

November 15, 2023



Jake Janicek
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Report of Work Completed – Wellhead Pre-P&A Investigation

ECMC Location Name (ID)	NPR/G09 Pad (335699)
ECMC Wellhead Name	N. PARACHUTE CP14A-09 G09 59
Operator Wellhead Name	G09-596 14A-09
API #	05-045-13007
ECMC Remediation Project Number	28648
Legal Description	SWNE Sec. 9 T5S-R96W
Coordinates (Lat/Long)	39.632252 / -108.173752
County	Garfield County, Colorado

Mr. Janicek,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document site investigation activities associated with plugging and abandonment (P&A) of the N. PARACHUTE CP14A-09 G09 59 (API# 05-045-13007) wellhead at the G09-596 well pad (Location). The Location is 13.7 miles northwest of Parachute, Colorado, in Garfield County as illustrated in the attached Topographic Location Map. Additional information on the Location and the associated investigation is provided in the title block above, the attached Site Diagram, and laboratory analytical report. This ROWC provides background on the Location, methods used to complete the site investigation, results of the investigation, and recommendations for how to proceed with this information.

Background

On March 9, 2023, to comply with Energy & Carbon Management Commission (ECMC) Rule 913.c.(9), Caerus submitted initial Form 27 Document 403342279 to open Remediation Project Number 28648 and propose site investigation activities. There are three additional wellheads at the Location planned for P&A which are being reported under separate Remediation Project Numbers.

Methodology

On July 20, 2023, a pre-P&A investigation was completed at the Location to document soil conditions prior to cut and cap operations. Using a hydro-vacuum truck, one soil boring was advanced to a depth of 10 feet below ground surface (bgs). One soil sample was collected at the terminus of the soil boring. The soil sample was characterized using visual and olfactory observations and field-screened using a photoionization detector (PID).

The sample was placed in laboratory provided containers, immediately placed on ice, shipped to Pace Analytical under completed chain of custody, and analyzed for ECMC Table 915-1 soil constituents of concern. The sample location is illustrated in the attached Site Diagram.

Results

These results summarize observations from onsite investigation efforts and associated laboratory analytical results. For organizational and presentation purposes, the results summary is divided between general observations of lithology and hydrogeology for the entire Location and site investigation activities.

Collected spatial data are depicted in the attached Site Diagrams. Laboratory analytical report are attached and summarized in the Laboratory Results Summary Table.

Lithology and Hydrogeology

Lithology at the Location is characterized as sandy clay with gravel. Groundwater is expected to flow north to West Fork Parachute Creek and ultimately to the Colorado River, located 14.7 miles south of the Location. The Location sits approximately 120 feet higher in elevation than West Fork Parachute Creek, located 0.12 miles north of the Location. Based on the elevation difference, depth to water at the Location is estimated to be greater than 100 feet. No groundwater was observed during sampling activities.

Pre-P&A Investigation Results

Field screening results of the initial P&A characterization sample indicated no hydrocarbon odor or staining with a PID measurement of 0.6 parts per million (ppm). Analytical results of the sample indicate compliance with ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) except for arsenic and hexavalent chromium. Arsenic exceeds at 10.1 milligrams per kilogram (mg/kg) and hexavalent chromium exceeds at 1.94 mg/kg.

Analysis and Recommendations

Based on the estimated depth to groundwater of greater than 100 feet bgs, Confluence recommends that Caerus request to compare analytical results for this remediation project to ECMC Table 915-1 RSSLs as no reasonable pathway to groundwater appears to exist.

Assuming the proposed request for comparison to ECMC Table 915-1 RSSLs is approved, levels of arsenic and hexavalent chromium exceeding ECMC Table 915-1 RSSLs are present in the investigation area. Confluence recommends collecting one confirmation soil sample adjacent to the capped well following the completion of P&A activities to determine whether soil impacts are present. Confluence recommends submitting the sample for laboratory analysis of all ECMC Table 915-1 soil constituents to confirm. Additionally, Confluence recommends the collection of background soil samples to establish native levels of inorganic constituents at the Location.



Confluence is grateful for the opportunity to support you with this project. If you have any questions about the methods, results, or recommendations presented here, please do not hesitate to contact us.

