J-15 PIPELINE LEAK SITE INVESTIGATION
LONG RIDGE
GARFIELD COUNTY, COLORADO

Prepared for:

Mr. Jon Armstrong
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1.0 INTRODUCTION

Nicholson GeoSolutions LLC was retained by Berry Petroleum Company to conduct additional site investigation at the site of a produced water/condensate leak near the J-15 well pad on Long Ridge, Garfield County, Colorado. About 50 barrels of produced water and condensate were reported to be lost underground from a pipeline that runs along the main road on Long Ridge to the J-J-15 well pad.

1.1 Previous Investigations

1.1.1 Soil Investigations

Upon discovery of the leak, an excavation contractor was immediately mobilized to the site to begin excavation of impacted soils. Nicholson GeoSolutions initially inspected the site on April 8th, 2020. The results of the inspection and sampling conducted at that time were provided in the letter report dated April 21st, 2020. Excavation of the spill area was conducted prior to the inspection and extended into bedrock about 8-10 feet. Impacted soil and rock was stored on plastic sheeting in a bermed area on the J-15 well pad. During the inspection the perimeter of the excavation was mapped using a hand-held GPS unit and a photoionization detector (PID) was used to screen the walls and floor of the excavation to select sampling locations. PID readings ranged from 0.0-1.9 ppm for the east wall, 1.0-3.4 ppm for the north wall, 10-59 ppm for the west wall, and 3.0-587 ppm for the floor of the excavation.

Seven discrete soil samples were collected to evaluate compliance with COGCC standards at levels below the elevation of the pipelines. Soil samples were analyzed for Total Volatile Petroleum Hydrocarbons (TVPH – gasoline range), Total Extractable Petroleum Hydrocarbons (TEPH – diesel and motor oil range), BTEX (benzene, toluene, ethylbenzene, and xylenes), sodium adsorption ratio (SAR), pH, and conductivity. Total TPH exceeded the standard of 500 mg/kg for three of these samples.

Subsequent to this sampling event, additional excavation was conducted on the northwest and west walls and the excavation was deepened by about 3-4 feet in the northern portion of the excavation and by about 2 feet across the remaining area. Seven additional discrete soil samples were collected on May 4th, 2020 and reported in the letter report dated May 13th, 2020. Two samples were collected from the same locations as previous samples and analyzed for total metals and PAHs to complete the suite of Table 910-1 analyses for these sample locations. All other samples were analyzed for TVPH, TEPH, BTEX, SAR, pH, conductivity, metals, and PAHs. TPH ranged from 80.8 mg/kg to 3,615 mg/kg for these samples and exceeded the standard of 500 mg/kg for the floor of the excavation. Further excavation was not feasible because of the hard sandstone bedrock encountered.

1.1.2 Initial Groundwater Investigation

One monitoring well was installed on the south side of the soil impact zone on July 20th, 2020 as described in the letter report dated September 15th, 2020. The total depth of well was measured at 60.40 feet from the top of the casing and the water level was 49.73 feet. Approximately 11 inches of condensate liquid was present on top of the water column. One water sample was collected from the well from below the condensate layer and analyzed for TVPH, TEPH, Total Dissolved Solids (TDS),

chloride, sulfate, sodium, methanol, ethanol, and VOCs. Table 1 provides the analytical results for the initial water sample. The laboratory analytical report is contained in Appendix A.

Gasoline-range TPH was reported at 55.9 mg/l and diesel-range TPH was reported at 42.6 mg/l for the initial sample. Benzene (3.43 mg/l), toluene (10.9), TDS (907 mg/l), and chloride (1,270 mg/l) exceeded the Table 910-1 standards for this sample. In addition, dissolved sodium (655 mg/l) and ethanol (9.86 mg/l) were also reported. All of these compounds are indicative of natural gas condensate liquids and produced water.

Table 1 MW-1 Initial Water Sample Results – August 31, 2020

Parameter	COGCC Table 910-1 Standards	J15-W-2 (Aug 31, 2020)
TDS	450[1]	**907**
dissolved sodium (mg/l)		655
chloride (mg/l)	4.0[1]	**1,270**
total petroleum hydrocarbons – gasoline range		55.9
total petroleum hydrocarbons – diesel range		42.6
benzene	0.005	**3.43**
toluene	1.0	**10.9**
ethylbenzene	0.7	0.426
xylenes	10	9.12
methanol		<1.0
ethanol		9.86

All values in mg/l Values in bold type exceed standards
[1]1.25x the background concentration given in Table 4

1.1.3 Field Reconnaissance

A field reconnaissance of the prominent drainage that extends to the south from the leak site and the upper reaches of the East Fork of Parachute Creek was conducted on August 31st, 2020. The purpose of the reconnaissance was to inspect the drainage for seeps or springs that may represent discharge of the spill water at lower elevations and to collect samples of any discharge water encountered. The entire drainage was inspected down to the cliff face above the East Fork. No springs or evidence of seeps was observed. The upper East Fork and the area near Ben Good Creek were also inspected. Ben Good Creek and the East Fork were both dry.

2.0 DRILLING AND SAMPLING PROCEDURES

Drilling was conducted using a Failing Speedstar truck-mounted air rotary drill rig by Artesian Services, Inc. of Grand Junction, Colorado on two occasions with oversight from Nicholson GeoSolutions. One monitoring well was installed during the first drilling event conducted on July 20th, 2020 as described in Section 1.2.2 above.

The drill rig was remobilized to the site on November 13th, 2020. Six additional borings were drilled and converted into monitoring wells during the period November 16-18, 2020. The locations of the wells are shown on Figure 1.

2.1 Lithologic Logging

Lithlogic logging was conducted during drilling by Nicholson GeoSolutions. Logging included observations of rock type, moisture content, fractures, and the presence of odors or soil staining. Borings MW-1 and MW-2 were cored for the first 40 feet. For all other borings and the interval between 40 ft and 60 ft bgs in wells MW-1 and MW-2, cuttings were used for logging purposes. The boring logs are provided in Appendix B.

2.2 PID Screening

The core and cuttings were screened with a PID to detect volatile organic vapors. PID readings ranged from 0.0 ppm to 111 ppm for the seven borings and were generally highest between 25 and 40 feet bgs.

2.3 Well Construction

Monitoring wells were installed in all seven borings whether water was present or not. Five wells were constructed using 4" PVC casing and screen (0.01" slots) to allow for the conversion of the well to an extraction well. Two other wells (MW-6 and MW-7) were constructed using 2" PVC. Well MW-2 was completed using 40 feet of well screen and all other wells contain 20 feet of screen. The casing was assembled and lowered into the boring using the wireline on the drill rig. A filter pack consisting of 10-20 silica sand was placed from the total depth of the well to various levels above the well screen. Bentonite (3/8" chips) was installed above the filter pack to 2 feet bgs. A concrete seal was placed in the upper two feet of the boring to complete the well. All wells were extended approximately 20 feet below the observed impact zone to provide a sump to collect water for extraction. Table 2 provides the monitoring well construction details.

Table 2 Monitoring Well Construction Details

Well ID	Well Diameter	Total Depth (ft bgs)	Screened Interval (ft bgs)	Top of Sand (ft bgs)	Easting	Northing	Approximate Elevation (ft amsl)
MW-1	4”	60.4	40.0-60.0	30.0	39.60975	108.03842	8,365.4
MW-2	4”	62.0	19.0-59.0	14.0	39.60979	108.03838	8,366.2
MW-3	4”	60.8	40.0-60.0	20.0	39.60960	108.03852	8,360.6
MW-4	4”	60.2	40.0-60.0	20.0	39.60970	108.03822	8,366.2
MW-5	4”	60.0	40.0-60.0	20.0	39.60977	108.03859	8,363.0
MW-6	2”	60.0	40.0-60.0	20.0	39.60978	108.03883	8,362.2
MW-7	2”	60.0	40.0-60.0	20.0	39.60977	108.03883	8,362.7

2.4 Water Sampling

Water samples were collected from wells MW-1, MW-4, and MW-5 on November 18th, 2020. Excessive condensate in well MW-2 prevented the collection of a sample from this well. Prior to water sampling, measurements of pH, SC, and T were made using a combination meter. The measurements were made by placing the probes for the meter into the sample, allowing the readings to stabilize, and recording the results. Samples were collected into new, pre-preserved sample containers provided by the laboratory. The sample bottles were labeled, placed in plastic zip-lock bags or bubble wrap, and placed immediately on ice in a cooler. The samples were shipped to the Pace Analytical National Laboratory in Mt. Juliet, Tennessee for analysis. Chain-of-custody procedures were followed during collection and shipping of the samples. The laboratory report is included in Appendix A.

Laboratory analyses consisted of all parameters for COGCC Table 910-1 and Rule 609, with the exception of microbial analyses and propane, which was inadvertently not analyzed by the laboratory. Water analyses included the following: BTEX and VOCs by EPA Method 8260B; SVOCs and PAHs by EPA Method 8270C; total metals by EPA Method 6010B and 6020; bromide, chloride, fluoride, nitrate, nitrite, and sulfate by EPA Method 9056A; nitrate-nitrite by EPA Method 353.2; alkalinity by EPA Method 2320B; ammonia by EPA Method 350.1; total dissolved solids (TDS) by EPA Method 2540C; total phosphorous by EPA Method 365.4; methane, ethane, and ethene by Method RSK-175M; and TPH (diesel and gasoline range) by EPA Method 8015.

2.5 Soil Sampling

One composite sample was collected from the landfarm on the J-15 well pad on November 18th, 2020. The sample was composited from 8 subsamples collected at depths of about 8-12 inches from locations distributed evenly across the surface of the landfarm. This sample was analyzed for TVPH, TEPH, SAR, pH, conductivity, metals, and PAHs to evaluate compliance with the COGCC Table 910-1 standards and further treatment needs. BTEX compounds (benzene, toluene, ethylbenzene, and xylenes) were inadvertently not analyzed. The laboratory report for this sample is included in Appendix A.

2.6 Soil Amendment and Backfilling

Soil sampling conducted in the excavation showed that impacted soil and rock was still present in the floor of the excavation. To provide treatment of the residual petroleum constituents in fractures

beneath the excavation, 1,100 pounds of an oxidizing compound (sodium percarbonate) was applied to the floor of the excavation. Clean water was used to flush the oxidizing compound into the fractures in the Uinta Formation. The oxidizing compound will thus be delivered to the same fractures that allowed the spill to penetrate the sandstone and will chemically oxidize the residual petroleum constituents in the fractures. The northern portion of the excavation was backfilled with clean fill to protect the pipeline during the winter.

3.0 INVESTIGATION RESULTS

Seven soil borings were drilled and completed as wells MW-1 through MW-7 as shown on Figure 1. Wells MW-3, MW-6, and MW-7 are currently dry.

3.1 Drilling Observations

Lithologic logging indicated that all of the materials drilled belong to the Uinta Formation and are composed mainly of hard sandstone. Water is contained only within the fractures in the sandstone and the sandstone matrix was dry within the cored intervals of MW-1 and MW-2. For boring MW-1, the impacted interval, as determined by PID readings, visual observations, odors, and soil staining, was from approximately 6 feet to 32 feet bgs. The impacted interval in boring MW-2 is from approximately 14 feet to 36 feet bgs. The drillers reported odors from borings MW-4 and MW-5 at approximately 30-40 feet bgs.

Several partings about one inch thick were observed in boring MW-2 between 14 and 25 feet bgs and correspond to the impacted interval. Fracture apertures appeared to become tighter with depth which likely has caused the spill fluids to be trapped within the sandstone. Figure 2 shows the estimated lateral extents of water and condensate within the subsurface. Sampling observations suggest that the movement of condensate has been retarded with respect to the produced water. Condensate has a higher surface tension than water and could therefore be expected to move more slowly through a fractured bedrock environment.

3.2 Water Sampling Results

Analytical results for the three water samples collected on November 18th, 2020 are provided in Table 3. Figure 3 shows the analytical results for TPH and benzene and Figure 4 shows the results for TDS, chloride, and sodium. Gasoline-range TPH ranged from 73.7 mg/l to 2,270 mg/l showing the influence of condensate free product on the results. Benzene, toluene, TDS, and chloride exceeded the Table 910-1 standards for all three samples, and xylenes exceeded the standard for two samples. In addition, dissolved sodium was also elevated above background levels. The results indicate that the fluids are composed entirely of natural gas condensate liquids and produced water.

Table 3 Water Sampling Results – November 18, 2020

Parameter	COGCC Table 910-1 Standards	MW-1	MW-4	MW-5
Field Parameters				
sp. conductance (µS/cm)		10,260	2,730	4,910
pH (standard units)		6.92	7.73	7.28
temperature (°C)		9.4	8.9	9.4
Table 910-1 Parameters				
benzene	0.005	**3.08**	**3.12**	**1.45**
toluene	1.0	**12.0**	**14.8**	**6.27**
ethylbenzene	0.7	0.583	0.802	0.534
xylenes	10	**14.4**	**12.8**	5.84
TDS	450[1]	**8,920**	**1,700**	**3,530**
chloride	4.0[1]	**3,550**	**673**	**1,570**
sulfate	90[1]	7.82	<5.0	<5.0
Rule 609 Parameters				
bicarbonate alkalinity		562	381	488
carbonate alkalinity		<20	<20	<20
bromide		22.0	3.58	8.60
fluoride		<0.15	<0.15	<0.15
nitrate		<0.1	<0.1	<0.1
nitrite		<0.1 UJ	<0.1 UJ	<0.1 UJ
nitrate-nitrite		<0.1	<0.1	<0.1
total phosphorous		0.666	0.589	0.201
barium		5.22	0.917	1.63
boron		0.856	<0.2	0.432
calcium		829	230	394
iron		3.74	6.02	0.522
magnesium		189	73.4	106
manganese		10.8	1.90	4.38
potassium		<10	2.63	3.16
Selenium		<0.01	<0.002	<0.002
sodium		1,130	217	562
strontium		10.5	2.30	5.02
methane		0.779	0.0246	10.6
ethane		<0.013	<0.013	<0.013
ethene		<0.013	<0.013	<0.013
total petroleum hydrocarbons – gasoline range		2,270	290	73.7
total petroleum hydrocarbons – diesel range		37.0	11.8	1.69
VOCs 8260B				
acetone		<25	<25	6.18
Isopropylbenzene		<0.5	<0.5	0.0456
n-propylbenzene		<0.5	<0.5	0.046
1,2,4-trimethylbenzene		2.79	1.36	0.933
1,2,3 -trimethylbenzene		<0.5	<0.5	0.148
1,3,5-trimethylbenzene		2.59	1.15	0.728
SVOCs 8270C				
naphthalene		0.0769	0.0497	0.0438
fluorene		<0.02	0.00165	<0.001
2,4-dimethylphenol		<0.2	<0.01	0.0409

All units in mg/l except where indicated UJ = Estimated detection limit uS/cm = microSiemens per centimeter

[1]1.25x the background concentration given in Table 4

3.2.1 Inorganic Parameters

The water sampling results show elevated levels of inorganic parameters, including chloride, sodium, TDS, and other parameters as compared to background groundwater in the area. Table 4 provides the most recent groundwater analyses for Spring 21-1, located southwest of the site on Long Ridge. The results for Spring 21-1 show much smaller concentrations of chloride, sodium, and TDS, and higher sulfate, as compared to the leaked fluids.

Table 4 Long Ridge Spring 21-1 Water Sample Results

Parameter	Spring 21-1 (June 10, 2011)
Field Parameters	
sp. conductance (µS/cm)	615
pH (standard units)	6.16
temperature (°C)	20.3
Table 910-1 Parameters	
TDS	360
chloride	3.2
sulfate	72
benzene	<0.005
toluene	<0.05
ethylbenzene	<0.005
xylenes	<0.015
Rule 609 Parameters	
methane	<0.01
ethane	<0.013
ethene	<0.013
bromide	<1.0
calcium	50.0
magnesium	24.0
potassium	<0.5
sodium	53.0
ammonia	<0.1 UJ
fluoride	0.16
nitrate	<0.1
nitrite	<0.1
bicarbonate alkalinity	250 J
carbonate alkalinity	<20.0
aluminum	1.10
arsenic	0.047
barium	0.86
boron	<2.0
chromium	<0.02
copper	<0.02
iron	<1.0
lead	<0.001
manganese	<0.01
nickel	<0.001
selenium	0.019
zinc	<0.01

All units in mg/l except where indicated J = Estimated Value UJ = Estimated detection limit

3.2.2 Organic Parameters

The water sampling results also show elevated levels of petroleum-related parameters, including TPH, BTEX, and several VOCs. Table 5 provides the most recent produced water analyses for the P-32 water facility, located south of the site on Old Mountain. The pit water contains elevated concentrations of TPH, BTEX compounds, and 2-propanol. All of these parameters are also elevated in the water samples from the site.

Table 5 P-32 Water Facility Pit Sample Results

Parameter	COGCC Table 910-1 Standards	P-32 Pit (Sept 26, 2020)
TPH – gasoline range		65.6
TPH – diesel range		115
benzene	0.005	**0.668**
ethylbenzene	1.0	<0.2
toluene	0.7	**1.71**
xylenes	10	2.05
2-propanol		9.31
methanol		<20
ethanol		<20

All units in mg/l

3.3 Landfarm Screening Sample

One screening level sample was collected from the landfarm spoils located on the J-15 well pad. Table 6 provides the results for this sample. All parameters are below the Table 910-1 standards for this sample except for arsenic. BTEX was not analyzed due to a laboratory error. However, based on previous sampling at other landfarms in the area, it is expected that all BTEX results would also be below the standards.

Table 6 J-15 Landfarm Composite Sample Results – November 18, 2020

Parameter	Table 910-1 Standards	J15-LF-1
Reclamation Parameters		
specific conductance (mmhos/cm)	<4	0.99
pH (standard units)	6-9	7.93
SAR (ratio)	<12	4.26
Petroleum Constituents		
TVPH – gasoline range	500[1]	<0.1
TEPH – diesel and motor oil range		53.1
Metals		
arsenic	0.39	**3.43**
barium	15,000	338
boron	--	<20
cadmium	70	<0.5
chromium	120,000	26.8
chromium VI	23	<2.0
copper	3,100	17.3
lead	400	13.0
mercury	23	0.306
nickel	1,600	20.7
selenium	390	<2.0

silver	390	<1.0
zinc	23,000	46.2
PAHs		
anthracene	1,000	<0.006
acenaphthene	1,000	<0.006
benzo (a) anthracene	0.22	<0.006
benzo (b) fluoranthene	0.22	<0.006
benzo (k) fluoranthene	2.20	<0.006
benzo (a) pyrene	0.022	<0.006
chrysene	22	<0.006
dibenzo (a,h) anthracene	0.022	<0.006
pyrene	1,000	<0.006
fluoranthene	1,000	<0.006
indeno(1,2,3-cd) pyrene	0.22	<0.006
fluorene	1,000	<0.006
napthalene	23	<0.02

[1]The standard is 500 for the combined total of TVPH and TEPH
Values in bold type exceed standards
All units in mg/kg except where indicated

3.4 Conceptual Site Model

Figure 5 provides a cross-section and conceptual model of the site based on the drilling results. Produced water and condensate were released from a small hole in one pipeline at a depth of about 6 feet bgs. The released fluids migrated laterally to the limits of the excavation and downward through fractures in the Uinta Formation sandstones. The drilling results demonstrate that water is contained only in fractures within the sandstone bedrock at the site between the depths of about 14 to 40 feet. This interpretation is confirmed by the absence of water in wells MW-3, MW-6, and MW-7 that were drilled at nearly the same elevation as the four wells that contain fluids.

The measured water levels in the monitoring wells are lower than the impact zone because the wells were drilled approximately 20 feet deeper than the impact zone to provide a sump for extraction of water. Based on the drilling observations, and the analytical results for the water sampling, it appears that the water encountered in the wells is composed of produced water and condensate with little or no natural groundwater present. In addition, the water appears to be caught within the fractures in the Uinta Formation sandstone that is preventing further vertical migration and is likely not discharging into the drainages to the south, east, or north, or Ben Good Creek.

4.0 FUTURE ACTIONS

A pumping system has been installed and is currently being upgraded to extract the spilled fluids from monitoring wells MW-1, MW-2, MW-4, and MW-5. Fluids removed are transported to the P-32 water facility for disposal. Measurements of water levels, pumping times, and the amount of fluids recovered will be kept and reported in monthly reports to the COGCC.

Wells MW-3, MW-6, and MW-7 will be periodically checked for water and sampled if water is present.

Groundwater that originates as recharge in the spill area moves to the south down the prominent drainage that begins in the area that flows to the south and discharges into Ben Good Creek or the East Fork of Parachute Creek. In addition, subsurface flow could potentially discharge into the drainages located to the southeast, northeast, and northwest of the site. A spring or series of springs may be present in the lower reaches of these drainages, above the cliffs. Nicholson GeoSolutions will conduct a hydrologic reconnaissance of these four drainages in the spring of 2021 to search for seeps and springs and will sample any springs located. In addition, surface water samples will be collected (when flow is present) from the East Fork and Ben Good Creek. Sampling will be conducted periodically for six months at these locations.

Final sampling of the landfarm on the J-15 well pad will be conducted in the spring of 2021 when conditions allow using the landfarm sampling protocol previously established for the Berry landfarms in the Garden Gulch, Old Mountain, and Long Ridge areas.

5.0 CERTIFICATION

Nicholson GeoSolutions LLC has prepared this report using all available site data. If you have any questions please call me at 303-601-2023.

