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## Report of Work Completed – Release Investigation

<b>ECMC Location Name (ID)</b>	BAXTER PASS SOUTH UNIT (12449)
<b>Operator Location Name</b>	Garden Gulch 8" Pipeline
<b>ECMC Remediation Project</b>	24488
<b>Legal Description</b>	NWSE Sec. 32 T5S-R96W
<b>Coordinates (Lat/Long)</b>	39.566968/-108.183634
<b>County</b>	Garfield County, Colorado

Mr. Rollins,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil & Gas LLC (Caerus) to document remedial investigation activities associated with the release of produced water along the Garden Gulch 8 inch (") to Latham Pipeline (Location). The Location is 10.2 miles northwest of Parachute, Colorado, in Garfield County as illustrated in the attached Topographic Map. Additional information on the Location and the associated remediation project is provided in the title block above, the attached Site Diagrams, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the spill investigation, results of the investigation, and recommendations for how to proceed with this information.

### Background

To date, based on soil analytical results and approved alternative allowable limits to date, levels of organic and inorganic constituents of concern exceeding ECMC Table 915-1 Protection of Groundwater Soil Screening Levels remain undelineated in the release area. Based on water analytical results, levels of benzene exceeding ECMC Table 915-1 allowable groundwater limits are present within MW02 and MW03 immediately downgradient of the POR. A two-phased remediation approach has been approved to address soil and groundwater impacts at the Location.

On March 22, 2022, produced water was observed surfacing from an access road to the Latham Laydown Yard. It is estimated that approximately 30 barrels of produced water were released due to the flowline failure. The failed portion of flowline was exposed, and standing fluids were recovered via hydro vacuum truck. The release was reported in an Energy & Carbon Management Commission (ECMC) Form 19 Document 402993777. Subsequently, ECMC Form 27 Document 403106734 was submitted to open Remediation Project 24488.

Initial investigation activities were conducted by Confluence between March 22 and 24, 2022. Soil and surface water samples were collected from the release area, indicating elevated levels of various organic and inorganic constituents per ECMC 915-1 Protection of Groundwater Soil Screening Levels. Additionally, spring and surface water samples were collected from House Log Gulch, located 0.05 miles east, downgradient of the release area.

Additional remedial excavations and sampling of House Log Gulch, conducted by Confluence from April 7 to June 3, 2022, uncovered visual impacts in the silt traps surrounding the release area. The excavation around the point of release (POR) was expanded to 35 feet, by 20 feet, by 8 feet below ground surface (bgs) before impervious lithology prevented additional advancement via hydrovacuum truck. Soil samples collected from the POR excavation and silt traps established that the contamination exceeded ECMC 915-1 Protection of Groundwater Soil Screening Levels for various organic and inorganic constituents of concern.

Confluence returned to the site multiple times from April 28, 2022, to August 25, 2022, conducting various activities such as background soil sampling, spring and surface water sample collection, additional soil removal and sampling of surrounding silt traps, and soil boring advancements within House Log Gulch to facilitate the installation of groundwater monitoring wells. With the completion of four monitoring wells, quarterly surface and groundwater monitoring began on August 23, 2022, and will be conducted through to closure of the remediation project 24488.

Due to severe winter conditions throughout the first quarter of 2023, Q1 surface and groundwater monitoring was completed on May 12, 2023. Following a period of substantial snow melt, exceedances of benzene were observed in groundwater samples collected from MW02 and MW03, leading to reassessment of all prior water sampling locations on May 24, 2023. Analytical results of groundwater samples MW01 through MW04 were compliant with ECMC Table 915-1 Groundwater Standards except for benzene in MW02 and MW03. Analytical results of surface water sampling and silt trap samples were compliant with ECMC Table 915-1 Groundwater Standards.

On June 6, 2023, Confluence returned to the Location to collect second quarter 2023 water samples. Groundwater samples were collected from MW01 through MW04, surface water samples were collected from upgradient and downgradient on House Log Gulch, and one spring sample was collected from an unnamed spring. Analytical results of second quarter groundwater samples MW01 through MW04 are compliant with ECMC Table 915-1 Groundwater Standards except for benzene and total dissolved solids (TDS). Benzene concentrations exceed in MW02 and MW03. TDS concentrations exceed 1.25 times the background limit of 552.5 mg/L established from the MW04 sample collected on September 19, 2022, in MW01. Analytical results of second quarter surface water samples are compliant with ECMC Table 915-1 Groundwater Standards.

On August 23, 2023, Caerus submitted ECMC Document 403471242 to provide updates to first and second quarter sampling and to propose a remediation plan to install treatment wells around the POR and inject a slurry of powdered carbon product and an alternative electron acceptor to enhance biodegradation and demobilize hydrocarbon impacts. The ECMC approved Document 403471242 on September 7, 2023, with the caveat that surface and groundwater monitoring and sampling be conducted weekly for a period of one month following the completion of chemical treatment.



