG970239

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND	J6	0.130	1	04/12/2017 15:41	WG969949

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.0100	5	04/16/2017 10:32	WG970328
Acenaphthene	0.120		0.0100	5	04/16/2017 10:32	WG970328
Acenaphthylene	ND		0.0100	5	04/16/2017 10:32	WG970328
Benzo(a)anthracene	0.0266		0.0100	5	04/16/2017 10:32	WG970328
Benzo(a)pyrene	0.0284		0.0100	5	04/16/2017 10:32	WG970328
Benzo(b)fluoranthene	ND		0.0100	5	04/16/2017 10:32	WG970328
Benzo(g,h,i)perylene	0.0276		0.0100	5	04/16/2017 10:32	WG970328
Benzo(k)fluoranthene	ND		0.0100	5	04/16/2017 10:32	WG970328
Chrysene	0.0597		0.0100	5	04/16/2017 10:32	WG970328
Dibenz(a,h)anthracene	ND		0.0100	5	04/16/2017 10:32	WG970328
Fluoranthene	0.0618		0.0100	5	04/16/2017 10:32	WG970328
Fluorene	0.205		0.0100	5	04/16/2017 10:32	WG970328
Indeno(1,2,3-cd)pyrene	ND		0.0100	5	04/16/2017 10:32	WG970328
Naphthalene	ND		0.0334	5	04/16/2017 10:32	WG970328
Phenanthrene	0.146		0.0100	5	04/16/2017 10:32	WG970328
Pyrene	0.213		0.0100	5	04/16/2017 10:32	WG970328
1-Methylnaphthalene	ND		0.0334	5	04/16/2017 10:32	WG970328
2-Methylnaphthalene	ND		0.0334	5	04/16/2017 10:32	WG970328
2-Chloronaphthalene	ND		0.0334	5	04/16/2017 10:32	WG970328
(S) p-Terphenyl-d14	*73.0*		*23.0-120*		*04/16/2017 10:32*	WG970328
(S) Nitrobenzene-d5	*24.8*		*14.0-149*		*04/16/2017 10:32*	WG970328
(S) 2-Fluorobiphenyl	*76.7*		*34.0-125*		*04/16/2017 10:32*	WG970328

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	2		4/15/2017 7:52:18 PM	WG970857
Initial pH	7.35		4/15/2017 7:52:18 PM	WG970857
Final pH	5.69		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 15:34	WG971213

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 19:41	WG971208
Barium	ND		0.100	100	1	04/17/2017 19:41	WG971208
Cadmium	ND		0.100	1	1	04/17/2017 19:41	WG971208
Chromium	ND		0.100	5	1	04/17/2017 19:41	WG971208
Lead	ND		0.100	5	1	04/17/2017 19:41	WG971208
Selenium	ND		0.100	1	1	04/17/2017 19:41	WG971208
Silver	ND		0.100	5	1	04/17/2017 19:41	WG971208

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 20:13	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 20:13	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 20:13	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 20:13	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 20:13	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 20:13	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 20:13	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 20:13	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 20:13	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 20:13	WG971492
(S) Toluene-d8	*107*		*80.0-120*	*120*		*04/18/2017 20:13*	WG971492
(S) Dibromofluoromethane	*118*		*76.0-123*	*123*		*04/18/2017 20:13*	WG971492
(S) α,α,α-Trifluorotoluene	*98.9*		*80.0-120*	*120*		*04/18/2017 20:13*	WG971492
(S) 4-Bromofluorobenzene	*99.5*		*80.0-120*	*120*		*04/18/2017 20:13*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 10:25	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 10:25	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 10:25	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 10:25	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 10:25	WG971250
Nitrobenzene	ND		0.100	2	1	04/18/2017 10:25	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 10:25	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 10:25	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 10:25	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 10:25	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 10:25	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 10:25	WG971250
(S) 2-Fluorophenol	*43.0*		*10.0-120*	*120*		*04/18/2017 10:25*	WG971250
(S) Phenol-d5	*32.9*		*10.0-120*	*120*		*04/18/2017 10:25*	WG971250
(S) Nitrobenzene-d5	*63.8*		*10.0-126*	*126*		*04/18/2017 10:25*	WG971250
(S) 2-Fluorobiphenyl	*70.4*		*22.0-127*	*127*		*04/18/2017 10:25*	WG971250
(S) 2,4,6-Tribromophenol	*61.8*		*10.0-153*	*153*		*04/18/2017 10:25*	WG971250
(S) p-Terphenyl-d14	*76.0*		*29.0-141*	*141*		*04/18/2017 10:25*	WG971250

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	89.5		1	04/13/2017 15:48	WG970239

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.130	1	04/17/2017 15:00	WG971215

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00400	2	04/16/2017 09:30	WG970328
Acenaphthene	0.0358		0.00400	2	04/16/2017 09:30	WG970328
Acenaphthylene	ND		0.00400	2	04/16/2017 09:30	WG970328
Benzo(a)anthracene	0.00776		0.00400	2	04/16/2017 09:30	WG970328
Benzo(a)pyrene	0.0101		0.00400	2	04/16/2017 09:30	WG970328
Benzo(b)fluoranthene	ND		0.00400	2	04/16/2017 09:30	WG970328
Benzo(g,h,i)perylene	0.00989		0.00400	2	04/16/2017 09:30	WG970328
Benzo(k)fluoranthene	ND		0.00400	2	04/16/2017 09:30	WG970328
Chrysene	0.0171		0.00400	2	04/16/2017 09:30	WG970328
Dibenz(a,h)anthracene	ND		0.00400	2	04/16/2017 09:30	WG970328
Fluoranthene	0.0188		0.00400	2	04/16/2017 09:30	WG970328
Fluorene	0.0641		0.00400	2	04/16/2017 09:30	WG970328
Indeno(1,2,3-cd)pyrene	ND		0.00400	2	04/16/2017 09:30	WG970328
Naphthalene	ND		0.0133	2	04/16/2017 09:30	WG970328
Phenanthrene	0.0899		0.00400	2	04/16/2017 09:30	WG970328
Pyrene	0.0749		0.00400	2	04/16/2017 09:30	WG970328
1-Methylnaphthalene	0.0708		0.0133	2	04/16/2017 09:30	WG970328
2-Methylnaphthalene	0.0422		0.0133	2	04/16/2017 09:30	WG970328
2-Chloronaphthalene	ND		0.0133	2	04/16/2017 09:30	WG970328
(S) p-Terphenyl-d14	*59.3*		*23.0-120*		*04/16/2017 09:30*	WG970328
(S) Nitrobenzene-d5	*27.4*		*14.0-149*		*04/16/2017 09:30*	WG970328
(S) 2-Fluorobiphenyl	*67.1*		*34.0-125*		*04/16/2017 09:30*	WG970328

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	1		4/15/2017 7:52:18 PM	WG970857
Initial pH	7.43		4/15/2017 7:52:18 PM	WG970857
Final pH	6.26		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND	J5 O1	0.0100	0.20	1	04/18/2017 14:26	WG971214