Regards,

Steve Sivigliano

Steve Sivigliano
Senior Project Manager
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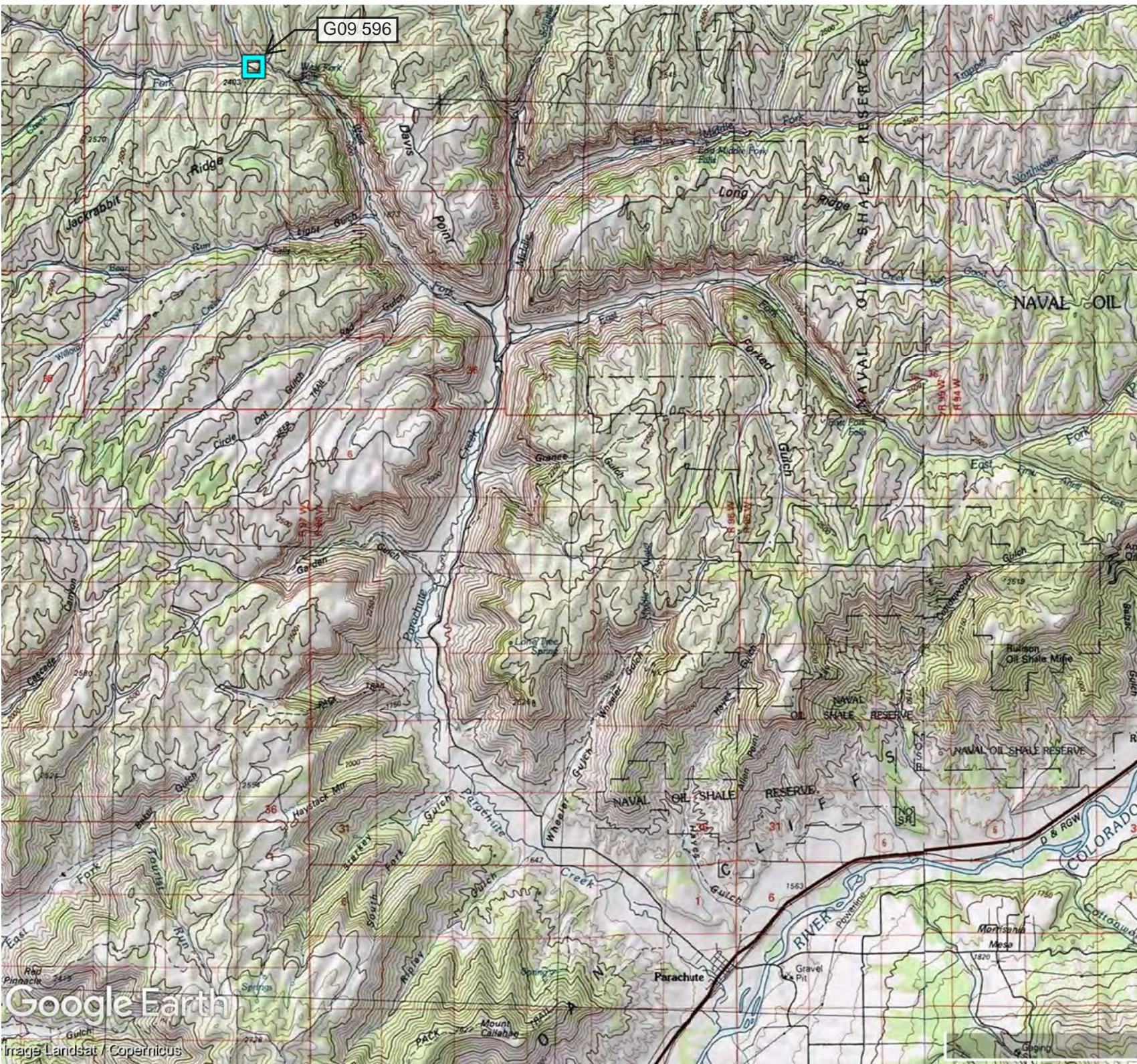


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Attachments

- Topographic Location Map
- Site Diagram – Pre-P&A Investigation
- Laboratory Results Summary Table
- Laboratory Analytical Report





G09 596



Topographic Location Map

Caerus Oil and Gas LLC

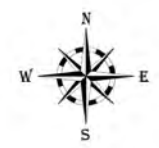
G09 596

(NPR/G09 Pad)

ECMC Location ID: 335699

Garfield County

SENW Sec. 9 T5S-R96W



Topographic map sourced from 2020 Earth Point using data provided by United States Geological Survey

Created by Miranda Beard on 10/13/2023.

Google Earth

Image Landsat / Copernicus

6 mi

Site Diagram Pre-P&A Investigation

Caerus Oil and Gas LLC

G09-596 (14A-09)

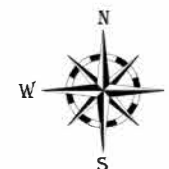
API# 05-045-13007

(NPR/G09 Pad)


ECMC Location ID: 335699

Garfield County

SENW Sec. 9 T5S-R96W



Legend

 Soil Sample

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by: Miranda Beard on 07/26/2023.

20230720-G09 596-(FC-WH02)@10



ECMC Soil Screening Levels				Organic Compounds (mg/kg [ppm])																									
ECMC Table 915-1 Residential-->			NA	500	NA	NA	NA	1.2	490	5.8	58	30	27	360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	18	24	2	180	
Sample Date	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (bgs)	Sample ID	PID (ppm)	TPH (total volatile and extractable petroleum hydrocarbons) (GRO+DRO+ORO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	TPH-ORO (C28-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total (sum of o-, m-, p- isomers)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(A)pyrene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Chrysene	Dibenz(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3,C,D)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Pyrene	
7/20/2023	-10	20230720-G09 596-(FC-WH02)@10	0.8	81.6	0.0261	8.53	73.0	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.00647	0.0173	0.0462	<0.00600	

ECMC Soil Screening Levels			Soil Suitability for Reclamation				Metals (mg/kg [ppm])									
ECMC Table 915-1 Residential -->			4	6	6-8.3	2	0.68	15000	71	0.3	3100	400	1500	390	390	23000
Sample Date	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (bgs)	Sample ID	EC (Specific Conductance) (millimhos/centimeter) (by saturated paste method)	SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)	pH (pH Units) (by saturated paste method)	Boron - Hot Water Soluble (mg/L)	Arsenic	Barium	Cadmium (mg/kg)	Chromium (VI)	Copper	Lead	Nickel	Selenium	Silver	Zinc
7/20/2023	-10	20230720-G09 596-(FC-WH02)@10	0.126	0.283	7.84	0.144	10.1	464	0.366	1.94	35.3	18.4	24.5	0.377	0.0935	79.8

Caerus Oil and Gas

Sample Delivery Group: L1637978
Samples Received: 07/21/2023
Project Number:
Description: G09 596
Site: G09 596
Report To: Blair Rollins
143 Diamond Avenue
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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