## Methodology

On September 29, 2023, Confluence returned to the Location to collect third quarter 2023 water samples. Groundwater samples were collected from MW01 through MW04, surface water samples were collected from upgradient and downgradient on House Log Gulch, and one spring sample collected from an unnamed spring.

All samples were collected in laboratory provided jars, immediately placed on ice, and shipped to a laboratory. Samples were submitted for analysis of ECMC Table 915-1 water constituents of concern. Sample locations are presented in the attached Site Diagrams.

## Results

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

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

### Lithology and Hydrogeology

Lithology at the Location is characterized by clayey sand with gravel. Groundwater expected to flow northeast along the unnamed tributary in House Log Gulch and ultimately to the Colorado River, located 11.08 miles southeast of the Location. Depth to groundwater at the POR is estimated to be approximately 27 feet bgs based on depth to water observations within the installed groundwater monitoring wells.

### Third Quarter Surface and Groundwater Results

September 29, 2023, field screening did not indicate groundwater impacts with no sheen or odor observed, and water quality parameters were consistent with historical values at the location. Analytical results of groundwater samples MW01 through MW04 are compliant with ECMC Table 915-1 Groundwater Standards. Analytical results of surface water samples are compliant with ECMC Table 915-1 Groundwater Standards for all constituents.

## Analysis and Recommendations

Based on the analytical results and approved allowable limits, benzene levels in MW02 and MW03, which previously exceeded the ECMC Table 915-1 allowable groundwater limits, have now decreased to within acceptable levels. There has been a noted increase in benzene concentrations in MW01, but it does not currently represent an exceedance.

Confluence recommends the continuation of quarterly surface and groundwater monitoring and sampling. Moreover, it is advised to complete the approved remediation plan prior to the onset of winter conditions to prevent further mobilization of additional constituents of concern downgradient toward House Log Gulch in the spring of 2024.



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

Regards,

*Andrew Smith*

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## Attachments

- Topographic Location Diagram
- Site Diagram – Water Monitoring
- Site Diagram – Groundwater Contour
- Analytical Results Summary Table – Water
- Analytical Results Summary Table – Soil
- Laboratory Reports





## Topographic Location Map

Garden Gulch 8-Inch Pipeline  
Latham Laydown Yard  
(MOC Water Storage Facility)  
ECMC Location ID: 425128  
Garfield County  
SWSE Sec. 32 T5S-R96W



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

Created by: Sage Maher on 07/07/2022.

Garden Gulch 8" to Latham

PLATEAU

NAVAL OIL SHALE

COLORADO

8 mi



## Site Diagram Water Monitoring

### Caerus Oil and Gas LLC

Garden Gulch 8-Inch Pipeline

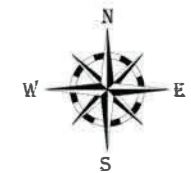
Latham Laydown Yard

(MOC Water Storage Facility)




ECMC Location ID: 425128

Garfield County

SWSE Sec. 32 T5S-R96W



### Legend

-  Surface Water Sample – 10/31/2022
-  Monitoring Wells – 10/31/2022
-  Excavation Extent

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

Map created by: Alex Slorby on 11/01/2022.

LATHAM GG 8 INCH-(MW01)

LATHAM GG 8 INCH-(MW02)

LATHAM GG 8 INCH-(MW03)

LATHAM GG 8 INCH-(SP-LANTHAM)

LATHAM GG 8 INCH-(ST-UP)

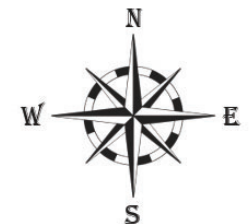
LATHAM GG 8 INCH-(MW04)

LATHAM GG 8 INCH-(ST-DOWN)







**Site Diagram**  
**9/29/2023**  
**Groundwater Contour**

Caerus Oil and Gas LLC  
Garden Gulch 8" Pipeline  
Latham Laydown Yard  
(MOC Water Storage Facility)  
ECMC Location ID: 425128  
Garfield County  
SWSE Sec. 32 T5S-R96W



**Legend**

-  Groundwater Monitoring Well
-  Final Excavation Extent
-  Groundwater Contour
-  Flow Direction

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

Map created by: Andrew Smith on 11/10/2023.