Nicholson GeoSolutions LLC

David K. Nicholson, P.G.
Principal Geologist

Figure 1

November 2020

GeoSolutions Nicholson

Legend

- 2" Monitoring Well
- 4" Monitoring Well
- 4" Monitoring/Extraction Well
- Cross Section A - A'
- Pipeline
- Excavation Perimeter

0 30 60 Feet

1" = 60'

Berry Petroleum Company

J-15 Spill Response Monitoring and Extraction Wells

Figure 2

November 2020

GeoSolutions Nicholson

Legend

- Excavation Perimeter
- 2" Monitoring Well
- 9.6' Fuid / 0.0' Condensate
- 4" Monitoring Well
- 4" Monitoring/Extraction Well
- Pipeline
- Estimated Extent of Condensate
- Estimated Extent of Fluid

0 30 60 Feet 1" = 60'

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J-15 Spill Response Fluid and Condensate Amounts After Drilling

Figure 3

November 2020

GeoSolutions Nicholson

Legend

- Excavation Perimeter
- 2" Monitoring Well
- **2,307 TPH (mg/l)**
- **3.08 Benzene (mg/l)**
- 4" Monitoring Well
- 4" Monitoring/Extraction Well
- Pipeline

0 30 60 Feet 1" = 60'

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J-15 Spill Response TPH and Benzene Concentrations

Figure 4

November 2020

GeoSolutions Nicholson

Legend

- Excavation Perimeter
- 2" Monitoring Well
- 4" Monitoring Well
- 4" Monitoring/Extraction Well
- Pipeline

1,700 TDS (mg/l)
673 Chloride (mg/l)
217 Sodium (mg/l)

0 30 60 Feet 1" = 60'

Berry Petroleum Company

J-15 Spill Response TDS, Chloride, and Sodium Concentrations

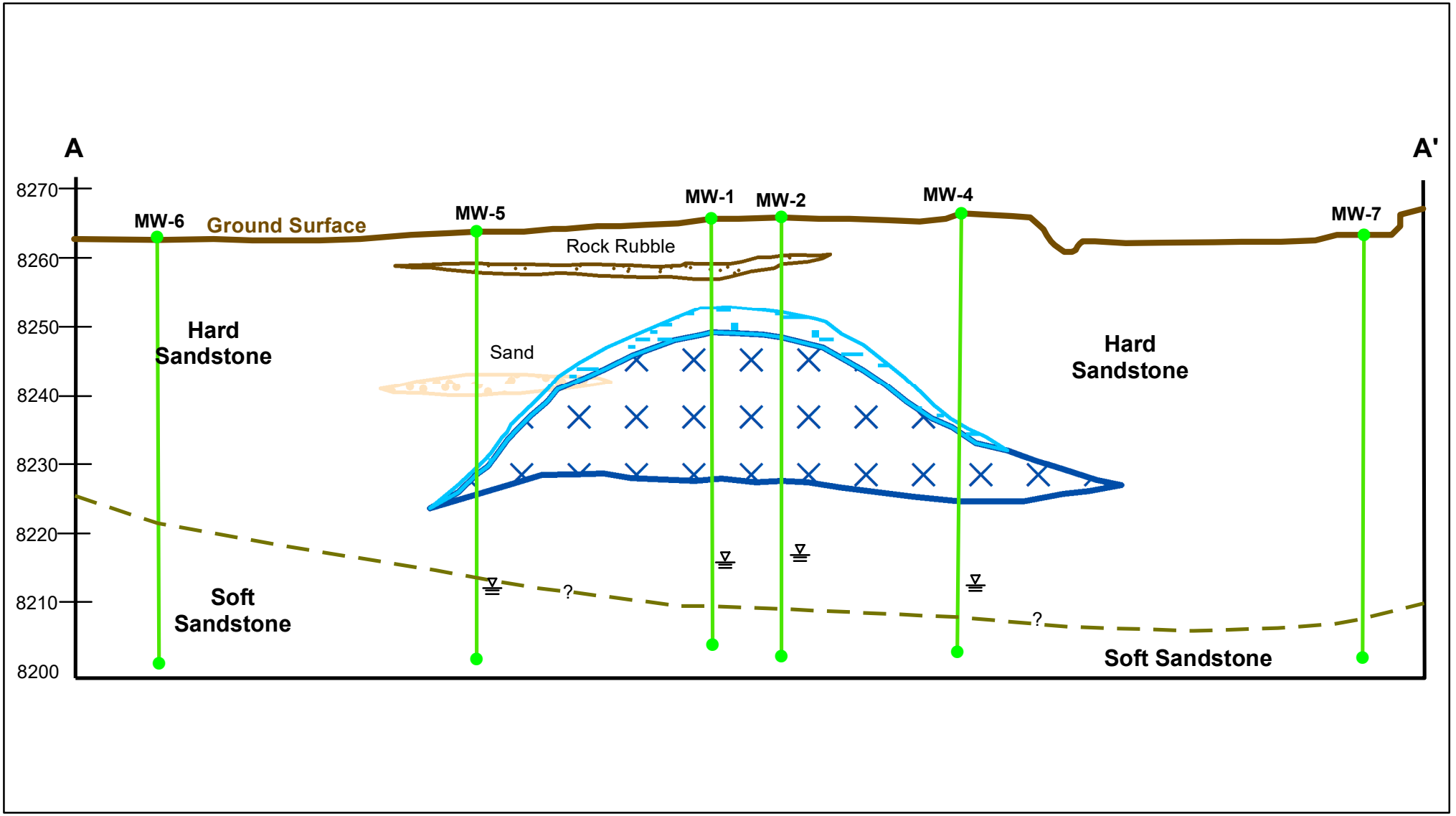

Figure 5

November 2020

GeoSolutions Nicholson

Legend

Fluid Levels

Estimated Extent of Condensate

Estimated Extent of Produced Water

0 30 60 120 Feet

1" = 60'

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J-15 Spill Response Cross Section A - A'

APPENDIX A
Laboratory Reports

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

September 14, 2020

Berry Petroleum - Denver, CO

Sample Delivery Group:	L1257749
Samples Received:	09/03/2020
Project Number:	
Description:	

Report To: Dave Nicholson
3433 E. Lake Dr
Centennial, CO 80121

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

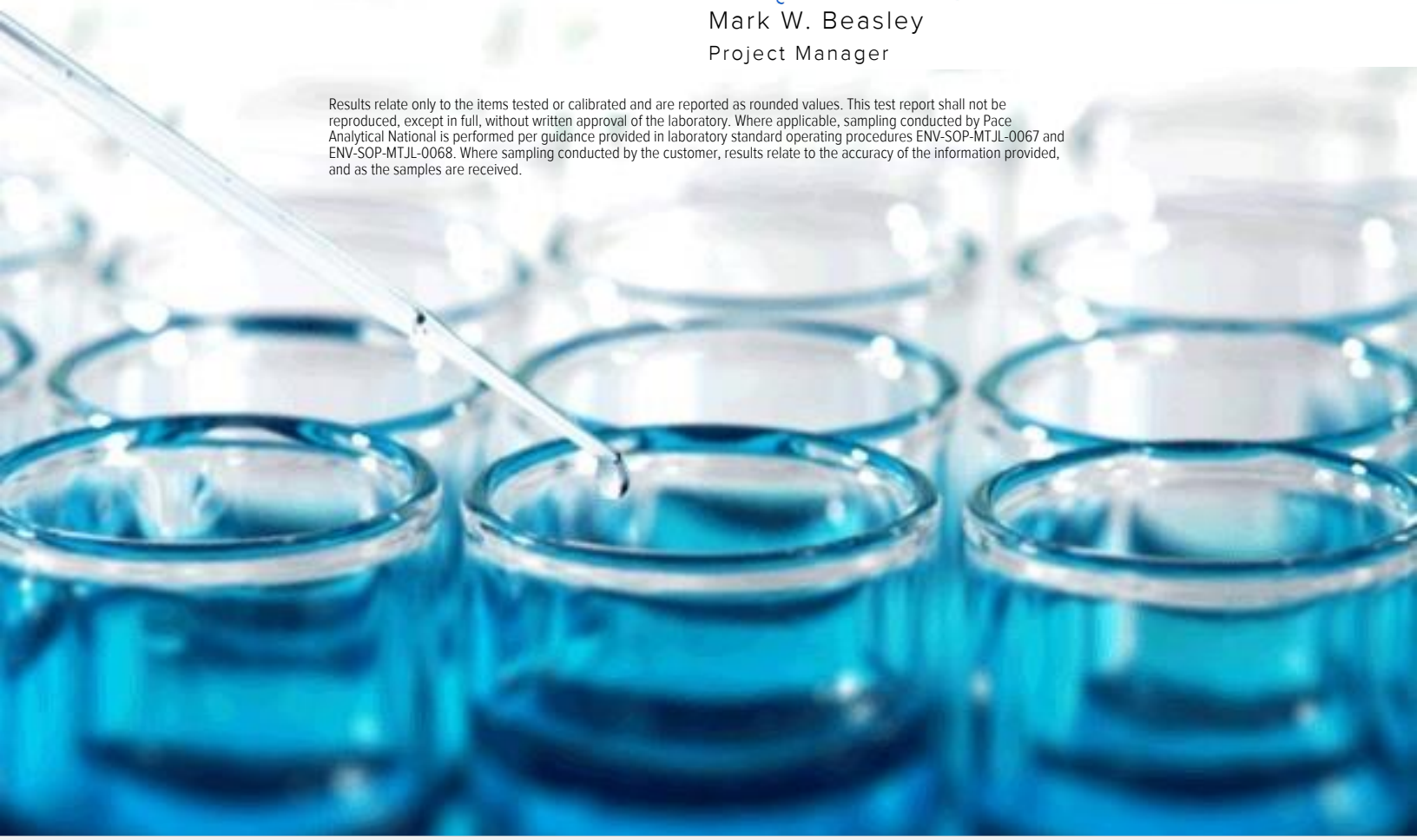


TABLE OF CONTENTS

J15-W-2 L1257749-01 GW

Collected by	Collected date/time	Received date/time
	08/31/20 08:50	09/03/20 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1539155	1	09/07/20 06:37	09/07/20 14:27	CAT	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1539342	20	09/07/20 23:46	09/07/20 23:46	ST	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1538273	1	09/09/20 00:02	09/09/20 11:51	EL	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1538383	250	09/05/20 00:48	09/05/20 00:48	BMB	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015M	WG1538696	1	09/08/20 11:41	09/08/20 11:41	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1539145	250	09/06/20 23:34	09/06/20 23:34	ACG	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1541660	250	09/11/20 17:43	09/11/20 17:43	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1537650	5	09/04/20 13:14	09/06/20 11:09	JN	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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.

Mark W. Beasley
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	907		10.0	1	09/07/2020 14:27	WG1539155

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	1270		20.0	20	09/07/2020 23:46	WG1539342
Sulfate	ND		100	20	09/07/2020 23:46	WG1539342

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sodium,Dissolved	655		3.00	1	09/09/2020 11:51	WG1538273

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	55.9		25.0	250	09/05/2020 00:48	WG1538383
(S) a,a,a-Trifluorotoluene(FID)	*97.2*		*78.0-120*		*09/05/2020 00:48*	WG1538383

Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Methanol	ND		1.00	1	09/08/2020 11:41	WG1538696
Ethanol	9.86		1.00	1	09/08/2020 11:41	WG1538696

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Acetone	ND		12.5	250	09/06/2020 23:34	WG1539145
Acrolein	ND		12.5	250	09/06/2020 23:34	WG1539145
Acrylonitrile	ND		2.50	250	09/06/2020 23:34	WG1539145
Benzene	3.43		0.250	250	09/06/2020 23:34	WG1539145
Bromodichloromethane	ND		0.250	250	09/06/2020 23:34	WG1539145
Bromoform	ND		0.250	250	09/06/2020 23:34	WG1539145
Bromomethane	ND		1.25	250	09/06/2020 23:34	WG1539145
Carbon disulfide	ND		0.250	250	09/06/2020 23:34	WG1539145
Carbon tetrachloride	ND		0.250	250	09/06/2020 23:34	WG1539145
Chlorobenzene	ND		0.250	250	09/06/2020 23:34	WG1539145
Chlorodibromomethane	ND		0.250	250	09/06/2020 23:34	WG1539145
Chloroethane	ND		1.25	250	09/06/2020 23:34	WG1539145
Chloroform	ND		1.25	250	09/06/2020 23:34	WG1539145
Chloromethane	ND		0.625	250	09/06/2020 23:34	WG1539145
1,2-Dibromoethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,2-Dibromo-3-Chloropropane	ND		1.25	250	09/06/2020 23:34	WG1539145
Dibromomethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,2-Dichlorobenzene	ND		0.250	250	09/06/2020 23:34	WG1539145
1,3-Dichlorobenzene	ND		0.250	250	09/06/2020 23:34	WG1539145
1,4-Dichlorobenzene	ND		0.250	250	09/06/2020 23:34	WG1539145
Dichlorodifluoromethane	ND		1.25	250	09/06/2020 23:34	WG1539145
1,1-Dichloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,2-Dichloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,1-Dichloroethene	ND		0.250	250	09/06/2020 23:34	WG1539145
cis-1,2-Dichloroethene	ND		0.250	250	09/06/2020 23:34	WG1539145

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
trans-1,2-Dichloroethene	ND		0.250	250	09/06/2020 23:34	WG1539145
1,2-Dichloropropane	ND		0.250	250	09/06/2020 23:34	WG1539145
cis-1,3-Dichloropropene	ND		0.250	250	09/06/2020 23:34	WG1539145
trans-1,3-Dichloropropene	ND		0.250	250	09/06/2020 23:34	WG1539145
Ethylbenzene	0.426		0.250	250	09/06/2020 23:34	WG1539145
2-Hexanone	ND		2.50	250	09/06/2020 23:34	WG1539145
Iodomethane	ND		2.50	250	09/06/2020 23:34	WG1539145
2-Butanone (MEK)	ND		2.50	250	09/06/2020 23:34	WG1539145
Methylene Chloride	ND		1.25	250	09/06/2020 23:34	WG1539145
4-Methyl-2-pentanone (MIBK)	ND		2.50	250	09/06/2020 23:34	WG1539145
Pentachloroethane	ND		1.25	250	09/11/2020 17:43	WG1541660
Styrene	ND		0.250	250	09/06/2020 23:34	WG1539145
1,1,2,2-Tetrachloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,1,1,2-Tetrachloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
Tetrachloroethene	ND		0.250	250	09/06/2020 23:34	WG1539145
Toluene	10.9		0.250	250	09/06/2020 23:34	WG1539145
1,1,1-Trichloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
1,1,2-Trichloroethane	ND		0.250	250	09/06/2020 23:34	WG1539145
Trichloroethene	ND		0.250	250	09/06/2020 23:34	WG1539145
Trichlorofluoromethane	ND		1.25	250	09/06/2020 23:34	WG1539145
1,2,3-Trichloropropane	ND		0.625	250	09/06/2020 23:34	WG1539145
Vinyl acetate	ND		2.50	250	09/06/2020 23:34	WG1539145
Vinyl chloride	ND		0.250	250	09/06/2020 23:34	WG1539145
Xylenes, Total	9.12		0.750	250	09/06/2020 23:34	WG1539145
Acetonitrile	ND		12.5	250	09/06/2020 23:34	WG1539145
Allyl chloride	ND		1.25	250	09/06/2020 23:34	WG1539145
Chloroprene	ND		12.5	250	09/06/2020 23:34	WG1539145
trans-1,4-Dichloro-2-butene	ND		0.625	250	09/06/2020 23:34	WG1539145
Isobutanol	ND		25.0	250	09/06/2020 23:34	WG1539145
1,4-Dioxane	ND		25.0	250	09/06/2020 23:34	WG1539145
Methacrylonitrile	ND		12.5	250	09/06/2020 23:34	WG1539145
Methyl methacrylate	ND		1.25	250	09/06/2020 23:34	WG1539145
Ethyl methacrylate	ND		1.25	250	09/06/2020 23:34	WG1539145
2-Propanol	ND		1.25	250	09/06/2020 23:34	WG1539145
Propionitrile	ND		12.5	250	09/06/2020 23:34	WG1539145
(S) Toluene-d8	*95.7*		*80.0-120*		*09/06/2020 23:34*	WG1539145
(S) Toluene-d8	*92.4*		*80.0-120*		*09/11/2020 17:43*	WG1541660
(S) 4-Bromofluorobenzene	*108*		*77.0-126*		*09/06/2020 23:34*	WG1539145
(S) 4-Bromofluorobenzene	*91.3*		*77.0-126*		*09/11/2020 17:43*	WG1541660
(S) 1,2-Dichloroethane-d4	*82.4*		*70.0-130*		*09/06/2020 23:34*	WG1539145
(S) 1,2-Dichloroethane-d4	*117*		*70.0-130*		*09/11/2020 17:43*	WG1541660

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	42.6		0.500	5	09/06/2020 11:09	WG1537650
(S) o-Terphenyl	*123*		*31.0-160*		*09/06/2020 11:09*	WG1537650

Method Blank (MB)

(MB) R3568311-1 09/07/20 14:27

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1257158-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1257158-01 09/07/20 14:27 • (DUP) R3568311-3 09/07/20 14:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	162	125	1	25.8	J3	5

L1257329-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1257329-02 09/07/20 14:27 • (DUP) R3568311-4 09/07/20 14:27

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	98.0	94.0	1	4.17		5

Laboratory Control Sample (LCS)

(LCS) R3568311-2 09/07/20 14:27

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	7120	80.9	77.4-123	

Method Blank (MB)

(MB) R3568306-1 09/07/20 16:44

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Sulfate	U		0.594	5.00

L1258073-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1258073-02 09/08/20 04:42 • (DUP) R3568306-5 09/08/20 04:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	ND	1.04	1	13.3		15
Sulfate	18.7	19.3	1	2.81		15

L1258113-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1258113-02 09/08/20 07:19 • (DUP) R3568306-6 09/08/20 07:36

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4.72	4.69	1	0.691		15
Sulfate	ND	ND	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3568306-2 09/07/20 17:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.6	99.0	80.0-120	
Sulfate	40.0	40.3	101	80.0-120	

L1258073-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1258073-01 09/08/20 03:50 • (MS) R3568306-3 09/08/20 04:07 • (MSD) R3568306-4 09/08/20 04:24

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 %
Chloride	50.0	6.05	51.9	52.0	91.7	92.0	1	80.0-120			0.316	15
Sulfate	50.0	143	182	182	78.6	78.3	1	80.0-120	E J6	E J6	0.0739	15

L1258113-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1258113-02 09/08/20 07:19 • (MS) R3568306-7 09/08/20 07:54

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	4.72	54.7	100	1	80.0-120	
Sulfate	50.0	ND	53.3	101	1	80.0-120	

Method Blank (MB)

(MB) R3568710-1 09/09/20 11:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sodium,Dissolved	U		0.504	3.00

Laboratory Control Sample (LCS)

(LCS) R3568710-2 09/09/20 11:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sodium,Dissolved	10.0	10.2	102	80.0-120	

L1257760-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1257760-01 09/09/20 11:35 • (MS) R3568710-4 09/09/20 11:40 • (MSD) R3568710-5 09/09/20 11:42

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 %
Sodium,Dissolved	10.0	74.5	82.2	82.4	76.7	78.2	1	75.0-125			0.178	20

Method Blank (MB)

(MB) R3569188-2 09/04/20 16:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	U		0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*98.4*			*78.0-120*

Laboratory Control Sample (LCS)

(LCS) R3569188-1 09/04/20 16:07

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.02	109	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*103*	*78.0-120*	

L1257749-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1257749-01 09/05/20 00:48 • (MS) R3569188-3 09/05/20 01:10 • (MSD) R3569188-4 09/05/20 01:32

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 %
TPH (GC/FID) Low Fraction	1380	55.9	1740	1760	122	123	250	10.0-160			1.14	22
(S) a,a,a-Trifluorotoluene(FID)					*105*	*104*		*78.0-120*				

Method Blank (MB)

(MB) R3568015-2 09/08/20 09:27

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Methanol	U		0.495	1.00
Ethanol	U		0.476	1.00

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

(LCS) R3568015-1 09/08/20 09:21 • (LCSD) R3568015-3 09/08/20 09:33

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	%	%	%			%	%
Methanol	5.00	5.67	5.30	113	106	61.0-132			6.75	21
Ethanol	5.00	5.06	4.78	101	95.6	64.0-130			5.69	20

Method Blank (MB)

(MB) R3569066-3 09/06/20 14:57

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0113	0.0500
Acrolein	U		0.00254	0.0500
Acrylonitrile	U		0.000671	0.0100
Benzene	U		0.0000941	0.00100
Bromodichloromethane	U		0.000136	0.00100
Bromoform	U		0.000129	0.00100
Bromomethane	U		0.000605	0.00500
Carbon disulfide	U		0.0000962	0.00100
Carbon tetrachloride	U		0.000128	0.00100
Chlorobenzene	U		0.000116	0.00100
Chlorodibromomethane	U		0.000140	0.00100
Chloroethane	U		0.000192	0.00500
Chloroform	U		0.000111	0.00500
Chloromethane	U		0.000960	0.00250
1,2-Dibromo-3-Chloropropane	U		0.000276	0.00500
1,2-Dibromoethane	U		0.000126	0.00100
Dibromomethane	U		0.000122	0.00100
1,2-Dichlorobenzene	U		0.000107	0.00100
1,3-Dichlorobenzene	U		0.000110	0.00100
1,4-Dichlorobenzene	U		0.000120	0.00100
trans-1,4-Dichloro-2-butene	U		0.000467	0.00250
Dichlorodifluoromethane	U		0.000374	0.00500
1,1-Dichloroethane	U		0.000100	0.00100
1,2-Dichloroethane	U		0.0000819	0.00100
1,1-Dichloroethene	U		0.000188	0.00100
cis-1,2-Dichloroethene	U		0.000126	0.00100
trans-1,2-Dichloroethene	U		0.000149	0.00100
1,2-Dichloropropane	U		0.000149	0.00100
cis-1,3-Dichloropropene	U		0.000111	0.00100
trans-1,3-Dichloropropene	U		0.000118	0.00100
Ethylbenzene	U		0.000137	0.00100
2-Hexanone	U		0.000787	0.0100
Iodomethane	U		0.00600	0.0100
2-Butanone (MEK)	U		0.00119	0.0100
Methylene Chloride	U		0.000430	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.000478	0.0100
2-Propanol	U		0.00165	0.00500
Styrene	U		0.000118	0.00100
1,1,1,2-Tetrachloroethane	U		0.000147	0.00100
1,1,2,2-Tetrachloroethane	U		0.000133	0.00100