SAMPLE SUMMARY

20230720-G09 596-(FC-WH01)@10 L1637978-01 Solid

Collected by
Ahmed Shah

Collected date/time
07/20/23 09:40

Received date/time
07/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2102794	1	07/28/23 18:10	07/28/23 18:10	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2101368	1	07/25/23 21:25	07/26/23 12:35	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2101874	1	07/26/23 10:08	07/27/23 08:38	MCC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2101724	1	07/26/23 09:20	07/26/23 12:45	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2102851	1	07/27/23 11:47	07/28/23 16:08	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2104344	5	07/31/23 07:59	08/01/23 13:41	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2101946	1	07/25/23 10:53	07/26/23 16:40	KSD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2101261	1	07/25/23 10:53	07/25/23 20:22	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2103926	1	07/29/23 08:34	07/29/23 19:30	HLJ	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2101711	1	07/27/23 15:15	07/28/23 03:52	AMM	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

20230720-G09 596-(FC-WH02)@10 L1637978-02 Solid

Collected by
Ahmed Shah

Collected date/time
07/20/23 10:20

Received date/time
07/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2102794	1	07/28/23 18:12	07/28/23 18:12	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2101368	1	07/25/23 21:25	07/26/23 12:40	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2101874	1	07/26/23 10:08	07/27/23 08:38	MCC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2101724	1	07/26/23 09:20	07/26/23 12:45	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2102851	1	07/27/23 11:47	07/28/23 16:11	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2104344	5	07/31/23 07:59	08/01/23 13:44	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2101946	1	07/25/23 10:53	07/26/23 17:03	KSD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2101261	1	07/25/23 10:53	07/25/23 20:41	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2101706	2	07/27/23 06:47	07/28/23 10:05	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2101711	1	07/27/23 15:15	07/28/23 05:36	AMM	Mt. Juliet, TN

⁷Gl

⁸Al

⁹Sc

20230720-G09 596-(FC-WH03)@10 L1637978-03 Solid

Collected by
Ahmed Shah

Collected date/time
07/20/23 11:15

Received date/time
07/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2102794	1	07/28/23 18:15	07/28/23 18:15	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2101368	1	07/25/23 21:25	07/26/23 12:46	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2101874	1	07/26/23 10:08	07/27/23 08:38	MCC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2101724	1	07/26/23 09:20	07/26/23 12:45	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2102867	1	07/27/23 12:20	07/28/23 11:23	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2104344	5	07/31/23 07:59	08/01/23 13:48	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2101946	1	07/25/23 10:53	07/26/23 17:26	KSD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2101261	1	07/25/23 10:53	07/25/23 21:00	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2101706	2	07/27/23 06:47	07/28/23 10:18	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2101711	1	07/27/23 15:15	07/28/23 06:46	AMM	Mt. Juliet, TN

20230720-G09 596-(FC-WH04)@10 L1637978-04 Solid

Collected by
Ahmed Shah

Collected date/time
07/20/23 11:35

Received date/time
07/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG2102794	1	07/28/23 18:24	07/28/23 18:24	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG2101368	1	07/25/23 21:25	07/26/23 12:51	SET	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG2101874	1	07/26/23 10:08	07/27/23 08:38	MCC	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG2101724	1	07/26/23 09:20	07/26/23 12:45	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG2102867	1	07/27/23 12:20	07/28/23 11:26	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG2104344	5	07/31/23 07:59	08/01/23 13:51	SJM	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG2101946	1	07/25/23 10:53	07/26/23 17:49	KSD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2101261	1	07/25/23 10:53	07/25/23 21:19	DWR	Mt. Juliet, TN

SAMPLE SUMMARY

20230720-G09 596-(FC-WH04)@10 L1637978-04 Solid

Collected by
Ahmed Shah

Collected date/time
07/20/23 11:35

Received date/time
07/21/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Semi-Volatile Organic Compounds (GC) by Method 8015M	WG2101706	50	07/27/23 06:47	07/27/23 21:56	JAS	Mt. Juliet, TN
Semi Volatile Organic Compounds (GC/MS) by Method 8270C-SIM	WG2101711	1	07/27/23 15:15	07/28/23 05:53	AMM	Mt. Juliet, TN

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

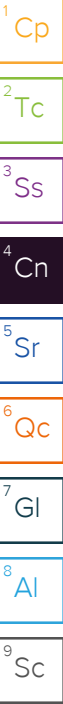
⁹Sc

CASE NARRATIVE

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.



Chris Ward
Project Manager



Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.731		1	07/28/2023 18:10	WG2102794

1
Cp

2
Tc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	2.35		0.255	1.00	1	07/26/2023 12:35	WG2101368

3
Ss

4
Cn

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.88	T8	1	07/27/2023 08:38	WG2101874

5
Sr

6
Qc

Sample Narrative:

L1637978-01 WG2101874: 7.88 at 24.4C

7
Gl

8
Al

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	92.3		10.0	1	07/26/2023 12:45	WG2101724

9
Sc

Sample Narrative:

L1637978-01 WG2101724: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.103	J	0.0167	0.200	1	07/28/2023 16:08	WG2102851

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	8.85		0.100	1.00	5	08/01/2023 13:41	WG2104344
Barium	250		0.152	2.50	5	08/01/2023 13:41	WG2104344
Cadmium	0.296	J	0.0855	1.00	5	08/01/2023 13:41	WG2104344
Copper	17.1		0.132	5.00	5	08/01/2023 13:41	WG2104344
Lead	12.8		0.0990	2.00	5	08/01/2023 13:41	WG2104344
Nickel	12.3		0.197	2.50	5	08/01/2023 13:41	WG2104344
Selenium	0.416	J	0.180	2.50	5	08/01/2023 13:41	WG2104344
Silver	U		0.0865	0.500	5	08/01/2023 13:41	WG2104344
Zinc	47.4		0.740	25.0	5	08/01/2023 13:41	WG2104344

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0287	B J	0.0217	0.100	1	07/26/2023 16:40	WG2101946
(S) a,a,a-Trifluorotoluene(FID)	96.9			77.0-120		07/26/2023 16:40	WG2101946