Laboratory Results Summary Table - Water  
Garden Gulch 8-Inch Pipeline Release  
Latham Laydown Yard

11/7/2023

ECMC Allowable Concentration (915-Groundwater)				Organic Compounds (µg/L)								Inorganics (mg/L)			
				5	560-1,000	700	1,400-10,000	140	67	67		1.25xBG	NA	250 or 1.25xBG	250 or 1.25xBG
Sample Date	Depth - Z (feet) below ground surface (ftss)	Sample ID	Free Product Present? (Yes/No)	Benzene	Toluene	Ethylbenzene	Xylenes - total	Naphthalene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene		TDS 1.25 x background	TSS	Chlorides 1.25 x background	Sulfates 1.25 x background
9/29/23	0	20230929-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		341	NA	5.44	38.4
9/29/23	0	20230929-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		395	NA	15.4	38.1
9/29/23	-10	20230929-LATHAM GG 8 INCH-(MW03)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		470	NA	29.5	40.5
9/29/23	-20	20230929-LATHAM GG 8 INCH-(MW02)	No	1.13	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		496	NA	53.9	41.7
9/29/23	0	20230929-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		284	NA	1.73	38.1
9/29/23	-8	20230929-LATHAM GG 8 INCH-(MW01)	No	2.69	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		521	NA	49.7	30.9
9/29/23	-9	20230929-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	0.170	<3.00	<5.00	<1.00	<1.00		323	NA	1.45	39.9
9/15/23	-8	20230915-LATHAM GG 8 INCH-(MW01)	No	3.09	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	-10	20230915-LATHAM GG 8 INCH-(MW02)	No	3.84	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	-20	20230915-LATHAM GG 8 INCH-(MW03)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	-9	20230915-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	0	20230915-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	0	20230915-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
9/15/23	0	20230915-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	0	20230830-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	0	20230830-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	0	20230830-LATHAM GG 8 INCH-(ST-DOWN02)	No	<1.00	22.5	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	-8	20230830-LATHAM GG 8 INCH-(MW01)	No	1.24	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	-10	20230830-LATHAM GG 8 INCH-(MW02)	No	2.66	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	-19	20230830-LATHAM GG 8 INCH-(MW03)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	-9	20230830-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	0.209	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/30/23	0	20230830-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	-8	20230817-LATHAM GG 8 INCH-(MW01)	No	0.998	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	-10	20230817-LATHAM GG 8 INCH-(MW02)	No	17.1	<1.00	<1.00	0.188	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	-19	20230817-LATHAM GG 8 INCH-(MW03)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	-9	20230817-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	0	20230817-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	0	20230817-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
8/17/23	0	20230817-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	-8	20230719-LATHAM GG 8 INCH-(MW01)	No	0.497	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	-10	20230719-LATHAM GG 8 INCH-(MW02)	No	67.7	<1.00	<1.00	0.814	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	-19	20230719-LATHAM GG 8 INCH-(MW03)	No	0.455	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	-9	20230719-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	0.162	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	0	20230719-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	0.328	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	0	20230719-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/19/23	0	20230719-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	0	20230707-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	0	20230707-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	-7	20230707-LATHAM GG 8 INCH-(MW01)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	-10	20230707-LATHAM GG 8 INCH-(MW02)	No	65.0	<1.00	0.166	2.16	<5.00	<1.00	0.162		NA	NA	NA	NA
7/7/23	-19	20230707-LATHAM GG 8 INCH-(MW03)	No	2.12	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	-9	20230707-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
7/7/23	0	20230707-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	0	20230622-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	0	20230622-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	0	20230622-LATHAM GG 8 INCH-(ST-MID)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	-5	20230622-LATHAM GG 8 INCH-(MW01)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	-6.5	20230622-LATHAM GG 8 INCH-(MW02)	No	29.5	<1.00	0.152	0.985	<5.00	<1.00	0.123		NA	NA	NA	NA
6/22/23	-16	20230622-LATHAM GG 8 INCH-(MW03)	No	77.9	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	-4	20230622-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/22/23	0	20230622-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		NA	NA	NA	NA
6/6/23	-5	20230606-LATHAM GG 8 INCH-(MW01)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00		562	NA	41.8	40.2