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 20:33	WG971202
Barium	ND		0.100	100	1	04/17/2017 20:33	WG971202
Cadmium	ND		0.100	1	1	04/17/2017 20:33	WG971202
Chromium	ND		0.100	5	1	04/17/2017 20:33	WG971202
Lead	ND		0.100	5	1	04/17/2017 20:33	WG971202
Selenium	ND		0.100	1	1	04/17/2017 20:33	WG971202
Silver	ND		0.100	5	1	04/17/2017 20:33	WG971202

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 20:34	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 20:34	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 20:34	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 20:34	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 20:34	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 20:34	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 20:34	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 20:34	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 20:34	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 20:34	WG971492
(S) Toluene-d8	*107*		*80.0-120*	*120*		*04/18/2017 20:34*	WG971492
(S) Dibromofluoromethane	*119*		*76.0-123*	*123*		*04/18/2017 20:34*	WG971492
(S) α,α,α-Trifluorotoluene	*98.7*		*80.0-120*	*120*		*04/18/2017 20:34*	WG971492
(S) 4-Bromofluorobenzene	*100*		*80.0-120*	*120*		*04/18/2017 20:34*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 10:49	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 10:49	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 10:49	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 10:49	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 10:49	WG971250
Nitrobenzene	ND		0.100	2	1	04/18/2017 10:49	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 10:49	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 10:49	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 10:49	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 10:49	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 10:49	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 10:49	WG971250
(S) 2-Fluorophenol	*42.1*		*10.0-120*	*120*		*04/18/2017 10:49*	WG971250
(S) Phenol-d5	*32.6*		*10.0-120*	*120*		*04/18/2017 10:49*	WG971250
(S) Nitrobenzene-d5	*63.1*		*10.0-126*	*126*		*04/18/2017 10:49*	WG971250
(S) 2-Fluorobiphenyl	*68.9*		*22.0-127*	*127*		*04/18/2017 10:49*	WG971250
(S) 2,4,6-Tribromophenol	*60.0*		*10.0-153*	*153*		*04/18/2017 10:49*	WG971250
(S) p-Terphenyl-d14	*77.2*		*29.0-141*	*141*		*04/18/2017 10:49*	WG971250

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	93.3		1	04/13/2017 15:19	WG970240

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.130	1	04/17/2017 15:01	WG971215

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00200	1	04/16/2017 08:48	WG970328
Acenaphthene	ND		0.00200	1	04/16/2017 08:48	WG970328
Acenaphthylene	ND		0.00200	1	04/16/2017 08:48	WG970328
Benzo(a)anthracene	0.00284		0.00200	1	04/16/2017 08:48	WG970328
Benzo(a)pyrene	ND		0.00200	1	04/16/2017 08:48	WG970328
Benzo(b)fluoranthene	ND		0.00200	1	04/16/2017 08:48	WG970328
Benzo(g,h,i)perylene	0.00346		0.00200	1	04/16/2017 08:48	WG970328
Benzo(k)fluoranthene	ND		0.00200	1	04/16/2017 08:48	WG970328
Chrysene	0.00475		0.00200	1	04/16/2017 08:48	WG970328
Dibenz(a,h)anthracene	ND		0.00200	1	04/16/2017 08:48	WG970328
Fluoranthene	0.00574		0.00200	1	04/16/2017 08:48	WG970328
Fluorene	ND		0.00200	1	04/16/2017 08:48	WG970328
Indeno(1,2,3-cd)pyrene	ND		0.00200	1	04/16/2017 08:48	WG970328
Naphthalene	ND		0.00667	1	04/16/2017 08:48	WG970328
Phenanthrene	0.0213		0.00200	1	04/16/2017 08:48	WG970328
Pyrene	0.0229		0.00200	1	04/16/2017 08:48	WG970328
1-Methylnaphthalene	0.00847		0.00667	1	04/16/2017 08:48	WG970328
2-Methylnaphthalene	ND		0.00667	1	04/16/2017 08:48	WG970328
2-Chloronaphthalene	ND		0.00667	1	04/16/2017 08:48	WG970328
(S) p-Terphenyl-d14	*56.2*		*23.0-120*		*04/16/2017 08:48*	WG970328
(S) Nitrobenzene-d5	*85.3*		*14.0-149*		*04/16/2017 08:48*	WG970328
(S) 2-Fluorobiphenyl	*57.8*		*34.0-125*		*04/16/2017 08:48*	WG970328

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	1		4/15/2017 7:52:18 PM	WG970857
Initial pH	7.42		4/15/2017 7:52:18 PM	WG970857
Final pH	6.26		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 14:53	WG971214

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 20:36	WG971202
Barium	ND		0.100	100	1	04/17/2017 20:36	WG971202
Cadmium	ND		0.100	1	1	04/17/2017 20:36	WG971202
Chromium	ND		0.100	5	1	04/17/2017 20:36	WG971202
Lead	ND		0.100	5	1	04/17/2017 20:36	WG971202
Selenium	ND		0.100	1	1	04/17/2017 20:36	WG971202
Silver	ND		0.100	5	1	04/17/2017 20:36	WG971202

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 20:56	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 20:56	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 20:56	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 20:56	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 20:56	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 20:56	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 20:56	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 20:56	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 20:56	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 20:56	WG971492
(S) Toluene-d8	*108*		*80.0-120*	*120*		*04/18/2017 20:56*	WG971492
(S) Dibromofluoromethane	*117*		*76.0-123*	*123*		*04/18/2017 20:56*	WG971492
(S) α,α,α-Trifluorotoluene	*99.9*		*80.0-120*	*120*		*04/18/2017 20:56*	WG971492
(S) 4-Bromofluorobenzene	*101*		*80.0-120*	*120*		*04/18/2017 20:56*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 11:12	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 11:12	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 11:12	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 11:12	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 11:12	WG971250
Nitrobenzene	ND		0.100	2	1	04/18/2017 11:12	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 11:12	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 11:12	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 11:12	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 11:12	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 11:12	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 11:12	WG971250
(S) 2-Fluorophenol	*40.0*		*10.0-120*	*120*		*04/18/2017 11:12*	WG971250
(S) Phenol-d5	*31.3*		*10.0-120*	*120*		*04/18/2017 11:12*	WG971250
(S) Nitrobenzene-d5	*60.2*		*10.0-126*	*126*		*04/18/2017 11:12*	WG971250
(S) 2-Fluorobiphenyl	*66.0*		*22.0-127*	*127*		*04/18/2017 11:12*	WG971250
(S) 2,4,6-Tribromophenol	*59.6*		*10.0-153*	*153*		*04/18/2017 11:12*	WG971250
(S) p-Terphenyl-d14	*77.6*		*29.0-141*	*141*		*04/18/2017 11:12*	WG971250

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	92.7		1	04/13/2017 15:19	WG970240

Wet Chemistry by Method 9012B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Cyanide	ND		0.130	1	04/17/2017 15:02	WG971215

Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Anthracene	ND		0.00400	2	04/16/2017 09:51	WG970328
Acenaphthene	0.0824		0.00400	2	04/16/2017 09:51	WG970328
Acenaphthylene	0.0118		0.00400	2	04/16/2017 09:51	WG970328
Benzo(a)anthracene	0.0216		0.00400	2	04/16/2017 09:51	WG970328
Benzo(a)pyrene	0.0208		0.00400	2	04/16/2017 09:51	WG970328
Benzo(b)fluoranthene	0.0216		0.00400	2	04/16/2017 09:51	WG970328
Benzo(g,h,i)perylene	0.0207		0.00400	2	04/16/2017 09:51	WG970328
Benzo(k)fluoranthene	ND		0.00400	2	04/16/2017 09:51	WG970328
Chrysene	0.0379		0.00400	2	04/16/2017 09:51	WG970328
Dibenz(a,h)anthracene	ND		0.00400	2	04/16/2017 09:51	WG970328
Fluoranthene	0.0334		0.00400	2	04/16/2017 09:51	WG970328
Fluorene	0.0804		0.00400	2	04/16/2017 09:51	WG970328
Indeno(1,2,3-cd)pyrene	0.00684		0.00400	2	04/16/2017 09:51	WG970328
Naphthalene	0.0517		0.0133	2	04/16/2017 09:51	WG970328
Phenanthrene	0.166		0.00400	2	04/16/2017 09:51	WG970328
Pyrene	0.115		0.00400	2	04/16/2017 09:51	WG970328
1-Methylnaphthalene	0.139		0.0133	2	04/16/2017 09:51	WG970328
2-Methylnaphthalene	0.0673		0.0133	2	04/16/2017 09:51	WG970328
2-Chloronaphthalene	ND		0.0133	2	04/16/2017 09:51	WG970328
(S) p-Terphenyl-d14	*63.8*		*23.0-120*		*04/16/2017 09:51*	WG970328
(S) Nitrobenzene-d5	*123*		*14.0-149*		*04/16/2017 09:51*	WG970328
(S) 2-Fluorobiphenyl	*71.3*		*34.0-125*		*04/16/2017 09:51*	WG970328

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	1		4/15/2017 7:52:18 PM	WG970857
Initial pH	7.18		4/15/2017 7:52:18 PM	WG970857
Final pH	6.30		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 14:56	WG971214

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 20:38	WG971202
Barium	ND		0.100	100	1	04/17/2017 20:38	WG971202
Cadmium	ND		0.100	1	1	04/17/2017 20:38	WG971202
Chromium	ND		0.100	5	1	04/17/2017 20:38	WG971202
Lead	ND		0.100	5	1	04/17/2017 20:38	WG971202
Selenium	ND		0.100	1	1	04/17/2017 20:38	WG971202
Silver	ND		0.100	5	1	04/17/2017 20:38	WG971202

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 21:18	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 21:18	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 21:18	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 21:18	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 21:18	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 21:18	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 21:18	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 21:18	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 21:18	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 21:18	WG971492
(S) Toluene-d8	*106*		*80.0-120*	*120*		*04/18/2017 21:18*	WG971492
(S) Dibromofluoromethane	*120*		*76.0-123*	*123*		*04/18/2017 21:18*	WG971492
(S) α,α,α-Trifluorotoluene	*99.5*		*80.0-120*	*120*		*04/18/2017 21:18*	WG971492
(S) 4-Bromofluorobenzene	*98.5*		*80.0-120*	*120*		*04/18/2017 21:18*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 11:35	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 11:35	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 11:35	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 11:35	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 11:35	WG971250
Nitrobenzene	ND		0.100	2	1	04/18/2017 11:35	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 11:35	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 11:35	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 11:35	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 11:35	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 11:35	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 11:35	WG971250
(S) 2-Fluorophenol	*43.2*		*10.0-120*	*120*		*04/18/2017 11:35*	WG971250
(S) Phenol-d5	*33.6*		*10.0-120*	*120*		*04/18/2017 11:35*	WG971250
(S) Nitrobenzene-d5	*64.9*		*10.0-126*	*126*		*04/18/2017 11:35*	WG971250
(S) 2-Fluorobiphenyl	*70.6*		*22.0-127*	*127*		*04/18/2017 11:35*	WG971250
(S) 2,4,6-Tribromophenol	*60.0*		*10.0-153*	*153*		*04/18/2017 11:35*	WG971250
(S) p-Terphenyl-d14	*78.0*		*29.0-141*	*141*		*04/18/2017 11:35*	WG971250

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	2		4/15/2017 7:52:18 PM	WG970857
Initial pH	8.48		4/15/2017 7:52:18 PM	WG970857
Final pH	5.39		4/15/2017 7:52:18 PM	WG970857

Wet Chemistry by Method 9034-9030B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Reactive Sulfide	1010		25.0	1	04/13/2017 19:35	WG970005

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 15:37	WG971213

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 19:44	WG971208
Barium	ND		0.100	100	1	04/17/2017 19:44	WG971208
Cadmium	ND		0.100	1	1	04/17/2017 19:44	WG971208
Chromium	ND		0.100	5	1	04/17/2017 19:44	WG971208
Lead	ND		0.100	5	1	04/17/2017 19:44	WG971208
Selenium	ND		0.100	1	1	04/17/2017 19:44	WG971208
Silver	ND		0.100	5	1	04/17/2017 19:44	WG971208

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0500	0.50	1	04/18/2017 21:40	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/18/2017 21:40	WG971492
Chlorobenzene	ND		0.0500	100	1	04/18/2017 21:40	WG971492
Chloroform	ND		0.250	6	1	04/18/2017 21:40	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/18/2017 21:40	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/18/2017 21:40	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/18/2017 21:40	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/18/2017 21:40	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/18/2017 21:40	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/18/2017 21:40	WG971492
(S) Toluene-d8	*107*		*80.0-120*	*120*		*04/18/2017 21:40*	WG971492
(S) Dibromofluoromethane	*117*		*76.0-123*	*123*		*04/18/2017 21:40*	WG971492
(S) a,a,a-Trifluorotoluene	*101*		*80.0-120*	*120*		*04/18/2017 21:40*	WG971492
(S) 4-Bromofluorobenzene	*100*		*80.0-120*	*120*		*04/18/2017 21:40*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		0.100	7.50	1	04/18/2017 11:59	WG971250
2,4-Dinitrotoluene	ND		0.100	0.13	1	04/18/2017 11:59	WG971250
Hexachlorobenzene	ND		0.100	0.13	1	04/18/2017 11:59	WG971250
Hexachloro-1,3-butadiene	ND		0.100	0.50	1	04/18/2017 11:59	WG971250
Hexachloroethane	ND		0.100	3	1	04/18/2017 11:59	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Nitrobenzene	ND		0.100	2	1	04/18/2017 11:59	WG971250
Pyridine	ND		0.100	5	1	04/18/2017 11:59	WG971250
3&4-Methyl Phenol	ND		0.100	400	1	04/18/2017 11:59	WG971250
2-Methylphenol	ND		0.100	200	1	04/18/2017 11:59	WG971250
Pentachlorophenol	ND		0.100	100	1	04/18/2017 11:59	WG971250
2,4,5-Trichlorophenol	ND		0.100	400	1	04/18/2017 11:59	WG971250
2,4,6-Trichlorophenol	ND		0.100	2	1	04/18/2017 11:59	WG971250
(S) 2-Fluorophenol	*41.0*		*10.0-120*	*120*		*04/18/2017 11:59*	WG971250
(S) Phenol-d5	*31.5*		*10.0-120*	*120*		*04/18/2017 11:59*	WG971250
(S) Nitrobenzene-d5	*61.7*		*10.0-126*	*126*		*04/18/2017 11:59*	WG971250
(S) 2-Fluorobiphenyl	*68.2*		*22.0-127*	*127*		*04/18/2017 11:59*	WG971250
(S) 2,4,6-Tribromophenol	*61.8*		*10.0-153*	*153*		*04/18/2017 11:59*	WG971250
(S) p-Terphenyl-d14	*71.7*		*29.0-141*	*141*		*04/18/2017 11:59*	WG971250