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	07/25/2023 20:22	WG2101261
Toluene	U		0.00130	0.00500	1	07/25/2023 20:22	WG2101261
Ethylbenzene	U		0.000737	0.00250	1	07/25/2023 20:22	WG2101261
Xylenes, Total	U		0.000880	0.00650	1	07/25/2023 20:22	WG2101261
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	07/25/2023 20:22	WG2101261
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	07/25/2023 20:22	WG2101261
(S) Toluene-d8	116			75.0-131		07/25/2023 20:22	WG2101261
(S) 4-Bromofluorobenzene	100			67.0-138		07/25/2023 20:22	WG2101261
(S) 1,2-Dichloroethane-d4	73.2			70.0-130		07/25/2023 20:22	WG2101261

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	1.63	J	1.61	4.00	1	07/29/2023 19:30	WG2103926
C28-C36 Motor Oil Range	4.84		0.274	4.00	1	07/29/2023 19:30	WG2103926
(S) o-Terphenyl	28.9			18.0-148		07/29/2023 19:30	WG2103926

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	07/28/2023 03:52	WG2101711
Anthracene	U		0.00230	0.00600	1	07/28/2023 03:52	WG2101711
Benzo(a)anthracene	U		0.00173	0.00600	1	07/28/2023 03:52	WG2101711
Benzo(b)fluoranthene	U		0.00153	0.00600	1	07/28/2023 03:52	WG2101711
Benzo(k)fluoranthene	U		0.00215	0.00600	1	07/28/2023 03:52	WG2101711
Benzo(a)pyrene	U		0.00179	0.00600	1	07/28/2023 03:52	WG2101711
Chrysene	U		0.00232	0.00600	1	07/28/2023 03:52	WG2101711
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	07/28/2023 03:52	WG2101711
Fluoranthene	U		0.00227	0.00600	1	07/28/2023 03:52	WG2101711
Fluorene	U		0.00205	0.00600	1	07/28/2023 03:52	WG2101711
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	07/28/2023 03:52	WG2101711
1-Methylnaphthalene	U		0.00449	0.0200	1	07/28/2023 03:52	WG2101711
2-Methylnaphthalene	U		0.00427	0.0200	1	07/28/2023 03:52	WG2101711
Naphthalene	U		0.00408	0.0200	1	07/28/2023 03:52	WG2101711
Pyrene	U		0.00200	0.00600	1	07/28/2023 03:52	WG2101711
(S) p-Terphenyl-d14	94.6			23.0-120		07/28/2023 03:52	WG2101711
(S) Nitrobenzene-d5	90.7			14.0-149		07/28/2023 03:52	WG2101711
(S) 2-Fluorobiphenyl	80.5			34.0-125		07/28/2023 03:52	WG2101711

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.283		1	07/28/2023 18:12	WG2102794

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	1.94		0.255	1.00	1	07/26/2023 12:40	WG2101368

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.84	T8	1	07/27/2023 08:38	WG2101874

Sample Narrative:
L1637978-02 WG2101874: 7.84 at 24.2C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	126		10.0	1	07/26/2023 12:45	WG2101724

Sample Narrative:
L1637978-02 WG2101724: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.144	J	0.0167	0.200	1	07/28/2023 16:11	WG2102851

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	10.1		0.100	1.00	5	08/01/2023 13:44	WG2104344
Barium	464		0.152	2.50	5	08/01/2023 13:44	WG2104344
Cadmium	0.366	J	0.0855	1.00	5	08/01/2023 13:44	WG2104344
Copper	35.3		0.132	5.00	5	08/01/2023 13:44	WG2104344
Lead	18.4		0.0990	2.00	5	08/01/2023 13:44	WG2104344
Nickel	24.5		0.197	2.50	5	08/01/2023 13:44	WG2104344
Selenium	0.377	J	0.180	2.50	5	08/01/2023 13:44	WG2104344
Silver	0.0935	J	0.0865	0.500	5	08/01/2023 13:44	WG2104344
Zinc	79.8		0.740	25.0	5	08/01/2023 13:44	WG2104344

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0261	B J	0.0217	0.100	1	07/26/2023 17:03	WG2101946
(S) a,a,a-Trifluorotoluene(FID)	95.3			77.0-120		07/26/2023 17:03	WG2101946

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	07/25/2023 20:41	WG2101261
Toluene	U		0.00130	0.00500	1	07/25/2023 20:41	WG2101261
Ethylbenzene	U		0.000737	0.00250	1	07/25/2023 20:41	WG2101261
Xylenes, Total	U		0.000880	0.00650	1	07/25/2023 20:41	WG2101261
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	07/25/2023 20:41	WG2101261
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	07/25/2023 20:41	WG2101261
(S) Toluene-d8	115			75.0-131		07/25/2023 20:41	WG2101261
(S) 4-Bromofluorobenzene	101			67.0-138		07/25/2023 20:41	WG2101261
(S) 1,2-Dichloroethane-d4	73.6			70.0-130		07/25/2023 20:41	WG2101261

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	8.53		3.22	8.00	2	07/28/2023 10:05	WG2101706
C28-C36 Motor Oil Range	73.0		0.548	8.00	2	07/28/2023 10:05	WG2101706
(S) o-Terphenyl	50.6			18.0-148		07/28/2023 10:05	WG2101706