ECMC Allowable Concentration (915-Groundwater)				Organic Compounds (µg/L)							Inorganics (mg/L)			
				5	560-1,000	700	1,400-10,000	140	67	67	1.25xBG	NA	250 or 1.25xBG	250 or 1.25xBG
Sample Date	Depth - Z (feet) below ground surface (bgs)	Sample ID	Free Product Present? (Yes/No)	Benzene	Toluene	Ethylbenzene	Xylenes - total	Naphthalene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	TDS 1.25 x background	TSS	Chlorides 1.25 x background	Sulfates 1.25 x background
6/6/23	-5.5	20230606-LATHAM GG 8 INCH-(MW02)	No	162	<1.00	0.524	2.83	<5.00	<1.00	0.288	477	NA	46.7	37.4
6/6/23	-15	20230606-LATHAM GG 8 INCH-(MW03)	No	185	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	545	NA	43.1	44.9
6/6/23	-3.5	20230606-LATHAM GG 8 INCH-(MW04)	No	0.191	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	367	NA	1.96	50.9
6/6/23	0	20230606-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	552	NA	33.7	37.0
6/6/23	0	2230606-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	285	NA	5.10	28.5
6/6/23	0	2230606-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	251	NA	1.29	26.7
5/24/23	-4.5	20230524-LATHAM GG 8 INCH-(MW01)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	506	NA	44.3	47.9
5/24/23	-5	20230524-LATHAM GG 8 INCH-(MW02)	No	141	<1.00	1.38	8.22	<5.00	<1.00	<1.00	471	NA	50.4	43.1
5/24/23	-14	20230524-LATHAM GG 8 INCH-(MW03)	No	174	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	523	NA	49.5	51.8
5/24/23	-2.5	20230524-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	386	NA	2.28	50.7
5/24/23	0	20230524-LATHAM GG 8 INCH-(SILT-TRAP-1)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	298	NA	25.1	67.1
5/24/23	0	20230524-LATHAM GG 8 INCH-(SILT-TRAP-2)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	302	NA	26.5	37.6
5/24/23	0	20230524-LATHAM GG 8 INCH-(SILT-TRAP-3)	No	1.28	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	439	NA	27.2	49.1
5/24/23	0	20230524-LATHAM GG 8 INCH-(SILT-TRAP-4)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	438	NA	27.3	49.0
5/24/23	0	20230524-LATHAM GG 8 INCH-(SILT-TRAP-5)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	433	NA	27.3	49.0
5/24/23	0	20230524-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	523	NA	36.5	43.5
5/24/23	0	20230524-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	263	NA	4.01	26.7
5/24/23	0	20230524-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	237	NA	1.54	25.0
5/12/23	-4.50	20230512-LATHAM GG 8 INCH-(MW01)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	475	NA	51.6	45.0
5/12/23	-5.00	20230512-LATHAM GG 8 INCH-(MW02)	No	26.4	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	502	NA	66.7	45.1
5/12/23	-14.01	20230512-LATHAM GG 8 INCH-(MW03)	No	113	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	517	NA	55.0	46.0
5/12/23	-2.67	20230512-LATHAM GG 8 INCH-(MW04)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	340	NA	2.57	41.5
5/12/23	0	20230512-LATHAM GG 8 INCH-(SP-LATHAM)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	450	NA	34.8	35.5
5/12/23	0	20230512-LATHAM GG 8 INCH-(ST-DOWN)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	235	NA	3.62	22.3
5/12/23	0	20230512-LATHAM GG 8 INCH-(ST-UP)	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	241	NA	1.82	21.8
10/31/22	0	20221031-GG8"-Downgradient	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	361	NA	11.5	39.7
10/31/22	-9.18	20221031-GG8"-MW-01	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	556	NA	70.9	50.7
10/31/22	-12.08	20221031-GG8"-MW-02	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	594	NA	117	69.8
10/31/22	-22.16	20221031-GG8"-MW-03	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	509	NA	30.4	41.6
10/31/22	-12.12	20221031-GG8"-MW-04	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	410	NA	3.39	37.5
10/31/22	0	20221031-GG8"-Spring	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	393	NA	13.2	40.2
10/31/22	0	20221031-GG8"-Upgradient	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	281	NA	4.85	29.6
9/19/22	0	20220919-GG8"-Downgradient	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	374	NA	10.7	40.9
9/19/22	-9.18	20220919-GG8"-MW-01	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	604	NA	102	67.3
9/19/22	-12.08	20220919-GG8"-MW-02	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	649	NA	99.2	79.0
9/19/22	-22.16	20220919-GG8"-MW-03	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	674	NA	28.9	43.0
9/19/22	-12.13	20220919-GG8"-MW-04	No	0.137	0.460	0.308	<3.00	<5.00	<1.00	<1.00	442	NA	5.20	37.0
9/19/22	0	20220919-GG8"-Spring	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	427	NA	22.6	42.5
9/19/22	0	20220919-GG8"-Upgradient	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	395	NA	4.86	44.3
8/23/22	-6.09	20220823-GG8"-MW-01	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	728	NA	95.3	146
8/23/22	-7.38	20220823-GG8"-MW-02	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	724	NA	119	160
7/19/22	0	(220719-GG8"-SPRING_SW	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	430	NA	15.5	41.4
7/19/22	0	(220719-GG8"-UPGRADIENT_SW	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	370	NA	1.90	25.8
7/19/22	0	220719-GG8"-DOWNGRADIENT_SW	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	372	NA	7.77	36.8
3/23/22	0	220323_Latham_WW_Source	Yes	18700	29600	<5000	<15000	<25000	<5000	<5000	8640	NA	5690	6.38
3/22/22	0	220322_Latham_SW_DownCreek	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	405	NA	20.0	45.3
3/22/22	0	220322_Latham_SW_UpCrk	No	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	409	NA	19.8	46.7