Preparation by Method 1311

Analyte	Result	Qualifier	Prep date / time	Batch
TCLP Extraction	-		4/15/2017 7:52:18 PM	WG970857
TCLP ZHE Extraction	-		4/17/2017 3:22:27 PM	WG971143
Fluid	1		4/15/2017 7:52:18 PM	WG970857
Initial pH	5.15		4/15/2017 7:52:18 PM	WG970857
Final pH	4.91		4/15/2017 7:52:18 PM	WG970857

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.0100	0.20	1	04/18/2017 14:58	WG971214

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Arsenic	ND		0.100	5	1	04/17/2017 20:41	WG971202
Barium	0.983		0.100	100	1	04/17/2017 20:41	WG971202
Cadmium	ND		0.100	1	1	04/17/2017 20:41	WG971202
Chromium	ND		0.100	5	1	04/17/2017 20:41	WG971202
Lead	ND		0.100	5	1	04/17/2017 20:41	WG971202
Selenium	ND		0.100	1	1	04/17/2017 20:41	WG971202
Silver	ND		0.100	5	1	04/17/2017 20:41	WG971202

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
Benzene	0.968		0.0500	0.50	1	04/19/2017 14:46	WG971492
Carbon tetrachloride	ND		0.0500	0.50	1	04/19/2017 14:46	WG971492
Chlorobenzene	ND		0.0500	100	1	04/19/2017 14:46	WG971492
Chloroform	ND		0.250	6	1	04/19/2017 14:46	WG971492
1,2-Dichloroethane	ND		0.0500	0.50	1	04/19/2017 14:46	WG971492
1,1-Dichloroethene	ND		0.0500	0.70	1	04/19/2017 14:46	WG971492
2-Butanone (MEK)	ND		0.500	200	1	04/19/2017 14:46	WG971492
Tetrachloroethene	ND		0.0500	0.70	1	04/19/2017 14:46	WG971492
Trichloroethene	ND		0.0500	0.50	1	04/19/2017 14:46	WG971492
Vinyl chloride	ND		0.0500	0.20	1	04/19/2017 14:46	WG971492
(S) Toluene-d8	*103*		*80.0-120*	*120*		*04/19/2017 14:46*	WG971492
(S) Dibromofluoromethane	*108*		*76.0-123*	*123*		*04/19/2017 14:46*	WG971492
(S) α,α,α-Trifluorotoluene	*96.8*		*80.0-120*	*120*		*04/19/2017 14:46*	WG971492
(S) 4-Bromofluorobenzene	*94.1*		*80.0-120*	*120*		*04/19/2017 14:46*	WG971492

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
1,4-Dichlorobenzene	ND		2.00	7.50	20	04/18/2017 18:37	WG971250
2,4-Dinitrotoluene	ND		2.00	0.13	20	04/18/2017 18:37	WG971250
Hexachlorobenzene	ND		2.00	0.13	20	04/18/2017 18:37	WG971250
Hexachloro-1,3-butadiene	ND		2.00	0.50	20	04/18/2017 18:37	WG971250
Hexachloroethane	ND		2.00	3	20	04/18/2017 18:37	WG971250
Nitrobenzene	ND		2.00	2	20	04/18/2017 18:37	WG971250
Pyridine	ND		2.00	5	20	04/18/2017 18:37	WG971250
3&4-Methyl Phenol	ND		2.00	400	20	04/18/2017 18:37	WG971250
2-Methylphenol	ND		2.00	200	20	04/18/2017 18:37	WG971250
Pentachlorophenol	ND		2.00	100	20	04/18/2017 18:37	WG971250
2,4,5-Trichlorophenol	ND		2.00	400	20	04/18/2017 18:37	WG971250

Semi Volatile Organic Compounds (GC/MS) by Method 8270C

Analyte	Result mg/l	Qualifier	RDL mg/l	Limit mg/l	Dilution	Analysis date / time	Batch
2,4,6-Trichlorophenol	ND		2.00	2	20	04/18/2017 18:37	WG971250
(S) 2-Fluorophenol	*33.4*	J7	*10.0-120*	*120*		*04/18/2017 18:37*	WG971250
(S) Phenol-d5	*27.0*	J7	*10.0-120*	*120*		*04/18/2017 18:37*	WG971250
(S) Nitrobenzene-d5	*58.4*	J7	*10.0-126*	*126*		*04/18/2017 18:37*	WG971250
(S) 2-Fluorobiphenyl	*62.2*	J7	*22.0-127*	*127*		*04/18/2017 18:37*	WG971250
(S) 2,4,6-Tribromophenol	*34.0*	J7	*10.0-153*	*153*		*04/18/2017 18:37*	WG971250
(S) p-Terphenyl-d14	*63.2*	J7	*29.0-141*	*141*		*04/18/2017 18:37*	WG971250

Sample Narrative:

8270C L901839-12 WG971250: Dilution due to matrix

Method Blank (MB)

(MB) R3210762-1 04/13/17 15:48

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000900			

L901834-12 Original Sample (OS) • Duplicate (DUP)

(OS) L901834-12 04/13/17 15:48 • (DUP) R3210762-3 04/13/17 15:48

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	82.2	82.2	1	0.0320		5

Laboratory Control Sample (LCS)

(LCS) R3210762-2 04/13/17 15:48

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3210760-1 04/13/17 15:19

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00120			

L901839-07 Original Sample (OS) • Duplicate (DUP)

(OS) L901839-07 04/13/17 15:19 • (DUP) R3210760-3 04/13/17 15:19

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	93.3	94.5	1	1.20		5

Laboratory Control Sample (LCS)

(LCS) R3210760-2 04/13/17 15:19

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	99.9	85.0-115	

Method Blank (MB)

(MB) R3210299-1 04/12/17 15:00

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.039	0.130

L901839-01 Original Sample (OS) • Duplicate (DUP)