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	07/28/2023 05:36	WG2101711
Anthracene	U		0.00230	0.00600	1	07/28/2023 05:36	WG2101711
Benzo(a)anthracene	U		0.00173	0.00600	1	07/28/2023 05:36	WG2101711
Benzo(b)fluoranthene	U		0.00153	0.00600	1	07/28/2023 05:36	WG2101711
Benzo(k)fluoranthene	U		0.00215	0.00600	1	07/28/2023 05:36	WG2101711
Benzo(a)pyrene	U		0.00179	0.00600	1	07/28/2023 05:36	WG2101711
Chrysene	U		0.00232	0.00600	1	07/28/2023 05:36	WG2101711
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	07/28/2023 05:36	WG2101711
Fluoranthene	U		0.00227	0.00600	1	07/28/2023 05:36	WG2101711
Fluorene	U		0.00205	0.00600	1	07/28/2023 05:36	WG2101711
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	07/28/2023 05:36	WG2101711
1-Methylnaphthalene	0.00647	U	0.00449	0.0200	1	07/28/2023 05:36	WG2101711
2-Methylnaphthalene	0.0173	U	0.00427	0.0200	1	07/28/2023 05:36	WG2101711
Naphthalene	0.0462		0.00408	0.0200	1	07/28/2023 05:36	WG2101711
Pyrene	U		0.00200	0.00600	1	07/28/2023 05:36	WG2101711
(S) p-Terphenyl-d14	90.4			23.0-120		07/28/2023 05:36	WG2101711
(S) Nitrobenzene-d5	96.5			14.0-149		07/28/2023 05:36	WG2101711
(S) 2-Fluorobiphenyl	86.7			34.0-125		07/28/2023 05:36	WG2101711

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.79		1	07/28/2023 18:15	WG2102794

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	2.30		0.255	1.00	1	07/26/2023 12:46	WG2101368

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.78	T8	1	07/27/2023 08:38	WG2101874

Sample Narrative:

L1637978-03 WG2101874: 7.78 at 24.4C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	169		10.0	1	07/26/2023 12:45	WG2101724

Sample Narrative:

L1637978-03 WG2101724: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.527		0.0167	0.200	1	07/28/2023 11:23	WG2102867

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	9.66		0.100	1.00	5	08/01/2023 13:48	WG2104344
Barium	559		0.152	2.50	5	08/01/2023 13:48	WG2104344
Cadmium	0.568	J	0.0855	1.00	5	08/01/2023 13:48	WG2104344
Copper	33.3		0.132	5.00	5	08/01/2023 13:48	WG2104344
Lead	22.0		0.0990	2.00	5	08/01/2023 13:48	WG2104344
Nickel	25.9		0.197	2.50	5	08/01/2023 13:48	WG2104344
Selenium	0.530	J	0.180	2.50	5	08/01/2023 13:48	WG2104344
Silver	0.0991	J	0.0865	0.500	5	08/01/2023 13:48	WG2104344
Zinc	78.5		0.740	25.0	5	08/01/2023 13:48	WG2104344

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0304	B J	0.0217	0.100	1	07/26/2023 17:26	WG2101946
(S) a,a,a-Trifluorotoluene(FID)	94.6			77.0-120		07/26/2023 17:26	WG2101946

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	07/25/2023 21:00	WG2101261
Toluene	U		0.00130	0.00500	1	07/25/2023 21:00	WG2101261
Ethylbenzene	U		0.000737	0.00250	1	07/25/2023 21:00	WG2101261
Xylenes, Total	U		0.000880	0.00650	1	07/25/2023 21:00	WG2101261
1,2,4-Trimethylbenzene	U		0.00158	0.00500	1	07/25/2023 21:00	WG2101261
1,3,5-Trimethylbenzene	U		0.00200	0.00500	1	07/25/2023 21:00	WG2101261
(S) Toluene-d8	117			75.0-131		07/25/2023 21:00	WG2101261
(S) 4-Bromofluorobenzene	96.8			67.0-138		07/25/2023 21:00	WG2101261
(S) 1,2-Dichloroethane-d4	72.3			70.0-130		07/25/2023 21:00	WG2101261

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	10.4		3.22	8.00	2	07/28/2023 10:18	WG2101706
C28-C36 Motor Oil Range	99.8		0.548	8.00	2	07/28/2023 10:18	WG2101706
(S) o-Terphenyl	52.4			18.0-148		07/28/2023 10:18	WG2101706

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	07/28/2023 06:46	WG2101711
Anthracene	U		0.00230	0.00600	1	07/28/2023 06:46	WG2101711
Benzo(a)anthracene	U		0.00173	0.00600	1	07/28/2023 06:46	WG2101711
Benzo(b)fluoranthene	U		0.00153	0.00600	1	07/28/2023 06:46	WG2101711
Benzo(k)fluoranthene	U		0.00215	0.00600	1	07/28/2023 06:46	WG2101711
Benzo(a)pyrene	U		0.00179	0.00600	1	07/28/2023 06:46	WG2101711
Chrysene	U		0.00232	0.00600	1	07/28/2023 06:46	WG2101711
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	07/28/2023 06:46	WG2101711
Fluoranthene	U		0.00227	0.00600	1	07/28/2023 06:46	WG2101711
Fluorene	U		0.00205	0.00600	1	07/28/2023 06:46	WG2101711
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	07/28/2023 06:46	WG2101711
1-Methylnaphthalene	U		0.00449	0.0200	1	07/28/2023 06:46	WG2101711
2-Methylnaphthalene	U		0.00427	0.0200	1	07/28/2023 06:46	WG2101711
Naphthalene	U		0.00408	0.0200	1	07/28/2023 06:46	WG2101711
Pyrene	U		0.00200	0.00600	1	07/28/2023 06:46	WG2101711
(S) p-Terphenyl-d14	89.9			23.0-120		07/28/2023 06:46	WG2101711
(S) Nitrobenzene-d5	91.3			14.0-149		07/28/2023 06:46	WG2101711
(S) 2-Fluorobiphenyl	85.8			34.0-125		07/28/2023 06:46	WG2101711

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	1.22		1	07/28/2023 18:24	WG2102794

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	2.03		0.255	1.00	1	07/26/2023 12:51	WG2101368

Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.94	T8	1	07/27/2023 08:38	WG2101874

Sample Narrative:

L1637978-04 WG2101874: 7.94 at 24.1C

Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	156		10.0	1	07/26/2023 12:45	WG2101724

Sample Narrative:

L1637978-04 WG2101724: at 25C

Metals (ICP) by Method 6010B-NE493 Ch 2

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.266		0.0167	0.200	1	07/28/2023 11:26	WG2102867

Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	5.97		0.100	1.00	5	08/01/2023 13:51	WG2104344
Barium	554		0.152	2.50	5	08/01/2023 13:51	WG2104344
Cadmium	0.551	J	0.0855	1.00	5	08/01/2023 13:51	WG2104344
Copper	26.3		0.132	5.00	5	08/01/2023 13:51	WG2104344
Lead	15.7		0.0990	2.00	5	08/01/2023 13:51	WG2104344
Nickel	18.8		0.197	2.50	5	08/01/2023 13:51	WG2104344
Selenium	0.323	J	0.180	2.50	5	08/01/2023 13:51	WG2104344
Silver	U		0.0865	0.500	5	08/01/2023 13:51	WG2104344
Zinc	61.7		0.740	25.0	5	08/01/2023 13:51	WG2104344

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	1.19		0.0217	0.100	1	07/26/2023 17:49	WG2101946
(S) a,a,a-Trifluorotoluene(FID)	95.7			77.0-120		07/26/2023 17:49	WG2101946

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	U		0.000467	0.00100	1	07/25/2023 21:19	WG2101261
Toluene	0.00225	J	0.00130	0.00500	1	07/25/2023 21:19	WG2101261
Ethylbenzene	0.00163	J	0.000737	0.00250	1	07/25/2023 21:19	WG2101261
Xylenes, Total	0.169		0.000880	0.00650	1	07/25/2023 21:19	WG2101261
1,2,4-Trimethylbenzene	0.0393		0.00158	0.00500	1	07/25/2023 21:19	WG2101261
1,3,5-Trimethylbenzene	0.170		0.00200	0.00500	1	07/25/2023 21:19	WG2101261
(S) Toluene-d8	115			75.0-131		07/25/2023 21:19	WG2101261
(S) 4-Bromofluorobenzene	103			67.0-138		07/25/2023 21:19	WG2101261
(S) 1,2-Dichloroethane-d4	80.9			70.0-130		07/25/2023 21:19	WG2101261

Semi-Volatile Organic Compounds (GC) by Method 8015M

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
C10-C28 Diesel Range	349		80.5	200	50	07/27/2023 21:56	WG2101706
C28-C36 Motor Oil Range	367		13.7	200	50	07/27/2023 21:56	WG2101706
(S) o-Terphenyl	0.000	J7		18.0-148		07/27/2023 21:56	WG2101706

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

Analyte	Result mg/kg	Qualifier	MDL mg/kg	RDL mg/kg	Dilution	Analysis date / time	Batch
Acenaphthene	U		0.00209	0.00600	1	07/28/2023 05:53	WG2101711
Anthracene	U		0.00230	0.00600	1	07/28/2023 05:53	WG2101711
Benzo(a)anthracene	U		0.00173	0.00600	1	07/28/2023 05:53	WG2101711
Benzo(b)fluoranthene	U		0.00153	0.00600	1	07/28/2023 05:53	WG2101711
Benzo(k)fluoranthene	U		0.00215	0.00600	1	07/28/2023 05:53	WG2101711
Benzo(a)pyrene	U		0.00179	0.00600	1	07/28/2023 05:53	WG2101711
Chrysene	U		0.00232	0.00600	1	07/28/2023 05:53	WG2101711
Dibenz(a,h)anthracene	U		0.00172	0.00600	1	07/28/2023 05:53	WG2101711
Fluoranthene	U		0.00227	0.00600	1	07/28/2023 05:53	WG2101711
Fluorene	0.00506	J	0.00205	0.00600	1	07/28/2023 05:53	WG2101711
Indeno(1,2,3-cd)pyrene	U		0.00181	0.00600	1	07/28/2023 05:53	WG2101711
1-Methylnaphthalene	0.0280		0.00449	0.0200	1	07/28/2023 05:53	WG2101711
2-Methylnaphthalene	0.0640		0.00427	0.0200	1	07/28/2023 05:53	WG2101711
Naphthalene	0.0231		0.00408	0.0200	1	07/28/2023 05:53	WG2101711
Pyrene	U		0.00200	0.00600	1	07/28/2023 05:53	WG2101711
(S) p-Terphenyl-d14	78.8			23.0-120		07/28/2023 05:53	WG2101711
(S) Nitrobenzene-d5	117			14.0-149		07/28/2023 05:53	WG2101711
(S) 2-Fluorobiphenyl	74.3			34.0-125		07/28/2023 05:53	WG2101711

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3952975-1 07/26/23 11:05

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/kg		mg/kg	mg/kg
Hexavalent Chromium	U		0.255	1.00

L1637974-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1637974-06 07/26/23 12:25 • (DUP) R3952975-7 07/26/23 12:30

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

L1637996-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1637996-02 07/26/23 13:12 • (DUP) R3952975-8 07/26/23 13:17

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

Laboratory Control Sample (LCS)

(LCS) R3952975-2 07/26/23 11:12

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	11.1	111	80.0-120	

L1637305-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1637305-01 07/26/23 11:23 • (MS) R3952975-3 07/26/23 11:28 • (MSD) R3952975-4 07/26/23 11:33

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Hexavalent Chromium	20.0	U	22.1	20.6	110	103	1	75.0-125			6.90	20

L1637305-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1637305-01 07/26/23 11:23 • (MS) R3952975-5 07/26/23 11:38

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	651	U	734	113	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1636838-27 Original Sample (OS) • Duplicate (DUP)