Method Blank (MB)

(MB) R3569066-3 09/06/20 14:57

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Tetrachloroethene	U		0.000300	0.00100
Toluene	U		0.000278	0.00100
1,1,1-Trichloroethane	U		0.000149	0.00100
1,1,2-Trichloroethane	U		0.000158	0.00100
Trichloroethene	U		0.000190	0.00100
Trichlorofluoromethane	U		0.000160	0.00500
1,2,3-Trichloropropane	U		0.000237	0.00250
Vinyl acetate	U		0.000692	0.0100
Vinyl chloride	U		0.000234	0.00100
Xylenes, Total	U		0.000174	0.00300
Allyl Chloride	U		0.000500	0.00500
Acetonitrile	U		0.0240	0.0500
Chloroprene	U		0.00145	0.0500
Ethyl methacrylate	U		0.00148	0.00500
Isobutanol	U		0.0421	0.100
Methacrylonitrile	U		0.0142	0.0500
Methyl methacrylate	U		0.00152	0.00500
Propionitrile	U		0.0162	0.0500
1,4-Dioxane	U		0.0360	0.100
(S) Toluene-d8	*94.5*			*80.0-120*
(S) 4-Bromofluorobenzene	*104*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*84.7*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3569066-1 09/06/20 13:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.0250	0.0191	76.4	19.0-160	
Acrolein	0.0250	0.0147	58.8	10.0-160	
Acrylonitrile	0.0250	0.0200	80.0	55.0-149	
Benzene	0.00500	0.00494	98.8	70.0-123	
Bromodichloromethane	0.00500	0.00482	96.4	75.0-120	
Bromoform	0.00500	0.00453	90.6	68.0-132	
Bromomethane	0.00500	0.00297	59.4	10.0-160	
Carbon disulfide	0.00500	0.00481	96.2	61.0-128	
Carbon tetrachloride	0.00500	0.00496	99.2	68.0-126	
Chlorobenzene	0.00500	0.00483	96.6	80.0-121	
Chlorodibromomethane	0.00500	0.00450	90.0	77.0-125	

Laboratory Control Sample (LCS)

(LCS) R3569066-1 09/06/20 13:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloroethane	0.00500	0.00638	128	47.0-150	
Chloroform	0.00500	0.00496	99.2	73.0-120	
Chloromethane	0.00500	0.00532	106	41.0-142	
1,2-Dibromo-3-Chloropropane	0.00500	0.00370	74.0	58.0-134	
1,2-Dibromoethane	0.00500	0.00464	92.8	80.0-122	
Dibromomethane	0.00500	0.00499	99.8	80.0-120	
1,2-Dichlorobenzene	0.00500	0.00422	84.4	79.0-121	
1,3-Dichlorobenzene	0.00500	0.00431	86.2	79.0-120	
1,4-Dichlorobenzene	0.00500	0.00434	86.8	79.0-120	
trans-1,4-Dichloro-2-butene	0.00500	0.00288	57.6	33.0-144	
Dichlorodifluoromethane	0.00500	0.00565	113	51.0-149	
1,1-Dichloroethane	0.00500	0.00448	89.6	70.0-126	
1,2-Dichloroethane	0.00500	0.00419	83.8	70.0-128	
1,1-Dichloroethene	0.00500	0.00501	100	71.0-124	
cis-1,2-Dichloroethene	0.00500	0.00501	100	73.0-120	
trans-1,2-Dichloroethene	0.00500	0.00528	106	73.0-120	
1,2-Dichloropropane	0.00500	0.00450	90.0	77.0-125	
cis-1,3-Dichloropropene	0.00500	0.00467	93.4	80.0-123	
trans-1,3-Dichloropropene	0.00500	0.00424	84.8	78.0-124	
Ethylbenzene	0.00500	0.00474	94.8	79.0-123	
2-Hexanone	0.0250	0.0195	78.0	67.0-149	
Iodomethane	0.0250	0.0160	64.0	33.0-147	
2-Butanone (MEK)	0.0250	0.0184	73.6	44.0-160	
Methylene Chloride	0.00500	0.00514	103	67.0-120	
4-Methyl-2-pentanone (MIBK)	0.0250	0.0172	68.8	68.0-142	
Styrene	0.00500	0.00474	94.8	73.0-130	
1,1,1,2-Tetrachloroethane	0.00500	0.00456	91.2	75.0-125	
1,1,2,2-Tetrachloroethane	0.00500	0.00432	86.4	65.0-130	
Tetrachloroethene	0.00500	0.00504	101	72.0-132	
Toluene	0.00500	0.00442	88.4	79.0-120	
1,1,1-Trichloroethane	0.00500	0.00497	99.4	73.0-124	
1,1,2-Trichloroethane	0.00500	0.00470	94.0	80.0-120	
Trichloroethene	0.00500	0.00526	105	78.0-124	
Trichlorofluoromethane	0.00500	0.00542	108	59.0-147	
1,2,3-Trichloropropane	0.00500	0.00441	88.2	73.0-130	
Vinyl acetate	0.0250	0.0203	81.2	11.0-160	
Vinyl chloride	0.00500	0.00525	105	67.0-131	
Xylenes, Total	0.0150	0.0146	97.3	79.0-123	
Allyl chloride	0.0250	0.0253	101	72.0-128	
(S) Toluene-d8			*94.1*	*80.0-120*	

Laboratory Control Sample (LCS)

(LCS) R3569066-1 09/06/20 13:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) 4-Bromofluorobenzene			*106*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*86.2*	*70.0-130*	

Laboratory Control Sample (LCS)

(LCS) R3569066-2 09/06/20 14:18

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetonitrile	0.500	0.395	79.0	40.0-160	
Chloroprene	0.0500	0.0419	83.8	60.0-143	
1,4-Dioxane	1.00	1.02	102	13.0-160	
Ethyl methacrylate	0.0500	0.0475	95.0	72.0-129	
Isobutanol	1.00	0.828	82.8	40.0-160	
Methacrylonitrile	0.500	0.524	105	61.0-145	
Methyl methacrylate	0.0500	0.0388	77.6	63.0-149	
2-Propanol	0.0500	0.0426	85.2	10.0-160	
Propionitrile	0.500	0.439	87.8	49.0-160	
(S) Toluene-d8			*93.4*	*80.0-120*	
(S) 4-Bromofluorobenzene			*107*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*83.1*	*70.0-130*	

Method Blank (MB)

(MB) R3569808-3 09/11/20 16:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Pentachloroethane	U		0.00230	0.00500
(S) Toluene-d8	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.4*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*116*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3569808-2 09/11/20 15:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Pentachloroethane	0.0500	0.0713	143	10.0-160	
(S) Toluene-d8			*93.6*	*80.0-120*	
(S) 4-Bromofluorobenzene			*104*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*105*	*70.0-130*	

Method Blank (MB)

(MB) R3567683-1 09/05/20 18:46

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
TPH (GC/FID) High Fraction	U		0.0247	0.100
(S) o-Terphenyl	*89.0*			*31.0-160*

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

(LCS) R3567683-2 09/05/20 19:07 • (LCSD) R3567683-3 09/05/20 19:27

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	%	%	%			%	%
TPH (GC/FID) High Fraction	1.50	1.56	1.56	104	104	50.0-150			0.000	20
(S) o-Terphenyl				*115*	*115*	*31.0-160*				

Guide to Reading and Understanding Your Laboratory Report

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

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Pace National 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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

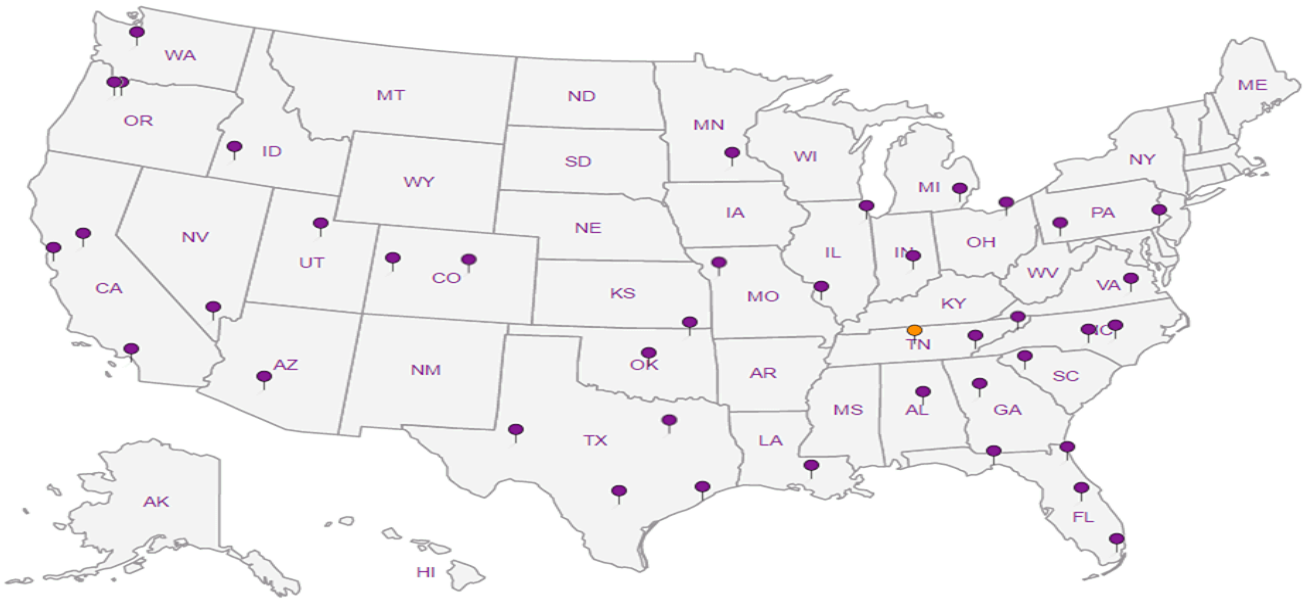
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



Berry Petroleum - Denver, CO

3433 E. Lake Dr
Centennial, CO 80121

Billing Information:
Don Wilbourn
235 Callahan Ave
Parachute, CO 81635

Pres Chk

Report to: **Dave Nicholson**

Email To: **dknicholson@q.com**

Project Description:

City/State Collected:

Please Circle: PT MT CT ET

Phone: **303-601-2023**
Fax: ~~303-999-4401~~

Client Project #

Lab Project # **BERPETDCO-NICHOLSON**

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately
Packed on Ice N____ Y____

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

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	~~**Cl,NO2,NO3,SO4~~ 125mlHDPE-NoPres Chloride, sulfate	~~TDS~~ 250mlHDPE-NoPres	~~BTEX~~GRO 40mlAmb-HCl	DROLVI 40mlAmb-HCl-BT	Dissolved Sodium 250mlHDPE-NoPres	~~NH3, NO2NO3 250mlHDPE-H2SO4~~	~~RSK175 40mlAmb-HCl~~	VOCs 8260 + AP IX	MEETAC		
J15-W-2		GW		8/31	0850	12	X	X	X	X	X			X	X		61
		GW															

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

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

SDG # 125779

Table # F022

Acctnum: **BERPETDCO**
Template: **T122368**
Prelogin: **P729746**
PM: **134 - Mark W. Beasley**
PB: 9-1-20

Shipped Via: **FedEX Ground**

Remarks | Sample # (lab only)

* 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 # 1790 3023 6855

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
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
DK Nicholson	9/2/20	1600	FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Olivia Luna

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 3.5:1:3.4 °C AT CK
Bottles Received: 12

Date: 9/3/20 Time: 945

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 03, 2020

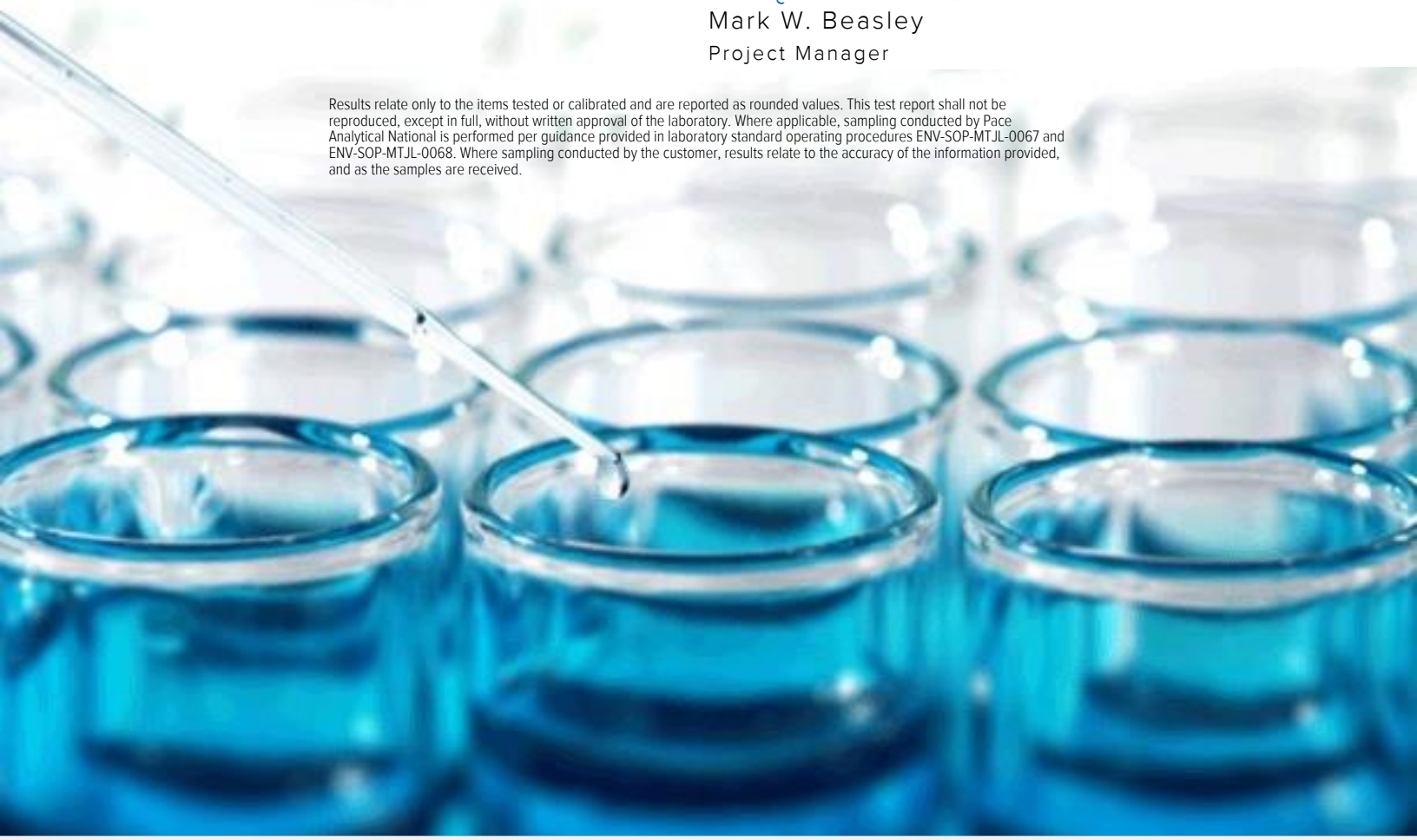
Berry Petroleum - Denver, CO

Sample Delivery Group:	L1288266
Samples Received:	11/20/2020
Project Number:	
Description:	Berry Petroleum J15 Spill Response

Report To: Dave Nicholson
3433 E. Lake Dr
Centennial, CO 80121

Entire Report Reviewed By:

Mark W. Beasley
Project Manager



MW-1 L1288266-01 GW

Collected by: D. Nicholson | Collected date/time: 11/18/20 10:00 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1582225	1	11/25/20 01:15	11/25/20 04:00	CAT	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1584345	1	12/02/20 04:50	12/02/20 04:50	KAB	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1583093	1	11/28/20 01:12	11/28/20 01:12	SDL	Mt. Juliet, TN
Wet Chemistry by Method 365.4	WG1583704	1	11/27/20 15:34	11/29/20 08:43	SDL	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	1	11/22/20 10:41	11/22/20 10:41	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	100	11/22/20 08:23	11/22/20 08:23	MCG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1583394	1	11/29/20 23:51	12/02/20 08:21	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	10	11/30/20 03:08	11/30/20 18:50	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	5	11/30/20 03:08	11/30/20 18:27	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1583438	500	11/28/20 06:12	11/28/20 06:12	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1580959	1	11/24/20 09:31	11/24/20 09:31	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1583275	500	11/28/20 15:59	11/28/20 15:59	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1584573	500	12/01/20 17:50	12/01/20 17:50	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1583827	10	11/30/20 12:58	12/01/20 20:38	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1581301	20	11/24/20 05:48	11/24/20 18:55	SHG	Mt. Juliet, TN

MW-4 L1288266-02 GW

Collected by: D. Nicholson | Collected date/time: 11/18/20 10:30 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1582225	1	11/25/20 01:15	11/25/20 04:00	CAT	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1584345	1	12/02/20 04:58	12/02/20 04:58	KAB	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1583093	1	11/28/20 01:13	11/28/20 01:13	SDL	Mt. Juliet, TN
Wet Chemistry by Method 365.4	WG1583704	1	11/27/20 15:34	11/29/20 08:44	SDL	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	1	11/22/20 09:09	11/22/20 09:09	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	20	11/22/20 09:24	11/22/20 09:24	MCG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1583394	1	11/29/20 23:51	12/02/20 08:29	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	1	11/30/20 03:08	11/30/20 18:53	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	5	11/30/20 03:08	11/30/20 18:31	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1583438	500	11/28/20 06:33	11/28/20 06:33	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1580959	1	11/24/20 09:33	11/24/20 09:33	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1583275	500	11/28/20 16:22	11/28/20 16:22	ADM	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1584573	500	12/01/20 18:11	12/01/20 18:11	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1583827	5	11/30/20 12:58	12/01/20 20:58	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1581301	1	11/24/20 05:48	11/24/20 14:01	SHG	Mt. Juliet, TN

MW-5 L1288266-03 GW

Collected by: D. Nicholson | Collected date/time: 11/18/20 11:20 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1582225	1	11/25/20 01:15	11/25/20 04:00	CAT	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1584345	1	12/02/20 05:07	12/02/20 05:07	KAB	Mt. Juliet, TN
Wet Chemistry by Method 353.2	WG1583093	1	11/28/20 01:14	11/28/20 01:14	SDL	Mt. Juliet, TN
Wet Chemistry by Method 365.4	WG1583704	1	11/27/20 15:34	11/29/20 08:45	SDL	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	1	11/22/20 09:40	11/22/20 09:40	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1580059	50	11/22/20 09:55	11/22/20 09:55	MCG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1583394	1	11/29/20 23:51	12/02/20 08:32	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	1	11/30/20 03:08	11/30/20 18:57	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1583400	5	11/30/20 03:08	11/30/20 18:34	LD	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1583438	10	11/28/20 05:09	11/28/20 05:09	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1580959	1	11/24/20 09:36	11/24/20 09:36	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method RSK175	WG1581976	10	11/24/20 16:18	11/24/20 16:18	DAH	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1583275	10	11/28/20 16:46	11/28/20 16:46	ADM	Mt. Juliet, TN

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

MW-5 L1288266-03 GW

Collected by: D. Nicholson
Collected date/time: 11/18/20 11:20
Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1584573	100	12/01/20 18:31	12/01/20 18:31	ACG	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1583827	2	11/30/20 12:58	12/01/20 17:16	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C	WG1581306	1	11/24/20 11:09	11/25/20 02:03	AO	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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.