**Caerus Oil and Gas**

Sample Delivery Group: L1661539  
Samples Received: 09/30/2023  
Project Number: GARDEN GULCH 8" PIPE  
Description: Garden Gulch 8" Pipeline  
Site: LATHAM LAYDOWN YARD  
Report To: Jake J. / Brett M. / Blair R. / Andy V.  
143 Diamond Avenue  
Parachute, CO 81635

Entire Report Reviewed By:



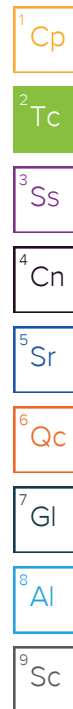
Chris Ward  
Project Manager

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

## 20230929-LATHAM GG 8 INCH-(MW01) L1661539-01 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 10:40

Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2144249	1	10/04/23 00:41	10/04/23 13:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2143086	1	10/05/23 04:44	10/05/23 04:44	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 14:06	10/07/23 14:06	ADM	Mt. Juliet, TN

## 20230929-LATHAM GG 8 INCH-(MW02) L1661539-02 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 10:55

Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2145139	1	10/04/23 21:57	10/05/23 13:08	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2143086	1	10/05/23 04:57	10/05/23 04:57	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 14:25	10/07/23 14:25	ADM	Mt. Juliet, TN

## 20230929-LATHAM GG 8 INCH-(MW03) L1661539-03 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 11:40

Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2145139	1	10/04/23 21:57	10/05/23 13:08	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2143086	1	10/05/23 05:11	10/05/23 05:11	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 14:44	10/07/23 14:44	ADM	Mt. Juliet, TN

## 20230929-LATHAM GG 8 INCH-(MW04) L1661539-04 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 09:45

Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2145139	1	10/04/23 21:57	10/05/23 13:08	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2143086	1	10/05/23 05:25	10/05/23 05:25	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 15:03	10/07/23 15:03	ADM	Mt. Juliet, TN

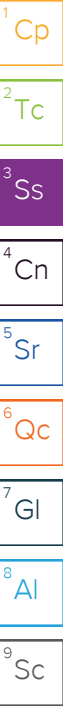
## 20230929-LATHAM GG 8 INCH-(SP-LATHAM) L1661539-05 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 11:45

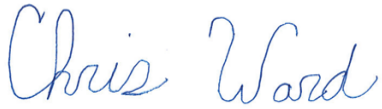
Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2145139	1	10/04/23 21:57	10/05/23 13:08	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2143086	1	10/05/23 05:39	10/05/23 05:39	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 15:23	10/07/23 15:23	ADM	Mt. Juliet, TN

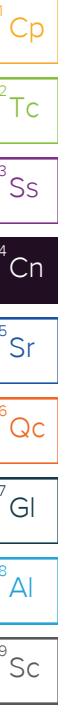


# CASE NARRATIVE

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



Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	521		10.0	1	10/04/2023 13:32	<a href="#">WG2144249</a>

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	49.7		0.379	1.00	1	10/05/2023 04:44	<a href="#">WG2143086</a>
Sulfate	30.9		0.594	5.00	1	10/05/2023 04:44	<a href="#">WG2143086</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.00269		0.0000941	0.00100	1	10/07/2023 14:06	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 14:06	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 14:06	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 14:06	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 14:06	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 14:06	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 14:06	<a href="#">WG2146297</a>
(S) Toluene-d8	113			80.0-120		10/07/2023 14:06	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	93.1			77.0-126		10/07/2023 14:06	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	93.3			70.0-130		10/07/2023 14:06	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	496		10.0	1	10/05/2023 13:08	<a href="#">WG2145139</a>

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	53.9		0.379	1.00	1	10/05/2023 04:57	<a href="#">WG2143086</a>
Sulfate	41.7		0.594	5.00	1	10/05/2023 04:57	<a href="#">WG2143086</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.00113		0.0000941	0.00100	1	10/07/2023 14:25	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 14:25	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 14:25	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 14:25	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 14:25	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 14:25	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 14:25	<a href="#">WG2146297</a>
(S) Toluene-d8	111			80.0-120		10/07/2023 14:25	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	94.6			77.0-126		10/07/2023 14:25	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	93.9			70.0-130		10/07/2023 14:25	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	470		10.0	1	10/05/2023 13:08	<a href="#">WG2145139</a>

