



October 27, 2022  
Kleinfelder Project No. 20231065.001A

Mr. Jake Janicek  
Caerus Piceance, LLC  
1001 17th Street #1600  
Denver, Colorado 80202

**SUBJECT: Site Investigation Report  
Caerus Piceance, LLC  
REMEDIATION PROJECT # 25510  
RA11 Pad  
Garfield County, Colorado**

Dear Mr. Janicek:

Kleinfelder Inc. (Kleinfelder) performed soil sampling activities at the RA11 Pad in Garfield County, Colorado under contract by Caerus Piceance LLC (Caerus). Enclosed is the report of work complete for this effort.

Please do not hesitate to contact me at (303) 319-2456 or by email at [VDeCianne@kleinfelder.com](mailto:VDeCianne@kleinfelder.com) should you have questions or concerns.

Respectfully submitted,  
**KLEINFELDER, INC.**

A handwritten signature in black ink, appearing to read "Vince DeCianne", written over a horizontal line.

Vince DeCianne  
VP, Senior Principal Professional



**SITE INVESTIGATION REPORT  
CAERUS PICEANCE, LLC  
REMEDIAION PROJECT # 25510  
RA11 PAD  
GARFIELD COUNTY, COLORADO**

**KLEINFELDER PROJECT NO. 20231065.001A**

**October 27, 2022**

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PROJECT FOR WHICH THIS REPORT WAS PREPARED.**

A Report Prepared for:

Caerus Piceance, LLC  
1001 17th Street #1600  
Denver, CO 80202

**SITE INVESTIGATION REPORT  
CAERUS PICEANCE, LLC  
REMEDATION PROJECT # 25510  
RA11 PAD  
GARFIELD COUNTY, COLORADO**

Prepared by:



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Tristan Schmalz  
Staff Professional I

Reviewed by:



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Vince DeCianne  
VP, Senior Principal Professional

**KLEINFELDER**  
707 17th Street, Suite 3000  
Denver, Colorado 80202  
P| 303.237.6601  
F| 303.237.6602

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**SITE INVESTIGATION REPORT  
CAERUS PICEANCE, LLC  
REMEDIATION PROJECT # 25510  
RA11 PAD  
GARFIELD COUNTY, COLORADO**

**1 INTRODUCTION**

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This document was prepared by Kleinfelder Inc. (Kleinfelder) on behalf of Caerus Piceance, LLC (Caerus) to provide documentation of recent sampling support services conducted at the RA11 Pad located in Garfield County, Colorado (**Figure 1**).

Kleinfelder has been contracted by Caerus to perform soil sampling support services to provide necessary information to complete the Colorado Oil and Gas Conservation Commission (COGCC) Form 27 for their upstream oil and gas production facilities located in the Piceance Basin. According to the approved COGCC Form 19 Spill / Release Report (document # 403074356) and supplemental COGCC Form 19 Spill / Release Report (document # 40308834) provided to Kleinfelder by Caerus (**Appendix A**), a dumphine failure was identified upon the discovery of surfaced fluids at the RA11 Pad on April 22, 2022. Caerus proposed soil sampling to characterize the approximate release area from the reported spill under COGCC 913.c.(3) Rule 906: Remediation of Spill and Release pursuant to Rule 912 (refer to **Appendix B**, Approved Form 27 Site Investigation and Remediation Workplan). Kleinfelder collected the soil samples. Samples were analyzed by Pace Analytical National (Pace) laboratory and results are reported herein.

## 2 SITE LOCATION AND GEOLOGIC SETTING

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The RA11 Pad is located within the Piceance Basin in Garfield County, northwestern Colorado (NENE, Section 11, Township 7 South, Range 94 West) (**Figure 1**). The Piceance Basin is a geologic structural basin consisting of sandstones and siltstones, containing reserves of coal, natural gas, and oil shale.

No surface water or groundwater were encountered during Kleinfelder's soil sampling activities. The general soil type within the release area was classified based on Kleinfelder's field observations using the Unified Soil Classification System (USCS) and were observed as silty sands, sand-silt mixture. Topographical information is provided in **Figure 1**.

### 3 FIELD ACTIVITIES

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As prescribed within the approved COGCC Form 27 Site Investigation and Remediation Workplan, Kleinfelder performed the following field activities at the RA11 Pad on August 23, 2022.

#### August 23, 2022

- Collected thirteen (13) background soil samples from locations east and west of the RA11 Pad from eight different locations. Shipped soil samples to Pace Analytical Laboratories to analyze for the contaminants of concern listed within COGCC Table 915-1, minus organics.
- Collected one (1) produced water sample from a produced water tank on the RA11 Pad. Shipped the produced water sample to Pace Analytical Laboratories to analyze for pH and arsenic.
- Shipped soil samples to Pace to analyze for the contaminants of concern listed within COGCC Table 915-1, minus organics.

Caerus identified the soil sampling locations for the sampling event. Five sample locations were located to the east in a gully that reflected the varying soil types encountered in the area. Two other locations were identified by Caerus as soil sampling locations that could be accessed by a hydrovac. Hard-packed shale was encountered at approximately 5 feet below ground surface (bgs) and the western hydrovac location. One sample was collected at 3 feet bgs. The hydrovac moved approximately 50 feet west and was able to achieve a pothole depth of 13 feet bgs. Kleinfelder used an EOS Arrow 100 Submeter GNSS receiver to record latitude and longitude at each sample location and the sample locations are shown on **Figures 2a and 2b**.

Soil samples were collected from a stainless-steel hand auger or a stainless-steel hand trowel and placed into two laboratory-supplied, 9-ounce jars with Teflon lids per sample. Each sample was collected directly from the hand auger or trowel from the appropriate depth and placed into the glass jars. The produced water sample was collected with the assistance of a Caerus pumper. The sample was collected directly from the tank loadout valve into a 1-liter unpreserved polyethylene collection bottle. The samples were immediately placed on ice in a cooler. Standard

chain-of-custody (COC) procedures were used during sampling and transportation to Pace in Mount Juliet, Tennessee (via FEDEX).

Sampling equipment (i.e., hand auger cutter head, soil sampler, etc.) was washed with a solution of Liquinox® detergent, rinsed with tap water, and then distilled water between samples.

Soil sample conditions and observations are provided in **Table 1**.



## 4 RESULTS

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Analytical results are summarized in **Table 2** and compared to release area samples collected on 6/10/2022 and 7/7/2022 (see the Report of Work Complete dated 8/18/2022 for more details on previous sampling events) and to the COGCC Table 915-1 Protection of Groundwater Soil Screening Level Concentrations. Within the release area, levels of the contaminants of concern in the COGCC Table 915-1 Residential Soil Screening Level Concentrations were within the range of the background samples except for total petroleum hydrocarbons (TPH) at the point of release (POR) and sodium adsorption ratio (SAR) at three other sample locations. However, since the SAR levels at the POR were lower than that at the three locations with exceeding levels of SAR, it is believed that these levels are naturally elevated and not as a result of the release.

Arsenic and pH were detected at concentrations above the Table 915-1 Residential Soil Screening Level Concentrations, but less than the site-specific background concentrations (per COGCC) at all sample locations. Additionally, the results of the produced water sample show that the elevated levels of pH and arsenic likely did not result from the produced water leak as the pH and arsenic levels from the produced water sample were 7.24 and 0.00223 mg/kg, respectively. Laboratory reports are provided in **Appendix C**.

## 5 CONCLUSIONS AND RECOMMENDATIONS

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TPH was the only contaminant of concern to exceed the COGCC Table 915-1 Residential Soil Screening Level Concentrations when also compared to background concentrations. The exceedance of TPH occurred at the POR at 5 feet bgs, however, there were no exceedances of TPH at 7 feet bgs at the POR. There were no other TPH exceedances from the confirmation samples collected on 7/7/2022. Kleinfelder's opinion is that the release area has been delineated. See **Figure 3** for the approximate release extent map.

## 6 LIMITATIONS

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Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that Caerus has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage, or treatment of hazardous materials within the meaning of any governmental statute, regulation, or order. Caerus is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. Caerus is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

## FIGURES

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**PN 20231065.001A**

1





RA11 Pad Site Investigation  
East Background Samples  
Caerus Piceance, LLC  
NENE Sec. 11 T7S R94W  
Garfield County, Colorado

PN 20231065.001A

Figure

**2a**





RA11 Pad Site Investigation  
West Background and Produced Water Samples  
Caerus Piceance, LLC  
NENE Sec. 11 T7S R94W  
Garfield County, Colorado

PN 20231065.001A

Figure

**2b**





**Legend**

● Approximate Release Area



RA11 Pad Site Investigation  
Approximate Release Extent  
Caerus Piceance, LLC  
NENE Sec. 11 T7S R94W  
Garfield County, Colorado

PN 20231065.001A

**Figure**

**3**



## TABLES

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**Table 1**  
**COGCC Soil Sampling**  
 by **Jordan Veith** on **8/23/2022**  
 for **Caerus RA 11**

Caerus - 2022 Sampling Support  
 Services  
 20231065.001A  
 DeCianne, Vincent G. (Vince)

**Sample Register**

Sample ID	Sample Type	Date	Time	Depth	PID (ppmv)	Odor	Staining	Comments
20220823_RA 11_BG03@1ft	Background	08/23/2022	07:15 AM	1 to 1	0	N	N	Soil is light tan in color.
20220823_RA 11_BG04@1ft	Background	08/23/2022	07:20 AM	1 to 1	0	N	N	Soil is light tan/light red in color.
20220823_RA 11_BG08@3ft	Background	08/23/2022	07:45 AM	3 to 3	0	N	N	
20220823_RA 11_BG08@5ft	Background	08/23/2022	07:55 AM	5 to 5	0	N	N	
20220823_RA 11_BG09@3ft	Background	08/23/2022	08:20 AM	3 to 3	0	N	N	Rocky soil.
20220823_RA 11_PW01	Other	08/23/2022	08:45 AM	0 to 0	0	Y	N	PID measurement not collected.
20220823_RA 11_BG10@5ft	Background	08/23/2022	08:50 AM	5 to 5	0	N	N	
20220823_RA 11_BG10@7ft	Background	08/23/2022	09:20 AM	7 to 7	0	N	N	
20220823_RA 11_BG10@9ft	Background	08/23/2022	09:50 AM	9 to 9	0	N	N	
20220823_RA 11_BG10@11ft	Background	08/23/2022	10:15 AM	11 to 11	0	N	N	
20220823_RA 11_BG10@13ft	Background	08/23/2022	10:45 AM	13 to 13	0	N	N	
20220823_RA 11_BG05@1ft	Background	08/23/2022	11:00 AM	1 to 1	0	N	N	Soil is white/yellow in color.
20220823_RA 11_BG06@1ft	Background	08/23/2022	11:10 AM	1 to 1	0	N	N	Soil is white/yellow in color.
20220823_RA 11_BG07@1ft	Background	08/23/2022	11:20 AM	1 to 1	0	N	N	In drainage gully.

-----  
 Kleinfelder Representative Signature

# Table 2 - Soil Analytical Results Summary

		RA11																
		4/10/2022			8/19/2022													
Contaminant of Concern	Change Concentration (mg/kg unless otherwise noted)	20220410_RA11_R001@01	20220610_RA11_R002@01	20220610_RA11_R003@01	20220610_RA11_R004@01	20220610_RA11_R005@01	20220610_RA11_R006@01	20220610_RA11_R007@01	20220610_RA11_R008@01	20220610_RA11_R009@01	20220610_RA11_R010@01	20220610_RA11_R011@01	20220610_RA11_R012@01	20220610_RA11_R013@01	20220610_RA11_R014@01	20220610_RA11_R015@01	20220610_RA11_R016@01	20220610_RA11_R017@01
Soil TPH (total volatile [C6-C10] and semivolatile [C9-C10] hydrocarbons)	500	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
TPH (low fraction [C6-C10])		NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
CHC (C10-C15)		NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
NMCL (C16-C20)		NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Soils and Groundwater - Rapid Hydrocarbons including condensate and	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits
Electrical conductivity (EC) (by saturated paste method)		0.024	0.0385	0.061	0.014	0.0712	0.176	0.789	1.070	1.120	0.930	0.612	0.785	0.480	2.210	0.276		
Salinity (saturated paste) (by saturated paste method)		4.146 units	0.061	0.067	0.010	0.175	0.175	0.34	14.4	16.4	14.4	14.3	10.94	0.0271	0.049			
EC (by saturated paste method)		6.6.9.99 units	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99	6.6.9.99
Boron (hot water soluble soil extract)	2 mg/L	NM	NM	ND	0.204	ND	ND	0.211	ND	0.267	ND	0.260	0.213	0.086	ND	ND	ND	ND
Organic Compounds in Soils	Residential Soil Screening Level Concentrations																	
benzene	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
toluene	400	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
ethylbenzene	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
xylene (m + p-, m- and o- isomers + total xylene)	10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,2,4-trimethylbenzene	0.5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1,3,5-trimethylbenzene	20	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
acetophenone	100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
anthracene	1000	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benz[a]anthracene	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benz[b]fluoranthene	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
benz[b]fluoranthene	0.11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
fluorene	100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
fluoranthene	0.11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
pyrene	100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
indeno[1,2,3-cd]pyrene	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
pyrene	100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
1-methylcyclopentadiene	10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
2-methylcyclopentadiene	10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
indolizidine	1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
Metals in Soils	Residential Soil Screening Level Concentrations																	
arsenic	0.45	10.6	4.69	0.12	2.87	0.29	1.90	0.53	0.06	0.17	0.04	0.15	0.29	0.46	21.9	0.06		
barium	10000	NM	NM	NM	7.94	62.4	109	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4
cadmium	75	NM	NM	0.781	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
chromium (VI)	0.1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
copper	1000	NM	NM	10.4	13.1	11.2	7.00	15.4	11.9	17.1	12.1	8.59	9.45	26.7	25.1	10.1		
lead	100	NM	NM	11.0	7.71	11.0	6.75	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
nickel	1000	NM	NM	10.3	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
silver	100	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
zinc	21000	NM	NM	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1

NOTES:

Greater than Table EIS-1 Residential Soil Screening Level Concentrations

Greater than Table EIS-1 Standards, but less than adjusted standards (highest background level is the adjusted standard for inorganic; 1,250 highest background level for metals)

RG = background sample

C = carbon range

COSEC = Colorado Oil and Gas Conservation Commission

R 100 = 100 feet below ground surface

GC/MS = gas chromatography with flame ionization detector

(+) = The identification of the analyte is acceptable; the reported value is an estimate

NMCL = maximum contaminant level

mg/L = milligram per liter

mg/kg = milligram per kilogram

mg/L = milligram per liter

mg/kg = milligram per kilogram

NM = Not applicable. No COSEC cleanup concentration provided.

ND = Not detected at the Reporting Level (or MCL, where applicable).

PH = phosphate

TR = Samples received past/late due to holding time expiration.

U = Not detected at the Reporting Level (or MCL, where applicable).

		RA11												
		6/18/2022	7/7/2022										8/23/2022	
Contaminant of Concern	Cleanup Concentration (mg/kg unless otherwise noted)	20220610_RA11_POR@5ft	20220707_RA11_POR@7ft	20220707_RA11_PH01@7ft	20220707_RA11_PH02@5ft	20220707_RA11_PH03@5ft	20220707_RA11_PH05@6ft	20220707_RA11_PH06@6ft	20220707_RA11_PH07@6ft	20220707_RA11_PH08@5ft	20220707_RA11_PH09@5ft	20220707_RA11_PH10@5ft	20220823_RA11_PW01	
Soil TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons)	500	684.64	0.9681	113.76	8.283	121.39	37.77	1.1852	9.915	1.1674	1.7912	1.676	NM	
TPH Low Fraction GFO [C6-C10]		457	05331	4.39	4.55	47	7.04	0.0552 J	4.09	0.0574 J	0.0312 J	0.0560 J	NM	
GFO [C10-C28]		222	U	102	1.181	U	106.31.5	28.5	U	U	U	U	NM	
MBO [C28-C36]		5.64	0.915	7.37	0.553 J	7.82	2.13 J	1.13 J	0.285 J	1.11 J	1.76 J	1.62 J	NM	
Soils and groundwater - liquid hydrocarbons including condensate and oil	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	Below Visual Detection Limits	N/A	
Electrical conductivity (EC) (by saturated paste method)	<4mmhos/cm	1.94	0.523	1.00	0.779	1.77	1.05	0.296	0.233	0.322	0.206	0.234	NM	
Sodium adsorption ratio (SAR) (by saturated paste method)	<6 SAR units	14.3	10.9	19.9	17.3	21.0	13.9	1.17	0.998	0.579	0.631	1.19	NM	
pH (by saturated paste method)	6-8.3 pH units	7.79 TB	9.00 TB	9.51 TB	9.04 TB	8.62 TB	8.96 TB	8.22 TB	8.31 TB	8.71 TB	8.34 TB	8.56 TB	7.24 TB	
Boron (hot water soluble soil extract)	2 mg/L	0.389	0.285	0.2571	0.251	0.261	0.157 J	0.261	0.206	0.292	0.271	0.277	NM	
Organic Compounds in Soils	Residential Soil Screening Level Concentrations													
benzene	1.2	0.0986	U	0.0005751	0.0111	0.00133	U	U	0.0652	U	U	U	NM	
toluene	490	1.43	0.01971	0.001431	0.0274	0.00265 J	U	U	0.244	0.00222 J	U	U	NM	
ethylbenzene	5.8	0.345	U	0.00228	0.0145	0.0573	0.0148	U	0.0296	U	U	U	NM	
xylenes (sum of o-, m- and p- isomers + total xylenes)	58	8.75	0.01751	0.004031	0.269	0.0321	0.0577	0.09456 J	0.551	0.09460 J	U	0.0020 J	NM	
1,2,4-trimethylbenzene	30	2.04	U	0.0107	0.563	0.0373	0.385	U	0.0798	U	U	U	NM	
1,3,5-trimethylbenzene	27	2.14	U	0.133	0.0383	1.63	0.0344	U	0.0779	U	U	U	NM	
acenaphthene	360	U	U	U	U	0.0130	U	U	U	U	U	U	NM	
anthracene	1800	U	U	U	U	U	U	U	U	U	U	0.00281 J	NM	
benz[a]anthracene	1.1	U	U	U	U	U	U	U	U	U	U	0.00204 J	NM	
benz[b]fluoranthene	1.1	U	U	U	U	U	U	U	U	U	U	U	NM	
benzo[a]fluoranthene	1.1	U	U	U	U	U	U	U	U	U	U	U	NM	
benzo[a]pyrene	0.11	U	U	U	U	U	U	U	U	U	U	U	NM	
chrysene	110	U	U	U	U	U	U	U	U	U	U	U	NM	
dibenz[a,h]anthracene	0.11	U	U	U	U	U	U	U	U	U	U	U	NM	
fluoranthene	240	U	U	U	U	U	U	U	U	U	U	0.00892	NM	
fluorene	240	0.0155	U	0.005901	U	0.0402	0.00657	U	U	U	U	U	NM	
indene[1,2,3-cd]pyrene	1.1	U	U	U	U	U	U	U	U	U	U	U	NM	
pyrene	340	U	U	U	U	0.00562 J	U	U	U	U	U	0.00669	NM	
1-methylnaphthalene	18	0.2	U	0.0131	U	0.187	0.00739 J	U	0.00735 J	U	U	U	NM	
2-methylnaphthalene	24	0.609	U	0.04761	U	0.392	0.0124 J	U	0.0230	U	U	U	NM	
naphthalene	2	0.209	U	0.00861 J	U	0.110	U	U	0.0100 J	U	U	U	NM	
Metals in Soils	Residential Soil Screening Level Concentrations													
arsenic	0.68	3.12	5.04	8.30	3.75	7.79	8.88	8.63	12.0	5.92	4.65	4.09	0.00221 J	
barium	15000	1190	98.3	1600	84.1	1730	307	134	75.5	127	185	160	NM	
cadmium	71	0.111 J	0.4951	0.4461	0.617	0.454 J	0.517	0.406 J	0.610	0.403 J	0.367 J	0.152	NM	
chromium (VI)	0.1	0.109 J	U	0.176	U	0.281 J	U	U	U	U	U	0.109 J	NM	
copper	3100	18.7	11.0	12.8	9.52	14.5	13.3	12.0	26.0	12.4	13.0	11.8	NM	
lead	400	9.23	9.86	10.4	9.79	12.3	9.60	11.0	10.9	11.1	9.09	9.09	NM	
nickel	1500	11.3	15.9	11.9	12.3	16.5	14.4	14.5	14.5	14.1	14.1	14.1	NM	
selenium	390	U	U	U	U	U	U	U	6.28	U	U	U	NM	
silver	390	U	U	U	U	U	U	U	U	U	U	U	NM	
zinc	23000	44.5	54.3	47.2	40.9	53.4	51.6	49.1	71.8	54.3	53.9	47.6	NM	

## NOTES:

Greater than Table 915-1 Residential Soil Screening Level Concentrations

Greater than Table 915-1 Standards, but less than adjusted standards (Highest background level is the adjusted standard for Inorganics; 1.25X highest background level for metals).

BG = background sample

C = carbon range

COGCC = Colorado Oil and Gas Conservation Commission

ft bgs = feet below ground surface

GC/MS = gas chromatography with flame ionization detector

J = The identification of the analyte is acceptable; the reported value is an estimate

MCL = maximum contaminant level

mg/kg = milligram per kilogram

mg/L = milligram per liter

mmhos/cm = millimhos per centimeter

N/A = Not applicable. No COGCC cleanup concentration provided

ND = Not detected at the Reporting Limit (or MDL where applicable).

PH = pit hole

TB = Samples received past/hot close to holding time expiration.

U = Not detected at the Reporting Limit (or MDL where applicable).

**APPENDIX A**  
**COGCC FORM 19 SPILL / RELEASE REPORTS**

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# State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:

403074356

Date Received:

06/09/2022

Spill report taken by:

FISCHER, ALEX

Spill/Release Point ID:

482310

## SPILL/RELEASE REPORT (INITIAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Refer to COGCC Rule 912.b. for reporting requirements of spills or releases of E&P Waste, produced Fluids, or unauthorized Releases of natural gas. Submit a Site Investigation and Remediation Workplan (Form 27) if Rule 913.c. applies.

### OPERATOR INFORMATION

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	<b>Phone Numbers</b> Phone: (970) 285.2739 Mobile: (970) 987.4650 Email: bmiddleton@caerusoila.ndgas.com
Address: 1001 17TH STREET #1600		
City: DENVER	State: CO Zip: 80202	
Contact Person: Brett Middleton		

### INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 403074356

Initial Report Date: 06/09/2022 Date of Discovery: 06/09/2022 Spill Type: Recent Spill

#### Spill/Release Point Location:

QTRQTR NENE SEC 11 TWP 7S RNG 94W MERIDIAN 6

Latitude: 39.458841 Longitude: -107.847325

Municipality (if within municipal boundaries): County: GARFIELD

Enter Lat./long measurement of the actual Spill/Release Point. Lat./Long. Data shall meet standards of Rule 216.

#### Reference Location:

Facility Type: WELL SITE ☒ Facility/Location ID No 334688  
 Spill/Release Point Name: RA11 Dumpline Release ☐ Well API No. (Only if the reference facility is well) 05- -  
☐ No Existing Facility or Location ID No.

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0 Estimated Condensate Spill Volume(bbl): Unknown

Estimated Flow Back Fluid Spill Volume(bbl): 0 Estimated Produced Water Spill Volume(bbl): Unknown

Estimated Other E&amp;P Waste Spill Volume(bbl): 0 Estimated Drilling Fluid Spill Volume(bbl): 0

Specify:

Has the subject Spill/Release been controlled at the time of reporting? Yes

#### Land Use:

Current Land Use: NON-CROP LAND Other(Specify):

Weather Condition: clear

Surface Owner: FEDERAL Other(Specify): BLM

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

Operator identified a dumphine failure which surfaced on location.

**List of Agencies and Other Parties Notified Pursuant to Rule 912.b.(7)-(11):**

**OTHER NOTIFICATIONS**

<u>Date</u>	<u>Agency/Party</u>	<u>Contact</u>	<u>Phone</u>	<u>Response</u>
6/9/2022	GARCO	Kirby Wynn	970-987..2557	email
6/9/2022	BLM	Doug Jones	970-309.2188	email
6/9/2022	CPW	Taylor Elm	970-986.9767	email

**REPORT CRITERIA**

**Rule 912.b.(1) Report to the Director (select all criteria that apply):**

No Rule 912.b.(1).A: A Spill or Release of any size that impacts or threatens to impact any Waters of the State, Public Water System, residence or occupied structure, livestock, wildlife, or publicly-maintained road.

Waters of the State: \_\_\_\_\_ Public Water System: \_\_\_\_\_

Residence or Occupied Structure: \_\_\_\_\_ Livestock: \_\_\_\_\_

Wildlife: \_\_\_\_\_ Publicly-Maintained Road: \_\_\_\_\_

Yes Rule 912.b.(1).B: A Spill or Release in which 1 barrel or more of E&P Waste or produced fluids is spilled or released outside of berms or other secondary containment.

No Rule 912.b.(1).C: A Spill or Release of 5 barrels or more of E&P Waste or produced Fluids regardless of whether the Spill or Release is completely contained within berms or other secondary containment.

No Rule 912.b.(1).D: Within 6 hours of discovery, a Grade 1 Gas Leak. For a Grade 1 Gas Leak from a Flowline, the Operator also must submit the Form 19 – Initial, document number on a Form 44, Flowline Report, for the Grade 1 Gas Leak

Enter the approximate time of discovery \_\_\_\_\_ (HH:MM)

Enter the Document Number of the Grade 1 Gas Leak Report, Form 44 \_\_\_\_\_

Was there a reportable accident associated with either a Grade 1 Gas Leak or an E&P waste spill or release? \_\_\_\_\_

Enter the Document Number of the Initial Accident Report, Form 22 \_\_\_\_\_

Was there damage during excavation? \_\_\_\_\_

Was CO 811 notified prior to excavation? \_\_\_\_\_

No Rule 912.b.(1).E: The discovery of 10 cubic yards or more of impacted material resulting from a current or historic Spill or Release. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards.

Estimated Volume of Impacted Solids (cu. yd.): \_\_\_\_\_

No Rule 912.b.(1).F: The discovery of impacted Waters of the State, including Groundwater. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards. The presence of free product or hydrocarbon sheen on Groundwater or surface water is reportable. The presence of contaminated soil in contact with Groundwater or surface water is reportable. Check all that apply:

☐ The presence of free product or hydrocarbon sheen Surface Water

☐ The presence of free product or hydrocarbon sheen on Groundwater

☐ The presence of contaminated soil in contact with Groundwater

☐ The presence of contaminated soil in contact with Surface water

Yes	Rule 912.b.(1).G: A suspected or actual Spill or Release of any volume where the volume cannot be immediately determined, including a spill or release of any volume that daylights from the subsurface.
No	Rule 912.b.(1).H: Spill or Release resulting in vaporized hydrocarbon mists that leave the Oil and Gas Location or Off-Location Flowline right of way from an Oil and Gas Location and impacts or threatens to impact off-location property.  <input type="checkbox"/> Areas offsite of Oil & Gas Location <input type="checkbox"/> Off-Location Flowline right of way
No	Rule 912.b.(1).I: A Release of natural gas that results in an accumulation of soil gas or gas seeps.
No	Rule 912.b.(1).J: A Release that results in natural gas in Groundwater.

**OPERATOR COMMENTS:**

--

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: \_\_\_\_\_ Print Name: Brett Middleton  
Title: Environmental Lead Date: 06/09/2022 Email: bmiddleton@caerusoilandgas.com

**Condition of Approval**

<b><u>COA Type</u></b>	<b><u>Description</u></b>
	Assess nature and extent of contamination with confirmation soil samples. The operator shall comply with Rule 915.e.(2) for collection of soil samples. The operator shall notify the COGCC and comply with Rule 915.e.(3) if groundwater is encountered during cleanup operations.
	Operator shall collect sample(s) from comparable, nearby non-impacted native soil for purposes of establishing background soil conditions including pH, electrical conductivity (EC) and sodium adsorption ratio (SAR), per Rule 915.e.(2).D.
	Submit photo documentation, as described in Rule 912.b.(4).B, via a Supplemental Form 19.
	Additional information required by Rule 912.b.(4) shall be submitted on a supplemental spill report no later than ten days after discovery (reported Discovery Date: 06/09/2022). Within 90 days of spill discovery date, Operator shall comply with Spill/Release closure requirements outlined in Rule 912.b.(6).
	In the Supplemental eForm 19, identify the root cause of the failure and explain how reoccurrence on this flowline and the other flowlines associated with this pad will be prevented, per Rule 912.d.(3). Operator shall coordinate with COGCC Integrity Unit, Mark Schlagenhauf, regarding dumphine excavation, assessment, and repair.
	Delineate horizontal and vertical extent of impacted area using the Table 915-1 Protection of Groundwater Soil Screening Level Concentrations and remediate impacts to Table 915-1 standards. Provide documentation in either a Supplemental eForm 19 if cleaned up immediately and/or Initial eForm 27 if additional site investigation and remediation is required OR if groundwater is encountered during cleanup operations. Documentation must include a figure showing spill area with sample locations plus laboratory results.
6 COAs	

**Attachment List**

<b><u>Att Doc Num</u></b>	<b><u>Name</u></b>
403074356	SPILL/RELEASE REPORT(INITIAL)
403074813	FORM 19 SUBMITTED

Total Attach: 2 Files

**General Comments**



<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)

**State of Colorado**  
**Oil and Gas Conservation Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
 Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:

403082834

Date Received:

06/17/2022

Spill report taken by:

FISCHER, ALEX

Spill/Release Point ID:

482310

## SPILL/RELEASE REPORT (SUPPLEMENTAL)

This form is to be submitted by the party responsible for the oil and gas spill or release. Refer to COGCC Rule 912.b. for reporting requirements of spills or releases of E&P Waste, produced Fluids, or unauthorized Releases of natural gas. Submit a Site Investigation and Remediation Workplan (Form 27) if Rule 913.c. applies.

### OPERATOR INFORMATION

Name of Operator: <u>CAERUS PICEANCE LLC</u>	Operator No: <u>10456</u>	<b>Phone Numbers</b>
Address: <u>1001 17TH STREET #1600</u>		Phone: <u>(970) 778-2314</u>
City: <u>DENVER</u>	State: <u>CO</u>	Mobile: <u>(970) 778-2314</u>
Zip: <u>80202</u>		Email: <u>jjanicek@caerusoilandgas.com</u>
Contact Person: <u>Jake Janicek</u>		

☐ Transfer of Operatorship: Pursuant to Rule 912.f, this Supplemental Form 19 is being submitted to designate the Buying Operator as the responsible Operator for this Spill and Release.

### INITIAL SPILL/RELEASE REPORT

Initial Spill/Release Report Doc# 403074356

Initial Report Date: 06/09/2022 Date of Discovery: 06/09/2022 Spill Type: Recent Spill

#### Spill/Release Point Location:

QTRQTR NENE SEC 11 TWP 7S RNG 94W MERIDIAN 6Latitude: 39.458867 Longitude: -107.847270Municipality (if within municipal boundaries): \_\_\_\_\_ County: GARFIELD

Enter Lat./long measurement of the actual Spill/Release Point. Lat./Long. Data shall meet standards of Rule 216.

#### Reference Location:

Facility Type: WELL SITE☒ Facility/Location ID No 334688Spill/Release Point Name: RA11 Dumpline Release☐ Well API No. (Only if the reference facility is well) 05- -☐ No Existing Facility or Location ID No.

Estimated Total Spill Volume: use same ranges as others for values

Estimated Oil Spill Volume(bbl): 0Estimated Condensate Spill Volume(bbl): UnknownEstimated Flow Back Fluid Spill Volume(bbl): 0Estimated Produced Water Spill Volume(bbl): UnknownEstimated Other E&P Waste Spill Volume(bbl): 0Estimated Drilling Fluid Spill Volume(bbl): 0

Specify: \_\_\_\_\_

Has the subject Spill/Release been controlled at the time of reporting? Yes

#### Land Use:

Current Land Use: NON-CROP LAND

Other(Specify): \_\_\_\_\_

Weather Condition: clearSurface Owner: FEDERALOther(Specify): BLM

Describe what is known about the spill/release event (what happened -- including how it was stopped, contained, and recovered):

Operator identified a dumphine failure which surfaced on location.

**List of Agencies and Other Parties Notified Pursuant to Rule 912.b.(7)-(11):**

**OTHER NOTIFICATIONS**

<u>Date</u>	<u>Agency/Party</u>	<u>Contact</u>	<u>Phone</u>	<u>Response</u>
6/9/2022	GARCO	Kirby Wynn	970-987..2557	email
6/9/2022	BLM	Doug Jones	970-309.2188	email
6/9/2022	CPW	Taylor Elm	970-986.9767	email

**REPORT CRITERIA**

**Rule 912.b.(1) Report to the Director (select all criteria that apply):**

No Rule 912.b.(1).A: A Spill or Release of any size that impacts or threatens to impact any Waters of the State, Public Water System, residence or occupied structure, livestock, wildlife, or publicly-maintained road.

Waters of the State: \_\_\_\_\_ Public Water System: \_\_\_\_\_

Residence or Occupied Structure: \_\_\_\_\_ Livestock: \_\_\_\_\_

Wildlife: \_\_\_\_\_ Publicly-Maintained Road: \_\_\_\_\_

Yes Rule 912.b.(1).B: A Spill or Release in which 1 barrel or more of E&P Waste or produced fluids is spilled or released outside of berms or other secondary containment.

No Rule 912.b.(1).C: A Spill or Release of 5 barrels or more of E&P Waste or produced Fluids regardless of whether the Spill or Release is completely contained within berms or other secondary containment.

No Rule 912.b.(1).D: Within 6 hours of discovery, a Grade 1 Gas Leak. For a Grade 1 Gas Leak from a Flowline, the Operator also must submit the Form 19 – Initial, document number on a Form 44, Flowline Report, for the Grade 1 Gas Leak

Enter the approximate time of discovery \_\_\_\_\_ (HH:MM)

Enter the Document Number of the Grade 1 Gas Leak Report, Form 44 \_\_\_\_\_

Was there a reportable accident associated with either a Grade 1 Gas Leak or an E&P waste spill or release? \_\_\_\_\_

Enter the Document Number of the Initial Accident Report, Form 22 \_\_\_\_\_

Was there damage during excavation? \_\_\_\_\_

Was CO 811 notified prior to excavation? \_\_\_\_\_

No Rule 912.b.(1).E: The discovery of 10 cubic yards or more of impacted material resulting from a current or historic Spill or Release. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards.

Estimated Volume of Impacted Solids (cu. yd.): \_\_\_\_\_

No Rule 912.b.(1).F: The discovery of impacted Waters of the State, including Groundwater. Discovery and reporting will not be contingent upon confirmation samples demonstrating exceedance of Table 915-1 standards. The presence of free product or hydrocarbon sheen on Groundwater or surface water is reportable. The presence of contaminated soil in contact with Groundwater or surface water is reportable. Check all that apply:

☐ The presence of free product or hydrocarbon sheen Surface Water

☐ The presence of free product or hydrocarbon sheen on Groundwater

☐ The presence of contaminated soil in contact with Groundwater

☐ The presence of contaminated soil in contact with Surface water

Yes	Rule 912.b.(1).G: A suspected or actual Spill or Release of any volume where the volume cannot be immediately determined, including a spill or release of any volume that daylights from the subsurface.
No	Rule 912.b.(1).H: Spill or Release resulting in vaporized hydrocarbon mists that leave the Oil and Gas Location or Off-Location Flowline right of way from an Oil and Gas Location and impacts or threatens to impact off-location property.
	<input type="checkbox"/> Areas offsite of Oil & Gas Location <input type="checkbox"/> Off-Location Flowline right of way
No	Rule 912.b.(1).I: A Release of natural gas that results in an accumulation of soil gas or gas seeps.
No	Rule 912.b.(1).J: A Release that results in natural gas in Groundwater.

## SPILL/RELEASE DETAIL REPORTS

#1	Supplemental Report Date: 06/17/2022		
----	--------------------------------------	--	--

FLUIDS	BBL's SPILLED	BBL's RECOVERED	Unknown
OIL	0	0	<input type="checkbox"/>
CONDENSATE	0	0	<input type="checkbox"/>
PRODUCED WATER			<input checked="" type="checkbox"/>
DRILLING FLUID	0	0	<input type="checkbox"/>
FLOW BACK FLUID	0	0	<input type="checkbox"/>
OTHER E&P WASTE	0	0	<input type="checkbox"/>

specify: \_\_\_\_\_

Was spill/release completely contained within berms or secondary containment? NO    Was an Emergency Pit constructed? NO

*Secondary containment, **including walls & floor regardless of construction material**, must be sufficiently impervious to contain any discharge from primary containment until cleanup occurs.*

**A Form 15 Pit Report shall be submitted within 30 calendar days after the construction of an emergency pit**

Impacted Media (Check all that apply)    ☒ Soil    ☐ Groundwater    ☐ Surface Water    ☐ Dry Drainage Feature

Surface Area Impacted:    Length of Impact (feet): \_\_\_\_\_    Width of Impact (feet): \_\_\_\_\_

Depth of Impact (feet BGS): \_\_\_\_\_    Depth of Impact (inches BGS): \_\_\_\_\_

How was extent determined?

It will be determined via field observations and laboratory analytical data of soil samples.

Soil/Geology Description:

Torriorthents-Rock outcrop complex, steep

Depth to Groundwater (feet BGS) <u>650</u>	Number Water Wells within 1/2 mile radius: <u>1</u>
--	---

If less than 1 mile, distance in feet to nearest	Water Well <u>2386</u>	None <input type="checkbox"/>	Surface Water <u>2778</u>	None <input type="checkbox"/>
	Wetlands _____	None <input checked="" type="checkbox"/>	Springs _____	None <input checked="" type="checkbox"/>
	Livestock _____	None <input checked="" type="checkbox"/>	Occupied Building <u>2558</u>	None <input type="checkbox"/>

Additional Spill Details Not Provided Above:

The depth to groundwater value listed above is an estimate based on the nearest water well which is identified as DWR Permit # 177190. Documents associated with that well list that the well was drilled to 600 feet and no water was found.

## REQUEST FOR CLOSURE

**Spill/Release Reports should be closed when impacts have been remediated or when further investigation and corrective actions will take place under an approved Form 27.**

Basis for Closure: ☐ Corrective Actions Completed (documentation attached, check all that apply)

☐ Horizontal and Vertical extents of impacts have been delineated.

☐ Documentation of compliance with Table 915-1 is attached.

☐ All E&P Waste has been properly treated or disposed.

☐ Work proceeding under an approved Form 27 (Rule 912.c).

Form 27 Remediation Project No: \_\_\_\_\_

☐ SUSPECTED Spill/Release did not occur or was below Rule 912.a.(5) reporting thresholds.

### OPERATOR COMMENTS:

Please see attached photo documentation for photographs of the failure point. The GPS coordinates were also updated in the "Spill/Release Point Location" section of this form.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: \_\_\_\_\_ Print Name: Jake Janicek

Title: EHS Specialist Date: 06/17/2022 Email: jjanicek@caerusoilandgas.com

### Condition of Approval

#### COA Type

#### Description

0 COA	

### Attachment List

<u>Att Doc Num</u>	<u>Name</u>
403082834	SPILL/RELEASE REPORT(SUPPLEMENTAL)
403082845	PHOTO DOCUMENTATION
403082848	TOPOGRAPHIC MAP
403089051	FORM 19 SUBMITTED

Total Attach: 4 Files

### General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Comply with outstanding COAs.	06/24/2022

Total: 1 comment(s)

**APPENDIX B**  
**COGCC FORM 27 SITE INVESTIGATION AND REMEDIATION WORKPLAN**

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# State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:

403140056

Receive Date:

09/06/2022

Report taken by:

Steven Arauza

## Site Investigation and Remediation Workplan (Initial Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by COGCC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27. This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

### OPERATOR INFORMATION

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	<b>Phone Numbers</b>
Address: 1001 17TH STREET #1600		
City: DENVER State: CO Zip: 80202		
Contact Person: Jake Janicek	Email: jjanicek@caerusoilandgas.com	
		Phone: (970) 778-2314
		Mobile: (970) 778-2314

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 25510 Initial Form 27 Document #: 403140056

#### PURPOSE INFORMATION

- ☐ Rule 913.c.(1): Pit or Cuttings Trench closure.
- ☐ Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- ☒ Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- ☐ Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- ☐ Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- ☐ Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- ☐ Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- ☐ Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- ☐ Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- ☐ Rule 913.g: Changes of Operator.
- ☐ Rule 915.b: Request to leave elevated inorganics in situ.
- ☐ Other: \_\_\_\_\_

#### SITE INFORMATION

No Multiple Facilities

Facility Type: LOCATION	Facility ID: 334688	API #: _____	County Name: GARFIELD
Facility Name: RULISON FEDERAL-67S94W 11NENE	Latitude: 39.458740	Longitude: -107.847640	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NENE	Sec: 11	Twp: 7S	Range: 94W Meridian: 6 Sensitive Area? Yes

#### SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use Rangeland/grazing

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? Yes

Is groundwater less than 20 feet below ground surface? No

## SITE INVESTIGATION PLAN

### TYPE OF WASTE:

- ☒ **E&P Waste**
☐ **Other E&P Waste**
☐ **Non-E&P Waste**
- ☒ Produced Water
 ☐ Workover Fluids
- ☐ Oil
 ☐ Tank Bottoms
- ☐ Condensate
 ☐ Pigging Waste
- ☐ Drilling Fluids
 ☐ Rig Wash
- ☐ Drill Cuttings
 ☐ Spent Filters
- ☐ Pit Bottoms
- ☐ Other (as described by EPA)

### DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	To be determined	Laboratory analysis

### INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

Caerus is providing this From 27 as an initial action notification for the release that originated from the dumphine failure on 6/9/2022. The release extent was attempted to be delineated through soil sampling which occurred on 6/10/2022 and 7/7/2022. Two background samples were collected on 6/10. A hydrovac was used to pothole locations north, south, east, and west at lateral intervals on 10 feet, and vertical intervals of 2 feet below ground surface (bgs) starting from the initial Point of Release (POR) of 5 feet bgs. Samples were collected at locations that were field screened using a PID and olfactory observations and deemed to be free of impacts. See attached initial field reports from 6/10 and 7/7 for details and sample locations. Additional background samples were collected at 5 offsite and undisturbed locations east of the RA11 facility at 1 foot bgs. Three additional offsite and undisturbed locations east and west of the RA11 were sampled through the aid of a hydrovac truck. Samples were to be collected in 2 foot intervals until a depth of 15 feet bgs is achieved (i.e. 3, 5, 7, 9, 11, 13, and 15 feet). However, due to the geology of the area, a depth of 15 feet was unachievable with the use of a hydrovac. The additional background samples were collected to gain a better understanding of the soil types encountered in the area. One produced water sample was collected from one tank on the RA11 facility and was analyzed for pH and arsenic. See the attached initial field report from 8/23/2022 for more details.

### PROPOSED SAMPLING PLAN

#### Proposed Soil Sampling

- ☐ Will soil samples be collected as part of this investigation? ( Number, type (grab/composite), analyses, and locations of samples ):

Currently, there are exceedances for Organic Compounds in Soils under the COGCC 915-1 Protection of Groundwater Soil Screening Level Concentrations. Caerus will be submitting data supporting a request to analyze against the COGCC 915-1 Resident Soil Screening Level Concentrations after the data from the most recent background samples are returned. If necessary, additional soil samples will be collected to further delineate the release extent.

#### Proposed Groundwater Sampling

- ☐ Will groundwater samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

Caerus does not anticipate encountering groundwater associated with the release. If groundwater is encountered, Caerus will notify the COGCC and attempt to collect a representative sample for analysis.

#### Proposed Surface Water Sampling

- ☐ Will surface water samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

### Additional Investigative Actions

- ☐ Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):



## SITE INVESTIGATION REPORT

### SAMPLE SUMMARY

#### Soil

Number of soil samples collected 11

Number of soil samples exceeding 915-1 11

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 0

#### NA / ND

-- Highest concentration of TPH (mg/kg) 684.6  
4

-- Highest concentration of SAR 21

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 0

#### Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet)

Number of groundwater monitoring wells installed

Number of groundwater samples exceeding 915-1

Highest concentration of Benzene (µg/l)

Highest concentration of Toluene (µg/l)

Highest concentration of Ethylbenzene (µg/l)

Highest concentration of Xylene (µg/l)

Highest concentration of Methane (mg/l)

#### Surface Water

0 Number of surface water samples collected

Number of surface water samples exceeding 915-1

If surface water is impacted, other agency notification may be required.

### OTHER INVESTIGATION INFORMATION

☐ Were impacts to adjacent property or offsite impacts identified?

☒ Were background samples collected as part of this site investigation?

15 background samples were collected ranging from 1-13 feet bgs north, south, east, and west of the facility.

☐ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards)

Volume of liquid waste (barrels)

☐ Is further site investigation required?

## REMEDIAL ACTION PLAN

### SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Once impacts are fully delineated, Caerus will provide the COGCC plans for source removal.

### REMEDIATION SUMMARY

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

Once impacts are fully delineated, Caerus will provide the COGCC with a remediation plan.

### Soil Remediation Summary

☐ In Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Air sparge / Soil vapor extraction  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

☐ Ex Situ

\_\_\_\_\_ Excavate and offsite disposal  
\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_  
\_\_\_\_\_ Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_  
\_\_\_\_\_ Excavate and onsite remediation  
\_\_\_\_\_ Land Treatment  
\_\_\_\_\_ Bioremediation (or enhanced bioremediation)  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Other \_\_\_\_\_

### **Groundwater Remediation Summary**

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Air sparge / Soil vapor extraction  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

### **GROUNDWATER MONITORING**

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

## REMEDIATION PROGRESS UPDATE

### PERIODIC REPORTING

**Approved Reporting Schedule:**

☐ Quarterly    ☐ Semi-Annually    ☐ Annually    ☐ Other

☐ **Request Alternative Reporting Schedule:**

☐ Semi-Annually    ☐ Annually    ☐ Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

**Report Type:**    ☐ Groundwater Monitoring    ☐ Land Treatment Progress Report    ☐ O&M Report  
☐ Other

### Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Operator anticipates the remaining cost for this project to be: \$

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation?

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards

E&P waste (solid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

E&P waste (liquid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

# RECLAMATION PLAN

## RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

Caerus plans to return the disturbed area to the active working surface of the well pad for continued operation.

Is the described reclamation complete? No

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim ☐ Final

Did the Surface Owner provide the seed mix? Yes

If YES, does the seed mix comply with local soil conservation district recommendations? Yes

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

## SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. \_\_\_\_\_

Proposed date of completion of Reclamation. \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. \_\_\_\_\_

Actual Spill or Release date, or date of discovery. 06/09/2022

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/10/2022

Proposed site investigation commencement. \_\_\_\_\_

Proposed completion of site investigation. \_\_\_\_\_

### REMEDIAL ACTION DATES

Proposed start date of Remediation. \_\_\_\_\_

Proposed date of completion of Remediation. \_\_\_\_\_

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

☐ Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

**OPERATOR COMMENT**

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Jordan Veith

Title: Environmental Scientist

Submit Date: 09/06/2022

Email: jveith@kleinfelder.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: Steven Arauza

Date: 10/17/2022

Remediation Project Number: 25510

**COA Type****Description**

	Submit Supplemental eForm 19 to request closure of Spill/Release ID #482310. Supplemental report shall comply with outstanding COAs, indicate that work is proceeding under an approved eForm 27 and shall reference the Remediation Project number assigned upon approval of this report.
	Provide a revised Implementation Schedule with proposed start and completion dates for Site Investigation and Remediation on the next Supplemental Form 27, per Rule 913.d
	Operator shall collect soil samples from areas most likely to be impacted and shall collect an appropriate number of representative soil samples to delineate the horizontal and vertical extents of contamination, per Rule 915.e.(2).B.
	Operator shall collect sample(s) from comparable, nearby non-impacted native soil for purposes of establishing background soil conditions including pH, electrical conductivity (EC) and sodium adsorption ratio (SAR), per Rule 915.e.(2).D.
	Per Rule 913.b.(2), the Operator will conduct sampling and analysis of soil, and groundwater--if encountered, to determine the horizontal and vertical extent of any contamination in excess of the cleanup concentrations in Table 915-1 for soil and groundwater. The Operator shall analyze samples for the complete Table 915-1 list and shall compare analytical results for site investigation samples to both the Table 915-1 Residential Soil Screening Level Concentrations and the Protection of Groundwater Soil Screening Level Concentrations. Submit an assessment of potential pathways to groundwater via a Supplemental Form 27.
	Operator will provide updates to the Adequacy of Operator's General Liability Insurance and Financial Assurance and a remaining cost estimate on the next Form 27 submitted for this project.
6 COAs	

**Attachment Check List**

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

**Att Doc Num****Name**

403140056	FORM 27-INITIAL-SUBMITTED
403149943	SITE INVESTIGATION REPORT
403149949	SITE INVESTIGATION REPORT
403150543	SITE INVESTIGATION REPORT
403156976	SITE INVESTIGATION REPORT

Total Attach: 5 Files

**General Comments**

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)

## APPENDIX C

### LABORATORY ANALYTICAL REPORTS

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## Caerus Oil and Gas

Sample Delivery Group: L1528876  
Samples Received: 08/24/2022  
Project Number:  
Description: RA11 Backgrounds  
Site: RA11  
Report To: Brett Middleton  
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 National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)



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<sup>4</sup> Cn
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<sup>7</sup> Gl
<sup>8</sup> Al
<sup>9</sup> Sc

# SAMPLE SUMMARY

## 20220823-RA11-BG03 @ 1FT L1528876-01 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 07:15

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 16:32	08/30/22 16:32	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1919060	1	09/02/22 03:13	09/02/22 11:44	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923611	1	09/09/22 16:10	09/13/22 13:30	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918588	1	08/30/22 15:45	08/31/22 13:48	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:04	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918592	5	08/30/22 15:46	08/31/22 01:26	SJM	Mt. Juliet, TN



## 20220823-RA11-BG04 @ 1FT L1528876-02 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 07:20

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 16:35	08/30/22 16:35	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1919060	1	09/02/22 03:13	09/02/22 12:10	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923611	1	09/09/22 16:10	09/13/22 13:30	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1916971	1	08/28/22 09:28	08/29/22 13:45	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:07	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1916975	5	08/28/22 09:31	08/29/22 11:06	SJM	Mt. Juliet, TN

## 20220823-RA11-BG05 @ 1FT L1528876-03 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 11:00

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 16:38	08/30/22 16:38	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1919060	1	09/02/22 03:13	09/02/22 12:20	ARD	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1916940	1	08/29/22 16:28	08/30/22 17:55	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:10	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1916966	5	08/29/22 16:57	08/29/22 22:59	LD	Mt. Juliet, TN

## 20220823-RA11-BG06 @ 1FT L1528876-04 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 11:10

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 16:41	08/30/22 16:41	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 10:47	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918588	1	08/30/22 15:45	08/31/22 13:51	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:13	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918592	5	08/30/22 15:46	08/31/22 01:30	SJM	Mt. Juliet, TN

## 20220823-RA11-BG07 @ 1FT L1528876-05 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 11:20

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 16:44	08/30/22 16:44	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 10:52	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN

# SAMPLE SUMMARY

20220823-RA11-BG07 @ 1FT L1528876-05 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 11:20

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1918588	1	08/30/22 15:45	08/31/22 13:54	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:15	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918592	5	08/30/22 15:46	08/31/22 01:33	SJM	Mt. Juliet, TN



20220823-RA11-BG08 @ 3FT L1528876-06 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 07:45

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:21	08/30/22 17:21	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:03	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1917505	1	08/31/22 09:00	08/31/22 11:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918588	1	08/30/22 15:45	08/31/22 14:02	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:18	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918592	5	08/30/22 15:46	08/31/22 01:43	SJM	Mt. Juliet, TN

20220823-RA11-BG08 @ 5FT L1528876-07 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 07:55

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:24	08/30/22 17:24	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:08	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1919627	1	09/01/22 11:00	09/01/22 13:00	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:03	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:21	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 01:53	JPD	Mt. Juliet, TN

20220823-RA11-BG09 @ 3FT L1528876-08 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 08:20

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:27	08/30/22 17:27	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:13	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1919627	1	09/01/22 11:00	09/01/22 13:00	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:05	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:29	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 01:57	JPD	Mt. Juliet, TN

20220823-RA11-BG10 @ 5FT L1528876-09 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 08:50

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:29	08/30/22 17:29	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:18	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1916686	1	08/30/22 11:00	08/30/22 13:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:08	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:32	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 02:11	JPD	Mt. Juliet, TN

# SAMPLE SUMMARY

## 20220823-RA11-BG10 @ 7FT L1528876-10 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 09:20

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:38	08/30/22 17:38	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:24	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1919627	1	09/01/22 11:00	09/01/22 13:00	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:16	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:35	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 02:14	JPD	Mt. Juliet, TN



## 20220823-RA11-BG10 @ 9FT L1528876-11 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 09:50

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:07	08/30/22 17:07	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:39	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1919627	1	09/01/22 11:00	09/01/22 13:00	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:18	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:37	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 02:17	JPD	Mt. Juliet, TN

## 20220823-RA11-BG10 @ 11FT L1528876-12 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 10:15

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:09	08/30/22 17:09	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1916686	1	08/30/22 11:00	08/30/22 13:00	SGB	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:21	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:40	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 02:21	JPD	Mt. Juliet, TN

## 20220823-RA11-BG10 @ 13FT L1528876-13 Solid

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 10:45

Received date/time  
08/24/22 08:45

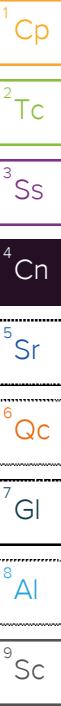
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1916909	1	08/30/22 17:12	08/30/22 17:12	ZSA	Mt. Juliet, TN
Wet Chemistry by Method 7199	WG1920916	1	09/07/22 19:43	09/14/22 11:49	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9045D	WG1919627	1	09/01/22 11:00	09/01/22 13:00	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9050AMod	WG1923754	1	09/10/22 15:00	09/13/22 12:40	NTG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1918717	1	08/30/22 15:44	08/31/22 13:24	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B-NE493 Ch 2	WG1917805	1	08/28/22 17:20	08/30/22 12:43	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1918718	5	08/30/22 15:45	08/31/22 02:24	JPD	Mt. Juliet, TN

# 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	0.467		1	08/30/2022 16:32	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/02/2022 11:44	<a href="#">WG1919060</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.32	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-01 WG1917505: 9.32 at 20.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	251		10.0	1	09/13/2022 13:30	<a href="#">WG1923611</a>

## Sample Narrative:

L1528876-01 WG1923611: at 25C

## Metals (ICP) by Method 6010B

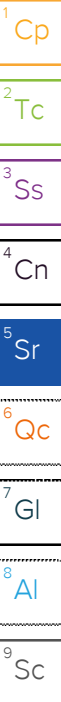
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	330		0.500	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Cadmium	0.783		0.500	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Copper	18.4		2.00	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Lead	13.0		0.500	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Nickel	26.3		2.00	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Selenium	ND		2.00	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Silver	ND		1.00	1	08/31/2022 13:48	<a href="#">WG1918588</a>
Zinc	81.3		5.00	1	08/31/2022 13:48	<a href="#">WG1918588</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:04	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.12		1.00	5	08/31/2022 01:26	<a href="#">WG1918592</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.810		1	08/30/2022 16:35	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/02/2022 12:10	<a href="#">WG1919060</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.88	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-02 WG1917505: 9.88 at 20.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	354		10.0	1	09/13/2022 13:30	<a href="#">WG1923611</a>

## Sample Narrative:

L1528876-02 WG1923611: at 25C

## Metals (ICP) by Method 6010B

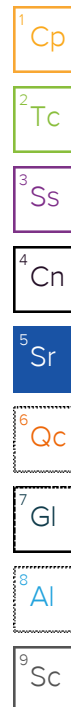
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	734		0.500	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Cadmium	ND		0.500	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Copper	13.3		2.00	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Lead	7.73		0.500	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Nickel	29.4		2.00	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Selenium	ND		2.00	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Silver	ND		1.00	1	08/29/2022 13:45	<a href="#">WG1916971</a>
Zinc	82.5		5.00	1	08/29/2022 13:45	<a href="#">WG1916971</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.204		0.200	1	08/30/2022 12:07	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	2.87		1.00	5	08/29/2022 11:06	<a href="#">WG1916975</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.994		1	08/30/2022 16:38	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/02/2022 12:20	<a href="#">WG1919060</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	10.2	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-03 WG1917505: 10.16 at 20.3C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	450		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-03 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	46.9		0.500	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Cadmium	0.565		0.500	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Copper	26.7		2.00	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Lead	12.8		0.500	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Nickel	9.45		2.00	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Selenium	ND		2.00	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Silver	ND		1.00	1	08/30/2022 17:55	<a href="#">WG1916940</a>
Zinc	36.4		5.00	1	08/30/2022 17:55	<a href="#">WG1916940</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.288		0.200	1	08/30/2022 12:10	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	2.85		1.00	5	08/29/2022 22:59	<a href="#">WG1916966</a>

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	0.0221		1	08/30/2022 16:41	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Hexavalent Chromium	1.14		1.00	1	09/14/2022 10:47	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result pH	Qualifier	Dilution	Analysis date / time	Batch
pH	6.48	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-04 WG1917505: 6.48 at 20.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result umhos/cm	Qualifier	RDL umhos/cm	Dilution	Analysis date / time	Batch
Specific Conductance	2210		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-04 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Barium	159		0.500	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Cadmium	1.51		0.500	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Copper	25.0		2.00	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Lead	37.8		0.500	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Nickel	42.2		2.00	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Selenium	ND		2.00	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Silver	ND		1.00	1	08/31/2022 13:51	<a href="#">WG1918588</a>
Zinc	148		5.00	1	08/31/2022 13:51	<a href="#">WG1918588</a>

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:13	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Arsenic	75.9		1.00	5	08/31/2022 01:30	<a href="#">WG1918592</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.649		1	08/30/2022 16:44	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 10:52	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.82	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-05 WG1917505: 9.82 at 20C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	276		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-05 WG1923754: at 25C

## Metals (ICP) by Method 6010B

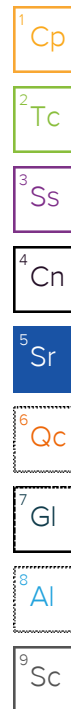
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	893		0.500	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Cadmium	1.26		0.500	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Copper	13.0		2.00	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Lead	16.5		0.500	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Nickel	19.7		2.00	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Selenium	ND		2.00	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Silver	ND		1.00	1	08/31/2022 13:54	<a href="#">WG1918588</a>
Zinc	52.7		5.00	1	08/31/2022 13:54	<a href="#">WG1918588</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:15	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	5.38		1.00	5	08/31/2022 01:33	<a href="#">WG1918592</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	0.175		1	08/30/2022 17:21	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:03	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.13	<a href="#">T8</a>	1	08/31/2022 11:00	<a href="#">WG1917505</a>

## Sample Narrative:

L1528876-06 WG1917505: 8.13 at 20C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	73.1		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-06 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	86.9		0.500	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Cadmium	ND		0.500	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Copper	11.2		2.00	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Lead	8.06		0.500	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Nickel	16.4		2.00	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Selenium	ND		2.00	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Silver	ND		1.00	1	08/31/2022 14:02	<a href="#">WG1918588</a>
Zinc	45.0		5.00	1	08/31/2022 14:02	<a href="#">WG1918588</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:18	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	4.29		1.00	5	08/31/2022 01:43	<a href="#">WG1918592</a>

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	0.275		1	08/30/2022 17:24	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:08	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.42	<a href="#">T8</a>	1	09/01/2022 13:00	<a href="#">WG1919627</a>

## Sample Narrative:

L1528876-07 WG1919627: 8.42 at 20C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	176		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-07 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	62.2		0.500	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Copper	7.36		2.00	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Lead	6.75		0.500	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Nickel	12.8		2.00	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:03	<a href="#">WG1918717</a>
Zinc	36.2		5.00	1	08/31/2022 13:03	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:21	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.88		1.00	5	08/31/2022 01:53	<a href="#">WG1918718</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	6.24		1	08/30/2022 17:27	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:13	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	8.62	<a href="#">T8</a>	1	09/01/2022 13:00	<a href="#">WG1919627</a>

## Sample Narrative:

L1528876-08 WG1919627: 8.62 at 19.8C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	706		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-08 WG1923754: at 25C

## Metals (ICP) by Method 6010B

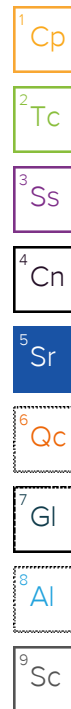
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	169		0.500	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Copper	16.4		2.00	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Lead	9.58		0.500	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Nickel	13.8		2.00	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:05	<a href="#">WG1918717</a>
Zinc	52.8		5.00	1	08/31/2022 13:05	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.211		0.200	1	08/30/2022 12:29	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.53		1.00	5	08/31/2022 01:57	<a href="#">WG1918718</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	14.4		1	08/30/2022 17:29	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:18	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.38	<a href="#">T8</a>	1	08/30/2022 13:00	<a href="#">WG1916686</a>

## Sample Narrative:

L1528876-09 WG1916686: 9.38 at 22C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1070		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-09 WG1923754: at 25C

## Metals (ICP) by Method 6010B

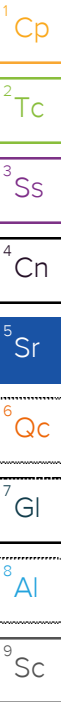
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	231		0.500	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Copper	11.9		2.00	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Lead	8.96		0.500	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Nickel	20.1		2.00	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:08	<a href="#">WG1918717</a>
Zinc	75.7		5.00	1	08/31/2022 13:08	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:32	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.06		1.00	5	08/31/2022 02:11	<a href="#">WG1918718</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	16.8		1	08/30/2022 17:38	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:24	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.35	<a href="#">T8</a>	1	09/01/2022 13:00	<a href="#">WG1919627</a>

## Sample Narrative:

L1528876-10 WG1919627: 9.35 at 19.8C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	1120		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-10 WG1923754: at 25C

## Metals (ICP) by Method 6010B

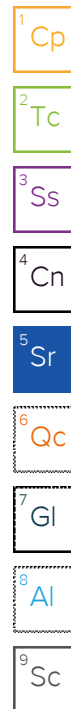
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	88.7		0.500	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Copper	12.3		2.00	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Lead	9.92		0.500	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Nickel	18.3		2.00	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:16	<a href="#">WG1918717</a>
Zinc	68.0		5.00	1	08/31/2022 13:16	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.267		0.200	1	08/30/2022 12:35	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.17		1.00	5	08/31/2022 02:14	<a href="#">WG1918718</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	15.6		1	08/30/2022 17:07	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:39	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.48	<a href="#">T8</a>	1	09/01/2022 13:00	<a href="#">WG1919627</a>

## Sample Narrative:

L1528876-11 WG1919627: 9.48 at 19.8C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	930		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-11 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	69.3		0.500	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Copper	12.1		2.00	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Lead	15.5		0.500	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Nickel	12.4		2.00	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:18	<a href="#">WG1918717</a>
Zinc	42.4		5.00	1	08/31/2022 13:18	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	ND		0.200	1	08/30/2022 12:37	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.91		1.00	5	08/31/2022 02:17	<a href="#">WG1918718</a>

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	16.0		1	08/30/2022 17:09	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:44	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.50	<a href="#">T8</a>	1	08/30/2022 13:00	<a href="#">WG1916686</a>

## Sample Narrative:

L1528876-12 WG1916686: 9.5 at 22.1C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	812		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-12 WG1923754: at 25C

## Metals (ICP) by Method 6010B

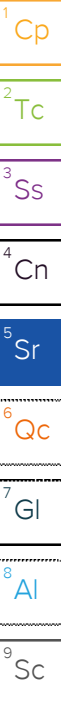
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	80.5		0.500	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Copper	8.59		2.00	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Lead	8.25		0.500	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Nickel	16.3		2.00	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:21	<a href="#">WG1918717</a>
Zinc	55.8		5.00	1	08/31/2022 13:21	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.260		0.200	1	08/30/2022 12:40	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	3.53		1.00	5	08/31/2022 02:21	<a href="#">WG1918718</a>



## Calculated Results

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Sodium Adsorption Ratio	11.5		1	08/30/2022 17:12	WG1916909

## Wet Chemistry by Method 7199

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hexavalent Chromium	ND		1.00	1	09/14/2022 11:49	<a href="#">WG1920916</a>

## Wet Chemistry by Method 9045D

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	9.68	<a href="#">T8</a>	1	09/01/2022 13:00	<a href="#">WG1919627</a>

## Sample Narrative:

L1528876-13 WG1919627: 9.68 at 20.2C

## Wet Chemistry by Method 9050AMod

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Specific Conductance	785		10.0	1	09/13/2022 12:40	<a href="#">WG1923754</a>

## Sample Narrative:

L1528876-13 WG1923754: at 25C

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Barium	200		0.500	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Cadmium	ND		0.500	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Copper	9.43		2.00	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Lead	8.10		0.500	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Nickel	21.9		2.00	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Selenium	ND		2.00	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Silver	ND		1.00	1	08/31/2022 13:24	<a href="#">WG1918717</a>
Zinc	66.8		5.00	1	08/31/2022 13:24	<a href="#">WG1918717</a>

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hot Water Sol. Boron	0.223		0.200	1	08/30/2022 12:43	<a href="#">WG1917805</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Arsenic	2.79		1.00	5	08/31/2022 02:24	<a href="#">WG1918718</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3838211-1 09/14/22 10:35

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

L1528876-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1528876-05 09/14/22 10:52 • (DUP) R3838211-3 09/14/22 10:58

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/kg	mg/kg		%		%
Hexavalent Chromium	ND	ND	1	3.79		20

L1529292-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1529292-06 09/14/22 13:14 • (DUP) R3838211-8 09/14/22 13:19

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

Laboratory Control Sample (LCS)

(LCS) R3838211-2 09/14/22 10:42

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/kg	mg/kg	%	%	
Hexavalent Chromium	10.0	10.6	106	80.0-120	

L1529292-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1529292-01 09/14/22 12:15 • (MS) R3838211-4 09/14/22 12:21 • (MSD) R3838211-5 09/14/22 12:26

	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	ND	21.1	21.8	105	109	1	75.0-125			3.13	20

L1529292-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1529292-01 09/14/22 12:15 • (MS) R3838211-7 09/14/22 12:47

	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/kg	mg/kg	mg/kg	%		%	
Hexavalent Chromium	641	ND	762	119	50	75.0-125	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1528639-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1528639-03 08/30/22 13:00 • (DUP) R3831897-2 08/30/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	7.88	7.87	1	0.127		1

Sample Narrative:

OS: 7.88 at 22.3C

DUP: 7.87 at 22.3C



L1528793-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1528793-02 08/30/22 13:00 • (DUP) R3831897-3 08/30/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.02	7.99	1	0.375		1

Sample Narrative:

OS: 8.02 at 22C

DUP: 7.99 at 21.9C

Laboratory Control Sample (LCS)

(LCS) R3831897-1 08/30/22 13:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.90	99.0	99.0-101	

Sample Narrative:

LCS: 9.9 at 22.2C

L1528744-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1528744-02 08/31/22 11:00 • (DUP) R3832371-2 08/31/22 11:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	8.84	8.83	1	0.113		1

Sample Narrative:

OS: 8.84 at 20.7C

DUP: 8.83 at 20.8C

L1528876-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1528876-03 08/31/22 11:00 • (DUP) R3832371-3 08/31/22 11:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	10.2	10.1	1	0.394		1

Sample Narrative:

OS: 10.16 at 20.3C

DUP: 10.12 at 20.2C

Laboratory Control Sample (LCS)

(LCS) R3832371-1 08/31/22 11:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.92	99.2	99.0-101	

Sample Narrative:

LCS: 9.92 at 20.7C



L1528730-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1528730-01 09/01/22 13:00 • (DUP) R3832944-2 09/01/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.74	7.73	1	0.129		1

Sample Narrative:

OS: 7.74 at 20.2C

DUP: 7.73 at 19.9C

L1528876-13 Original Sample (OS) • Duplicate (DUP)

(OS) L1528876-13 09/01/22 13:00 • (DUP) R3832944-3 09/01/22 13:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	pH	su		%		%
pH	9.68	9.68	1	0.000		1

Sample Narrative:

OS: 9.68 at 20.2C

DUP: 9.68 at 20.3C

Laboratory Control Sample (LCS)

(LCS) R3832944-1 09/01/22 13:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.90	99.0	99.0-101	

Sample Narrative:

LCS: 9.9 at 19.3C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3836553-1 09/13/22 13:30

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

L1528633-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1528633-01 09/13/22 13:30 • (DUP) R3836553-3 09/13/22 13:30

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	162	163	1	0.123		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1528794-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1528794-02 09/13/22 13:30 • (DUP) R3836553-4 09/13/22 13:30

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	283	286	1	1.16		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3836553-2 09/13/22 13:30

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1110	99.2	85.0-115	

Sample Narrative:

LCS: at 25C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3836523-1 09/13/22 12:40

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

L1528876-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1528876-07 09/13/22 12:40 • (DUP) R3836523-3 09/13/22 12:40

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	176	173	1	1.55		20

Sample Narrative:

OS: at 25C

DUP: at 25C

L1529291-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1529291-04 09/13/22 12:40 • (DUP) R3836523-4 09/13/22 12:40

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	237	237	1	0.0421		20

Sample Narrative:

OS: at 25C

DUP: at 25C

Laboratory Control Sample (LCS)

(LCS) R3836523-2 09/13/22 12:40

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	1120	1120	99.6	85.0-115	

Sample Narrative:

LCS: at 25C

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

Method Blank (MB)

(MB) R3832136-1 08/30/22 16:09

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
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

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3832136-2 08/30/22 16:12

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	95.6	95.6	80.0-120	
Cadmium	100	92.0	92.0	80.0-120	
Copper	100	93.9	93.9	80.0-120	
Lead	100	91.7	91.7	80.0-120	
Nickel	100	92.5	92.5	80.0-120	
Selenium	100	93.8	93.8	80.0-120	
Silver	20.0	17.4	87.1	80.0-120	
Zinc	100	90.8	90.8	80.0-120	

L1528692-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528692-03 08/30/22 16:15 • (MS) R3832136-5 08/30/22 16:24 • (MSD) R3832136-6 08/30/22 16:27

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 %
Barium	99.7	180	237	231	57.2	51.7	1	75.0-125	J6	J6	2.34	20
Cadmium	99.7	ND	92.6	87.2	92.4	87.0	1	75.0-125			5.91	20
Copper	99.7	42.6	138	133	95.3	90.2	1	75.0-125			3.77	20
Lead	99.7	11.6	108	105	96.8	92.9	1	75.0-125			3.68	20
Nickel	99.7	9.41	109	103	99.2	93.5	1	75.0-125			5.39	20
Selenium	99.7	ND	86.3	79.3	86.3	79.3	1	75.0-125			8.53	20
Silver	20.0	ND	17.4	16.3	87.0	81.6	1	75.0-125			6.46	20
Zinc	99.7	34.3	118	112	84.1	78.1	1	75.0-125			5.25	20

Method Blank (MB)

(MB) R3831610-1 08/29/22 12:28

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
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

1  
Cp

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Tc

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Ss

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Cn

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Sr

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Qc

Laboratory Control Sample (LCS)

(LCS) R3831610-2 08/29/22 12:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	92.5	92.5	80.0-120	
Cadmium	100	88.9	88.9	80.0-120	
Copper	100	90.6	90.6	80.0-120	
Lead	100	87.7	87.7	80.0-120	
Nickel	100	91.4	91.4	80.0-120	
Selenium	100	89.6	89.6	80.0-120	
Silver	20.0	16.3	81.3	80.0-120	
Zinc	100	89.9	89.9	80.0-120	

7  
Gl

8  
Al

9  
Sc

L1528508-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528508-01 08/29/22 12:33 • (MS) R3831610-5 08/29/22 12:41 • (MSD) R3831610-6 08/29/22 12:43

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 %
Barium	100	180	238	235	58.3	55.1	1	75.0-125	J6	J6	1.32	20
Cadmium	100	ND	94.1	88.4	93.7	88.0	1	75.0-125			6.19	20
Copper	100	16.3	109	104	93.2	87.6	1	75.0-125			5.24	20
Lead	100	18.2	108	101	89.9	83.3	1	75.0-125			6.27	20
Nickel	100	22.2	115	108	93.2	85.4	1	75.0-125			7.03	20
Selenium	100	ND	95.6	90.0	94.7	89.1	1	75.0-125			6.09	20
Silver	20.0	ND	17.3	16.4	86.5	81.8	1	75.0-125			5.60	20
Zinc	100	81.1	157	147	76.2	65.8	1	75.0-125		J6	6.86	20

Method Blank (MB)

(MB) R3832626-1 08/31/22 13:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
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

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS)

(LCS) R3832626-2 08/31/22 13:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	102	102	80.0-120	
Cadmium	100	98.5	98.5	80.0-120	
Copper	100	99.4	99.4	80.0-120	
Lead	100	98.1	98.1	80.0-120	
Nickel	100	98.4	98.4	80.0-120	
Selenium	100	98.8	98.8	80.0-120	
Silver	20.0	18.5	92.5	80.0-120	
Zinc	100	97.1	97.1	80.0-120	

L1529737-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1529737-04 08/31/22 13:34 • (MS) R3832626-5 08/31/22 13:43 • (MSD) R3832626-6 08/31/22 13:45

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 %
Barium	100	125	232	214	106	88.2	1	75.0-125			8.06	20
Cadmium	100	ND	90.9	92.0	90.6	91.7	1	75.0-125			1.20	20
Copper	100	10.6	105	104	94.2	93.3	1	75.0-125			0.874	20
Lead	100	13.2	105	104	91.9	91.0	1	75.0-125			0.843	20
Nickel	100	13.9	107	108	93.0	93.7	1	75.0-125			0.696	20
Selenium	100	ND	90.9	92.2	90.9	92.2	1	75.0-125			1.46	20
Silver	20.0	ND	17.1	17.4	85.7	86.9	1	75.0-125			1.42	20
Zinc	100	54.5	135	133	80.6	78.7	1	75.0-125			1.36	20

Method Blank (MB)

(MB) R3832641-1 08/31/22 12:40

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Barium	U		0.0852	0.500
Cadmium	U		0.0471	0.500
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

1  
Cp

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Tc

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Ss

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Cn

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Sr

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Qc

Laboratory Control Sample (LCS)

(LCS) R3832641-2 08/31/22 12:47

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	100	97.3	97.3	80.0-120	
Cadmium	100	93.4	93.4	80.0-120	
Copper	100	95.1	95.1	80.0-120	
Lead	100	94.0	94.0	80.0-120	
Nickel	100	96.4	96.4	80.0-120	
Selenium	100	92.9	92.9	80.0-120	
Silver	20.0	18.3	91.6	80.0-120	
Zinc	100	93.0	93.0	80.0-120	

7  
Gl

8  
Al

9  
Sc

L1529292-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1529292-04 08/31/22 12:50 • (MS) R3832641-5 08/31/22 12:57 • (MSD) R3832641-6 08/31/22 13:00

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 %
Barium	100	185	289	283	104	97.6	1	75.0-125			2.16	20
Cadmium	100	ND	94.0	96.3	93.8	96.1	1	75.0-125			2.44	20
Copper	100	9.98	107	109	97.2	98.9	1	75.0-125			1.57	20
Lead	100	9.28	103	105	93.6	95.4	1	75.0-125			1.73	20
Nickel	100	15.1	112	114	97.1	99.3	1	75.0-125			1.98	20
Selenium	100	ND	91.1	94.1	91.1	94.1	1	75.0-125			3.17	20
Silver	20.0	ND	18.4	18.8	91.9	93.9	1	75.0-125			2.23	20
Zinc	100	37.8	124	126	85.7	88.1	1	75.0-125			1.90	20

Method Blank (MB)

(MB) R3831952-1 08/30/22 11:56

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) R3831952-2 08/30/22 11:59 • (LCSD) R3831952-3 08/30/22 12:01

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	0.962	0.963	96.2	96.3	80.0-120			0.0894	20

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3831693-1 08/29/22 21:22

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3831693-2 08/29/22 21:25

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	85.7	85.7	80.0-120	

L1528692-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528692-03 08/29/22 21:29 • (MS) R3831693-5 08/29/22 21:39 • (MSD) R3831693-6 08/29/22 21:42

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	99.7	1.11	77.8	71.5	76.7	70.4	5	75.0-125		J6	8.39	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3831367-1 08/29/22 09:19

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3831367-2 08/29/22 09:23

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	88.9	88.9	80.0-120	

L1528508-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528508-01 08/29/22 09:26 • (MS) R3831367-5 08/29/22 09:36 • (MSD) R3831367-6 08/29/22 09:39

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	6.87	93.0	88.9	86.1	82.0	5	75.0-125			4.51	20

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Cp

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Tc

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Ss

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Cn

5

Sr

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Qc

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Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3832320-1 08/31/22 01:03

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3832320-2 08/31/22 01:07

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	92.0	92.0	80.0-120	

L1529737-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1529737-04 08/31/22 01:10 • (MS) R3832320-5 08/31/22 01:20 • (MSD) R3832320-6 08/31/22 01:23

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 %
Arsenic	100	5.05	85.9	87.1	80.9	82.0	5	75.0-125			1.32	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3832322-1 08/31/22 01:31

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.100	1.00

Laboratory Control Sample (LCS)

(LCS) R3832322-2 08/31/22 01:34

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	100	91.8	91.8	80.0-120	

L1529292-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1529292-04 08/31/22 01:37 • (MS) R3832322-4 08/31/22 01:47 • (MSD) R3832322-5 08/31/22 01:50

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 %
Arsenic	100	4.26	87.4	89.9	83.2	85.7	5	75.0-125			2.85	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

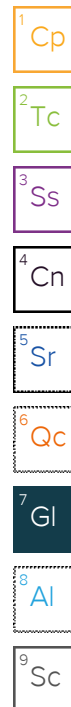
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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.
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.
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
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.



# ACCREDITATIONS & LOCATIONS

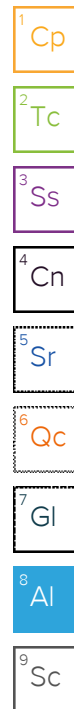
## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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 <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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.



Caerus Oil and Gas  
143 Diamond Avenue  
Parachute, CO 81635

Billing Information:  
SAME AS LEFT

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page \_\_\_\_ of \_\_\_\_



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

SDG # **4528876**  
**B097**

Acctnum:  
Template:  
Prelogin:  
PM:  
PB:  
Shipped Via:

Report to: Jake Janicek  
Email To: [jjanicek@caerusoilandgas.com](mailto:jjanicek@caerusoilandgas.com)

Project Description: **RAII Backgrounds**  
City/State Collected: **Piceance Crk, CO** Please Circle: PT **MT** CT ET

Phone: (970) 778-2314  
Client Project #  
Lab Project #

Collected by (print): **Tristan Schmalz**  
Site/Facility ID # **RAII**  
P.O. #

Collected by (signature): *Tristan Schmalz*  
Quote #

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  
Date Results Needed  
**Standard TAT**  
No. of Cntrs

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	Cntrs
20220823-RAII-BG03@ 1ft	Grab	SS	1 ft	8/23/22	7:15	2
20220823-RAII-BG04@ 1ft			1 ft		7:20	2
20220823-RAII-BG05@ 1ft			1 ft		11:00	2
20220823-RAII-BG06@ 1ft			1 ft		11:10	2
20220823-RAII-BG07@ 1ft			1 ft		11:20	2
20220823-RAII-BG08@ 3ft			3 ft		7:45	2
20220823-RAII-BG08@ 5ft			5 ft		7:55	2
20220823-RAII-BG09@ 3ft			3 ft		8:20	2
20220823-RAII-BG10@ 5ft			5 ft		8:50	2
20220823-RAII-BG10@ 7ft			7 ft		9:20	2

COGCC Table 915-1 MENUS ORGANICS

EC, pH, SAR

Arsenic, Boron

COGCC Table 910-1

Remarks Sample # (lab only)

-01  
-02  
-03  
-04  
-05  
-06  
-07  
-08  
-09  
-10

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

Remarks:

Samples returned via:  
\_\_\_\_ UPS \_\_\_\_ FedEx \_\_\_\_ Courier

Tracking #

pH \_\_\_\_ Temp \_\_\_\_  
Flow \_\_\_\_ Other \_\_\_\_

Sample Receipt Checklist

COC Seal Present/Intact: ☒ NP ☒ 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)

*Tristan Schmalz*

Date:

8/23/2022

Time:

12:30

Received by: (Signature)

*[Signature]*

Trip Blank Received: Yes ☒ No ☒

HCL / MeOH  
TBR

Relinquished by: (Signature)

*[Signature]*

Date:

8/23/22

Time:

1300

Received by: (Signature)

*[Signature]*

Temp: °C Bottles Received:

15/10 = 1.5

If preservation required by Login: Date/Time

Relinquished by: (Signature)

*[Signature]*

Date:

8/24/22

Time:

845

Received for lab by: (Signature)

*[Signature]*

Date: Time:

8/24/22 845

Hold:

Condition:  
NCF / OK



Caerus Oil and Gas  
143 Diamond Avenue  
Parachute, CO 81635

Billing Information:  
SAME AS LEFT

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page \_\_\_\_ of \_\_\_\_



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



Report to:  
Jake Janicek

Email To:  
jjanicek@caerusoilandgas.com

Project Description:  
RAII Backgrounds

City/State  
Collected: Piceance Crk, CO

Please Circle:  
PT MT CT ET

Phone: (970) 778-2314

Client Project #

Lab Project #

Collected by (print):  
Tristan Schmalz

Site/Facility ID #  
RAII

P.O. #

Collected by (signature):  
*Tristan Schmalz*

Quote #

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

Date Results Needed  
Standard TAT

No.  
of  
Cntrs

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs
20220823-RAII-BG10@9ft	Grab	SS	9ft	8/23/22	9:50	2
20220823-RAII-BG10@11ft	Grab	SS	11ft	8/23/22	10:15	2
20220823-RAII-BG10@13ft	Grab	SS	13ft	8/23/22	10:45	2
<i>Tristan Schmalz</i> 8/23/2022						

Analysis / Container / Preservative
COGCC Table 915-1 MINUS ORGANICS
EC, pH, SAR
Arsenic, Boron
COGCC Table 910-1

SDG # L528876

Table #

Acctnum:

Template:

Prelogin:

PM:

PB:

Shipped Via:

Remarks	Sample # (lab only)
	-11
	-12
	-13

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

Remarks:  
pH \_\_\_\_ Temp \_\_\_\_  
Flow \_\_\_\_ Other \_\_\_\_  
Samples returned via:  
\_\_\_\_ UPS \_\_\_\_ FedEx \_\_\_\_ Courier \_\_\_\_  
Tracking #

Sample Receipt Checklist  
COC Seal Present/Intact: ☒ NP ☒ N  
COC Signed/Accurate: ☒ N  
Bottles arrive intact: ☒ N  
Correct bottles used: ☒ N  
Sufficient volume sent: ☒ N  
If Applicable  
VOA Zero Headspace: ☒ Y ☒ N  
Preservation Correct/Checked: ☒ Y ☒ N  
RAD Screen <0.5 mR/hr: ☒ Y ☒ N

Relinquished by: (Signature) <i>Tristan Schmalz</i>	Date: 8/23/2022	Time: 12:30	Received by: (Signature) <i>[Signature]</i>	Trip Blank Received: Yes / No HCL / MeOH TBR
Relinquished by: (Signature) <i>[Signature]</i>	Date: 8/23/22	Time: 1500	Received by: (Signature) <i>[Signature]</i>	Temp: °C Bottles Received: 1.5 + 1.0 = 1.5
Relinquished by: (Signature) <i>[Signature]</i>	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 8/24/22

Hold: Condition:  
NCF / OK

## Caerus Oil and Gas

Sample Delivery Group: L1528950  
Samples Received: 08/24/2022  
Project Number:  
Description: RA11 Flowline Investigation  
Site: RA11  
Report To: Brett Middleton  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



Chris Ward  
Project Manager

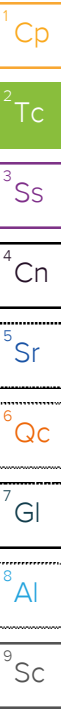
Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory 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 National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)

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# SAMPLE SUMMARY

20220823-RA11-PW01 L1528950-01 WW

Collected by  
Tristan Schmalz

Collected date/time  
08/23/22 08:45

Received date/time  
08/24/22 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 4500H+ B-2011	WG1919598	1	09/01/22 15:00	09/01/22 15:00	SGB	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1918395	5	08/30/22 08:32	08/31/22 03:35	JPD	Mt. Juliet, TN

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

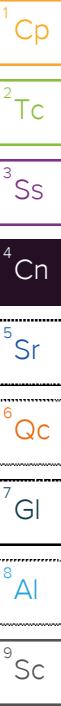
<sup>9</sup>Sc

# 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



Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.24	T8	1	09/01/2022 15:00	WG1919598

Sample Narrative:

L1528950-01 WG1919598: 7.24 at 19.8C

Metals (ICPMS) by Method 200.8

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Arsenic	0.00223	J	0.000975	0.00500	5	08/31/2022 03:35	WG1918395

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1528760-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1528760-01 09/01/22 15:00 • (DUP) R3833008-2 09/01/22 15:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.77	7.79	1	0.257		1

Sample Narrative:

OS: 7.77 at 19.9C

DUP: 7.79 at 19.8C

L1528780-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1528780-02 09/01/22 15:00 • (DUP) R3833008-3 09/01/22 15:00

	Original Result	DUP Result	Dilution	DUP RPD	<u>DUP Qualifier</u>	DUP RPD Limits
Analyte	su	su		%		%
pH	7.61	7.59	1	0.263		1

Sample Narrative:

OS: 7.61 at 19.7C

DUP: 7.59 at 19.7C

Laboratory Control Sample (LCS)

(LCS) R3833008-1 09/01/22 15:00

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	su	su	%	%	
pH	10.0	9.91	99.1	99.0-101	

Sample Narrative:

LCS: 9.91 at 19.7C





Method Blank (MB)

(MB) R3832318-1 08/31/22 00:11

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Arsenic	U		0.000195	0.00100

Laboratory Control Sample (LCS)

(LCS) R3832318-2 08/31/22 00:14

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Arsenic	0.0500	0.0483	96.5	85.0-115	

L1528501-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528501-01 08/31/22 00:17 • (MS) R3832318-4 08/31/22 00:24 • (MSD) R3832318-5 08/31/22 00:27

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	0.0500	0.000293	0.0505	0.0480	100	95.5	1	70.0-130			5.09	20

L1528836-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1528836-01 08/31/22 00:30 • (MS) R3832318-6 08/31/22 00:34 • (MSD) R3832318-7 08/31/22 00:37

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	0.0500	0.00266	0.0509	0.0509	96.5	96.4	1	70.0-130			0.148	20

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.
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

J	The identification of the analyte is acceptable; the reported value is an estimate.
T8	Sample(s) received past/too close to holding time expiration.

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

# 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 <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	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 <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	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 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA--Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> 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.



Caerus Oil and Gas  
143 Diamond Avenue  
Parachute, CO 81635

Billing Information:  
SAME AS LEFT

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page \_\_\_\_ of \_\_\_\_



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



SDG # U528950  
**B095**

Acctnum:

Template:

Prelogin:

PM:

PB:

Shipped Via:

Remarks

Sample # (lab only)

Report to:  
Jake Janicek

Email To:  
jjanicek@caerusoilandgas.com

Project Description:

RAII Flowline Investigation

City/State  
Collected: Piceance Crk, CO

Please Circle:  
PT TMT CT ET

Phone: (970) 778-2314

Client Project #

Lab Project #

Collected by (print):

Tristan Schmalz

Site/Facility ID #

RAII

P.O. #

Collected by (signature):

Tristan Schmalz  
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

Standard TAT

No.  
of  
Cntrs

Sample ID

Comp/Grab

Matrix\*

Depth

Date

Time

20220823-RAII-PW01

Grab

OT

—

8/23/22

8:45

1

COGCC Table 915-1

EC, pH, SAR

Arsenic, Boron

COGCC Table 910-1

Arsenic, pH

X

-01

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

Remarks:

Samples returned via:

UPS FedEx Courier

Tracking #

pH        Temp       

Flow        Other       

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

If preservation required by Login: Date/Time

Relinquished by: (Signature)

Tristan Schmalz

Date:

8/23/2022

Time:

12:30

Received by: (Signature)

[Signature]

Trip Blank Received: Yes / No

HCL / MeOH  
TBR

Temp: 15.70 °C Bottles Received:

15.70 / 15

Date: 8/24/22 Time: 845

Hold:

Condition:

NCF / OK