Mark W. Beasley
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	8920		100	1	11/25/2020 04:00	WG1582225

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity,Bicarbonate	562		20.0	1	12/02/2020 04:50	WG1584345
Alkalinity,Carbonate	ND		20.0	1	12/02/2020 04:50	WG1584345

Sample Narrative:

L1288266-01 WG1584345: Endpoint pH 4.5

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	11/28/2020 01:12	WG1583093

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.666		0.100	1	11/29/2020 08:43	WG1583704

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	22.0		1.00	1	11/22/2020 10:41	WG1580059
Chloride	3550		100	100	11/22/2020 08:23	WG1580059
Fluoride	ND		0.150	1	11/22/2020 10:41	WG1580059
Nitrate as (N)	ND	T8	0.100	1	11/22/2020 10:41	WG1580059
Nitrite as (N)	ND	T8	0.100	1	11/22/2020 10:41	WG1580059
Sulfate	7.82		5.00	1	11/22/2020 10:41	WG1580059

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.856		0.200	1	12/02/2020 08:21	WG1583394

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	5.22		0.100	5	11/30/2020 18:27	WG1583400
Calcium	829		5.00	5	11/30/2020 18:27	WG1583400
Iron	3.74		0.500	5	11/30/2020 18:27	WG1583400
Magnesium	189		5.00	5	11/30/2020 18:27	WG1583400
Manganese	10.8		0.0250	5	11/30/2020 18:27	WG1583400
Potassium	ND		10.0	5	11/30/2020 18:27	WG1583400
Selenium	ND		0.0100	5	11/30/2020 18:27	WG1583400
Sodium	1130		10.0	5	11/30/2020 18:27	WG1583400
Strontium	10.5		0.100	10	11/30/2020 18:50	WG1583400

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	2270		50.0	500	11/28/2020 06:12	WG1583438
(S) a,a,a-Trifluorotoluene(FID)	*109*		*78.0-120*		*11/28/2020 06:12*	WG1583438

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	0.779		0.0100	1	11/24/2020 09:31	WG1580959
Ethane	ND		0.0130	1	11/24/2020 09:31	WG1580959
Ethene	ND		0.0130	1	11/24/2020 09:31	WG1580959

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		25.0	500	11/28/2020 15:59	WG1583275
Acrolein	ND		25.0	500	11/28/2020 15:59	WG1583275
Acrylonitrile	ND		5.00	500	11/28/2020 15:59	WG1583275
Benzene	3.08		0.500	500	11/28/2020 15:59	WG1583275
Bromobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
Bromodichloromethane	ND		0.500	500	11/28/2020 15:59	WG1583275
Bromoform	ND		0.500	500	11/28/2020 15:59	WG1583275
Bromomethane	ND		2.50	500	11/28/2020 15:59	WG1583275
n-Butylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
sec-Butylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
tert-Butylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
Carbon tetrachloride	ND		0.500	500	11/28/2020 15:59	WG1583275
Chlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
Chlorodibromomethane	ND		0.500	500	11/28/2020 15:59	WG1583275
Chloroethane	ND		2.50	500	11/28/2020 15:59	WG1583275
2-Chloroethyl vinyl ether	ND		25.0	500	11/28/2020 15:59	WG1583275
Chloroform	ND		2.50	500	11/28/2020 15:59	WG1583275
Chloromethane	ND		1.25	500	11/28/2020 15:59	WG1583275
2-Chlorotoluene	ND		0.500	500	11/28/2020 15:59	WG1583275
4-Chlorotoluene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,2-Dibromo-3-Chloropropane	ND		2.50	500	11/28/2020 15:59	WG1583275
1,2-Dibromoethane	ND		0.500	500	11/28/2020 15:59	WG1583275
Dibromomethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,2-Dichlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,3-Dichlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,4-Dichlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
Dichlorodifluoromethane	ND		2.50	500	11/28/2020 15:59	WG1583275
1,1-Dichloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,2-Dichloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1-Dichloroethene	ND		0.500	500	11/28/2020 15:59	WG1583275
cis-1,2-Dichloroethene	ND		0.500	500	11/28/2020 15:59	WG1583275
trans-1,2-Dichloroethene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,2-Dichloropropane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1-Dichloropropene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,3-Dichloropropane	ND		0.500	500	11/28/2020 15:59	WG1583275
cis-1,3-Dichloropropene	ND		0.500	500	11/28/2020 15:59	WG1583275
trans-1,3-Dichloropropene	ND		0.500	500	11/28/2020 15:59	WG1583275
2,2-Dichloropropane	ND		0.500	500	12/01/2020 17:50	WG1584573
Di-isopropyl ether	ND		0.500	500	11/28/2020 15:59	WG1583275
Ethylbenzene	0.583		0.500	500	11/28/2020 15:59	WG1583275
Hexachloro-1,3-butadiene	ND		0.500	500	11/28/2020 15:59	WG1583275
Isopropylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
p-Isopropyltoluene	ND		0.500	500	11/28/2020 15:59	WG1583275
2-Butanone (MEK)	ND		5.00	500	11/28/2020 15:59	WG1583275
Methylene Chloride	ND		2.50	500	11/28/2020 15:59	WG1583275
4-Methyl-2-pentanone (MIBK)	ND		5.00	500	11/28/2020 15:59	WG1583275
Methyl tert-butyl ether	ND		0.500	500	11/28/2020 15:59	WG1583275
Naphthalene	ND		2.50	500	11/28/2020 15:59	WG1583275
n-Propylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
Styrene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1,1,2-Tetrachloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1,2,2-Tetrachloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1,2-Trichlorotrifluoroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
Tetrachloroethene	ND		0.500	500	11/28/2020 15:59	WG1583275
Toluene	12.0		0.500	500	11/28/2020 15:59	WG1583275
1,2,3-Trichlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,2,4-Trichlorobenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1,1-Trichloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
1,1,2-Trichloroethane	ND		0.500	500	11/28/2020 15:59	WG1583275
Trichloroethene	ND		0.500	500	11/28/2020 15:59	WG1583275
Trichlorofluoromethane	ND		2.50	500	11/28/2020 15:59	WG1583275
1,2,3-Trichloropropane	ND		1.25	500	11/28/2020 15:59	WG1583275
1,2,4-Trimethylbenzene	2.79		0.500	500	11/28/2020 15:59	WG1583275
1,2,3-Trimethylbenzene	ND		0.500	500	11/28/2020 15:59	WG1583275
1,3,5-Trimethylbenzene	2.59		0.500	500	11/28/2020 15:59	WG1583275
Vinyl chloride	ND		0.500	500	11/28/2020 15:59	WG1583275
Xylenes, Total	14.4		1.50	500	11/28/2020 15:59	WG1583275
Ethanol	ND		50.0	500	11/28/2020 15:59	WG1583275
2-Propanol	ND		2.50	500	12/01/2020 17:50	WG1584573
(S) Toluene-d8	*98.6*		*80.0-120*		*11/28/2020 15:59*	WG1583275
(S) Toluene-d8	*105*		*80.0-120*		*12/01/2020 17:50*	WG1584573
(S) 4-Bromofluorobenzene	*103*		*77.0-126*		*11/28/2020 15:59*	WG1583275
(S) 4-Bromofluorobenzene	*94.3*		*77.0-126*		*12/01/2020 17:50*	WG1584573
(S) 1,2-Dichloroethane-d4	*108*		*70.0-130*		*11/28/2020 15:59*	WG1583275
(S) 1,2-Dichloroethane-d4	*98.7*		*70.0-130*		*12/01/2020 17:50*	WG1584573

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	37.0		1.00	10	12/01/2020 20:38	WG1583827
(S) o-Terphenyl	*59.5*		*31.0-160*		*12/01/2020 20:38*	WG1583827

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Acenaphthylene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Anthracene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzidine	ND		0.200	20	11/24/2020 18:55	WG1581301
Benzo(a)anthracene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzo(b)fluoranthene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzo(k)fluoranthene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzo(g,h,i)perylene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzo(a)pyrene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Bis(2-chlorethoxy)methane	ND		0.200	20	11/24/2020 18:55	WG1581301
Bis(2-chloroethyl)ether	ND		0.200	20	11/24/2020 18:55	WG1581301
2,2-Oxybis(1-Chloropropane)	ND		0.200	20	11/24/2020 18:55	WG1581301

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
4-Bromophenyl-phenylether	ND		0.200	20	11/24/2020 18:55	WG1581301
2-Chloronaphthalene	ND		0.0200	20	11/24/2020 18:55	WG1581301
4-Chlorophenyl-phenylether	ND		0.200	20	11/24/2020 18:55	WG1581301
Chrysene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Dibenz(a,h)anthracene	ND		0.0200	20	11/24/2020 18:55	WG1581301
1,2-Dichlorobenzene	ND		0.200	20	11/24/2020 18:55	WG1581301
1,3-Dichlorobenzene	ND		0.200	20	11/24/2020 18:55	WG1581301
1,4-Dichlorobenzene	ND		0.200	20	11/24/2020 18:55	WG1581301
3,3-Dichlorobenzidine	ND		0.200	20	11/24/2020 18:55	WG1581301
2,4-Dinitrotoluene	ND		0.200	20	11/24/2020 18:55	WG1581301
2,6-Dinitrotoluene	ND		0.200	20	11/24/2020 18:55	WG1581301
Fluoranthene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Fluorene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Hexachlorobenzene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Hexachloro-1,3-butadiene	ND		0.200	20	11/24/2020 18:55	WG1581301
Hexachlorocyclopentadiene	ND		0.200	20	11/24/2020 18:55	WG1581301
Hexachloroethane	ND		0.200	20	11/24/2020 18:55	WG1581301
Indeno(1,2,3-cd)pyrene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Isophorone	ND		0.200	20	11/24/2020 18:55	WG1581301
Naphthalene	0.0769		0.0200	20	11/24/2020 18:55	WG1581301
Nitrobenzene	ND		0.200	20	11/24/2020 18:55	WG1581301
n-Nitrosodimethylamine	ND		0.200	20	11/24/2020 18:55	WG1581301
n-Nitrosodiphenylamine	ND		0.200	20	11/24/2020 18:55	WG1581301
n-Nitrosodi-n-propylamine	ND		0.200	20	11/24/2020 18:55	WG1581301
Phenanthrene	ND		0.0200	20	11/24/2020 18:55	WG1581301
Benzylbutyl phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Bis(2-ethylhexyl)phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Di-n-butyl phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Diethyl phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Dimethyl phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Di-n-octyl phthalate	ND		0.0600	20	11/24/2020 18:55	WG1581301
Pyrene	ND		0.0200	20	11/24/2020 18:55	WG1581301
1,2,4-Trichlorobenzene	ND		0.200	20	11/24/2020 18:55	WG1581301
4-Chloro-3-methylphenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2-Chlorophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2,4-Dichlorophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2,4-Dimethylphenol	ND		0.200	20	11/24/2020 18:55	WG1581301
4,6-Dinitro-2-methylphenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2,4-Dinitrophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2-Nitrophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
4-Nitrophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
Pentachlorophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
Phenol	ND		0.200	20	11/24/2020 18:55	WG1581301
2,4,6-Trichlorophenol	ND		0.200	20	11/24/2020 18:55	WG1581301
(S) 2-Fluorophenol	*0.000*	J7	*10.0-120*		*11/24/2020 18:55*	WG1581301
(S) Phenol-d5	*0.000*	J7	*10.0-120*		*11/24/2020 18:55*	WG1581301
(S) Nitrobenzene-d5	*0.000*	J7	*10.0-127*		*11/24/2020 18:55*	WG1581301
(S) 2-Fluorobiphenyl	*63.2*	J7	*10.0-130*		*11/24/2020 18:55*	WG1581301
(S) 2,4,6-Tribromophenol	*49.0*	J7	*10.0-155*		*11/24/2020 18:55*	WG1581301
(S) p-Terphenyl-d14	*52.9*	J7	*10.0-128*		*11/24/2020 18:55*	WG1581301

Sample Narrative:

L1288266-01 WG1581301: Diluted due to matrix

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	1700		20.0	1	11/25/2020 04:00	WG1582225

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity,Bicarbonate	381		20.0	1	12/02/2020 04:58	WG1584345
Alkalinity,Carbonate	ND		20.0	1	12/02/2020 04:58	WG1584345

Sample Narrative:

L1288266-02 WG1584345: Endpoint pH 4.5

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	11/28/2020 01:13	WG1583093

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.589		0.100	1	11/29/2020 08:44	WG1583704

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	3.58		1.00	1	11/22/2020 09:09	WG1580059
Chloride	673		20.0	20	11/22/2020 09:24	WG1580059
Fluoride	ND		0.150	1	11/22/2020 09:09	WG1580059
Nitrate as (N)	ND	T8	0.100	1	11/22/2020 09:09	WG1580059
Nitrite as (N)	ND	T8	0.100	1	11/22/2020 09:09	WG1580059
Sulfate	ND		5.00	1	11/22/2020 09:09	WG1580059

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	12/02/2020 08:29	WG1583394

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.917		0.0200	1	11/30/2020 18:53	WG1583400
Calcium	230		1.00	1	11/30/2020 18:53	WG1583400
Iron	6.02		0.100	1	11/30/2020 18:53	WG1583400
Magnesium	73.4		1.00	1	11/30/2020 18:53	WG1583400
Manganese	1.90		0.00500	1	11/30/2020 18:53	WG1583400
Potassium	2.63		2.00	1	11/30/2020 18:53	WG1583400
Selenium	ND		0.00200	1	11/30/2020 18:53	WG1583400
Sodium	217		2.00	1	11/30/2020 18:53	WG1583400
Strontium	2.30		0.0500	5	11/30/2020 18:31	WG1583400

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	290		50.0	500	11/28/2020 06:33	WG1583438
(S) a,a,a-Trifluorotoluene(FID)	*109*		*78.0-120*		*11/28/2020 06:33*	WG1583438

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	0.0246		0.0100	1	11/24/2020 09:33	WG1580959
Ethane	ND		0.0130	1	11/24/2020 09:33	WG1580959
Ethene	ND		0.0130	1	11/24/2020 09:33	WG1580959

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND		25.0	500	11/28/2020 16:22	WG1583275
Acrolein	ND		25.0	500	11/28/2020 16:22	WG1583275
Acrylonitrile	ND		5.00	500	11/28/2020 16:22	WG1583275
Benzene	3.12		0.500	500	11/28/2020 16:22	WG1583275
Bromobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
Bromodichloromethane	ND		0.500	500	11/28/2020 16:22	WG1583275
Bromoform	ND		0.500	500	11/28/2020 16:22	WG1583275
Bromomethane	ND		2.50	500	11/28/2020 16:22	WG1583275
n-Butylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
sec-Butylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
tert-Butylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
Carbon tetrachloride	ND		0.500	500	11/28/2020 16:22	WG1583275
Chlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
Chlorodibromomethane	ND		0.500	500	11/28/2020 16:22	WG1583275
Chloroethane	ND		2.50	500	11/28/2020 16:22	WG1583275
2-Chloroethyl vinyl ether	ND		25.0	500	11/28/2020 16:22	WG1583275
Chloroform	ND		2.50	500	11/28/2020 16:22	WG1583275
Chloromethane	ND		1.25	500	11/28/2020 16:22	WG1583275
2-Chlorotoluene	ND		0.500	500	11/28/2020 16:22	WG1583275
4-Chlorotoluene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,2-Dibromo-3-Chloropropane	ND		2.50	500	11/28/2020 16:22	WG1583275
1,2-Dibromoethane	ND		0.500	500	11/28/2020 16:22	WG1583275
Dibromomethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,2-Dichlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,3-Dichlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,4-Dichlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
Dichlorodifluoromethane	ND		2.50	500	11/28/2020 16:22	WG1583275
1,1-Dichloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,2-Dichloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1-Dichloroethene	ND		0.500	500	11/28/2020 16:22	WG1583275
cis-1,2-Dichloroethene	ND		0.500	500	11/28/2020 16:22	WG1583275
trans-1,2-Dichloroethene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,2-Dichloropropane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1-Dichloropropene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,3-Dichloropropane	ND		0.500	500	11/28/2020 16:22	WG1583275
cis-1,3-Dichloropropene	ND		0.500	500	11/28/2020 16:22	WG1583275
trans-1,3-Dichloropropene	ND		0.500	500	11/28/2020 16:22	WG1583275
2,2-Dichloropropane	ND		0.500	500	12/01/2020 18:11	WG1584573
Di-isopropyl ether	ND		0.500	500	11/28/2020 16:22	WG1583275
Ethylbenzene	0.802		0.500	500	11/28/2020 16:22	WG1583275
Hexachloro-1,3-butadiene	ND		0.500	500	11/28/2020 16:22	WG1583275
Isopropylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
p-Isopropyltoluene	ND		0.500	500	11/28/2020 16:22	WG1583275
2-Butanone (MEK)	ND		5.00	500	11/28/2020 16:22	WG1583275
Methylene Chloride	ND		2.50	500	11/28/2020 16:22	WG1583275
4-Methyl-2-pentanone (MIBK)	ND		5.00	500	11/28/2020 16:22	WG1583275
Methyl tert-butyl ether	ND		0.500	500	11/28/2020 16:22	WG1583275
Naphthalene	ND		2.50	500	11/28/2020 16:22	WG1583275
n-Propylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
Styrene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1,1,2-Tetrachloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1,2,2-Tetrachloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1,2-Trichlorotrifluoroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
Tetrachloroethene	ND		0.500	500	11/28/2020 16:22	WG1583275
Toluene	14.8		0.500	500	11/28/2020 16:22	WG1583275
1,2,3-Trichlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,2,4-Trichlorobenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1,1-Trichloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
1,1,2-Trichloroethane	ND		0.500	500	11/28/2020 16:22	WG1583275
Trichloroethene	ND		0.500	500	11/28/2020 16:22	WG1583275
Trichlorofluoromethane	ND		2.50	500	11/28/2020 16:22	WG1583275
1,2,3-Trichloropropane	ND		1.25	500	11/28/2020 16:22	WG1583275
1,2,4-Trimethylbenzene	1.36		0.500	500	11/28/2020 16:22	WG1583275
1,2,3-Trimethylbenzene	ND		0.500	500	11/28/2020 16:22	WG1583275
1,3,5-Trimethylbenzene	1.15		0.500	500	11/28/2020 16:22	WG1583275
Vinyl chloride	ND		0.500	500	11/28/2020 16:22	WG1583275
Xylenes, Total	12.8		1.50	500	11/28/2020 16:22	WG1583275
Ethanol	ND		50.0	500	11/28/2020 16:22	WG1583275
2-Propanol	ND		2.50	500	12/01/2020 18:11	WG1584573
(S) Toluene-d8	*102*		*80.0-120*		*11/28/2020 16:22*	WG1583275
(S) Toluene-d8	*101*		*80.0-120*		*12/01/2020 18:11*	WG1584573
(S) 4-Bromofluorobenzene	*101*		*77.0-126*		*11/28/2020 16:22*	WG1583275
(S) 4-Bromofluorobenzene	*92.6*		*77.0-126*		*12/01/2020 18:11*	WG1584573
(S) 1,2-Dichloroethane-d4	*105*		*70.0-130*		*11/28/2020 16:22*	WG1583275
(S) 1,2-Dichloroethane-d4	*99.1*		*70.0-130*		*12/01/2020 18:11*	WG1584573

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	11.8		0.500	5	12/01/2020 20:58	WG1583827
(S) o-Terphenyl	*101*		*31.0-160*		*12/01/2020 20:58*	WG1583827

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Acenaphthylene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Anthracene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzidine	ND		0.0100	1	11/24/2020 14:01	WG1581301
Benzo(a)anthracene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzo(b)fluoranthene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzo(k)fluoranthene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzo(g,h,i)perylene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzo(a)pyrene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Bis(2-chlorethoxy)methane	ND		0.0100	1	11/24/2020 14:01	WG1581301
Bis(2-chloroethyl)ether	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,2-Oxybis(1-Chloropropane)	ND		0.0100	1	11/24/2020 14:01	WG1581301

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
4-Bromophenyl-phenylether	ND		0.0100	1	11/24/2020 14:01	WG1581301
2-Chloronaphthalene	ND		0.00100	1	11/24/2020 14:01	WG1581301
4-Chlorophenyl-phenylether	ND		0.0100	1	11/24/2020 14:01	WG1581301
Chrysene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Dibenz(a,h)anthracene	ND		0.00100	1	11/24/2020 14:01	WG1581301
1,2-Dichlorobenzene	ND		0.0100	1	11/24/2020 14:01	WG1581301
1,3-Dichlorobenzene	ND		0.0100	1	11/24/2020 14:01	WG1581301
1,4-Dichlorobenzene	ND		0.0100	1	11/24/2020 14:01	WG1581301
3,3-Dichlorobenzidine	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,4-Dinitrotoluene	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,6-Dinitrotoluene	ND		0.0100	1	11/24/2020 14:01	WG1581301
Fluoranthene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Fluorene	0.00165		0.00100	1	11/24/2020 14:01	WG1581301
Hexachlorobenzene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Hexachloro-1,3-butadiene	ND		0.0100	1	11/24/2020 14:01	WG1581301
Hexachlorocyclopentadiene	ND		0.0100	1	11/24/2020 14:01	WG1581301
Hexachloroethane	ND		0.0100	1	11/24/2020 14:01	WG1581301
Indeno(1,2,3-cd)pyrene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Isophorone	ND		0.0100	1	11/24/2020 14:01	WG1581301
Naphthalene	0.0497		0.00100	1	11/24/2020 14:01	WG1581301
Nitrobenzene	ND		0.0100	1	11/24/2020 14:01	WG1581301
n-Nitrosodimethylamine	ND		0.0100	1	11/24/2020 14:01	WG1581301
n-Nitrosodiphenylamine	ND		0.0100	1	11/24/2020 14:01	WG1581301
n-Nitrosodi-n-propylamine	ND		0.0100	1	11/24/2020 14:01	WG1581301
Phenanthrene	ND		0.00100	1	11/24/2020 14:01	WG1581301
Benzylbutyl phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Di-n-butyl phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Diethyl phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Dimethyl phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Di-n-octyl phthalate	ND		0.00300	1	11/24/2020 14:01	WG1581301
Pyrene	ND		0.00100	1	11/24/2020 14:01	WG1581301
1,2,4-Trichlorobenzene	ND		0.0100	1	11/24/2020 14:01	WG1581301
4-Chloro-3-methylphenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2-Chlorophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,4-Dichlorophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,4-Dimethylphenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
4,6-Dinitro-2-methylphenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,4-Dinitrophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2-Nitrophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
4-Nitrophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
Pentachlorophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
Phenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
2,4,6-Trichlorophenol	ND		0.0100	1	11/24/2020 14:01	WG1581301
(S) 2-Fluorophenol	*0.000*	J2	*10.0-120*		*11/24/2020 14:01*	WG1581301
(S) Phenol-d5	*16.4*		*10.0-120*		*11/24/2020 14:01*	WG1581301
(S) Nitrobenzene-d5	*83.6*		*10.0-127*		*11/24/2020 14:01*	WG1581301
(S) 2-Fluorobiphenyl	*51.8*		*10.0-130*		*11/24/2020 14:01*	WG1581301
(S) 2,4,6-Tribromophenol	*46.2*		*10.0-155*		*11/24/2020 14:01*	WG1581301
(S) p-Terphenyl-d14	*49.1*		*10.0-128*		*11/24/2020 14:01*	WG1581301

Sample Narrative:

L1288266-02 WG1581301: Surrogate failure due to matrix interference

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	3530		40.0	1	11/25/2020 04:00	WG1582225

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity,Bicarbonate	488		20.0	1	12/02/2020 05:07	WG1584345
Alkalinity,Carbonate	ND		20.0	1	12/02/2020 05:07	WG1584345

Sample Narrative:

L1288266-03 WG1584345: Endpoint pH 4.5

Wet Chemistry by Method 353.2

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Nitrate-Nitrite	ND		0.100	1	11/28/2020 01:14	WG1583093

Wet Chemistry by Method 365.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Phosphorus,Total	0.201	B	0.100	1	11/29/2020 08:45	WG1583704