(OS) L901839-01 04/12/17 15:38 • (DUP) R3210299-4 04/12/17 15:39

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0.0500	1	0	J	20

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

(LCS) R3210299-2 04/12/17 15:02 • (LCSD) R3210299-3 04/12/17 15:03

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 %
Cyanide	2.50	2.42	2.45	97	98	50-150			1	20

L901839-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901839-03 04/12/17 15:41 • (MS) R3210299-5 04/12/17 15:42 • (MSD) R3210299-6 04/12/17 15:44

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 %
Cyanide	3.33	ND	1.70	1.65	51	50	1	75-125	J6	J6	3	20

Method Blank (MB)

(MB) R3211264-1 04/17/17 14:54

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Cyanide	U		0.039	0.130

L902544-01 Original Sample (OS) • Duplicate (DUP)

(OS) L902544-01 04/17/17 15:19 • (DUP) R3211264-4 04/17/17 15:21

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Cyanide	ND	0	1	0		20

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

(LCS) R3211264-2 04/17/17 14:55 • (LCSD) R3211264-3 04/17/17 14:56

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 %
Cyanide	2.50	2.75	2.72	110	109	50-150			1	20

Method Blank (MB)

(MB) WG970005-1 04/13/17 19:35

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Reactive Sulfide	U		7.63	25.0

L902055-01 Original Sample (OS) • Duplicate (DUP)

(OS) L902055-01 04/13/17 19:35 • (DUP) WG970005-4 04/13/17 19:35

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Reactive Sulfide	ND	42.2	1	15.4		20

L902098-16 Original Sample (OS) • Duplicate (DUP)

(OS) L902098-16 04/13/17 19:35 • (DUP) WG970005-5 04/13/17 19:35

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Reactive Sulfide	ND	ND	1	0.000		20

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

(LCS) WG970005-2 04/13/17 19:35 • (LCSD) WG970005-3 04/13/17 19:35

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Reactive Sulfide	100	78.4	84.4	78.4	84.4	70.0-130			7.37	20

Method Blank (MB)

(MB) R3211604-1 04/18/17 15:21

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury	U		0.00333	0.0100

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

(LCS) R3211604-2 04/18/17 15:23 • (LCSD) R3211604-3 04/18/17 15:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Mercury	0.0300	0.0269	0.0272	90	91	80-120			1	20

L901839-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901839-02 04/18/17 15:28 • (MS) R3211604-4 04/18/17 15:30 • (MSD) R3211604-5 04/18/17 15:32

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0283	0.0275	94	92	1	75-125			3	20

Method Blank (MB)

(MB) R3211603-1 04/18/17 14:12

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury	U		0.00333	0.0100

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

(LCS) R3211603-2 04/18/17 14:15 • (LCSD) R3211603-9 04/18/17 15:51

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Mercury	0.0300	0.0281	0.0249	94	83	80-120			12	20

L901839-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901839-06 04/18/17 14:26 • (MS) R3211603-4 04/18/17 14:28 • (MSD) R3211603-5 04/18/17 14:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0554	0.0542	185	181	1	75-125	J5	J5	2	20

L901846-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901846-02 04/18/17 14:33 • (MS) R3211603-6 04/18/17 14:35 • (MSD) R3211603-7 04/18/17 14:38

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.0300	ND	0.0242	0.0258	81	86	1	75-125			6	20

Method Blank (MB)

(MB) R3211355-1 04/17/17 19:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

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

(LCS) R3211355-2 04/17/17 19:54 • (LCSD) R3211355-3 04/17/17 19:57

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	10.3	10.2	103	102	80-120			1	20
Barium	10.0	10.2	10.1	102	101	80-120			1	20
Cadmium	10.0	9.96	9.86	100	99	80-120			1	20
Chromium	10.0	9.72	9.65	97	96	80-120			1	20
Lead	10.0	9.91	9.76	99	98	80-120			2	20
Selenium	10.0	10.4	10.3	104	103	80-120			1	20
Silver	2.00	1.86	1.83	93	92	80-120			1	20

L901826-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901826-01 04/17/17 20:00 • (MS) R3211355-5 04/17/17 20:05 • (MSD) R3211355-6 04/17/17 20:08

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	10.9	10.8	109	108	1	75-125			0	20
Barium	10.0	0.130	10.2	10.2	101	100	1	75-125			1	20
Cadmium	10.0	ND	10.2	10.2	102	102	1	75-125			1	20
Chromium	10.0	ND	9.85	9.78	98	98	1	75-125			1	20
Lead	10.0	ND	10.1	10.0	101	100	1	75-125			1	20
Selenium	10.0	ND	11.0	11.0	110	110	1	75-125			0	20
Silver	2.00	ND	1.91	1.90	95	95	1	75-125			0	20

L901846-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901846-02 04/17/17 20:10 • (MS) R3211355-7 04/17/17 20:13 • (MSD) R3211355-8 04/17/17 20:15

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	10.5	10.5	105	105	1	75-125			1	20
Barium	10.0	ND	10.3	10.3	102	103	1	75-125			1	20
Cadmium	10.0	ND	10.1	10.1	101	101	1	75-125			1	20
Chromium	10.0	ND	9.75	9.82	97	98	1	75-125			1	20
Lead	10.0	ND	9.93	9.99	99	100	1	75-125			1	20
Selenium	10.0	ND	10.5	10.6	105	106	1	75-125			1	20
Silver	2.00	ND	1.88	1.89	94	95	1	75-125			1	20

Method Blank (MB)

(MB) R3211354-1 04/17/17 19:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.0333	0.100
Barium	U		0.0333	0.100
Cadmium	U		0.0333	0.100
Chromium	U		0.0333	0.100
Lead	U		0.0333	0.100
Selenium	U		0.0333	0.100
Silver	U		0.0333	0.100

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

(LCS) R3211354-2 04/17/17 19:25 • (LCSD) R3211354-3 04/17/17 19:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	10.4	10.4	104	104	80-120			0	20
Barium	10.0	10.3	10.3	103	103	80-120			0	20
Cadmium	10.0	10.1	10.1	101	101	80-120			0	20
Chromium	10.0	9.88	9.86	99	99	80-120			0	20
Lead	10.0	10.0	10.0	100	100	80-120			0	20
Selenium	10.0	10.4	10.4	104	104	80-120			0	20
Silver	2.00	1.89	1.89	94	94	80-120			0	20

L901839-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901839-02 04/17/17 19:30 • (MS) R3211354-5 04/17/17 19:36 • (MSD) R3211354-6 04/17/17 19:38

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	10.0	ND	10.9	10.8	109	108	1	75-125			0	20
Barium	10.0	0.110	10.3	10.3	102	102	1	75-125			0	20
Cadmium	10.0	ND	10.3	10.3	103	103	1	75-125			0	20
Chromium	10.0	ND	9.77	9.75	98	98	1	75-125			0	20
Lead	10.0	ND	10.0	10.0	100	100	1	75-125			0	20
Selenium	10.0	ND	11.1	11.0	111	110	1	75-125			0	20
Silver	2.00	ND	1.94	1.93	97	96	1	75-125			0	20