(OS) L1636838-27 07/27/23 08:38 • (DUP) R3953287-2 07/27/23 08:38

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	8.26	8.27	1	0.121		1

Sample Narrative:

OS: 8.26 at 24.5C

DUP: 8.27 at 24.4C

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1637974-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1637974-03 07/27/23 08:38 • (DUP) R3953287-3 07/27/23 08:38

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.96	7.98	1	0.251		1

Sample Narrative:

OS: 7.96 at 24.3C

DUP: 7.98 at 24.3C

Laboratory Control Sample (LCS)

(LCS) R3953287-1 07/27/23 08:38

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10 at 23.8C

Method Blank (MB)

(MB) R3952901-1 07/26/23 12:45

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

Sample Narrative:

BLANK: at 25C

L1637974-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1637974-03 07/26/23 12:45 • (DUP) R3952901-3 07/26/23 12:45

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	312	382	1	20.2	J3	20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1637996-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1637996-06 07/26/23 12:45 • (DUP) R3952901-4 07/26/23 12:45

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	166	167	1	0.361		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3952901-2 07/26/23 12:45

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	732	732	100	85.0-115	

Sample Narrative:

LCS: at 25C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3954161-1 07/28/23 14:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R3954161-2 07/28/23 15:00 • (LCSD) R3954161-3 07/28/23 15:03

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 %
Hot Water Sol. Boron	1.00	1.01	1.01	101	101	80.0-120			0.0979	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3953962-1 07/28/23 10:48

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Hot Water Sol. Boron	U		0.0167	0.200

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

(LCS) R3953962-2 07/28/23 10:51 • (LCSD) R3953962-3 07/28/23 10:53

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 %
Hot Water Sol. Boron	1.00	1.08	1.08	108	108	80.0-120			0.406	20

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3955300-1 08/01/23 11:43

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00
Barium	U		0.152	2.50
Cadmium	U		0.0855	1.00
Copper	U		0.133	5.00
Lead	U		0.0990	2.00
Nickel	U		0.197	2.50
Selenium	U		0.180	2.50
Silver	U		0.0865	0.500
Zinc	U		0.740	25.0

Laboratory Control Sample (LCS)

(LCS) R3955300-2 08/01/23 11:46

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.8	91.8	80.0-120	
Barium	100	88.2	88.2	80.0-120	
Cadmium	100	90.8	90.8	80.0-120	
Copper	100	83.5	83.5	80.0-120	
Lead	100	87.1	87.1	80.0-120	
Nickel	100	89.1	89.1	80.0-120	
Selenium	100	92.8	92.8	80.0-120	
Silver	20.0	17.6	88.1	80.0-120	
Zinc	100	87.4	87.4	80.0-120	

L1637974-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1637974-01 08/01/23 11:50 • (MS) R3955300-5 08/01/23 12:00 • (MSD) R3955300-6 08/01/23 12:03

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	5.70	92.2	102	86.5	96.4	5	75.0-125			10.1	20
Barium	100	246	348	409	102	163	5	75.0-125		J5	16.1	20
Cadmium	100	0.291	88.5	101	88.2	100	5	75.0-125			12.8	20
Copper	100	20.5	96.1	115	75.6	94.1	5	75.0-125			17.5	20
Lead	100	13.2	93.2	112	80.0	98.5	5	75.0-125			18.1	20
Nickel	100	15.7	95.9	113	80.2	97.2	5	75.0-125			16.3	20
Selenium	100	0.383	93.2	99.1	92.8	98.7	5	75.0-125			6.12	20
Silver	20.0	U	17.3	19.3	86.4	96.6	5	75.0-125			11.2	20
Zinc	100	49.4	120	141	70.5	92.1	5	75.0-125	J6		16.5	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3953574-2 07/26/23 10:34

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TPH (GC/FID) Low Fraction	0.0242	⬇	0.0217	0.100
(S) a,a,a-Trifluorotoluene(FID)	96.9			77.0-120

Laboratory Control Sample (LCS)

(LCS) R3953574-1 07/26/23 09:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
TPH (GC/FID) Low Fraction	5.50	5.37	97.6	72.0-127	
(S) a,a,a-Trifluorotoluene(FID)			100	77.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3954113-2 07/25/23 13:55

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000467	0.00100
Toluene	U		0.00130	0.00500
Ethylbenzene	U		0.000737	0.00250
Xylenes, Total	U		0.000880	0.00650
1,2,4-Trimethylbenzene	U		0.00158	0.00500
1,3,5-Trimethylbenzene	U		0.00200	0.00500
(S) Toluene-d8	114			75.0-131
(S) 4-Bromofluorobenzene	97.9			67.0-138
(S) 1,2-Dichloroethane-d4	76.5			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3954113-1 07/25/23 11:55

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.108	86.4	70.0-123	
Toluene	0.125	0.126	101	75.0-121	
Ethylbenzene	0.125	0.116	92.8	74.0-126	
Xylenes, Total	0.375	0.353	94.1	72.0-127	
1,2,4-Trimethylbenzene	0.125	0.0913	73.0	70.0-126	
1,3,5-Trimethylbenzene	0.125	0.0955	76.4	73.0-127	
(S) Toluene-d8			107	75.0-131	
(S) 4-Bromofluorobenzene			98.3	67.0-138	
(S) 1,2-Dichloroethane-d4			86.4	70.0-130	

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3953651-1 07/27/23 14:39

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-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	72.5			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3953651-2 07/27/23 14:52

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	31.1	62.2	50.0-150	
(S) o-Terphenyl			66.1	18.0-148	

L1637978-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1637978-03 07/28/23 10:18 • (MS) R3954165-1 07/28/23 10:31 • (MSD) R3954165-2 07/28/23 10:45

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	10.4	43.5	45.1	66.2	72.6	2	50.0-150			3.61	20
(S) o-Terphenyl					53.5	59.1		18.0-148				