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	8.60		1.00	1	11/22/2020 09:40	WG1580059
Chloride	1570		50.0	50	11/22/2020 09:55	WG1580059
Fluoride	ND		0.150	1	11/22/2020 09:40	WG1580059
Nitrate as (N)	ND	T8	0.100	1	11/22/2020 09:40	WG1580059
Nitrite as (N)	ND	T8	0.100	1	11/22/2020 09:40	WG1580059
Sulfate	ND		5.00	1	11/22/2020 09:40	WG1580059

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	0.432		0.200	1	12/02/2020 08:32	WG1583394

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	1.63		0.0200	1	11/30/2020 18:57	WG1583400
Calcium	394		1.00	1	11/30/2020 18:57	WG1583400
Iron	0.522		0.100	1	11/30/2020 18:57	WG1583400
Magnesium	106		1.00	1	11/30/2020 18:57	WG1583400
Manganese	4.38		0.00500	1	11/30/2020 18:57	WG1583400
Potassium	3.16		2.00	1	11/30/2020 18:57	WG1583400
Selenium	ND		0.00200	1	11/30/2020 18:57	WG1583400
Sodium	562		2.00	1	11/30/2020 18:57	WG1583400
Strontium	5.02		0.0500	5	11/30/2020 18:34	WG1583400

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	73.7		1.00	10	11/28/2020 05:09	WG1583438
(S) a,a,a-Trifluorotoluene(FID)	*103*		*78.0-120*		*11/28/2020 05:09*	WG1583438

Volatile Organic Compounds (GC) by Method RSK175

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Methane	10.6		0.100	10	11/24/2020 16:18	WG1581976
Ethane	ND		0.0130	1	11/24/2020 09:36	WG1580959
Ethene	ND		0.0130	1	11/24/2020 09:36	WG1580959

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	6.18		0.500	10	11/28/2020 16:46	WG1583275
Acrolein	ND		0.500	10	11/28/2020 16:46	WG1583275
Acrylonitrile	ND		0.100	10	11/28/2020 16:46	WG1583275
Benzene	1.45		0.100	100	12/01/2020 18:31	WG1584573
Bromobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Bromodichloromethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
Bromoform	ND		0.0100	10	11/28/2020 16:46	WG1583275
Bromomethane	ND		0.0500	10	11/28/2020 16:46	WG1583275
n-Butylbenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
sec-Butylbenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
tert-Butylbenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Carbon tetrachloride	ND		0.0100	10	11/28/2020 16:46	WG1583275
Chlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Chlorodibromomethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
Chloroethane	ND		0.0500	10	11/28/2020 16:46	WG1583275
2-Chloroethyl vinyl ether	ND		0.500	10	11/28/2020 16:46	WG1583275
Chloroform	ND		0.0500	10	11/28/2020 16:46	WG1583275
Chloromethane	ND		0.0250	10	11/28/2020 16:46	WG1583275
2-Chlorotoluene	ND		0.0100	10	11/28/2020 16:46	WG1583275
4-Chlorotoluene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,2-Dibromo-3-Chloropropane	ND		0.0500	10	11/28/2020 16:46	WG1583275
1,2-Dibromoethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
Dibromomethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,2-Dichlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,3-Dichlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,4-Dichlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Dichlorodifluoromethane	ND		0.0500	10	11/28/2020 16:46	WG1583275
1,1-Dichloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,2-Dichloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1-Dichloroethene	ND		0.0100	10	11/28/2020 16:46	WG1583275
cis-1,2-Dichloroethene	ND		0.0100	10	11/28/2020 16:46	WG1583275
trans-1,2-Dichloroethene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,2-Dichloropropane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1-Dichloropropene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,3-Dichloropropane	ND		0.0100	10	11/28/2020 16:46	WG1583275
cis-1,3-Dichloropropene	ND		0.0100	10	11/28/2020 16:46	WG1583275
trans-1,3-Dichloropropene	ND		0.0100	10	11/28/2020 16:46	WG1583275
2,2-Dichloropropane	ND		0.100	100	12/01/2020 18:31	WG1584573
Di-isopropyl ether	ND		0.0100	10	11/28/2020 16:46	WG1583275
Ethylbenzene	0.534		0.0100	10	11/28/2020 16:46	WG1583275
Hexachloro-1,3-butadiene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Isopropylbenzene	0.0456		0.0100	10	11/28/2020 16:46	WG1583275

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
p-Isopropyltoluene	ND		0.0100	10	11/28/2020 16:46	WG1583275
2-Butanone (MEK)	ND		0.100	10	11/28/2020 16:46	WG1583275
Methylene Chloride	ND		0.0500	10	11/28/2020 16:46	WG1583275
4-Methyl-2-pentanone (MIBK)	ND		0.100	10	11/28/2020 16:46	WG1583275
Methyl tert-butyl ether	ND		0.0100	10	11/28/2020 16:46	WG1583275
Naphthalene	0.0791		0.0500	10	11/28/2020 16:46	WG1583275
n-Propylbenzene	0.0460		0.0100	10	11/28/2020 16:46	WG1583275
Styrene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1,1,2-Tetrachloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1,2,2-Tetrachloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1,2-Trichlorotrifluoroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
Tetrachloroethene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Toluene	6.27		0.100	100	12/01/2020 18:31	WG1584573
1,2,3-Trichlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,2,4-Trichlorobenzene	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1,1-Trichloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
1,1,2-Trichloroethane	ND		0.0100	10	11/28/2020 16:46	WG1583275
Trichloroethene	ND		0.0100	10	11/28/2020 16:46	WG1583275
Trichlorofluoromethane	ND		0.0500	10	11/28/2020 16:46	WG1583275
1,2,3-Trichloropropane	ND		0.0250	10	11/28/2020 16:46	WG1583275
1,2,4-Trimethylbenzene	0.933		0.0100	10	11/28/2020 16:46	WG1583275
1,2,3-Trimethylbenzene	0.148		0.0100	10	11/28/2020 16:46	WG1583275
1,3,5-Trimethylbenzene	0.728		0.0100	10	11/28/2020 16:46	WG1583275
Vinyl chloride	ND		0.0100	10	11/28/2020 16:46	WG1583275
Xylenes, Total	5.84		0.300	100	12/01/2020 18:31	WG1584573
Ethanol	ND		1.00	10	11/28/2020 16:46	WG1583275
2-Propanol	ND		0.500	100	12/01/2020 18:31	WG1584573
(S) Toluene-d8	*95.1*		*80.0-120*		*11/28/2020 16:46*	WG1583275
(S) Toluene-d8	*105*		*80.0-120*		*12/01/2020 18:31*	WG1584573
(S) 4-Bromofluorobenzene	*106*		*77.0-126*		*11/28/2020 16:46*	WG1583275
(S) 4-Bromofluorobenzene	*97.5*		*77.0-126*		*12/01/2020 18:31*	WG1584573
(S) 1,2-Dichloroethane-d4	*103*		*70.0-130*		*11/28/2020 16:46*	WG1583275
(S) 1,2-Dichloroethane-d4	*101*		*70.0-130*		*12/01/2020 18:31*	WG1584573

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1.69		0.200	2	12/01/2020 17:16	WG1583827
(S) o-Terphenyl	*37.5*		*31.0-160*		*12/01/2020 17:16*	WG1583827

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acenaphthene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Acenaphthylene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Anthracene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzidine	ND		0.0100	1	11/25/2020 02:03	WG1581306
Benzo(a)anthracene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzo(b)fluoranthene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzo(k)fluoranthene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzo(g,h,i)perylene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzo(a)pyrene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Bis(2-chlorethoxy)methane	ND		0.0100	1	11/25/2020 02:03	WG1581306
Bis(2-chloroethyl)ether	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,2-Oxybis(1-Chloropropane)	ND		0.0100	1	11/25/2020 02:03	WG1581306

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
4-Bromophenyl-phenylether	ND		0.0100	1	11/25/2020 02:03	WG1581306
2-Chloronaphthalene	ND		0.00100	1	11/25/2020 02:03	WG1581306
4-Chlorophenyl-phenylether	ND		0.0100	1	11/25/2020 02:03	WG1581306
Chrysene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Dibenz(a,h)anthracene	ND		0.00100	1	11/25/2020 02:03	WG1581306
1,2-Dichlorobenzene	ND		0.0100	1	11/25/2020 02:03	WG1581306
1,3-Dichlorobenzene	ND		0.0100	1	11/25/2020 02:03	WG1581306
1,4-Dichlorobenzene	ND		0.0100	1	11/25/2020 02:03	WG1581306
3,3-Dichlorobenzidine	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,4-Dinitrotoluene	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,6-Dinitrotoluene	ND		0.0100	1	11/25/2020 02:03	WG1581306
Fluoranthene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Fluorene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Hexachlorobenzene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Hexachloro-1,3-butadiene	ND		0.0100	1	11/25/2020 02:03	WG1581306
Hexachlorocyclopentadiene	ND		0.0100	1	11/25/2020 02:03	WG1581306
Hexachloroethane	ND		0.0100	1	11/25/2020 02:03	WG1581306
Indeno(1,2,3-cd)pyrene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Isophorone	ND		0.0100	1	11/25/2020 02:03	WG1581306
Naphthalene	0.0438		0.00100	1	11/25/2020 02:03	WG1581306
Nitrobenzene	ND		0.0100	1	11/25/2020 02:03	WG1581306
n-Nitrosodimethylamine	ND		0.0100	1	11/25/2020 02:03	WG1581306
n-Nitrosodiphenylamine	ND		0.0100	1	11/25/2020 02:03	WG1581306
n-Nitrosodi-n-propylamine	ND		0.0100	1	11/25/2020 02:03	WG1581306
Phenanthrene	ND		0.00100	1	11/25/2020 02:03	WG1581306
Benzylbutyl phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Bis(2-ethylhexyl)phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Di-n-butyl phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Diethyl phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Dimethyl phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Di-n-octyl phthalate	ND		0.00300	1	11/25/2020 02:03	WG1581306
Pyrene	ND		0.00100	1	11/25/2020 02:03	WG1581306
1,2,4-Trichlorobenzene	ND		0.0100	1	11/25/2020 02:03	WG1581306
4-Chloro-3-methylphenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2-Chlorophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,4-Dichlorophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,4-Dimethylphenol	0.0409		0.0100	1	11/25/2020 02:03	WG1581306
4,6-Dinitro-2-methylphenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,4-Dinitrophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2-Nitrophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
4-Nitrophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
Pentachlorophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
Phenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
2,4,6-Trichlorophenol	ND		0.0100	1	11/25/2020 02:03	WG1581306
(S) 2-Fluorophenol	*36.6*		*10.0-120*		*11/25/2020 02:03*	WG1581306
(S) Phenol-d5	*34.5*		*10.0-120*		*11/25/2020 02:03*	WG1581306
(S) Nitrobenzene-d5	*82.7*		*10.0-127*		*11/25/2020 02:03*	WG1581306
(S) 2-Fluorobiphenyl	*70.1*		*10.0-130*		*11/25/2020 02:03*	WG1581306
(S) 2,4,6-Tribromophenol	*83.0*		*10.0-155*		*11/25/2020 02:03*	WG1581306
(S) p-Terphenyl-d14	*72.7*		*10.0-128*		*11/25/2020 02:03*	WG1581306

Method Blank (MB)

(MB) R3597742-1 11/25/20 04:00

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1287622-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1287622-07 11/25/20 04:00 • (DUP) R3597742-3 11/25/20 04:00

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	3230	3240	1	0.371		5

L1288108-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288108-01 11/25/20 04:00 • (DUP) R3597742-4 11/25/20 04:00

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	1120	1130	1	0.889		5

Laboratory Control Sample (LCS)

(LCS) R3597742-2 11/25/20 04:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8760	99.5	77.4-123	

Method Blank (MB)

(MB) R3599332-1 12/02/20 02:09

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity,Bicarbonate	U		8.45	20.0
Alkalinity,Carbonate	U		8.45	20.0

Sample Narrative:
BLANK: Endpoint pH 4.5

L1287958-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1287958-01 12/02/20 03:49 • (DUP) R3599332-3 12/02/20 03:58

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	67.3	68.8	1	2.16		20
Alkalinity,Carbonate	ND	ND	1	0.000		20

Sample Narrative:
OS: Endpoint pH 4.5
DUP: Endpoint pH 4.5

L1288834-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288834-01 12/02/20 05:42 • (DUP) R3599332-4 12/02/20 05:51

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity,Bicarbonate	264	251	1	5.14		20
Alkalinity,Carbonate	ND	ND	1	0.000		20

Sample Narrative:
OS: Endpoint pH 4.5
DUP: Endpoint pH 4.5

Method Blank (MB)

(MB) R3598032-1 11/28/20 00:36

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Nitrate-Nitrite	U		0.0500	0.100

Laboratory Control Sample (LCS)

(LCS) R3598032-2 11/28/20 00:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate-Nitrite	2.50	2.66	106	90.0-110	

Method Blank (MB)

(MB) R3598186-2 11/29/20 08:40

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Phosphorus,Total	0.0478	J	0.0350	0.100

L1288289-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288289-01 11/29/20 08:48 • (DUP) R3598186-4 11/29/20 08:49

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	1.03	1.26	1	20.1	J3	20

L1288291-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288291-01 11/29/20 09:02 • (DUP) R3598186-7 11/29/20 09:03

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Phosphorus,Total	0.675	0.917	1	30.4	J3	20

Laboratory Control Sample (LCS)

(LCS) R3598186-3 11/29/20 08:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Phosphorus,Total	4.26	3.97	93.3	82.4-117	

L1288289-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288289-01 11/29/20 08:48 • (MS) R3598186-5 11/29/20 08:59 • (MSD) R3598186-6 11/29/20 09:00

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 %
Phosphorus,Total	2.50	1.03	3.31	3.40	91.2	94.8	1	90.0-110			2.68	20

Method Blank (MB)

(MB) R3596253-1 11/21/20 23:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.353	1.00
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Nitrate	U		0.0480	0.100
Nitrite	U		0.0420	0.100
Sulfate	U		0.594	5.00

L1288005-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1288005-02 11/22/20 01:26 • (DUP) R3596253-3 11/22/20 01:42

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	ND	1	0.000		15
Chloride	28.7	28.7	1	0.000980		15
Fluoride	0.176	0.179	1	1.71		15
Nitrate	0.370	0.411	1	10.6		15
Nitrite	ND	ND	1	0.000		15
Sulfate	18.9	19.0	1	0.236		15

L1288238-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288238-01 11/22/20 07:21 • (DUP) R3596253-7 11/22/20 07:36

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	ND	1	0.000		15
Chloride	ND	ND	1	7.76		15
Fluoride	ND	ND	1	32.2	P1	15
Nitrate	0.721	0.721	1	0.0326		15
Nitrite	ND	ND	1	0.000		15
Sulfate	6.14	6.14	1	0.146		15

Laboratory Control Sample (LCS)

(LCS) R3596253-2 11/22/20 00:09

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromide	40.0	39.5	98.6	80.0-120	
Chloride	40.0	38.9	97.3	80.0-120	
Fluoride	8.00	7.92	99.0	80.0-120	
Nitrate	8.00	7.98	99.8	80.0-120	
Nitrite	8.00	8.03	100	80.0-120	
Sulfate	40.0	39.8	99.5	80.0-120	

L1288005-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288005-03 11/22/20 02:59 • (MS) R3596253-4 11/22/20 03:14 • (MSD) R3596253-5 11/22/20 03:29

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 %
Bromide	50.0	ND	49.4	49.9	98.8	99.9	1	80.0-120			1.05	15
Chloride	50.0	21.6	71.4	72.1	99.5	101	1	80.0-120			0.999	15
Fluoride	5.00	0.180	5.22	5.27	101	102	1	80.0-120			0.933	15
Nitrate	5.00	ND	5.02	5.08	100	102	1	80.0-120			1.05	15
Nitrite	5.00	ND	5.07	5.13	101	103	1	80.0-120			1.01	15
Sulfate	50.0	13.0	63.5	64.1	101	102	1	80.0-120			0.925	15

L1288102-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1288102-01 11/22/20 06:04 • (MS) R3596253-6 11/22/20 06:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	44.8	89.6	1	80.0-120	
Chloride	50.0	21.4	71.5	100	1	80.0-120	
Fluoride	5.00	0.290	5.26	99.5	1	80.0-120	
Nitrate	5.00	ND	4.90	98.0	1	80.0-120	
Nitrite	5.00	ND	5.08	102	1	80.0-120	

Method Blank (MB)

(MB) R3599483-1 12/02/20 07:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200

Laboratory Control Sample (LCS)

(LCS) R3599483-2 12/02/20 07:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron	1.00	1.01	101	80.0-120	

L1288243-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288243-03 12/02/20 08:02 • (MS) R3599483-4 12/02/20 08:07 • (MSD) R3599483-5 12/02/20 08:09

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 %
Boron	1.00	ND	1.03	1.03	103	103	1	75.0-125			0.154	20

Method Blank (MB)

(MB) R3598745-6 11/30/20 16:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000381	0.0200
Calcium	U		0.0936	1.00
Iron	U		0.0281	0.100
Magnesium	U		0.0735	1.00
Manganese	U		0.000704	0.00500
Potassium	U		0.108	2.00
Selenium	U		0.000300	0.00200
Sodium	U		0.376	2.00
Strontium	U		0.000590	0.0100

Laboratory Control Sample (LCS)

(LCS) R3598745-7 11/30/20 16:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	0.0500	0.0447	89.5	80.0-120	
Calcium	5.00	4.95	99.0	80.0-120	
Iron	5.00	4.98	99.6	80.0-120	
Magnesium	5.00	5.11	102	80.0-120	
Manganese	0.0500	0.0496	99.3	80.0-120	
Potassium	5.00	4.91	98.2	80.0-120	
Selenium	0.0500	0.0496	99.2	80.0-120	
Sodium	5.00	4.96	99.2	80.0-120	
Strontium	0.0500	0.0448	89.7	80.0-120	

L1288264-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288264-04 11/30/20 16:48 • (MS) R3598745-8 11/30/20 16:55 • (MSD) R3598745-9 11/30/20 16:58

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 %
Barium	0.0500	0.144	0.196	0.197	103	106	1	75.0-125			0.807	20
Calcium	5.00	87.8	93.5	94.9	116	143	1	75.0-125		V	1.46	20
Potassium	5.00	108	112	113	77.6	104	1	75.0-125			1.16	20
Iron	5.00	3.85	9.26	9.36	108	110	1	75.0-125			1.03	20
Magnesium	5.00	102	107	110	93.9	156	1	75.0-125		V	2.88	20
Manganese	0.0500	0.369	0.425	0.422	113	106	1	75.0-125			0.816	20
Selenium	0.0500	ND	0.0509	0.0527	100	104	1	75.0-125			3.48	20
Sodium	5.00	1250	1270	1320	472	1330	1	75.0-125	E V	E V	3.30	20
Strontium	0.0500	1.67	1.80	1.84	243	323	1	75.0-125	V	V	2.23	20

Method Blank (MB)

(MB) R3598185-2 11/27/20 23:13

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	U		0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*111*			*78.0-120*

Laboratory Control Sample (LCS)

(LCS) R3598185-1 11/27/20 22:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.93	108	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*99.8*	*78.0-120*	

Method Blank (MB)

(MB) R3596782-2 11/24/20 09:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100
Ethane	U		0.00407	0.0130
Ethene	U		0.00426	0.0130

L1288280-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1288280-08 11/24/20 10:27 • (DUP) R3596782-4 11/24/20 10:40

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Methane	ND	ND	1	0.000		20
Ethane	ND	ND	1	0.000		20
Ethene	ND	ND	1	0.000		20

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

(LCS) R3596782-1 11/24/20 08:58 • (LCSD) R3596782-5 11/24/20 10:42

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 %
Methane	0.0678	0.0640	0.0661	94.4	97.5	85.0-115			3.23	20
Ethane	0.129	0.121	0.122	93.8	94.6	85.0-115			0.823	20
Ethene	0.127	0.120	0.119	94.5	93.7	85.0-115			0.837	20

Method Blank (MB)

(MB) R3597063-2 11/24/20 15:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Methane	U		0.00291	0.0100

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

(LCS) R3597063-1 11/24/20 15:35 • (LCSD) R3597063-4 11/24/20 16:54

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 %
Methane	0.0678	0.0715	0.0690	105	102	85.0-115			3.56	20

Method Blank (MB)

(MB) R3598889-2 11/28/20 08:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0113	0.0500
Acrolein	U		0.00254	0.0500
Acrylonitrile	U		0.000671	0.0100
Benzene	U		0.0000941	0.00100
Bromobenzene	U		0.000118	0.00100
Bromodichloromethane	U		0.000136	0.00100
Bromoform	U		0.000129	0.00100
Bromomethane	U		0.000605	0.00500
n-Butylbenzene	U		0.000157	0.00100
sec-Butylbenzene	U		0.000125	0.00100
tert-Butylbenzene	U		0.000127	0.00100
Carbon tetrachloride	U		0.000128	0.00100
Chlorobenzene	U		0.000116	0.00100
Chlorodibromomethane	U		0.000140	0.00100
Chloroethane	U		0.000192	0.00500
2-Chloroethyl vinyl ether	U		0.000575	0.0500
Chloroform	U		0.000111	0.00500
Chloromethane	U		0.000960	0.00250
2-Chlorotoluene	U		0.000106	0.00100
4-Chlorotoluene	U		0.000114	0.00100
1,2-Dibromo-3-Chloropropane	U		0.000276	0.00500
1,2-Dibromoethane	U		0.000126	0.00100
Dibromomethane	U		0.000122	0.00100
1,2-Dichlorobenzene	U		0.000107	0.00100
1,3-Dichlorobenzene	U		0.000110	0.00100
1,4-Dichlorobenzene	U		0.000120	0.00100
Dichlorodifluoromethane	U		0.000374	0.00500
1,1-Dichloroethane	U		0.000100	0.00100
1,2-Dichloroethane	U		0.0000819	0.00100
1,1-Dichloroethene	U		0.000188	0.00100
cis-1,2-Dichloroethene	U		0.000126	0.00100
trans-1,2-Dichloroethene	U		0.000149	0.00100
1,2-Dichloropropane	U		0.000149	0.00100
1,1-Dichloropropene	U		0.000142	0.00100
1,3-Dichloropropane	U		0.000110	0.00100
cis-1,3-Dichloropropene	U		0.000111	0.00100
trans-1,3-Dichloropropene	U		0.000118	0.00100
Di-isopropyl ether	U		0.000105	0.00100
Ethylbenzene	U		0.000137	0.00100
Ethanol	U		0.0420	0.100