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	29.5		0.379	1.00	1	10/05/2023 05:11	<a href="#">WG2143086</a>
Sulfate	40.5		0.594	5.00	1	10/05/2023 05:11	<a href="#">WG2143086</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0000941	0.00100	1	10/07/2023 14:44	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 14:44	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 14:44	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 14:44	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 14:44	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 14:44	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 14:44	<a href="#">WG2146297</a>
(S) Toluene-d8	106			80.0-120		10/07/2023 14:44	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	93.1			77.0-126		10/07/2023 14:44	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	98.4			70.0-130		10/07/2023 14:44	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	323		10.0	1	10/05/2023 13:08	<a href="#">WG2145139</a>

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	1.45		0.379	1.00	1	10/05/2023 05:25	<a href="#">WG2143086</a>
Sulfate	39.9		0.594	5.00	1	10/05/2023 05:25	<a href="#">WG2143086</a>

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0000941	0.00100	1	10/07/2023 15:03	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 15:03	<a href="#">WG2146297</a>
Ethylbenzene	0.000170	J	0.000137	0.00100	1	10/07/2023 15:03	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 15:03	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 15:03	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 15:03	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 15:03	<a href="#">WG2146297</a>
(S) Toluene-d8	110			80.0-120		10/07/2023 15:03	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	91.2			77.0-126		10/07/2023 15:03	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	95.8			70.0-130		10/07/2023 15:03	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	395		10.0	1	10/05/2023 13:08	<a href="#">WG2145139</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	15.4		0.379	1.00	1	10/05/2023 05:39	<a href="#">WG2143086</a>
Sulfate	38.1	<a href="#">J6</a>	0.594	5.00	1	10/05/2023 05:39	<a href="#">WG2143086</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	10/07/2023 15:23	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 15:23	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 15:23	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 15:23	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 15:23	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 15:23	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 15:23	<a href="#">WG2146297</a>
(S) Toluene-d8	113			80.0-120		10/07/2023 15:23	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	90.1			77.0-126		10/07/2023 15:23	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	93.3			70.0-130		10/07/2023 15:23	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3982977-1 10/04/23 13:32

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

L1660528-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1660528-03 10/04/23 13:32 • (DUP) R3982977-3 10/04/23 13:32

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	778	848	1	8.61	J3	5

L1661446-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1661446-19 10/04/23 13:32 • (DUP) R3982977-4 10/04/23 13:32

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	473	478	1	1.05		5

Laboratory Control Sample (LCS)

(LCS) R3982977-2 10/04/23 13:32

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8790	99.9	77.3-123	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3983294-1 10/05/23 13:08

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

L1660924-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1660924-02 10/05/23 13:08 • (DUP) R3983294-3 10/05/23 13:08

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	362	378	1	4.32		5

L1660924-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1660924-04 10/05/23 13:08 • (DUP) R3983294-4 10/05/23 13:08

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	351	351	1	0.000		5

Laboratory Control Sample (LCS)

(LCS) R3983294-2 10/05/23 13:08

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8560	97.3	77.3-123	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3982210-1 10/04/23 22:50

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

L1661223-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1661223-02 10/05/23 00:12 • (DUP) R3982210-3 10/05/23 00:26

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	1.94	1.93	1	0.744		15
Sulfate	6.07	6.03	1	0.694		15

L1661539-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1661539-05 10/05/23 05:39 • (DUP) R3982210-6 10/05/23 05:52

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	15.4	15.3	1	0.802		15
Sulfate	38.1	37.8	1	0.718		15

Laboratory Control Sample (LCS)

(LCS) R3982210-2 10/04/23 23:04

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Chloride	40.0	40.2	100	80.0-120	
Sulfate	40.0	39.6	99.0	80.0-120	

L1661223-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1661223-02 10/05/23 00:12 • (MS) R3982210-4 10/05/23 00:40 • (MSD) R3982210-5 10/05/23 00:54

	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	%	%		%			%	%
Chloride	40.0	1.94	40.8	41.1	97.1	97.9	1	80.0-120			0.811	15
Sulfate	40.0	6.07	42.8	43.2	91.9	92.9	1	80.0-120			0.915	15

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1661539-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1661539-05 10/05/23 05:39 • (MS) R3982210-7 10/05/23 06:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Chloride	40.0	15.4	51.9	91.2	1	80.0-120	
Sulfate	40.0	38.1	68.4	75.8	1	80.0-120	J6

<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) R3983630-3 10/07/23 11:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Toluene	U		0.000278	0.00100
Ethylbenzene	U		0.000137	0.00100
Xylenes, Total	U		0.000174	0.00300
Naphthalene	U		0.00100	0.00500
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
(S) Toluene-d8	113			80.0-120
(S) 4-Bromofluorobenzene	92.9			77.0-126
(S) 1,2-Dichloroethane-d4	94.6			70.0-130