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Method Blank (MB)

(MB) R3954372-2 07/29/23 11:35

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-C36 Motor Oil Range	U		0.274	4.00
(S) o-Terphenyl	68.3			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3954372-1 07/29/23 11:22

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
C10-C28 Diesel Range	50.0	37.8	75.6	50.0-150	
(S) o-Terphenyl			72.4	18.0-148	

L1638900-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1638900-05 07/29/23 15:18 • (MS) R3954394-1 07/29/23 15:31 • (MSD) R3954394-2 07/29/23 15:44

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
C10-C28 Diesel Range	49.8	6.61	37.7	41.4	62.4	70.4	1	50.0-150			9.36	20
(S) o-Terphenyl					52.3	48.0		18.0-148				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3954015-2 07/28/23 01:51

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Acenaphthene	U		0.00209	0.00600
Anthracene	U		0.00230	0.00600
Benzo(a)anthracene	U		0.00173	0.00600
Benzo(b)fluoranthene	U		0.00153	0.00600
Benzo(k)fluoranthene	U		0.00215	0.00600
Benzo(a)pyrene	U		0.00179	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
1-Methylnaphthalene	U		0.00449	0.0200
2-Methylnaphthalene	U		0.00427	0.0200
Naphthalene	U		0.00408	0.0200
Pyrene	U		0.00200	0.00600
(S) p-Terphenyl-d14	98.1			23.0-120
(S) Nitrobenzene-d5	92.4			14.0-149
(S) 2-Fluorobiphenyl	89.7			34.0-125

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3954015-1 07/28/23 01:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Acenaphthene	0.0800	0.0622	77.8	50.0-120	
Anthracene	0.0800	0.0670	83.8	50.0-126	
Benzo(a)anthracene	0.0800	0.0701	87.6	45.0-120	
Benzo(b)fluoranthene	0.0800	0.0670	83.8	42.0-121	
Benzo(k)fluoranthene	0.0800	0.0657	82.1	49.0-125	
Benzo(a)pyrene	0.0800	0.0708	88.5	42.0-120	
Chrysene	0.0800	0.0683	85.4	49.0-122	
Dibenz(a,h)anthracene	0.0800	0.0660	82.5	47.0-125	
Fluoranthene	0.0800	0.0666	83.3	49.0-129	
Fluorene	0.0800	0.0671	83.9	49.0-120	
Indeno(1,2,3-cd)pyrene	0.0800	0.0717	89.6	46.0-125	
1-Methylnaphthalene	0.0800	0.0614	76.8	51.0-121	
2-Methylnaphthalene	0.0800	0.0630	78.8	50.0-120	
Naphthalene	0.0800	0.0607	75.9	50.0-120	
Pyrene	0.0800	0.0699	87.4	43.0-123	

Laboratory Control Sample (LCS)

(LCS) R3954015-1 07/28/23 01:33

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
(S) p-Terphenyl-d14			102	23.0-120	
(S) Nitrobenzene-d5			93.9	14.0-149	
(S) 2-Fluorobiphenyl			94.1	34.0-125	

L1637974-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1637974-01 07/28/23 04:44 • (MS) R3954015-3 07/28/23 05:01 • (MSD) R3954015-4 07/28/23 05:19

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 %
Acenaphthene	0.0772	U	0.0464	0.0387	60.1	50.1	1	14.0-127			18.1	27
Anthracene	0.0772	U	0.0500	0.0405	64.8	52.5	1	10.0-145			21.0	30
Benzo(a)anthracene	0.0772	U	0.0543	0.0441	70.3	57.1	1	10.0-139			20.7	30
Benzo(b)fluoranthene	0.0772	U	0.0476	0.0377	61.7	48.8	1	10.0-140			23.2	36
Benzo(k)fluoranthene	0.0772	U	0.0495	0.0408	64.1	52.8	1	10.0-137			19.3	31
Benzo(a)pyrene	0.0772	U	0.0556	0.0451	72.0	58.4	1	10.0-141			20.9	31
Chrysene	0.0772	U	0.0550	0.0450	71.2	58.3	1	10.0-145			20.0	30
Dibenz(a,h)anthracene	0.0772	U	0.0504	0.0422	65.3	54.7	1	10.0-132			17.7	31
Fluoranthene	0.0772	U	0.0502	0.0399	65.0	51.7	1	10.0-153			22.9	33
Fluorene	0.0772	U	0.0526	0.0421	68.1	54.5	1	11.0-130			22.2	29
Indeno(1,2,3-cd)pyrene	0.0772	U	0.0510	0.0412	66.1	53.4	1	10.0-137			21.3	32
1-Methylnaphthalene	0.0772	0.00624	0.0513	0.0447	58.4	49.8	1	10.0-142			13.8	28
2-Methylnaphthalene	0.0772	0.0129	0.0543	0.0474	53.6	44.7	1	10.0-137			13.6	28
Naphthalene	0.0772	0.00457	0.0526	0.0491	62.2	57.7	1	10.0-135			6.88	27
Pyrene	0.0772	0.00302	0.0516	0.0410	62.9	49.2	1	10.0-148			22.9	35
(S) p-Terphenyl-d14					77.3	55.7		23.0-120				
(S) Nitrobenzene-d5					94.2	102		14.0-149				
(S) 2-Fluorobiphenyl					73.7	56.6		34.0-125				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

GLOSSARY OF TERMS

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.

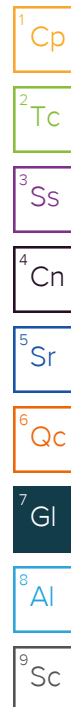
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location.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

Abbreviations and Definitions

MDL	Method Detection Limit.
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.
T8	Sample(s) received past/too close to holding time expiration.



ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
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	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
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

* 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 Analytical.