Method Blank (MB)

(MB) R3211625-3 04/18/17 13:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0167	0.0500
Carbon tetrachloride	U		0.0167	0.0500
Chlorobenzene	U		0.0167	0.0500
Chloroform	U		0.0833	0.250
1,2-Dichloroethane	U		0.0167	0.0500
1,1-Dichloroethene	U		0.0167	0.0500
2-Butanone (MEK)	U		0.167	0.500
Tetrachloroethene	U		0.0167	0.0500
Trichloroethene	U		0.0167	0.0500
Vinyl chloride	U		0.0167	0.0500
(S) Toluene-d8	*107*			*80.0-120*
(S) Dibromofluoromethane	*116*			*76.0-123*
(S) a,a,a-Trifluorotoluene	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*101*			*80.0-120*

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

(LCS) R3211625-1 04/18/17 12:27 • (LCSD) R3211625-2 04/18/17 12:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0271	0.0257	108	103	69.0-123			5.20	20
Carbon tetrachloride	0.0250	0.0263	0.0239	105	95.8	63.0-122			9.42	20
Chlorobenzene	0.0250	0.0229	0.0217	91.8	87.0	79.0-121			5.37	20
Chloroform	0.0250	0.0266	0.0254	106	101	72.0-121			4.75	20
1,2-Dichloroethane	0.0250	0.0252	0.0250	101	99.8	67.0-126			1.00	20
1,1-Dichloroethene	0.0250	0.0274	0.0257	109	103	64.0-129			6.10	20
2-Butanone (MEK)	0.125	0.123	0.124	98.7	98.9	37.0-158			0.170	20
Tetrachloroethene	0.0250	0.0207	0.0192	82.8	77.0	70.0-127			7.22	20
Trichloroethene	0.0250	0.0255	0.0248	102	99.0	78.0-120			3.10	20
Vinyl chloride	0.0250	0.0285	0.0270	114	108	64.0-133			5.48	20
(S) Toluene-d8				*106*	*105*	*80.0-120*				
(S) Dibromofluoromethane				*116*	*116*	*76.0-123*				
(S) a,a,a-Trifluorotoluene				*99.5*	*98.4*	*80.0-120*				
(S) 4-Bromofluorobenzene				*100*	*99.5*	*80.0-120*				

L902119-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L902119-02 04/19/17 15:25 • (MS) R3212007-1 04/19/17 16:04 • (MSD) R3212007-2 04/19/17 16:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	1.25	ND	1.21	1.22	93.8	94.1	1	34.0-147			0.290	20
Carbon tetrachloride	1.25	ND	1.17	1.19	93.3	95.5	1	41.0-138			2.26	20
Chlorobenzene	1.25	ND	1.08	1.07	86.7	85.9	1	52.0-141			0.910	20
Chloroform	1.25	ND	1.19	1.19	95.4	95.2	1	50.0-139			0.180	20
1,2-Dichloroethane	1.25	ND	1.26	1.23	101	98.6	1	47.0-141			2.10	20
1,1-Dichloroethene	1.25	ND	1.07	1.06	85.3	85.0	1	31.0-148			0.420	20
2-Butanone (MEK)	6.25	ND	3.83	5.79	61.3	92.6	1	12.0-149		J3	40.7	24
Tetrachloroethene	1.25	ND	1.04	1.07	82.8	85.1	1	38.0-147			2.62	20
Trichloroethene	1.25	ND	1.09	1.10	86.8	87.8	1	32.0-156			1.18	20
Vinyl chloride	1.25	ND	1.26	1.19	101	95.5	1	24.0-153			5.47	20
(S) Toluene-d8					*103*	*103*		*80.0-120*				
(S) Dibromofluoromethane					*108*	*109*		*76.0-123*				
(S) a,a,a-Trifluorotoluene					*98.3*	*98.4*		*80.0-120*				
(S) 4-Bromofluorobenzene					*97.1*	*95.3*		*80.0-120*				

Method Blank (MB)

(MB) R3211797-3 04/18/17 08:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,4-Dichlorobenzene	U		0.0333	0.100
2,4-Dinitrotoluene	U		0.0333	0.100
Hexachlorobenzene	U		0.0333	0.100
Hexachloro-1,3-butadiene	U		0.0333	0.100
Hexachloroethane	U		0.0333	0.100
Nitrobenzene	U		0.0333	0.100
Pyridine	U		0.0333	0.100
2-Methylphenol	U		0.0333	0.100
3&4-Methyl Phenol	U		0.0333	0.100
Pentachlorophenol	U		0.0333	0.100
2,4,5-Trichlorophenol	U		0.0333	0.100
2,4,6-Trichlorophenol	U		0.0333	0.100
(S) Nitrobenzene-d5	*61.7*			*10.0-126*
(S) 2-Fluorobiphenyl	*68.8*			*22.0-127*
(S) p-Terphenyl-d14	*83.8*			*29.0-141*
(S) Phenol-d5	*33.7*			*10.0-120*
(S) 2-Fluorophenol	*42.7*			*10.0-120*
(S) 2,4,6-Tribromophenol	*66.1*			*10.0-153*

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

(LCS) R3211797-1 04/18/17 08:05 • (LCSD) R3211797-2 04/18/17 08:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.0500	0.0274	0.0306	54.8	61.2	26.0-120			11.1	30
2,4-Dinitrotoluene	0.0500	0.0373	0.0411	74.5	82.1	47.0-127			9.71	21
Hexachlorobenzene	0.0500	0.0370	0.0393	74.1	78.5	41.0-124			5.84	21
Hexachloro-1,3-butadiene	0.0500	0.0298	0.0321	59.5	64.3	26.0-120			7.66	31
Hexachloroethane	0.0500	0.0271	0.0302	54.2	60.3	22.0-120			10.7	34
Nitrobenzene	0.0500	0.0267	0.0300	53.5	60.0	31.0-120			11.5	28
Pyridine	0.0500	0.00886	0.00956	17.7	19.1	10.0-120			7.62	39
2-Methylphenol	0.0500	0.0261	0.0294	52.2	58.8	26.0-120			11.9	27
3&4-Methyl Phenol	0.0500	0.0286	0.0322	57.3	64.3	27.0-120			11.6	28
Pentachlorophenol	0.0500	0.0286	0.0308	57.1	61.5	20.0-126			7.39	32
2,4,5-Trichlorophenol	0.0500	0.0327	0.0358	65.4	71.7	44.0-124			9.20	24
2,4,6-Trichlorophenol	0.0500	0.0330	0.0350	66.0	69.9	40.0-122			5.86	24
(S) Nitrobenzene-d5				*58.6*	*64.7*	*10.0-126*				
(S) 2-Fluorobiphenyl				*69.7*	*74.5*	*22.0-127*				
(S) p-Terphenyl-d14				*77.9*	*84.8*	*29.0-141*				