Method Blank (MB)

(MB) R3598889-2 11/28/20 08:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hexachloro-1,3-butadiene	U		0.000337	0.00100
Isopropylbenzene	U		0.000105	0.00100
p-Isopropyltoluene	U		0.000120	0.00100
2-Butanone (MEK)	U		0.00119	0.0100
Methylene Chloride	U		0.000430	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.000478	0.0100
Methyl tert-butyl ether	U		0.000101	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.0000993	0.00100
Styrene	U		0.000118	0.00100
1,1,1,2-Tetrachloroethane	U		0.000147	0.00100
1,1,2,2-Tetrachloroethane	U		0.000133	0.00100
Tetrachloroethene	U		0.000300	0.00100
Toluene	U		0.000278	0.00100
1,1,2-Trichlorotrifluoroethane	U		0.000180	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000481	0.00100
1,1,1-Trichloroethane	U		0.000149	0.00100
1,1,2-Trichloroethane	U		0.000158	0.00100
Trichloroethene	0.000201	J	0.000190	0.00100
Trichlorofluoromethane	U		0.000160	0.00500
1,2,3-Trichloropropane	U		0.000237	0.00250
1,2,3-Trimethylbenzene	U		0.000104	0.00100
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
Vinyl chloride	U		0.000234	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	*99.6*			*80.0-120*
(S) 4-Bromofluorobenzene	*107*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*101*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3598889-1 11/28/20 07:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acetone	0.0250	0.0254	102	19.0-160	
Acrolein	0.0250	0.0219	87.6	10.0-160	
Acrylonitrile	0.0250	0.0286	114	55.0-149	

Laboratory Control Sample (LCS)

(LCS) R3598889-1 11/28/20 07:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00505	101	70.0-123	
Bromobenzene	0.00500	0.00539	108	73.0-121	
Bromodichloromethane	0.00500	0.00491	98.2	75.0-120	
Bromoform	0.00500	0.00496	99.2	68.0-132	
Bromomethane	0.00500	0.00410	82.0	10.0-160	
n-Butylbenzene	0.00500	0.00442	88.4	73.0-125	
sec-Butylbenzene	0.00500	0.00498	99.6	75.0-125	
tert-Butylbenzene	0.00500	0.00487	97.4	76.0-124	
Carbon tetrachloride	0.00500	0.00469	93.8	68.0-126	
Chlorobenzene	0.00500	0.00515	103	80.0-121	
Chlorodibromomethane	0.00500	0.00479	95.8	77.0-125	
Chloroethane	0.00500	0.00538	108	47.0-150	
2-Chloroethyl vinyl ether	0.0250	0.0301	120	51.0-160	
Chloroform	0.00500	0.00494	98.8	73.0-120	
Chloromethane	0.00500	0.00484	96.8	41.0-142	
2-Chlorotoluene	0.00500	0.00521	104	76.0-123	
4-Chlorotoluene	0.00500	0.00474	94.8	75.0-122	
1,2-Dibromo-3-Chloropropane	0.00500	0.00472	94.4	58.0-134	
1,2-Dibromoethane	0.00500	0.00508	102	80.0-122	
Dibromomethane	0.00500	0.00507	101	80.0-120	
1,2-Dichlorobenzene	0.00500	0.00492	98.4	79.0-121	
1,3-Dichlorobenzene	0.00500	0.00523	105	79.0-120	
1,4-Dichlorobenzene	0.00500	0.00488	97.6	79.0-120	
Dichlorodifluoromethane	0.00500	0.00453	90.6	51.0-149	
1,1-Dichloroethane	0.00500	0.00528	106	70.0-126	
1,2-Dichloroethane	0.00500	0.00471	94.2	70.0-128	
1,1-Dichloroethene	0.00500	0.00501	100	71.0-124	
cis-1,2-Dichloroethene	0.00500	0.00536	107	73.0-120	
trans-1,2-Dichloroethene	0.00500	0.00497	99.4	73.0-120	
1,2-Dichloropropane	0.00500	0.00518	104	77.0-125	
1,1-Dichloropropene	0.00500	0.00508	102	74.0-126	
1,3-Dichloropropane	0.00500	0.00518	104	80.0-120	
cis-1,3-Dichloropropene	0.00500	0.00500	100	80.0-123	
trans-1,3-Dichloropropene	0.00500	0.00467	93.4	78.0-124	
Di-isopropyl ether	0.00500	0.00523	105	58.0-138	
Ethylbenzene	0.00500	0.00511	102	79.0-123	
Hexachloro-1,3-butadiene	0.00500	0.00419	83.8	54.0-138	
Isopropylbenzene	0.00500	0.00501	100	76.0-127	
p-Isopropyltoluene	0.00500	0.00506	101	76.0-125	
2-Butanone (MEK)	0.0250	0.0247	98.8	44.0-160	

Laboratory Control Sample (LCS)

(LCS) R3598889-1 11/28/20 07:48

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Methylene Chloride	0.00500	0.00520	104	67.0-120	
4-Methyl-2-pentanone (MIBK)	0.0250	0.0279	112	68.0-142	
Methyl tert-butyl ether	0.00500	0.00502	100	68.0-125	
Naphthalene	0.00500	0.00539	108	54.0-135	
n-Propylbenzene	0.00500	0.00519	104	77.0-124	
Styrene	0.00500	0.00441	88.2	73.0-130	
1,1,1,2-Tetrachloroethane	0.00500	0.00483	96.6	75.0-125	
1,1,2,2-Tetrachloroethane	0.00500	0.00596	119	65.0-130	
Tetrachloroethene	0.00500	0.00475	95.0	72.0-132	
Toluene	0.00500	0.00490	98.0	79.0-120	
1,1,2-Trichlorotrifluoroethane	0.00500	0.00524	105	69.0-132	
1,2,3-Trichlorobenzene	0.00500	0.00468	93.6	50.0-138	
1,2,4-Trichlorobenzene	0.00500	0.00498	99.6	57.0-137	
1,1,1-Trichloroethane	0.00500	0.00483	96.6	73.0-124	
1,1,2-Trichloroethane	0.00500	0.00516	103	80.0-120	
Trichloroethene	0.00500	0.00548	110	78.0-124	
Trichlorofluoromethane	0.00500	0.00443	88.6	59.0-147	
1,2,3-Trichloropropane	0.00500	0.00553	111	73.0-130	
1,2,3-Trimethylbenzene	0.00500	0.00505	101	77.0-120	
1,2,4-Trimethylbenzene	0.00500	0.00528	106	76.0-121	
1,3,5-Trimethylbenzene	0.00500	0.00485	97.0	76.0-122	
Vinyl chloride	0.00500	0.00635	127	67.0-131	
Xylenes, Total	0.0150	0.0152	101	79.0-123	
ethanol	0.250	0.248	99.2	10.0-160	
(S) Toluene-d8			*95.5*	*80.0-120*	
(S) 4-Bromofluorobenzene			*104*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*95.5*	*70.0-130*	

Method Blank (MB)

(MB) R3599036-3 12/01/20 11:04

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
2,2-Dichloropropane	U		0.000161	0.00100
2-Propanol	U		0.00165	0.00500
Toluene	U		0.000278	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	*107*			*80.0-120*
(S) 4-Bromofluorobenzene	*89.4*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*102*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3599036-1 12/01/20 10:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00511	102	70.0-123	
2,2-Dichloropropane	0.00500	0.00499	99.8	58.0-130	
Toluene	0.00500	0.00565	113	79.0-120	
Xylenes, Total	0.0150	0.0154	103	79.0-123	
(S) Toluene-d8			*108*	*80.0-120*	
(S) 4-Bromofluorobenzene			*90.8*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*101*	*70.0-130*	

Laboratory Control Sample (LCS)

(LCS) R3599036-2 12/01/20 10:23

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2-Propanol	0.0500	0.0337	67.4	10.0-160	
(S) Toluene-d8			*105*	*80.0-120*	
(S) 4-Bromofluorobenzene			*91.7*	*77.0-126*	
(S) 1,2-Dichloroethane-d4			*103*	*70.0-130*	

Method Blank (MB)

(MB) R3598905-1 12/01/20 05:37

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) High Fraction	U		0.0247	0.100
(S) o-Terphenyl	*86.5*			*31.0-160*

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

(LCS) R3598905-2 12/01/20 05:57 • (LCSD) R3598905-3 12/01/20 06:17

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 %
TPH (GC/FID) High Fraction	1.50	1.54	1.58	103	105	50.0-150			2.56	20
(S) o-Terphenyl				*103*	*103*	*31.0-160*				

Method Blank (MB)

(MB) R3597169-2 11/24/20 11:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acenaphthene	U		0.0000886	0.00100
Acenaphthylene	U		0.0000921	0.00100
Anthracene	U		0.0000804	0.00100
Benzidine	U		0.00374	0.0100
Benzo(a)anthracene	U		0.000199	0.00100
Benzo(b)fluoranthene	U		0.000130	0.00100
Benzo(k)fluoranthene	U		0.000120	0.00100
Benzo(g,h,i)perylene	U		0.000121	0.00100
Benzo(a)pyrene	U		0.0000381	0.00100
Bis(2-chlorethoxy)methane	U		0.000116	0.0100
Bis(2-chloroethyl)ether	U		0.000137	0.0100
2,2-Oxybis(1-Chloropropane)	U		0.000210	0.0100
4-Bromophenyl-phenylether	U		0.0000877	0.0100
2-Chloronaphthalene	U		0.0000648	0.00100
4-Chlorophenyl-phenylether	U		0.0000926	0.0100
Chrysene	U		0.000130	0.00100
Dibenz(a,h)anthracene	U		0.0000644	0.00100
1,2-Dichlorobenzene	U		0.0000713	0.0100
1,3-Dichlorobenzene	U		0.000132	0.0100
1,4-Dichlorobenzene	U		0.0000942	0.0100
3,3-Dichlorobenzidine	U		0.000212	0.0100
2,4-Dinitrotoluene	U		0.0000983	0.0100
2,6-Dinitrotoluene	U		0.000250	0.0100
Fluoranthene	U		0.000102	0.00100
Fluorene	U		0.0000844	0.00100
Hexachlorobenzene	U		0.0000755	0.00100
Hexachloro-1,3-butadiene	U		0.0000968	0.0100
Hexachlorocyclopentadiene	U		0.0000598	0.0100
Hexachloroethane	U		0.000127	0.0100
Indeno(1,2,3-cd)pyrene	U		0.000279	0.00100
Isophorone	U		0.000143	0.0100
Naphthalene	U		0.000159	0.00100
Nitrobenzene	U		0.000297	0.0100
n-Nitrosodimethylamine	U		0.000998	0.0100
n-Nitrosodiphenylamine	U		0.00237	0.0100
n-Nitrosodi-n-propylamine	U		0.000261	0.0100
Phenanthrene	U		0.000112	0.00100
Benzylbutyl phthalate	U		0.000765	0.00300
Bis(2-ethylhexyl)phthalate	U		0.000895	0.00300
Di-n-butyl phthalate	U		0.000453	0.00300

Method Blank (MB)

(MB) R3597169-2 11/24/20 11:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Diethyl phthalate	U		0.000287	0.00300
Dimethyl phthalate	U		0.000260	0.00300
Di-n-octyl phthalate	U		0.000932	0.00300
Pyrene	U		0.000107	0.00100
1,2,4-Trichlorobenzene	U		0.0000698	0.0100
4-Chloro-3-methylphenol	U		0.000131	0.0100
2-Chlorophenol	U		0.000133	0.0100
2,4-Dichlorophenol	U		0.000102	0.0100
2,4-Dimethylphenol	U		0.0000636	0.0100
4,6-Dinitro-2-methylphenol	U		0.00112	0.0100
2,4-Dinitrophenol	U		0.00593	0.0100
2-Nitrophenol	U		0.000117	0.0100
4-Nitrophenol	U		0.000143	0.0100
Pentachlorophenol	U		0.000313	0.0100
Phenol	U		0.00433	0.0100
2,4,6-Trichlorophenol	U		0.000100	0.0100
(S) Nitrobenzene-d5	*39.5*			*10.0-127*
(S) 2-Fluorobiphenyl	*45.4*			*10.0-130*
(S) p-Terphenyl-d14	*57.8*			*10.0-128*
(S) Phenol-d5	*21.2*			*10.0-120*
(S) 2-Fluorophenol	*31.9*			*10.0-120*
(S) 2,4,6-Tribromophenol	*33.9*			*10.0-155*

Laboratory Control Sample (LCS)

(LCS) R3597169-1 11/24/20 10:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0500	0.0330	66.0	41.0-120	
Acenaphthylene	0.0500	0.0341	68.2	43.0-120	
Anthracene	0.0500	0.0364	72.8	45.0-120	
Benzidine	0.100	0.0418	41.8	10.0-120	
Benzo(a)anthracene	0.0500	0.0373	74.6	47.0-120	
Benzo(b)fluoranthene	0.0500	0.0360	72.0	46.0-120	
Benzo(k)fluoranthene	0.0500	0.0389	77.8	46.0-120	
Benzo(g,h,i)perylene	0.0500	0.0386	77.2	48.0-121	
Benzo(a)pyrene	0.0500	0.0395	79.0	47.0-120	
Bis(2-chlorethoxy)methane	0.0500	0.0320	64.0	33.0-120	
Bis(2-chloroethyl)ether	0.0500	0.0367	73.4	23.0-120	

Laboratory Control Sample (LCS)

(LCS) R3597169-1 11/24/20 10:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2,2-Oxybis(1-Chloropropane)	0.0500	0.0345	69.0	28.0-120	
4-Bromophenyl-phenylether	0.0500	0.0353	70.6	45.0-120	
2-Chloronaphthalene	0.0500	0.0333	66.6	37.0-120	
4-Chlorophenyl-phenylether	0.0500	0.0353	70.6	44.0-120	
Chrysene	0.0500	0.0358	71.6	48.0-120	
Dibenz(a,h)anthracene	0.0500	0.0391	78.2	47.0-120	
1,2-Dichlorobenzene	0.0500	0.0349	69.8	20.0-120	
1,3-Dichlorobenzene	0.0500	0.0336	67.2	17.0-120	
1,4-Dichlorobenzene	0.0500	0.0328	65.6	18.0-120	
3,3-Dichlorobenzidine	0.100	0.0787	78.7	44.0-120	
2,4-Dinitrotoluene	0.0500	0.0357	71.4	49.0-124	
2,6-Dinitrotoluene	0.0500	0.0350	70.0	46.0-120	
Fluoranthene	0.0500	0.0358	71.6	51.0-120	
Fluorene	0.0500	0.0344	68.8	47.0-120	
Hexachlorobenzene	0.0500	0.0361	72.2	44.0-120	
Hexachloro-1,3-butadiene	0.0500	0.0305	61.0	19.0-120	
Hexachlorocyclopentadiene	0.0500	0.0181	36.2	15.0-120	
Hexachloroethane	0.0500	0.0337	67.4	15.0-120	
Indeno(1,2,3-cd)pyrene	0.0500	0.0378	75.6	49.0-122	
Isophorone	0.0500	0.0316	63.2	36.0-120	
Naphthalene	0.0500	0.0298	59.6	27.0-120	
Nitrobenzene	0.0500	0.0304	60.8	27.0-120	
n-Nitrosodimethylamine	0.0500	0.0232	46.4	10.0-120	
n-Nitrosodiphenylamine	0.0500	0.0357	71.4	47.0-120	
n-Nitrosodi-n-propylamine	0.0500	0.0374	74.8	31.0-120	
Phenanthrene	0.0500	0.0354	70.8	46.0-120	
Benzylbutyl phthalate	0.0500	0.0371	74.2	43.0-121	
Bis(2-ethylhexyl)phthalate	0.0500	0.0358	71.6	43.0-122	
Di-n-butyl phthalate	0.0500	0.0351	70.2	49.0-121	
Diethyl phthalate	0.0500	0.0363	72.6	48.0-122	
Dimethyl phthalate	0.0500	0.0355	71.0	48.0-120	
Di-n-octyl phthalate	0.0500	0.0348	69.6	42.0-125	
Pyrene	0.0500	0.0360	72.0	47.0-120	
1,2,4-Trichlorobenzene	0.0500	0.0305	61.0	24.0-120	
4-Chloro-3-methylphenol	0.0500	0.0269	53.8	40.0-120	
2-Chlorophenol	0.0500	0.0296	59.2	25.0-120	
2,4-Dichlorophenol	0.0500	0.0289	57.8	36.0-120	
2,4-Dimethylphenol	0.0500	0.0297	59.4	33.0-120	
4,6-Dinitro-2-methylphenol	0.0500	0.0417	83.4	38.0-138	
2,4-Dinitrophenol	0.0500	0.0469	93.8	10.0-120	

Laboratory Control Sample (LCS)

(LCS) R3597169-1 11/24/20 10:52

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2-Nitrophenol	0.0500	0.0303	60.6	31.0-120	
4-Nitrophenol	0.0500	0.0113	22.6	10.0-120	
Pentachlorophenol	0.0500	0.0344	68.8	23.0-120	
Phenol	0.0500	0.00973	19.5	10.0-120	
2,4,6-Trichlorophenol	0.0500	0.0347	69.4	42.0-120	
(S) Nitrobenzene-d5			*60.1*	*10.0-127*	
(S) 2-Fluorobiphenyl			*72.4*	*10.0-130*	
(S) p-Terphenyl-d14			*68.4*	*10.0-128*	
(S) Phenol-d5			*18.1*	*10.0-120*	
(S) 2-Fluorophenol			*33.4*	*10.0-120*	
(S) 2,4,6-Tribromophenol			*67.0*	*10.0-155*	

Method Blank (MB)

(MB) R3597387-2 11/24/20 22:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acenaphthene	U		0.0000886	0.00100
Acenaphthylene	U		0.0000921	0.00100
Anthracene	U		0.0000804	0.00100
Benzidine	U		0.00374	0.0100
Benzo(a)anthracene	U		0.000199	0.00100
Benzo(b)fluoranthene	U		0.000130	0.00100
Benzo(k)fluoranthene	U		0.000120	0.00100
Benzo(g,h,i)perylene	U		0.000121	0.00100
Benzo(a)pyrene	U		0.0000381	0.00100
Bis(2-chlorethoxy)methane	U		0.000116	0.0100
Bis(2-chloroethyl)ether	U		0.000137	0.0100
2,2-Oxybis(1-Chloropropane)	U		0.000210	0.0100
4-Bromophenyl-phenylether	U		0.0000877	0.0100
2-Chloronaphthalene	U		0.0000648	0.00100
4-Chlorophenyl-phenylether	U		0.0000926	0.0100
Chrysene	U		0.000130	0.00100
Dibenz(a,h)anthracene	U		0.0000644	0.00100
1,2-Dichlorobenzene	U		0.0000713	0.0100
1,3-Dichlorobenzene	U		0.000132	0.0100
1,4-Dichlorobenzene	U		0.0000942	0.0100
3,3-Dichlorobenzidine	U		0.000212	0.0100
2,4-Dinitrotoluene	U		0.0000983	0.0100
2,6-Dinitrotoluene	U		0.000250	0.0100
Fluoranthene	U		0.000102	0.00100
Fluorene	U		0.0000844	0.00100
Hexachlorobenzene	U		0.0000755	0.00100
Hexachloro-1,3-butadiene	U		0.0000968	0.0100
Hexachlorocyclopentadiene	U		0.0000598	0.0100
Hexachloroethane	U		0.000127	0.0100
Indeno(1,2,3-cd)pyrene	U		0.000279	0.00100
Isophorone	U		0.000143	0.0100
Naphthalene	U		0.000159	0.00100
Nitrobenzene	U		0.000297	0.0100
n-Nitrosodimethylamine	U		0.000998	0.0100
n-Nitrosodiphenylamine	U		0.00237	0.0100
n-Nitrosodi-n-propylamine	U		0.000261	0.0100
Phenanthrene	U		0.000112	0.00100
Benzylbutyl phthalate	U		0.000765	0.00300
Bis(2-ethylhexyl)phthalate	U		0.000895	0.00300
Di-n-butyl phthalate	U		0.000453	0.00300

Method Blank (MB)

(MB) R3597387-2 11/24/20 22:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Diethyl phthalate	U		0.000287	0.00300
Dimethyl phthalate	U		0.000260	0.00300
Di-n-octyl phthalate	U		0.000932	0.00300
Pyrene	U		0.000107	0.00100
1,2,4-Trichlorobenzene	U		0.0000698	0.0100
4-Chloro-3-methylphenol	U		0.000131	0.0100
2-Chlorophenol	U		0.000133	0.0100
2,4-Dichlorophenol	U		0.000102	0.0100
2,4-Dimethylphenol	U		0.0000636	0.0100
4,6-Dinitro-2-methylphenol	U		0.00112	0.0100
2,4-Dinitrophenol	U		0.00593	0.0100
2-Nitrophenol	U		0.000117	0.0100
4-Nitrophenol	U		0.000143	0.0100
Pentachlorophenol	U		0.000313	0.0100
Phenol	U		0.00433	0.0100
2,4,6-Trichlorophenol	U		0.000100	0.0100
(S) Nitrobenzene-d5	*59.4*			*10.0-127*
(S) 2-Fluorobiphenyl	*67.6*			*10.0-130*
(S) p-Terphenyl-d14	*71.4*			*10.0-128*
(S) Phenol-d5	*23.8*			*10.0-120*
(S) 2-Fluorophenol	*37.4*			*10.0-120*
(S) 2,4,6-Tribromophenol	*47.5*			*10.0-155*

Laboratory Control Sample (LCS)