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

(LCS) R3983630-1 10/07/23 10:56 • (LCSD) R3983630-2 10/07/23 11:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00477	0.00461	95.4	92.2	70.0-123			3.41	20
Toluene	0.00500	0.00560	0.00551	112	110	79.0-120			1.62	20
Ethylbenzene	0.00500	0.00546	0.00549	109	110	79.0-123			0.548	20
Xylenes, Total	0.0150	0.0159	0.0157	106	105	79.0-123			1.27	20
Naphthalene	0.00500	0.00513	0.00516	103	103	54.0-135			0.583	20
1,2,4-Trimethylbenzene	0.00500	0.00521	0.00527	104	105	76.0-121			1.15	20
1,3,5-Trimethylbenzene	0.00500	0.00551	0.00546	110	109	76.0-122			0.912	20
(S) Toluene-d8				114	113	80.0-120				
(S) 4-Bromofluorobenzene				94.9	93.1	77.0-126				
(S) 1,2-Dichloroethane-d4				88.6	89.5	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

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

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

### Abbreviations and Definitions

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

### Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

<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

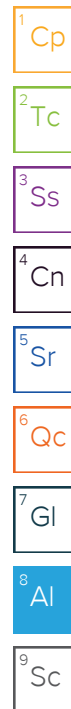
## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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**

Sample Delivery Group: L1661541  
Samples Received: 09/30/2023  
Project Number: GARDEN GULCH 8" PIPE  
Description: Garden Gulch 8" Pipeline  
Site: LATHAM LAYDOWN YARD  
Report To: Jake J. / Brett M. / Blair R. / Andy V.  
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>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

# SAMPLE SUMMARY

## 20230929-LATHAM GG 8 INCH-(ST-UP) L1661541-01 GW

Collected by  
Alex Slorby

Collected date/time  
09/29/23 10:50

Received date/time  
09/30/23 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2145139	1	10/04/23 21:57	10/05/23 13:08	NTG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2145426	1	10/05/23 13:09	10/05/23 13:09	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 15:42	10/07/23 15:42	ADM	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

## 20230929-LATHAM GG 8 INCH-(ST-DOWN) L1661541-02 GW

Collected by  
Alex Slorby

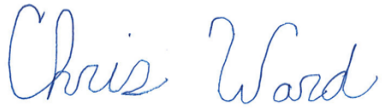
Collected date/time  
09/29/23 11:55

Received date/time  
09/30/23 09:00

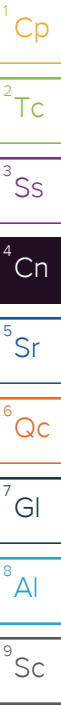
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG2144249	1	10/04/23 00:41	10/04/23 13:32	JAC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG2145426	1	10/05/23 13:21	10/05/23 13:21	GEB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG2146297	1	10/07/23 16:01	10/07/23 16:01	ADM	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





Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	284		10.0	1	10/05/2023 13:08	<a href="#">WG2145139</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	1.73		0.379	1.00	1	10/05/2023 13:09	<a href="#">WG2145426</a>
Sulfate	38.1		0.594	5.00	1	10/05/2023 13:09	<a href="#">WG2145426</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	10/07/2023 15:42	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 15:42	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 15:42	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 15:42	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 15:42	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 15:42	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 15:42	<a href="#">WG2146297</a>
(S) Toluene-d8	113			80.0-120		10/07/2023 15:42	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	93.3			77.0-126		10/07/2023 15:42	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	94.4			70.0-130		10/07/2023 15:42	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	341		10.0	1	10/04/2023 13:32	<a href="#">WG2144249</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Chloride	5.44		0.379	1.00	1	10/05/2023 13:21	<a href="#">WG2145426</a>
Sulfate	38.4		0.594	5.00	1	10/05/2023 13:21	<a href="#">WG2145426</a>

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

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Benzene	U		0.0000941	0.00100	1	10/07/2023 16:01	<a href="#">WG2146297</a>
Toluene	U		0.000278	0.00100	1	10/07/2023 16:01	<a href="#">WG2146297</a>
Ethylbenzene	U		0.000137	0.00100	1	10/07/2023 16:01	<a href="#">WG2146297</a>
Xylenes, Total	U		0.000174	0.00300	1	10/07/2023 16:01	<a href="#">WG2146297</a>
Naphthalene	U		0.00100	0.00500	1	10/07/2023 16:01	<a href="#">WG2146297</a>
1,2,4-Trimethylbenzene	U		0.000322	0.00100	1	10/07/2023 16:01	<a href="#">WG2146297</a>
1,3,5-Trimethylbenzene	U		0.000104	0.00100	1	10/07/2023 16:01	<a href="#">WG2146297</a>
(S) Toluene-d8	117			80.0-120		10/07/2023 16:01	<a href="#">WG2146297</a>
(S) 4-Bromofluorobenzene	93.1			77.0-126		10/07/2023 16:01	<a href="#">WG2146297</a>
(S) 1,2-Dichloroethane-d4	95.8			70.0-130		10/07/2023 16:01	<a href="#">WG2146297</a>

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3982977-1 10/04/23 13:32

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

L1660528-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1660528-03 10/04/23 13:32 • (DUP) R3982977-3 10/04/23 13:32

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	778	848	1	8.61	J3	5

L1661446-19 Original Sample (OS) • Duplicate (DUP)

(OS) L1661446-19 10/04/23 13:32 • (DUP) R3982977-4 10/04/23 13:32

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	473	478	1	1.05		5

Laboratory Control Sample (LCS)

(LCS) R3982977-2 10/04/23 13:32

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8790	99.9	77.3-123	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3983294-1 10/05/23 13:08

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

L1660924-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1660924-02 10/05/23 13:08 • (DUP) R3983294-3 10/05/23 13:08

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	362	378	1	4.32		5

L1660924-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1660924-04 10/05/23 13:08 • (DUP) R3983294-4 10/05/23 13:08

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	351	351	1	0.000		5

Laboratory Control Sample (LCS)

(LCS) R3983294-2 10/05/23 13:08

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8560	97.3	77.3-123	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Method Blank (MB)

(MB) R3982875-1 10/05/23 09:36

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Chloride	U		0.379	1.00
Sulfate	0.601	J	0.594	5.00

L1661535-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1661535-03 10/05/23 12:17 • (DUP) R3982875-3 10/05/23 12:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Chloride	79.1	80.2	1	1.29		15
Sulfate	13.4	13.5	1	0.521		15

L1661552-16 Original Sample (OS) • Duplicate (DUP)

(OS) L1661552-16 10/05/23 17:39 • (DUP) R3982875-5 10/05/23 17:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Chloride	105	106	1	0.411		15
Sulfate	50.4	50.3	1	0.123		15

Laboratory Control Sample (LCS)

(LCS) R3982875-2 10/05/23 09:49

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Chloride	40.0	39.6	99.1	80.0-120	
Sulfate	40.0	39.2	97.9	80.0-120	

L1661535-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1661535-03 10/05/23 12:17 • (MS) R3982875-4 10/05/23 12:43

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Chloride	40.0	79.1	104	62.9	1	80.0-120	J6
Sulfate	40.0	13.4	51.3	94.9	1	80.0-120	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

L1661552-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1661552-16 10/05/23 17:39 • (MS) R3982875-6 10/05/23 18:04 • (MSD) R3982875-7 10/05/23 18:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Chloride	40.0	105	125	125	50.9	50.0	1	80.0-120	<u>J6</u>	<u>J6</u>	0.288	15
Sulfate	40.0	50.4	81.2	81.1	77.0	76.8	1	80.0-120	<u>J6</u>	<u>J6</u>	0.0900	15

<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) R3983630-3 10/07/23 11:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Toluene	U		0.000278	0.00100
Ethylbenzene	U		0.000137	0.00100
Xylenes, Total	U		0.000174	0.00300
Naphthalene	U		0.00100	0.00500
1,2,4-Trimethylbenzene	U		0.000322	0.00100
1,3,5-Trimethylbenzene	U		0.000104	0.00100
(S) Toluene-d8	113			80.0-120
(S) 4-Bromofluorobenzene	92.9			77.0-126
(S) 1,2-Dichloroethane-d4	94.6			70.0-130

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

(LCS) R3983630-1 10/07/23 10:56 • (LCSD) R3983630-2 10/07/23 11:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.00500	0.00477	0.00461	95.4	92.2	70.0-123			3.41	20
Toluene	0.00500	0.00560	0.00551	112	110	79.0-120			1.62	20
Ethylbenzene	0.00500	0.00546	0.00549	109	110	79.0-123			0.548	20
Xylenes, Total	0.0150	0.0159	0.0157	106	105	79.0-123			1.27	20
Naphthalene	0.00500	0.00513	0.00516	103	103	54.0-135			0.583	20
1,2,4-Trimethylbenzene	0.00500	0.00521	0.00527	104	105	76.0-121			1.15	20
1,3,5-Trimethylbenzene	0.00500	0.00551	0.00546	110	109	76.0-122			0.912	20
(S) Toluene-d8				114	113	80.0-120				
(S) 4-Bromofluorobenzene				94.9	93.1	77.0-126				
(S) 1,2-Dichloroethane-d4				88.6	89.5	70.0-130				

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

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

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

### Abbreviations and Definitions

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

### Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

<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.