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

(LCS) R3211797-1 04/18/17 08:05 • (LCSD) R3211797-2 04/18/17 08:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
(S) Phenol-d5				*32.7*	*37.3*	*10.0-120*				
(S) 2-Fluorophenol				*42.4*	*48.0*	*10.0-120*				
(S) 2,4,6-Tribromophenol				*78.5*	*82.5*	*10.0-153*				

L901839-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901839-02 04/18/17 09:15 • (MS) R3211797-4 04/18/17 09:38 • (MSD) R3211797-5 04/18/17 10:02

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
1,4-Dichlorobenzene	0.500	ND	0.257	0.285	51.4	57.0	1	12.0-125			10.4	23
2,4-Dinitrotoluene	0.500	ND	0.384	0.380	76.9	76.0	1	30.0-156			1.09	29
Hexachlorobenzene	0.500	ND	0.374	0.369	74.7	73.7	1	29.0-144			1.31	33
Hexachloro-1,3-butadiene	0.500	ND	0.284	0.306	56.9	61.2	1	18.0-122			7.30	35
Hexachloroethane	0.500	ND	0.258	0.290	51.6	58.1	1	12.0-120			11.9	36
Nitrobenzene	0.500	ND	0.268	0.275	53.5	55.0	1	14.0-134			2.78	32
Pyridine	0.500	ND	0.0927	0.101	18.5	20.1	1	10.0-120			8.11	40
2-Methylphenol	0.500	ND	0.263	0.276	52.5	55.2	1	14.0-120			4.94	29
3&4-Methyl Phenol	0.500	ND	0.288	0.300	57.6	60.0	1	13.0-124			4.08	26
Pentachlorophenol	0.500	ND	0.308	0.306	61.6	61.3	1	10.0-160			0.590	40
2,4,5-Trichlorophenol	0.500	ND	0.343	0.347	68.5	69.3	1	15.0-160			1.20	27
2,4,6-Trichlorophenol	0.500	ND	0.337	0.339	67.3	67.7	1	10.0-153			0.600	29
(S) Nitrobenzene-d5					*57.2*	*60.2*		*10.0-126*				
(S) 2-Fluorobiphenyl					*70.7*	*70.1*		*22.0-127*				
(S) p-Terphenyl-d14					*80.6*	*79.1*		*29.0-141*				
(S) Phenol-d5					*31.5*	*34.2*		*10.0-120*				
(S) 2-Fluorophenol					*38.9*	*43.8*		*10.0-120*				
(S) 2,4,6-Tribromophenol					*77.3*	*77.7*		*10.0-153*				

Method Blank (MB)

(MB) R3211179-3 04/16/17 02:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.000600	0.00200
Acenaphthene	U		0.000600	0.00200
Acenaphthylene	U		0.000600	0.00200
Benzo(a)anthracene	U		0.000600	0.00200
Benzo(a)pyrene	U		0.000600	0.00200
Benzo(b)fluoranthene	U		0.000600	0.00200
Benzo(g,h,i)perylene	U		0.000600	0.00200
Benzo(k)fluoranthene	U		0.000600	0.00200
Chrysene	U		0.000600	0.00200
Dibenz(a,h)anthracene	U		0.000600	0.00200
Fluoranthene	U		0.000600	0.00200
Fluorene	U		0.000600	0.00200
Indeno(1,2,3-cd)pyrene	U		0.000600	0.00200
Naphthalene	U		0.00200	0.00667
Phenanthrene	U		0.000600	0.00200
Pyrene	U		0.000600	0.00200
1-Methylnaphthalene	U		0.00200	0.00667
2-Methylnaphthalene	U		0.00200	0.00667
2-Chloronaphthalene	U		0.00200	0.00667
(S) p-Terphenyl-d14	*82.9*			*23.0-120*
(S) Nitrobenzene-d5	*91.8*			*14.0-149*
(S) 2-Fluorobiphenyl	*83.5*			*34.0-125*

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

(LCS) R3211179-1 04/16/17 02:13 • (LCSD) R3211179-2 04/16/17 02:35

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 %
Anthracene	0.0800	0.0675	0.0748	84.3	93.5	50.0-125			10.3	20
Acenaphthene	0.0800	0.0704	0.0741	88.0	92.6	52.0-120			5.18	20
Acenaphthylene	0.0800	0.0682	0.0713	85.2	89.1	51.0-120			4.39	20
Benzo(a)anthracene	0.0800	0.0709	0.0741	88.7	92.7	46.0-121			4.38	20
Benzo(a)pyrene	0.0800	0.0712	0.0736	89.0	92.0	42.0-121			3.32	20
Benzo(b)fluoranthene	0.0800	0.0694	0.0720	86.8	89.9	42.0-123			3.60	20
Benzo(g,h,i)perylene	0.0800	0.0651	0.0674	81.4	84.3	43.0-128			3.45	20
Benzo(k)fluoranthene	0.0800	0.0749	0.0762	93.6	95.3	45.0-128			1.72	20
Chrysene	0.0800	0.0735	0.0766	91.9	95.8	48.0-127			4.16	20
Dibenz(a,h)anthracene	0.0800	0.0661	0.0674	82.7	84.3	43.0-132			1.98	20
Fluoranthene	0.0800	0.0815	0.0866	102	108	49.0-129			6.11	20

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

(LCS) R3211179-1 04/16/17 02:13 • (LCSD) R3211179-2 04/16/17 02:35

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 %
Fluorene	0.0800	0.0728	0.0771	91.0	96.4	50.0-120			5.71	20
Indeno(1,2,3-cd)pyrene	0.0800	0.0682	0.0696	85.2	87.0	44.0-131			2.13	20
Naphthalene	0.0800	0.0652	0.0680	81.5	85.0	50.0-120			4.16	20
Phenanthrene	0.0800	0.0685	0.0724	85.6	90.5	48.0-120			5.53	20
Pyrene	0.0800	0.0661	0.0689	82.6	86.1	48.0-135			4.16	20
1-Methylnaphthalene	0.0800	0.0724	0.0769	90.5	96.2	52.0-122			6.13	20
2-Methylnaphthalene	0.0800	0.0691	0.0730	86.4	91.3	52.0-120			5.50	20
2-Chloronaphthalene	0.0800	0.0697	0.0730	87.1	91.3	50.0-120			4.70	20
(S) p-Terphenyl-d14				*74.5*	*81.5*	*23.0-120*				
(S) Nitrobenzene-d5				*93.6*	*105*	*14.0-149*				
(S) 2-Fluorobiphenyl				*79.1*	*87.5*	*34.0-125*				

L901819-22 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L901819-22 04/16/17 05:42 • (MS) R3211179-4 04/16/17 06:02 • (MSD) R3211179-5 04/16/17 06:23