(LCS) R3597387-1 11/24/20 22:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0500	0.0296	59.2	41.0-120	
Acenaphthylene	0.0500	0.0308	61.6	43.0-120	
Anthracene	0.0500	0.0332	66.4	45.0-120	
Benzidine	0.100	0.0252	25.2	10.0-120	
Benzo(a)anthracene	0.0500	0.0359	71.8	47.0-120	
Benzo(b)fluoranthene	0.0500	0.0349	69.8	46.0-120	
Benzo(k)fluoranthene	0.0500	0.0368	73.6	46.0-120	
Benzo(g,h,i)perylene	0.0500	0.0338	67.6	48.0-121	
Benzo(a)pyrene	0.0500	0.0364	72.8	47.0-120	
Bis(2-chlorethoxy)methane	0.0500	0.0295	59.0	33.0-120	
Bis(2-chloroethyl)ether	0.0500	0.0355	71.0	23.0-120	

Laboratory Control Sample (LCS)

(LCS) R3597387-1 11/24/20 22:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2,2-Oxybis(1-Chloropropane)	0.0500	0.0331	66.2	28.0-120	
4-Bromophenyl-phenylether	0.0500	0.0339	67.8	45.0-120	
2-Chloronaphthalene	0.0500	0.0300	60.0	37.0-120	
4-Chlorophenyl-phenylether	0.0500	0.0317	63.4	44.0-120	
Chrysene	0.0500	0.0346	69.2	48.0-120	
Dibenz(a,h)anthracene	0.0500	0.0335	67.0	47.0-120	
1,2-Dichlorobenzene	0.0500	0.0317	63.4	20.0-120	
1,3-Dichlorobenzene	0.0500	0.0307	61.4	17.0-120	
1,4-Dichlorobenzene	0.0500	0.0299	59.8	18.0-120	
3,3-Dichlorobenzidine	0.100	0.0670	67.0	44.0-120	
2,4-Dinitrotoluene	0.0500	0.0324	64.8	49.0-124	
2,6-Dinitrotoluene	0.0500	0.0330	66.0	46.0-120	
Fluoranthene	0.0500	0.0351	70.2	51.0-120	
Fluorene	0.0500	0.0312	62.4	47.0-120	
Hexachlorobenzene	0.0500	0.0359	71.8	44.0-120	
Hexachloro-1,3-butadiene	0.0500	0.0277	55.4	19.0-120	
Hexachlorocyclopentadiene	0.0500	0.0155	31.0	15.0-120	
Hexachloroethane	0.0500	0.0296	59.2	15.0-120	
Indeno(1,2,3-cd)pyrene	0.0500	0.0326	65.2	49.0-122	
Isophorone	0.0500	0.0303	60.6	36.0-120	
Naphthalene	0.0500	0.0266	53.2	27.0-120	
Nitrobenzene	0.0500	0.0260	52.0	27.0-120	
n-Nitrosodimethylamine	0.0500	0.0210	42.0	10.0-120	
n-Nitrosodiphenylamine	0.0500	0.0317	63.4	47.0-120	
n-Nitrosodi-n-propylamine	0.0500	0.0383	76.6	31.0-120	
Phenanthrene	0.0500	0.0350	70.0	46.0-120	
Benzylbutyl phthalate	0.0500	0.0372	74.4	43.0-121	
Bis(2-ethylhexyl)phthalate	0.0500	0.0369	73.8	43.0-122	
Di-n-butyl phthalate	0.0500	0.0360	72.0	49.0-121	
Diethyl phthalate	0.0500	0.0343	68.6	48.0-122	
Dimethyl phthalate	0.0500	0.0335	67.0	48.0-120	
Di-n-octyl phthalate	0.0500	0.0328	65.6	42.0-125	
Pyrene	0.0500	0.0368	73.6	47.0-120	
1,2,4-Trichlorobenzene	0.0500	0.0272	54.4	24.0-120	
4-Chloro-3-methylphenol	0.0500	0.0266	53.2	40.0-120	
2-Chlorophenol	0.0500	0.0296	59.2	25.0-120	
2,4-Dichlorophenol	0.0500	0.0255	51.0	36.0-120	
2,4-Dimethylphenol	0.0500	0.0288	57.6	33.0-120	
4,6-Dinitro-2-methylphenol	0.0500	0.0303	60.6	38.0-138	
2,4-Dinitrophenol	0.0500	0.0341	68.2	10.0-120	

Laboratory Control Sample (LCS)

(LCS) R3597387-1 11/24/20 22:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
2-Nitrophenol	0.0500	0.0245	49.0	31.0-120	
4-Nitrophenol	0.0500	0.0101	20.2	10.0-120	
Pentachlorophenol	0.0500	0.0255	51.0	23.0-120	
Phenol	0.0500	0.0121	24.2	10.0-120	
2,4,6-Trichlorophenol	0.0500	0.0270	54.0	42.0-120	
(S) Nitrobenzene-d5			*53.7*	*10.0-127*	
(S) 2-Fluorobiphenyl			*63.5*	*10.0-130*	
(S) p-Terphenyl-d14			*65.8*	*10.0-128*	
(S) Phenol-d5			*23.2*	*10.0-120*	
(S) 2-Fluorophenol			*38.0*	*10.0-120*	
(S) 2,4,6-Tribromophenol			*54.5*	*10.0-155*	

Guide to Reading and Understanding Your Laboratory Report

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

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National 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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

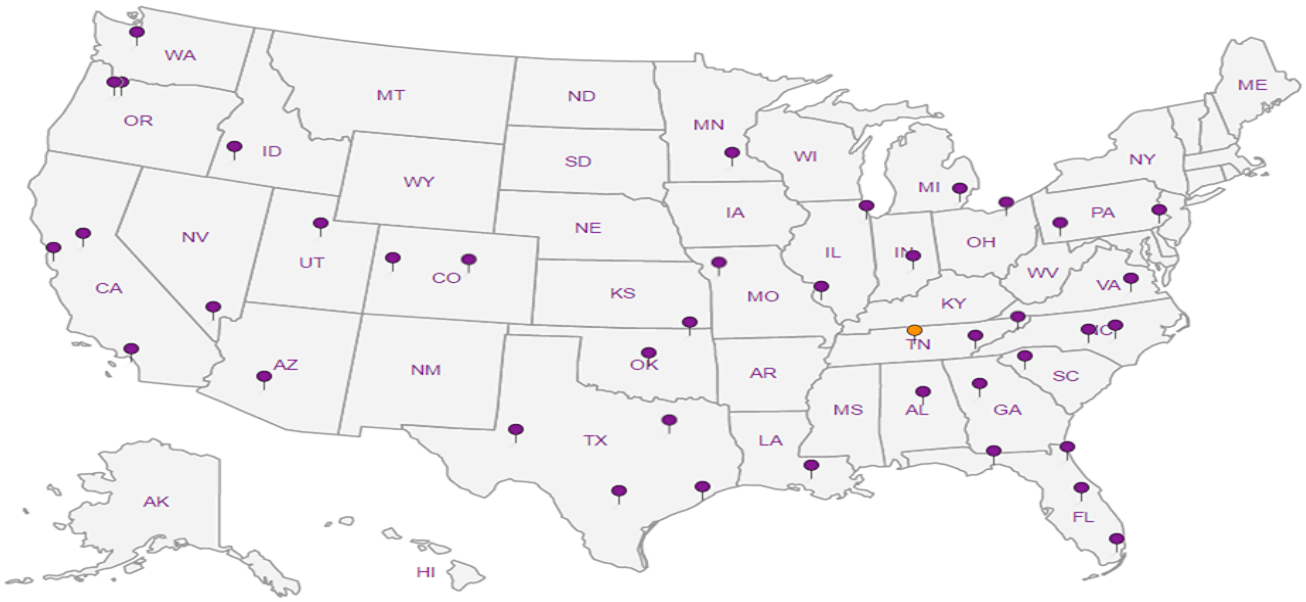
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



Nicholson GeoSolutions, LLC

3433 E. Lake Dr.
Centennial, CO 80121

Billing Information:
Don Wilbourn
Berry Petroleum Company
235 Callahan Ave
Parachute, CO 81635

Pres Chk

Report to: **Dave Nicholson**

Email To: **dnicholson@q.com**

Project Description: **Berry Petroleum J15 Spill Response**

City/State Collected:

Phone: **303-601-2023**
Fax:

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature): DK Nicholson
Immediately Packed on Ice N ___ Y (Y)

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

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

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

L# 1288266

Tabl F142

Acctnum: **BERPETDCO**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC8260 (2) 40ml Amber w/HCl	Cl, NO2, NO3, SO4,Br,Fl - 500ml HDPE No Pres	TDS, ALKBI, ALKCA - 500ml HDPE No Pres	RSK-175+propane (2) 40ml Amber w/HCl	Total Metals - 250ml HDPE w/HNO3	Total Phosphorus - 250ml HDPE w/H2SO4	SVOC8270 (2) 100ml Amber No Pres	TPH-GRO (2) 40ml Amber w/HCl	TPH-DRO (2) 40ml Amber w/HCl		Remarks	Sample # (lab only)
MW-1		GW		11/18	1000	14	X	X	X	X	X	X	X	X	X			-01
MW-4		GW		"	1030	14	X	X	X	X	X	X	X	X	X			-02
MW-5		GW		"	1120	14	X	X	X	X	X	X	X	X	X			-03
		GW				14	X	X	X	X	X	X	X	X	X			
		GW				14	X	X	X	X	X	X	X	X	X			

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

Remarks:
Total Metals: Ca,Fe,Mg,Mn,K,Na,Ba,B,Se,Sr

pH _____ Temp _____
Flow _____ Other _____

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

Tracking #

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

RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
DK Nicholson	11/19/20	1200	FedEx
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Olivia Turner

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

Temp: 1.5+0-1.5 °C (IR) Bottles Received: 42

Date: 11/20/20 Time: 915

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 02, 2020

Berry Petroleum - Denver, CO

Sample Delivery Group:	L1288676
Samples Received:	11/20/2020
Project Number:	
Description:	J15 Spill Response

Report To: Dave Nicholson
3433 E. Lake Dr
Centennial, CO 80121

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

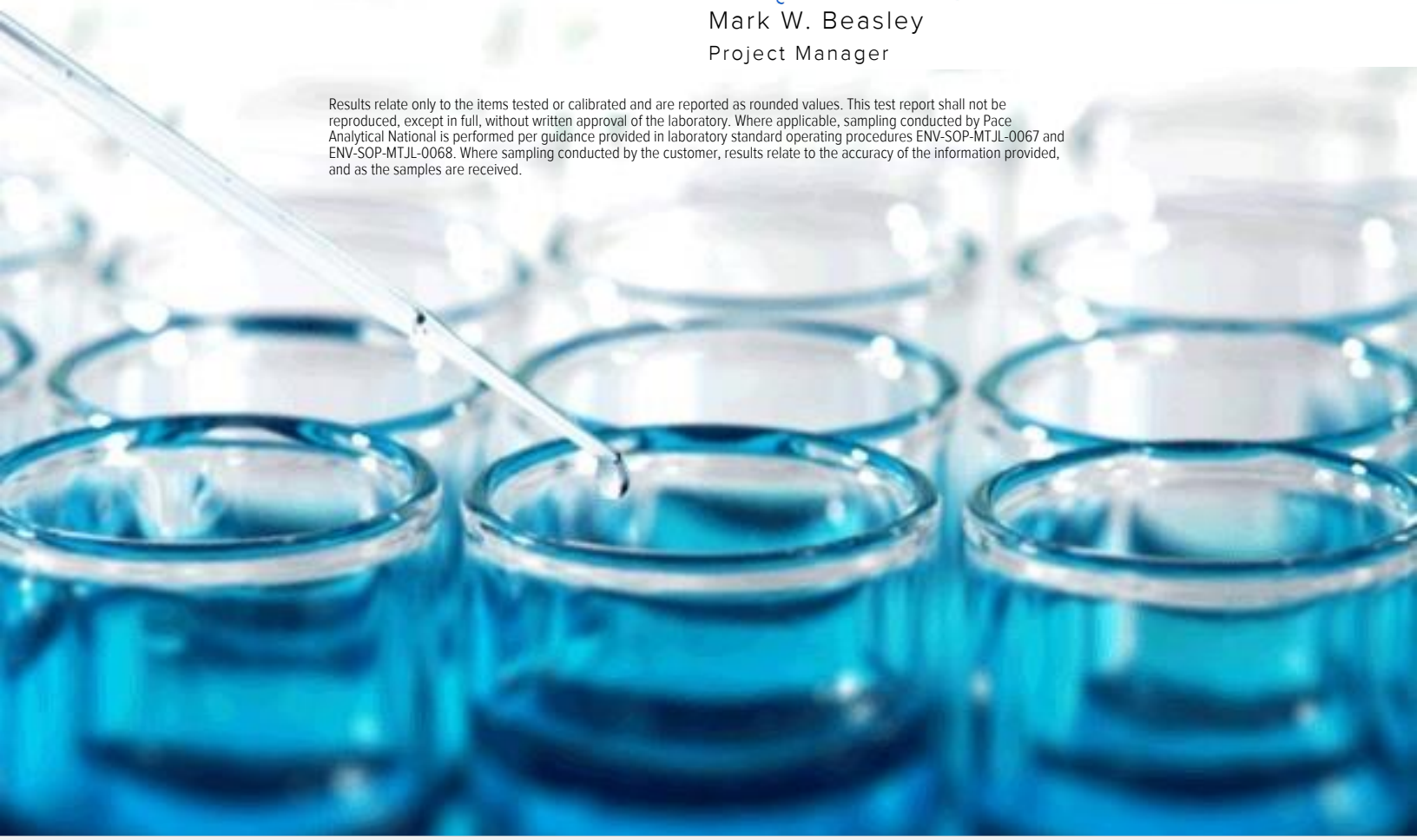


TABLE OF CONTENTS

J15-LF-1 L1288676-01 Solid

Collected by: DK Nicholson
Collected date/time: 11/18/20 12:00
Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1583423	1	11/30/20 19:40	11/30/20 19:40	EL	Mt. Juliet, TN
Calculated Results	WG1583319	1	11/29/20 12:57	11/30/20 23:35	CCE	Mt. Juliet, TN
Wet Chemistry by Method 3060A/7196A	WG1583386	1	11/29/20 12:38	11/30/20 12:19	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1583586	1	11/28/20 18:34	11/28/20 20:03	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1584289	1	11/30/20 15:27	12/01/20 14:00	JRB	Mt. Juliet, TN
Mercury by Method 7471A	WG1584185	1	11/30/20 13:03	12/02/20 12:02	BMF	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1583319	1	11/29/20 12:57	11/30/20 23:35	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1583378	1	11/25/20 20:53	11/28/20 06:36	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1584216	1	11/30/20 23:05	12/01/20 20:01	TJD	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG1583803	1	11/29/20 17:03	12/01/20 16:02	SHG	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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.

Mark W. Beasley
Project Manager

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	4.26		1	11/30/2020 19:40	WG1583423

Calculated Results

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Trivalent	26.8		1.00	1	11/30/2020 23:35	WG1583319

Wet Chemistry by Method 3060A/7196A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Chromium,Hexavalent	ND		2.00	1	11/30/2020 12:19	WG1583386

Wet Chemistry by Method 9045D

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.93	T8	1	11/28/2020 20:03	WG1583586

Sample Narrative:

L1288676-01 WG1583586: 7.93 at 21.7C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	990		10.0	1	12/01/2020 14:00	WG1584289

Mercury by Method 7471A

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Mercury	0.306		0.0400	1	12/02/2020 12:02	WG1584185

Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	3.43	B	2.00	1	11/30/2020 23:35	WG1583319
Barium	338		0.500	1	11/30/2020 23:35	WG1583319
Boron	ND		20.0	1	11/30/2020 23:35	WG1583319
Cadmium	ND		0.500	1	11/30/2020 23:35	WG1583319
Chromium	26.8		1.00	1	11/30/2020 23:35	WG1583319
Copper	17.3		2.00	1	11/30/2020 23:35	WG1583319
Lead	13.0		0.500	1	11/30/2020 23:35	WG1583319
Nickel	20.7		2.00	1	11/30/2020 23:35	WG1583319
Selenium	ND		2.00	1	11/30/2020 23:35	WG1583319
Silver	ND		1.00	1	11/30/2020 23:35	WG1583319
Zinc	46.2		5.00	1	11/30/2020 23:35	WG1583319

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		0.100	1	11/28/2020 06:36	WG1583378
(S) a,a,a-Trifluorotoluene(FID)	*90.6*		*77.0-120*		*11/28/2020 06:36*	WG1583378

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	30.0		4.00	1	12/01/2020 20:01	WG1584216
C28-C40 Oil Range	23.1		4.00	1	12/01/2020 20:01	WG1584216
(S) o-Terphenyl	*67.2*		*18.0-148*		*12/01/2020 20:01*	WG1584216

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

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Anthracene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Acenaphthene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Acenaphthylene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Benzo(a)anthracene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Benzo(a)pyrene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Benzo(b)fluoranthene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Benzo(g,h,i)perylene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Benzo(k)fluoranthene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Chrysene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Dibenz(a,h)anthracene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Fluoranthene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Fluorene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Indeno(1,2,3-cd)pyrene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Naphthalene	ND		0.0200	1	12/01/2020 16:02	WG1583803
Phenanthrene	ND		0.00600	1	12/01/2020 16:02	WG1583803
Pyrene	ND		0.00600	1	12/01/2020 16:02	WG1583803
1-Methylnaphthalene	ND		0.0200	1	12/01/2020 16:02	WG1583803
2-Methylnaphthalene	ND		0.0200	1	12/01/2020 16:02	WG1583803
2-Chloronaphthalene	ND		0.0200	1	12/01/2020 16:02	WG1583803
(S) p-Terphenyl-d14	*49.9*		*23.0-120*		*12/01/2020 16:02*	WG1583803
(S) Nitrobenzene-d5	*77.4*		*14.0-149*		*12/01/2020 16:02*	WG1583803
(S) 2-Fluorobiphenyl	*40.8*		*34.0-125*		*12/01/2020 16:02*	WG1583803

Method Blank (MB)

(MB) R3598475-1 11/30/20 12:16

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Chromium,Hexavalent	U		0.640	2.00

L1288377-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288377-01 11/30/20 12:16 • (DUP) R3598475-3 11/30/20 12:16

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	ND	1	0.000		20

L1288875-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1288875-01 11/30/20 12:20 • (DUP) R3598475-4 11/30/20 12:20

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chromium,Hexavalent	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3598475-2 11/30/20 12:16

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chromium,Hexavalent	24.0	22.6	94.0	80.0-120	

L1290336-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1290336-01 11/30/20 12:23 • (MS) R3598475-5 11/30/20 12:23 • (MSD) R3598475-6 11/30/20 12:23

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 %
Chromium,Hexavalent	20.0	ND	ND	ND	0.000	0.000	1	75.0-125	J6	J6	0.000	20

L1288685-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1288685-02 11/28/20 20:03 • (DUP) R3598123-2 11/28/20 20:03

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.68	8.69	1	0.115		1

Sample Narrative:

OS: 8.68 at 21.4C

DUP: 8.69 at 21.2C

Laboratory Control Sample (LCS)

(LCS) R3598123-1 11/28/20 20:03

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.96	99.6	99.0-101	

Sample Narrative:

LCS: 9.96 at 19C

Method Blank (MB)

(MB) R3599054-1 12/01/20 14:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	umhos/cm		umhos/cm	umhos/cm
Specific Conductance	U		10.0	10.0

L1288377-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1288377-02 12/01/20 14:00 • (DUP) R3599054-3 12/01/20 14:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	226	225	1	0.443		20

L1288879-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1288879-03 12/01/20 14:00 • (DUP) R3599054-4 12/01/20 14:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	289	290	1	0.104		20

Laboratory Control Sample (LCS)

(LCS) R3599054-2 12/01/20 14:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	umhos/cm	umhos/cm	%	%	
Specific Conductance	483	481	99.6	85.0-115	

Method Blank (MB)

(MB) R3599426-1 12/02/20 11:11

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3599426-2 12/02/20 11:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.549	110	80.0-120	

L1288503-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288503-13 12/02/20 11:15 • (MS) R3599426-3 12/02/20 11:17 • (MSD) R3599426-4 12/02/20 11:23

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 %
Mercury	0.500	ND	0.500	0.522	94.0	98.5	1	75.0-125			4.34	20

Method Blank (MB)

(MB) R3598814-7 12/01/20 03:13

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	0.519	J	0.518	2.00
Barium	U		0.0852	0.500
Boron	U		1.67	20.0
Cadmium	U		0.0471	0.500
Chromium	U		0.133	1.00
Copper	U		0.400	2.00
Lead	U		0.208	0.500
Nickel	U		0.132	2.00
Selenium	U		0.764	2.00
Silver	U		0.127	1.00
Zinc	U		0.832	5.00

Laboratory Control Sample (LCS)

(LCS) R3598814-2 11/30/20 22:50

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	96.9	96.9	80.0-120	
Barium	100	109	109	80.0-120	
Boron	100	106	106	80.0-120	
Cadmium	100	104	104	80.0-120	
Chromium	100	105	105	80.0-120	
Copper	100	109	109	80.0-120	
Lead	100	105	105	80.0-120	
Nickel	100	106	106	80.0-120	
Selenium	100	106	106	80.0-120	
Silver	20.0	19.3	96.3	80.0-120	
Zinc	100	103	103	80.0-120	

L1288377-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288377-07 11/30/20 22:53 • (MS) R3598814-5 11/30/20 23:01 • (MSD) R3598814-6 11/30/20 23:04

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 %
Arsenic	100	9.85	117	113	107	104	1	75.0-125			2.77	20
Barium	100	446	462	481	15.8	35.3	1	75.0-125	V	V	4.12	20
Boron	100	ND	122	118	111	107	1	75.0-125			2.95	20
Cadmium	100	ND	112	111	112	111	1	75.0-125			0.703	20
Chromium	100	12.0	114	113	102	101	1	75.0-125			0.541	20

L1288377-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288377-07 11/30/20 22:53 • (MS) R3598814-5 11/30/20 23:01 • (MSD) R3598814-6 11/30/20 23:04

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 %
Copper	100	15.1	123	123	108	108	1	75.0-125			0.291	20
Lead	100	37.2	115	113	77.7	76.1	1	75.0-125			1.40	20
Nickel	100	15.3	124	124	109	109	1	75.0-125			0.102	20
Selenium	100	ND	114	112	114	112	1	75.0-125			1.58	20
Silver	20.0	ND	20.9	20.8	104	104	1	75.0-125			0.549	20
Zinc	100	189	117	118	0.000	0.000	1	75.0-125	J6	J6	0.747	20

Method Blank (MB)

(MB) R3598140-2 11/27/20 23:43

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0238	J	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	*96.6*			*77.0-120*

Laboratory Control Sample (LCS)

(LCS) R3598140-1 11/27/20 23:01

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	6.37	116	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			*113*	*77.0-120*	

Method Blank (MB)

(MB) R3599012-1 12/01/20 07:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
C10-C28 Diesel Range	U		1.61	4.00
C28-C40 Oil Range	U		0.274	4.00
(S) o-Terphenyl	*81.1*			*18.0-148*

Laboratory Control Sample (LCS)

(LCS) R3599012-2 12/01/20 07:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	41.8	83.6	50.0-150	
(S) o-Terphenyl			*106*	*18.0-148*	

L1288722-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288722-01 12/01/20 15:24 • (MS) R3599012-3 12/01/20 15:37 • (MSD) R3599012-4 12/01/20 15:50

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	50.0	ND	37.7	28.0	75.4	56.0	1	50.0-150		J3	29.5	20
(S) o-Terphenyl					*96.1*	*71.8*		*18.0-148*				

Method Blank (MB)

(MB) R3599254-2 12/01/20 12:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Anthracene	U		0.00230	0.00600
Acenaphthene	U		0.00209	0.00600
Acenaphthylene	U		0.00216	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(a)pyrene	U		0.00179	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(g,h,i)perylene	U		0.00177	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Chrysene	U		0.00232	0.00600
Dibenz(a,h)anthracene	U		0.00172	0.00600
Fluoranthene	U		0.00227	0.00600
Fluorene	U		0.00205	0.00600
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600
Naphthalene	U		0.00408	0.0200
Phenanthrene	U		0.00231	0.00600
Pyrene	U		0.00200	0.00600
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
2-Chloronaphthalene	U		0.00466	0.0200
(S) Nitrobenzene-d5	*102*			*14.0-149*
(S) 2-Fluorobiphenyl	*72.2*			*34.0-125*
(S) p-Terphenyl-d14	*87.5*			*23.0-120*

Laboratory Control Sample (LCS)

(LCS) R3599254-1 12/01/20 11:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Anthracene	0.0800	0.0554	69.3	50.0-126	
Acenaphthene	0.0800	0.0584	73.0	50.0-120	
Acenaphthylene	0.0800	0.0584	73.0	50.0-120	
Benzo(a)anthracene	0.0800	0.0673	84.1	45.0-120	
Benzo(a)pyrene	0.0800	0.0496	62.0	42.0-120	
Benzo(b)fluoranthene	0.0800	0.0517	64.6	42.0-121	
Benzo(g,h,i)perylene	0.0800	0.0540	67.5	45.0-125	
Benzo(k)fluoranthene	0.0800	0.0508	63.5	49.0-125	
Chrysene	0.0800	0.0600	75.0	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0578	72.3	47.0-125	
Fluoranthene	0.0800	0.0653	81.6	49.0-129	

Laboratory Control Sample (LCS)

(LCS) R3599254-1 12/01/20 11:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Fluorene	0.0800	0.0596	74.5	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0591	73.9	46.0-125	
Naphthalene	0.0800	0.0607	75.9	50.0-120	
Phenanthrene	0.0800	0.0539	67.4	47.0-120	
Pyrene	0.0800	0.0572	71.5	43.0-123	
1-Methylnaphthalene	0.0800	0.0635	79.4	51.0-121	
2-Methylnaphthalene	0.0800	0.0598	74.8	50.0-120	
2-Chloronaphthalene	0.0800	0.0524	65.5	50.0-120	
(S) Nitrobenzene-d5			*100*	*14.0-149*	
(S) 2-Fluorobiphenyl			*72.5*	*34.0-125*	
(S) p-Terphenyl-d14			*88.0*	*23.0-120*	

L1288381-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1288381-01 12/01/20 12:28 • (MS) R3599254-3 12/01/20 12:50 • (MSD) R3599254-4 12/01/20 13:11

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 %
Anthracene	0.0780	ND	0.0401	0.0470	51.4	59.0	1	10.0-145			15.8	30
Acenaphthene	0.0780	ND	0.0436	0.0496	55.9	62.3	1	14.0-127			12.9	27
Acenaphthylene	0.0780	ND	0.0432	0.0489	55.4	61.4	1	21.0-124			12.4	25
Benzo(a)anthracene	0.0780	ND	0.0477	0.0530	61.2	66.6	1	10.0-139			10.5	30
Benzo(a)pyrene	0.0780	ND	0.0366	0.0407	46.9	51.1	1	10.0-141			10.6	31
Benzo(b)fluoranthene	0.0780	ND	0.0374	0.0413	47.9	51.9	1	10.0-140			9.91	36
Benzo(g,h,i)perylene	0.0780	ND	0.0386	0.0396	49.5	49.7	1	10.0-140			2.56	33
Benzo(k)fluoranthene	0.0780	ND	0.0353	0.0388	45.3	48.7	1	10.0-137			9.45	31
Chrysene	0.0780	ND	0.0446	0.0492	57.2	61.8	1	10.0-145			9.81	30
Dibenz(a,h)anthracene	0.0780	ND	0.0425	0.0460	54.5	57.8	1	10.0-132			7.91	31
Fluoranthene	0.0780	ND	0.0474	0.0539	60.8	67.7	1	10.0-153			12.8	33
Fluorene	0.0780	ND	0.0436	0.0500	55.9	62.8	1	11.0-130			13.7	29
Indeno(1,2,3-cd)pyrene	0.0780	ND	0.0420	0.0432	53.8	54.3	1	10.0-137			2.82	32
Naphthalene	0.0780	ND	0.0449	0.0507	57.6	63.7	1	10.0-135			12.1	27
Phenanthrene	0.0780	ND	0.0402	0.0455	51.5	57.2	1	10.0-144			12.4	31
Pyrene	0.0780	ND	0.0416	0.0467	53.3	58.7	1	10.0-148			11.6	35
1-Methylnaphthalene	0.0780	ND	0.0472	0.0545	60.5	68.5	1	10.0-142			14.4	28
2-Methylnaphthalene	0.0780	ND	0.0447	0.0510	57.3	64.1	1	10.0-137			13.2	28
2-Chloronaphthalene	0.0780	ND	0.0386	0.0439	49.5	55.2	1	29.0-120			12.8	24
(S) Nitrobenzene-d5					*82.0*	*87.8*		*14.0-149*				
(S) 2-Fluorobiphenyl					*58.3*	*62.0*		*34.0-125*				
(S) p-Terphenyl-d14					*68.0*	*74.6*		*23.0-120*				

Guide to Reading and Understanding Your Laboratory Report

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

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
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.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National 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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

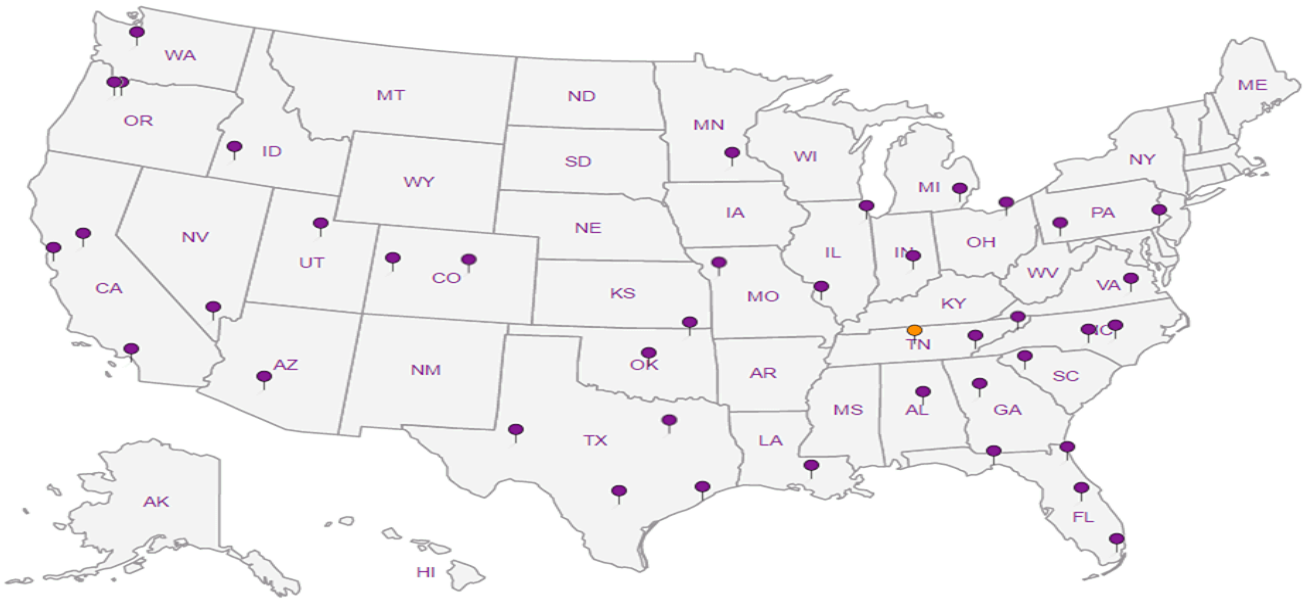
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



Berry Petroleum - Denver, CO

1999 Broadway, Suite 3700
Denver, CO 93309

Billing Information:
Don Wilboorn
Accounts Payable
235 Callahan Ave
Parachute, CO 81635

Report to: Dave Nicholson

Email To: dknicholson@q.com

Project Description: J15 Spill Response

City/State Collected:

Phone: ~~303-999-4400~~ 303-601-2023

Fax: ~~303-999-4401~~

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature): DK Nicholson

Immediately Packed on Ice N ___ Y (X)

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

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TPH	TEPH (Diesel + Motor oil)	PAHs by 8270 SIM	Metals	SAR	pH, SPCON	Extra Volume (Sample Kept Locally + Trucked)	Remarks	Sample # (lab only)
J15-LF-1		SS		11/18	1200	6	X	X	X	X	X	X	X		-01

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
a subsidiary of Pace Analytical

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

L# 1288676

M193

Acctnum: BERPETDCO

Template:

Prelogin:

TSR: 134 - Mark W. Beasley

PB:

Shipped Via:

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

Remarks: As, Ba, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Zn, Cr VI

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 9159 8781 8670

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	If preservation required by Login: Date/Time
DK Nicholson	11/19/20	1200	FedEx	0	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.8 °C Bottles Received: 2.8 6	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 11/20/2020 Time: 09:15	Hold: Condition: NCF / OK

APPENDIX B
Boring Logs

FIELD LOG

Boring No: J15-MW-1

GeoSolutions NICHOLSON

	Berry Petroleum	Location:	
		Drilling Equipment:	Failing Speedstar
Site ID:	LR J15	Driller:	Artesian Services Inc.
Date/Time Started:	7/20/20 1000	Date/Time Completed:	
Total Depth (ft):	60.4'	Init. Water Level (ft):	59.0'
Sampling Method:	Core 1st 90'; cuttings	Geologist:	DK Nicholson

Depth (ft)	Sample Interval	Recovery	Well Construction 4"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0								0
		2.0		sandstone, dry, tan (Vista Fm)				
	4.7/9.0			soil, tan-brown, rocky, slightly moist, no odors or staining			2.5	
9				Sandstone, tan, dry \ sample J15-1-16.7'				
10								
	9.0/9.0			Sandstone, hard w/ fractures, tan-brown, moist on outside of core but not in matrix, no odors or staining			2.4	
18				same as above			0.3	
	5.0/6.0							
24								

FIELD LOG

GeoSolutions NICHOLSON

Boring No: J15-MW-1

Site ID:	Location:
Date/Time Started:	Drilling Equipment:
Total Depth (ft):	Driller:
Sampling Method:	Date/Time Completed:
	Init. Water Level (ft): 59.0'
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30	6.0 / 30.0		same as above shale, vari-colored, dense, slightly moist, ~~sl~~ moderate petroleum odor - checked for water - none. sample J15-1-2			58.4	-
35			Sandstone, grey, solid w/ a few fractures; moist to wet; no odors or staining.				
40	13.0 / 13.0					1.07	
45							
50			(cuttings)				

FIELD LOG

GeoSolutions NICHOLSON

Boring No: JIS-MW-1

Location:	
Drilling Equipment:	
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
55			-water encountered after waiting 10 minutes. About one foot. Strong condensate odor. - wait overnight.				-
60	60.0		- ▽ - End 7/20			111.0	
65			TD = ~~60.4'~~ 60.4' Well construction: -4" PVC Screen 0.01" slot from 40.0 - 60.0' - 10-20 Silica sand 30.0 - 60.4' - 3/8 bentonite chips 2.0 - 30.0' - concrete seal 0 - 2.0'				
70							
75							

FIELD LOG

Boring No: MW-2

GeoSolutions NICHOLSON

Site ID:	J15	Location:	center of p.t
Date/Time Started:	11/16/20 1000	Drilling Equipment:	Failing Speedstar
Total Depth (ft):	62.0	Driller:	Brad
Sampling Method:	Core 1st 40'	Date/Time Completed:	11/16/20 1430
		Init. Water Level (ft):	59.0
		Geologist:	DK Nicholson

Depth (ft)	Sample Interval	Well Construction 4"	Description	Fracturing	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0								0
	5.4 / 8.0		rock rubble, dry.				4.2	
5			sandstone, tan, hard, dry, no odors or staining; fractured. every 4-6"				6.8	
10			same as above; less fractured. dry above.				3.2	
	7.2 / 7.5							
	14.0'							
15			a little water on some fracture surface; no odors or staining				0.7	
	10.8 / 11.5		sandstone, hard, dry to moist, several partings w/ rubble;				0.0	
20								
			blue staining on fracture surfaces; moist, condensate odor.					
25								

FIELD LOG

Boring No: MW-2

GeoSolutions NICHOLSON

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30			moist on outside of core; slight pw odor / condensate odor	-		1.1	
			Sandstone, wet on outside of core but dry in matrix; blue staining on some fracture surfaces.	-		2.4	
35	12.8 / 13.0			-			
40			parting w/ liquid on near-vertical fracture surface.	\		71.9	
			End coring.	-			
45							
50							

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-2

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
55			(no sample)				
60	59.0			▽			
			TD = 62' hole caved to 59' Well construction: 4" PVC w/ screen 0.01" slots from ~~20.0~~ 19.0 - 59.0' 10-20 Silica sand 14.0 - 59.0' 3/8 bentonite chips 2.0 - 14.0' Concrete seal 0 - 2.0'				

FIELD LOG

Boring No: MW-3

GeoSolutions NICHOLSON

Site ID:	Location: South of Pit
Date/Time Started: 11/16/20 1455	Drilling Equipment: Failing Speedster
Total Depth (ft): 60.8'	Driller: Brad
Sampling Method: None - cuttings	Date/Time Completed: 11/16/20 1600
	Init. Water Level (ft): dry
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction 4"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
5	2.0'		(cuttings) dry, no odors or staining			0.0	
10							
15							
20	20.0		dry.			0.0	
25							

FIELD LOG

Boring No: MW-3

GeoSolutions NICHOLSON

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
	30		dry. brown, slightly moist, no odors or staining			0.0	
	35						
	40.0		wait 10 minutes to check for water. — dry.			0.4	
	45						
	50						

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-3

Location:	
Drilling Equipment:	
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval		Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0								0
55				(cuttings).			0.0	
60				dry, no odors or staining			0.0	
		606		TD = ~~60.0~~ 60.8' dry at 60'.				
				Well construction				
				4" PVC w/ screen 0.01" slots from 40-60'				
				10-20 Silica sand 20-60.8'				
				3/8" bentonite chips 2.0-20'				
				Concrete seal 0-2.0'				
				steel protective surface casing				

FIELD LOG

Boring No: MW-4

GeoSolutions NICHOLSON

Site ID:		Location:	East of pit
Date/Time Started:	11/17/20 1150	Drilling Equipment:	Failing Speedstar
Total Depth (ft):	60.0'	Driller:	Brad
Sampling Method:	Cuttings Only	Date/Time Completed:	11/17/20 1300
		Init. Water Level (ft):	59.6'
		Geologist:	DK Nicholson

Depth (ft)	Sample Interval	Well Construction 4"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
5	2.0'		(cuttings) SS, dry, tan-brown, no odors or staining			0.0	
10							
15							
20	20.0					0.0	
25							

FIELD LOG

Boring No: MW-4

GeoSolutions NICHOLSON

Site ID:	Location:
Date/Time Started:	Drilling Equipment:
Total Depth (ft):	Driller:
Sampling Method:	Date/Time Completed:
	Init. Water Level (ft):
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30			(cuttings) same as above			0.0	
35							
40						0.0	
45			(cuttings) Same as above; grey-white, dry, no odors or staining				
50						0.0	

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-4

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
55			same as above; slight odor			3.2	
60			condensate in bottom of hole.			0.0	
			TD = 60.0'				
			Well construction 4" PVC w/ screen 0.01" slots from 40-60' 10-20 Silica sand 20-60'				
			3/8 bentonite chips 2.0'-20.0' Concrete seal 0-2.0'				

FIELD LOG

Boring No: MW-5

GeoSolutions NICHOLSON

Site ID:	Location: west of pit
Date/Time Started: 11/17/2020 1330	Drilling Equipment: Talon Speedstar
Total Depth (ft): 60.0'	Driller: Brad
Sampling Method: Cuttings Only	Date/Time Completed: 11/17/20 1430
	Init. Water Level (ft): 59.5'
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction 4"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
5	20.0'		(cuttings) SS, dry, tan, no odors or staining.				
10							
15							
20	20.0					0.0	
25							

FIELD LOG

Boring No: MW-5

GeoSolutions NICHOLSON

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30			(cuttings) SS, brown, and sand, brown. dry.			0.0	
35							
40			condensate odor.			3.2	
45			SS, grey-white, no odors or staining, dry.			0.0	
50							

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-5

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
55			Same as above			0.0	
60				W		0.0	
			TD = 60.0' Well Construction 4" PVC w/ screen 0.01" slots from 40-60' 10-20 Silica sand 20-60' 3/8 bentonite chips 2.0-20' Concrete seal 0'-2.0'				

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-6

Site ID:	Location: east step-out
Date/Time Started: 11/18/20 1040	Drilling Equipment: Failing Speedster
Total Depth (ft): 60.0'	Driller: Richard
Sampling Method: cuttings only	Date/Time Completed: 11/18/20 1340
	Init. Water Level (ft): Dry
	Geologist: DK Nicholson

Depth (ft)	Sample Interval		Well Construction 2"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0								0
		2.0'		(cuttings)				
	5			SS, grey-brown, dry, no odors or staining				
	10							
	15							
	20	20.0					0.0	
	25							

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-6

Site ID:	Location:
Date/Time Started:	Drilling Equipment:
Total Depth (ft):	Driller:
Sampling Method:	Date/Time Completed:
	Init. Water Level (ft):
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30	30		(cuttings) SS, light brown, dry, no odors or staining				
35	35					0.0	
40	40					0.0	
45	45		(cuttings) SS, soft, brown, dry, no odors or staining				
50	50					0.0	

FIELD LOG

GeoSolutions NICHOLSON

Boring No: MW-6

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
205	55		(same as above)				
210	60					0.0	
215			TD=60.0' Well Construction 2" PVC Screen 0.01" slot from 40.0-60.0' -10-20 Silica sand 20.0-60.0'				
220			3/8" bentonite chips 2.0-20.0' concrete seal 0-2.0' - steel protective surface casing				
225							

FIELD LOG

Boring No: MW-7

GeoSolutions NICHOLSON

Site ID:		Location:	West step-out
Date/Time Started:	11/18/20 1100	Drilling Equipment:	Failing Speedstar
Total Depth (ft):	60.0'	Driller:	Richard
Sampling Method:	cuttings only	Date/Time Completed:	11/18/20 1200
		Init. Water Level (ft):	dry
		Geologist:	DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0		2" 0.0' 6.0' 7.0' 0.0'					0
5	2.0'		(cuttings) SS, tan, dry, no odors or staining				
10							
15							
20	20.0'					0.0	
25							

FIELD LOG

Boring No: MW-7

GeoSolutions NICHOLSON

Site ID:	Location:
Date/Time Started:	Drilling Equipment:
Total Depth (ft):	Driller:
Sampling Method:	Date/Time Completed:
	Init. Water Level (ft):
	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction 2"	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
30			(cuttings). SS, brown to grey, dry, no odors or staining			0.0	
35							
40	40.0					0.0	
45			(cuttings). SS, grey-white, dry, no odors or staining				
50						0.0	

FIELD LOG

Boring No: MW-7

GeoSolutions NICHOLSON

	Location:
	Drilling Equipment:
Site ID:	Driller:
Date/Time Started:	Date/Time Completed:
Total Depth (ft):	Init. Water Level (ft):
Sampling Method:	Geologist: DK Nicholson

Depth (ft)	Sample Interval	Well Construction	Description	Moisture	Consistency	PID Headspace (ppm)	Lab Sample
0							0
55			SS, soft, brown, dry, no odors or staining.			1.7	
60			TD = 60.0'				
			Well Construction 2" PVC w/ Screen 0.01" slots from 40-60' 10-20 Silica sand 20.0-60.0' 3/8 bentonite chips 2.0-20.0' concrete seal 0-2.0' steel protective surface casing.				