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Anthracene	0.0933	ND	0.0569	0.0592	61.0	63.5	1	20.0-136			3.97	24
Acenaphthene	0.0933	ND	0.0578	0.0633	62.0	67.8	1	29.0-124			9.01	20
Acenaphthylene	0.0933	ND	0.0612	0.0651	65.6	69.8	1	35.0-120			6.31	20
Benzo(a)anthracene	0.0933	ND	0.0521	0.0633	55.8	67.8	1	13.0-132			19.4	27
Benzo(a)pyrene	0.0933	ND	0.0553	0.0633	59.3	67.9	1	14.0-138			13.6	27
Benzo(b)fluoranthene	0.0933	ND	0.0408	0.0557	43.7	59.7	1	10.0-129			30.9	31
Benzo(g,h,i)perylene	0.0933	ND	0.0438	0.0552	47.0	59.2	1	10.0-133			23.0	30
Benzo(k)fluoranthene	0.0933	ND	0.0636	0.0693	68.2	74.3	1	15.0-131			8.50	27
Chrysene	0.0933	ND	0.0652	0.0696	69.9	74.7	1	15.0-137			6.59	25
Dibenz(a,h)anthracene	0.0933	ND	0.0572	0.0641	61.3	68.7	1	15.0-132			11.4	27
Fluoranthene	0.0933	ND	0.0513	0.0682	54.1	72.1	1	13.0-139		J3	28.2	28
Fluorene	0.0933	ND	0.0554	0.0636	59.4	68.2	1	27.0-122			13.8	22
Indeno(1,2,3-cd)pyrene	0.0933	ND	0.0501	0.0600	53.8	64.4	1	11.0-133			18.0	29
Naphthalene	0.0933	0.157	0.226	0.236	73.9	84.9	1	18.0-136			4.42	21
Phenanthrene	0.0933	ND	0.0482	0.0589	51.7	63.2	1	15.0-133			19.9	25
Pyrene	0.0933	ND	0.0402	0.0527	43.1	56.5	1	11.0-146			27.0	29
1-Methylnaphthalene	0.0933	ND	0.0848	0.0874	72.8	75.6	1	24.0-137			2.96	22
2-Methylnaphthalene	0.0933	0.0317	0.0967	0.0997	69.7	72.9	1	23.0-136			3.01	22
2-Chloronaphthalene	0.0933	ND	0.0607	0.0655	65.1	70.2	1	36.0-120			7.55	20
(S) p-Terphenyl-d14					*58.7*	*61.4*		*23.0-120*				
(S) Nitrobenzene-d5					*99.0*	*103*		*14.0-149*				
(S) 2-Fluorobiphenyl					*61.4*	*68.3*		*34.0-125*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

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		

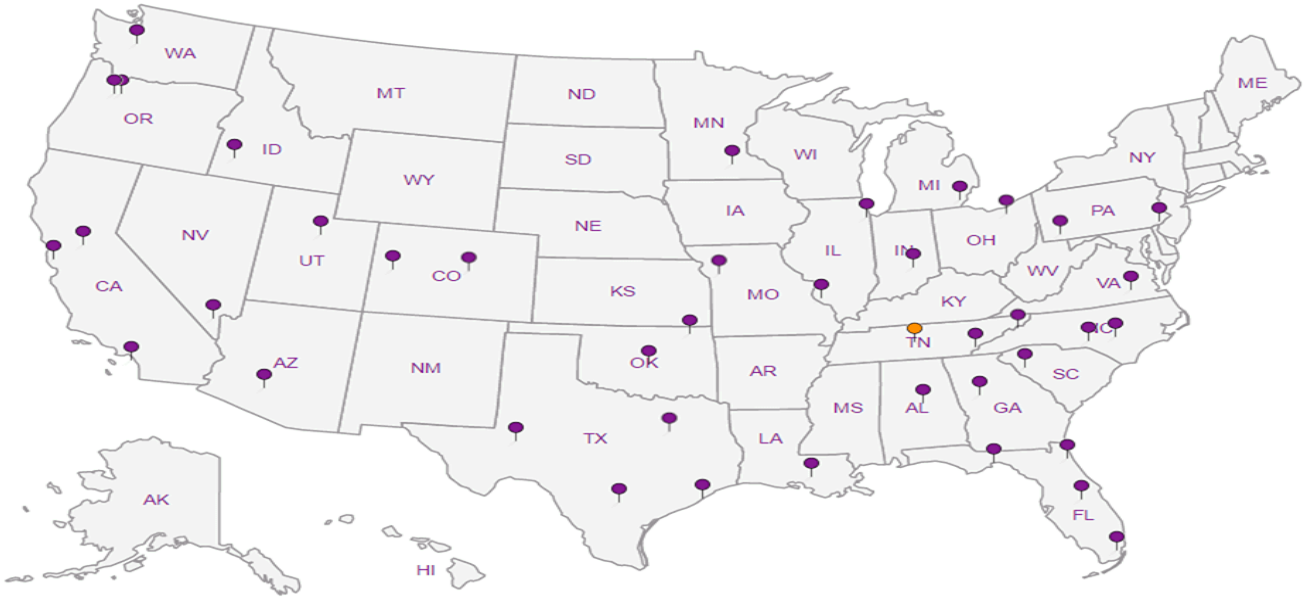
Third Party & Federal Accreditations

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.**



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Pres Chk

Report to: **Matt Turner**

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

Project Description: **WWTP K051; Sulfur Roll-Off Box; Carbon Vent Drum Sampling**

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	TCLP RCRA Metals	TCLP RCRA VOCs	TCLP RCRA SVOCs	PAH	Cyanide							Remarks	Sample # (lab only)
S-1	Grab	SS	2"	4-10-17	11:15	3	X	X	X	X	X								-01/.02
S-2	Grab	SS	2"	4-10-17	11:15	3	X	X	X	X	X								-03/.04
S-3	Grab	SS	2"	4-10-17	11:15	3	X	X	X	X	X								-05/.06

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# L901839
L032
T

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 # 7945 4572 0872

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)	Trip Blank Received: Yes (No) HCL / MeoH TBR
	4-10-17	15:07		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.7 °C Bottles Received: 9
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4-11-17 Time: 0845
			Marina Malone	Hold: Condition: NCF / OK

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: **WWTP K051; Sulfur Roll-Off Box; Carbon Vent Drum Sampling**

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	TCLP RCRA Metals	TCLP RCRA VOCs	TCLP RCRA SVOCs	PAH	Cyanide	Reactive Sulfides	Remarks	Sample # (lab only)
S-4	Grab	SS	2"	4-10-17	11:22	3	X	X	X	X	X			-07/-08
S-5	Grab	SS	2"	4-10-17	11:22	3	X	X	X	X	X			-09/-10
Sulfur Box	Grab	OT		4-10-17	13:11	1	X	X	X			X		-11
Carbon Vent Drum	Grab	F	1"	4-10-17	13:25	2	X	X	X					-12

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

Remarks:

pH ____ Temp ____
Flow ____ Other ____

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

Tracking # 7215 4522 4522 0861

Relinquished by : (Signature) — Date: 4-10-17 — Time: 15:07 — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received for lab by: (Signature) — Date: 4-11-17 — Time: 8:45

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 5.4 / 1.7 °C Bottles Received: 9

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

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

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Fax: 615-758-5859

L# L901868 TD
K043

Acctnum: MUROILSWI
Template: L901839
Prelogin:
TSR: John Hawkins (341)
PB:
Shipped Via: