Geologic and Hydrologic Assessment
Laramie Energy, LLC
Harrison Creek Water Treatment Facility

Project Number 018-089

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Introduction

Laramie Energy LLC retained Entrada Consulting Group, Inc. (Entrada) to conduct a Geologic and Hydrologic Assessment for submittal to the Colorado Oil and Gas Conservation Commission (COGCC) for the Harrison Creek Water Treatment Facility (HCWTF) located near Collbran, Colorado. The approximate site center (center of Pond 3) is located at Latitude 39.269222° and Longitude -107.752262° (WGS84) at an approximate elevation of 7,385 feet above mean sea level (edge of Pond 3). The project location (Site) relative to nearby towns is shown as Figure 1. Representatives from Entrada and Laramie Energy conducted a site reconnaissance on November 2, 2018. Based on observations made during the site reconnaissance, five proposed new monitoring well locations were chosen to the south, east and north of Ponds 2 and 3. The locations of monitoring wells and Ponds 2, 3 and 4 are shown in Figures 4 and 5. At the time of this report Pond 4 was under construction and empty.

Geology

The Site is located on the southern margin of the Piceance Basin between Battlement Mesa to the North and the Grand Mesa to the South as part of the Southern Rocky Mountain physiographic region. Bedrock geology in the area is characterized by low angle dipping sedimentary stratigraphy of the Tertiary Wasatch (Tw) formation and underlying Upper Cretaceous Mesaverde (Kmv) formation. Bedrock geology at the Site consists of the Wasatch Formation and is composed of claystone, siltstone and sandstone that unconformably overlies the Mesaverde formation (Group). The top of the Mesaverde formation, the Ohio Creek Member, contains sandstone, conglomerate and conglomeratic sandstone. The Mesaverde formation then grades into sandstone, shale and coal. According to the United States Geological Survey (USGS) map of the Carbondale Quadrangle (1984), there are no known faults or severe folds shown in the immediate vicinity of the Site. A generalized geologic map of the area located around the Site is presented as Figure 2.

The Site is shown by the USGS to sit on top of Terrace and Pediment Gravels (Qgy) resulting from Pleistocene glaciation. Previous investigations (e.g. Kumar and Associates, 2009, and Olsson Associates, 2010) conducted soil borings at the Site and reported clayey sand, fine to coarse sand and occasional to frequent gravel and cobble sized sandstone and shale fragments consistent with the USGS interpretation of terrace and pediment sediments.

A United States Department of Agriculture (USDA) Custom Soil Resource Report was generated for the area located in the vicinity of the Site. According to the report, the Site is underlain by the Hesperus - Empedrado, moist - Pagoda Complex found on mountain slopes with 5-35 degree slopes between elevations of 6,200 and 8,500 feet above mean sea level. A copy of this report and map unit descriptions is provided as Appendix C.

Local Hydrology and Historical Groundwater Analytical Results

Harrison Creek is located approximately 950 feet to the east of the edge of the Site where it flows north to the confluence of Harrison Creek and Buzzard Creek. Buzzard Creek flows towards the west approximately 1800 feet north of the northern Site boundary. The current elevation of the facility sits approximately 40 feet to 50 feet above the Harrison Creek channel.

Review of the online data from the Federal Emergency Management Agency (FEMA) Flood Map Service Center indicates that the Site is not located within a mapped floodplain.

Three monitoring wells (MW01, MW02 and MW03) previously existed in the vicinity of the Site. These were installed by Piceance Energy in 2015 and groundwater sampling events have been conducted on these wells since October 2015. A summary of the well names, permit numbers, total depth, depth to water at the time of drilling, elevations, screened casing intervals and solid casing intervals is presented in Table 1. The locations of these wells are shown on Figures 4 and 5. At the time of drilling the shallow perched groundwater table was encountered in MW01 and MW02 while MW03 was reported to be dry. Since quarterly groundwater sampling has commenced at these locations, groundwater has been observed in MW01 and MW03 while MW02 has been dry since September 2017.

During these sampling events Harrison Creek, Buzzard Creek and the Harrison Creek Cabin (HCCWS1, owned by Laramie Energy) residential well have also been sampled and submitted for analysis when possible. These groundwater results are presented in Table 2. A summary of hydrocarbon detections is presented below:

- In September 2017, Gasoline Range Organics (GRO) were reported at 0.107 mg/L in a sampled collected from Buzzard Creek.
- In March 2018, Diesel Range Organics (DRO) were reported at 0.12 mg/L in a sampled collected from Buzzard Creek.
- In September 2017, Gasoline Range Organics (GRO) were reported at 0.104 mg/L in a sampled collected from MW01.
- All other results for Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX), GRO and Diesel Range Organics (DRO) have been reported below their respective laboratory Method Detection Limits (MDLs) for all samples submitted for analysis from MW01, MW02, MW03, HCCWS1, Harrison Creek and Buzzard Creek.

Installation of Four Additional Groundwater Wells

In early November 2018, five new groundwater monitoring wells (MW04 through MW08) were permitted through the Colorado State Engineers Office for the Harrison Creek Water Treatment Facility. MW04 was permitted adjacent to the existing MW03 as drilling reports show MW03 to have been dry at the time of drilling. Because groundwater in MW03 has been successfully sampled since March 2017, it was determined that the installation of MW04 was unnecessary, and therefore was not drilled. Four new groundwater monitoring wells (MW05 through MW08) were installed at the facility between November 19, 2018 and November 21, 2018. The locations of the four new wells, in addition to the existing wells (MW01-MW03) are shown on figures 4 and 5.

Entrada contracted Colorado Drilling and Sampling of Montrose, Colorado to conduct the drilling and well installation activities at the Site. For drilling and sampling, solid stem augers were utilized to advance the soil borings past (and through) alluvial basalt boulders encountered at the Site. The soil was sampled at 5-foot intervals using 18-inch and 24-inch split-spoon samplers. Blow counts were recorded for every 6-inch interval until split-spoon refusal was

called by the driller. The Entrada site Geologist, Mr. Ben Baugh, visually characterized the soil samples collected from the split-spoon sampler. Moisture and percent fines were approximated by sight and feel, and the soil was screened in the field by placing the soil in clean plastic Ziploc bags and using a MiniRae Photoionization Detector (PID) to analyze the bag headspace for total volatile organic compounds. The PID was calibrated daily with a 100 parts per million (ppm) Isobutylene gas standard. Hydrocarbon staining and hydrocarbon odor were not observed in any of the soils described during the installation of these wells and PID readings were generally less than 20 ppm. Soil boring logs for monitoring wells MW05 through MW08 are provided as Appendix A.

The split-soon sampler was decontaminated using freshwater and Simple Green All-Purpose Cleaner© between each sampling interval. Likewise, the drilling augers were cleaned free of excess soil between soil borings. Drill cuttings were placed on plastic liners and subsequently spread onsite after it was observed that there was no evidence for hydrocarbon impact in the soils. Due to the lack of evidence of any hydrocarbon impacts to the soil samples observed in the borings, soil samples were not submitted for laboratory analysis.

The four new groundwater monitoring wells were completed using 2-inch diameter Polyvinyl Chloride (PVC) screen and casing including 0.10-inch slotted screen from total depth to approximately 2-feet above the saturated interval encountered in the boring. Schedule-40 solid PVC pipe was installed from the screened interval to approximately 3-feet above the ground surface. 10-20 silica sand was used as the filter pack around the screened casing interval to at least 2-feet above the top of the screened interval. Hydrated bentonite was used in the annular space around the solid PVC to seal between the surface and the screened interval of the well. The surface of the wells were completed with a concrete base, steel well protectors and adjustable J-plugs. Due to semi-confining conditions at the Site, the static groundwater level rose above the top of the screened interval at MW07 after the well was completed and at the time of the most recent sampling event on November 30, 2018.

Following drilling activities, Laramie Energy contracted D.R. Griffin Associates to survey the Top of casing (TOC) elevation above mean sea level (AMSL), ground elevation and latitude/longitude of all seven wells at the facility. Latitude, longitude and elevations are accurate to two-tenths (0.2') of one foot. These elevations are shown on Table 1.

November 2018 Groundwater Hydrology and Analytical Results

Groundwater levels were measured from the seven monitoring wells to evaluate hydraulic characteristics of the shallow perched aquifer. The wells were gauged on the north side of the casing to the nearest 0.01-foot using an oil-water interface probe. Groundwater levels were subsequently converted to elevations (feet AMSL). The groundwater elevations were plotted and a potentiometric groundwater contour map is presented as Figure 4.

The shallow perched groundwater across the Site flows generally north and northwest with an average calculated groundwater gradient of 0.04 feet per foot (ft/ft) as measured between MW05 and MW07 as well as between MW03 and MW08. A portion of the Site appears to be under semi-confined groundwater conditions. Groundwater levels rose approximately 10-feet in

MW06 and approximately 20-feet in MW07 between measuring depth to groundwater at the time of completion and again 1 to 2 days later. Conversely, no change in depth to groundwater was observed at MW05 and groundwater dropped 4-feet in MW08 over a similar timeframe of 1 to 2 days. These results are indicative of hydrologic complexities existing in the subsurface likely due to the presence or absence of impermeable (plastic) clay layers. Clay intervals were observed to be thicker and more common above the shallow perched groundwater table in the two wells exhibiting semi-confined behavior.

Following the installation of the four new monitoring wells, groundwater wells were sampled on November 30, 2018. Prior to sampling, the four new wells were developed November 29, 2018 using disposable bailers and at least ten casing volumes of groundwater were removed from each well. The groundwater samples were collected using disposable polyethylene bailers, placed in clean laboratory supplied containers, packed in an ice-filled cooler and maintained at approximately 4 degrees Celsius for transportation to the laboratory.

Groundwater samples were submitted for analysis to Pace Analytical, of Mount Juliette, Tennessee for analysis of BTEX, GRO, DRO, Alkalinity, Chloride, Sulfate, Specific Conductivity (SpC), pH, Cations (Calcium, Magnesium, Manganese, Potassium, Selenium and Sodium) and Anions (Chlorine, Calcium Carbonate, Iron and Sulfate). MW02, Buzzard Creek and Harrison Creek were dry at the time of sampling and the access to the Harrison Creek Cabin Well was frozen. Thus, samples were submitted for analysis for groundwater collected from monitoring wells MW01, MW03, MW05, MW06, MW07 and MW08. On December 12, 2018 a sample was collected from the water stored in Pond 2 using a disposable bailer and submitted for analysis of Cations, Anions, SpC and pH. These analytical results are presented in Table 2, in addition to historical results reported for the Site. A copy of the analytical reports for the November 30, 2018 sampling event and the December 12, 2018 sampling of Pond 2 are presented as Appendix D.

For the six groundwater samples submitted for analysis, all were reported to be below the laboratory MDL's for BTEX, GRO, DRO and Iron. The remaining reported constituent concentrations are similar to concentrations reported historically in groundwater collected at the Site and appear to be indicative of normal groundwater conditions for the area. Stiff (1951) Diagrams were created displaying the concentrations of Cations and Anions to provide a visual representation of the chemical characteristics of the groundwater from the seven monitoring wells versus the chemical characteristics of water collected from Pond 2. These Stiff diagrams are presented as Appendix B. As shown on these diagrams, the nature of Cations and Anions of groundwater collected from the six groundwater wells are each very similar to one another and dissimilar to the nature of water collected from Pond 2.

Of the Cations and Anions reported for samples collected at the Site, Sodium, Potassium, Chloride and Calcium Carbonate were reported to be significantly higher in concentration in the sample collected from Pond 2 than groundwater samples collected from the monitoring wells. Calcium, Magnesium and Sulfate are reported samples collected from the monitoring wells to be similar in concentration in the sample collected from Pond 2. The resulting shape of the stiff diagram for Pond 2 is significantly different in size and character than stiff diagrams created for samples collected from the monitoring wells as shown in Appendix B. In addition, the average

Specific Conductance of groundwater samples collected from the monitoring wells is 658 umhos/cm and the Specific Conductance of the water sample collected from Pond 2 is reported as 25,000 umhos/cm. This much higher SpC value is interpreted to be the result of the high concentrations of salts reported for Pond 2.

Summary and Conclusions

- At the request of the COGGC, a Geologic and Hydrologic evaluation was conducted at the HCWTF within proximity to Pond 2. This evaluation was conducted by Entrada personnel during the week of November 19, 2018.

- There was no indication of petroleum hydrocarbon impacted soil in the samples collected from the four borings based on visual observation, odor, or PID screenings of soil observed during drilling activities.

- The shallow perched groundwater underlying the Site appears to be under semi-confined conditions in the vicinity of MW07 and MW08 and unconfined at MW05 and MW06.

- Groundwater flows to the north-northwest across the Site with an average calculated groundwater gradient of approximately 0.04 ft/ft.

- All groundwater samples collected from monitoring wells MW01, MW03, MW05, MW06, MW07 and MW08 were reported to be below the laboratory Method Detection Limits for BTEX, GRO, DRO and Iron.

- All other constituents submitted for analysis are consistent with historical groundwater analytical results reported for the Site.

- Stiff diagrams indicate that concentrations of Cations and Anions reported in groundwater samples collected from monitoring wells MW01, MW03, MW05, MW06, MW07 and MW08 are significantly dissimilar to the concentrations of Cations and Anions reported for the water sample collected from Pond 2.

- At the time of this report, there is no indication that produced water stored in Pond 2 and Pond 3 has communicated with the groundwater monitoring wells located at the Site.

- Entrada recommends the continued quarterly groundwater sampling of monitoring wells located at the Site, in addition to Buzzard Creek, Harrison Creek and the Harrison Creek Cabin residential well when sampling is possible.

This report was developed by Mr. Ben Baugh and Mr. John Lohner with Entrada Consulting Group, Inc. on behalf of Laramie Energy, Inc.

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Summary of Attachments

Table 1: Groundwater Well Construction and Static Water Level Data
Table 2: Groundwater Analytical Results
Figure 1: General Site Location Map
Figure 2: Regional Geology
Figure 3: Regional USDA Soils Map
Figure 4: Potentiometric Surface Map November 2018
Figure 5: Groundwater Analytical Results Map November 2018
Appendix A: Boring Logs: MW05-MW08
Appendix B: Stiff Diagrams: MW01, MW03, MW05, MW06, MW07, MW08 and Pond 2
Appendix C: Custom USDA Soil Resources Report
Appendix D: Laboratory Analytical Results: November and December 2018

Tables

Table 1: Groundwater Well Construction and Static Water Level Data								
Well Name	Permit #	TD	DTW While Drilling	DTW 11/30/18	TOC Elevation	PS Elevation	Casing Interval	Screen Interval
		(ft-bgs)	(ft-bgs)	(ft-bgs)	(ft-amsl)	(ft-amsl)	(ft-bgs)	(ft-bgs)
MW01	299272	35	17	21.87	7379.87	7358.00	-3-15	15-35
MW02	299273	35	33	Dry	7398.29	NA	-3-15	15-35
MW03	299274	46	Dry*	38.96	7466.27	7427.31	-3-26	26-46
MW04	Permitted (311715), Not Drilled							
MW05	311716	40	30.5	33.22	7430.22	7397.00	-3-20	20-40
MW06	311717	35	34	27.64	7406.14	7378.50	-3-20	20-35
MW07	311718	55	48.5	32.99	7406.68	7373.69	-3-35	35-55
MW08	311719	50	40.5	44.58	7395.84	7351.26	-3-25	25-50
HCCWS1	232538	210	150	NA	NA	NA	-1-130	130-210

*: Has produced water since October 2015

TD: Total Depth

ft-bgs: Feet Below Ground Surface

ft-amsl: Feet Above Mean Sea Level

DTW: Depth to Water

HCCWS1: Harrison Creek Cabin Residential Well

TOC: Top of Casing

PS: Potentiometric Surface

Table 2: Anlytical Results For Harrison Creek Water Treatment Facility - Laramie Energy

Location / Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (mg/L)	Gasoline Range Organics (mg/L)	Diesel Range Organics (mg/L)	Alkalinity - Total as CaCO3 (mg/L)	Bromide (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Dissolved Solids (mg/L)	Specific Conductivity (umhos/cm)	Sulfate (mg/L)	pH	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)
MCL	0.005	1	0.7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6-9	NA	NA	NA	NA	NA	NA	NA
Buzzard Creek																							
9/8/2015	<0.2	<0.2	<0.2	<0.46	<0.05	< 0.17	178	<0.05	1.8	0.16	<0.02	<0.004	216	270	3.6	8.60	48.8	0.015	11.4	<0.005	1.58	<0.0008	12.1
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	214	<1.0	6.3	0.15	<0.1	<0.1	303	4466	23.6	8.30	65.3	<0.1	13.0	0.013	1.43	<0.01	21.1
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	90	<1.0	<1.0	<0.1	<0.1	<0.1	105	162	<5.0	8.22	23.5	0.232	4.8	<0.01	<1	<0.01	5.0
9/28/2017	<0.001	<0.001	<0.001	<0.003	0.107	<0.1	207	98.9	11	0.189	<0.1	<0.1	326	463	23.5	8.00	54.8	<0.1	13.4	<0.01	2.87	<0.01	27.5
12/1/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	221	<1.0	4.19	<0.1	<0.1	<0.1	291	439	16.8	8.08	65	<0.1	13.5	<0.01	1.57	<0.01	16.5
3/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	0.12	175	<1.0	4.45	0.102	<0.1	<0.1	207	367	21.6	8.29	51.4	0.112	10.0	<0.01	2.4	<0.01	15.8
6/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	233	<1.0	9.25	0.21	<0.1	<0.1	281	493	<5.0	8.30	96.5	<0.1	15.7	<0.01	1.9	<0.01	59.2
9/25/2018	DRY						DRY										DRY						
11/30/2018	DRY						DRY										DRY						
Harrison Creek																							
9/8/2015	<0.2	<0.2	<0.2	<0.46	<0.05	< 0.17	318	<0.25	39.2	0.34	<0.05	<0.02	539	707	89.1	8.60	68.5	0.021	24.8	0.045	3.65	<0.0008	99.7
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	270	<1.0	26.2	0.27	<0.1	<0.1	512	780	102.0	8.20	75.7	<0.1	17.6	<0.01	2.02	<0.01	76.4
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	268	<1.0	14.5	0.24	<0.1	<0.1	416	41	61.3	8.33	57.6	<0.1	18.5	<0.01	2.27	<0.01	61.5
9/28/2017	DRY						DRY										DRY						
12/1/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	347	<1.0	47	0.281	<0.1	<0.1	891	1200	251	8.04	105	<0.1	32.8	0.042	2.81	<0.01	139
3/29/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	272	<1.0	24.9	0.248	<0.1	<0.1	493	810	128	8.29	76.4	<0.1	18.2	<0.01	3.86	<0.01	84
6/30/2018	DRY						DRY										DRY						
9/25/2018	DRY						DRY										DRY						
11/30/2018	DRY						DRY										DRY						
HCCWS1 (Harrison Creek Cabin)																							
11/6/2015	<0.5	<0.71	<0.5	<1.0	<0.05	< 0.17	264	0.18	82.4	7.20	<0.01	<0.004	513	750	61.9	8.75	2.3	0.018	<0.2	0.0131	<1.0	<0.0008	207.0
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	232	<1.0	89.6	6.74	<0.1	<0.1	592	916	64.4	8.60	2.3	<0.1	<1.0	<0.01	<1.0	<0.01	197.0
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	259	<1.0	63.9	6.90	<0.1	<0.1	546	8520	63.5	8.64	2.1	<0.1	<1.0	<0.01	<1.0	<0.01	196.0
9/28/2017	No Generator						No Generator										No Generator						
12/1/2017	<0.001	<0.001	<0.001	<0.003	<0.1	0.102	218	<1.0	218	6.06	<0.1	<0.1	865	1190	28.6	8.59	3.61	<0.1	<1.0	0.0211	<1.0	<0.01	254
3/29/2018	No Generator						No Generator										No Generator						
6/30/2018	DRY						DRY										DRY						
9/25/2018	DRY						DRY										DRY						
11/30/2018	FROZEN						FROZEN										FROZEN						
MW-1																							
10/20/2015	<0.5	<0.71	<0.5	<1.0	<0.05	< 0.17	327	<0.25	15.0	0.27	1.60	0.0078	300	605	25.6	7.58	81.7	0.011	13.3	0.0438	1.98	0.0015	48.4
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	313	<1.0	12.6	0.25	2.15	<0.1	441	685	19.7	7.50	92.5	<0.1	15.3	<0.01	1.01	<0.01	38.7
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	260	<1.0	22.6	0.24	0.56	<0.1	657	634	46.3	7.37	76.6	<0.1	14.7	<0.01	2.65	0.011	47.2

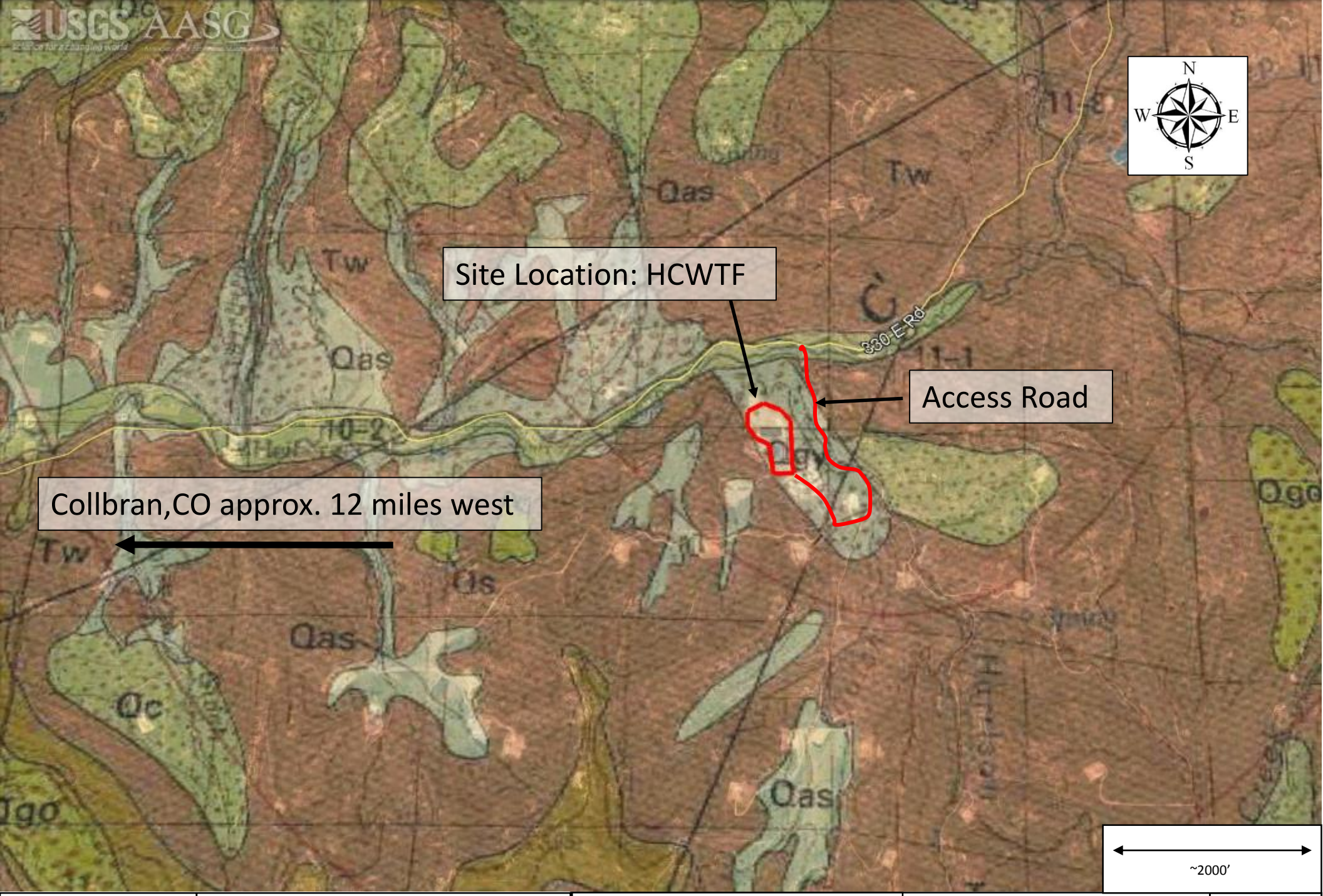
Table 2: Anlytical Results For Harrison Creek Water Treatment Facility - Laramie Energy

Location / Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (mg/L)	Gasoline Range Organics (mg/L)	Diesel Range Organics (mg/L)	Alkalinity - Total as CaCO3 (mg/L)	Bromide (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Dissolved Solids (mg/L)	Specific Conductivity (umhos/cm)	Sulfate (mg/L)	pH	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Sodium (mg/L)
MCL	0.005	1	0.7	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6-9	NA	NA	NA	NA	NA	NA	NA
9/28/2017	<0.001	<0.001	<0.001	<0.003	0.104	<0.1	261	91.7	23.4	0.20	0.449	<0.1	475	139	49.5	7.45	74.7	<0.1	15.1	<0.01	2.3	<0.01	47.5
12/1/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	294	<1.0	12.9	0.259	1.44	0.1	447	628	19.4	7.76	56.1	<0.1	7.91	<0.01	2.39	<0.01	80.6
3/29/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	314	<1.0	13.7	0.242	1.99	<0.1	385	663	22.7	7.73	82.4	<0.1	13.2	<0.01	1.95	<0.01	58.1
6/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	242	<1.0	21.2	0.271	0.765	<0.1	370	629	47.5	8.30	96.5	<0.1	15.7	<0.01	1.90	<0.01	59.2
9/25/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	329	<1.0	13.3	0.24	2.62	<0.1	NA	728	22.3	7.67	102	<0.1	17.1	<0.01	1.45	<0.01	43.7
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	287	NA	11.7	NA	NA	NA	NA	673	21.1	7.61	68.4	<0.1	10.8	<0.01	2.28	<0.01	62.7
MW-2																							
10/20/2015	DRY						DRY										DRY						
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	139	<1.0	3.7	0.36	0.94	<0.1	202	321	15.2	7.80	33.9	<0.1	8.9	<0.01	2.12	<0.01	22.0
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	143	<1.0	3.7	0.30	0.95	<0.1	207	318	19.1	7.80	32.0	<0.1	8.4	<0.01	2.60	<0.01	23.8
9/28/2017	DRY						DRY										DRY						
12/1/2017	DRY						DRY										DRY						
3/29/2018	DRY						DRY										DRY						
6/30/2018	DRY						DRY										DRY						
9/25/2018	DRY						DRY										DRY						
11/30/2018	DRY						DRY										DRY						
MW-3																							
10/20/2015	DRY						DRY										DRY						
3/9/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	234	<1.0	22.2	0.27	0.75	<0.1	399	603	47.6	7.50	65.3	<0.1	13.0	0.013	1.43	<0.01	21.1
6/7/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	348	<1.0	13.9	0.23	2.50	<0.1	473	729	20.0	7.33	109	<0.1	18.4	<0.01	<1.0	<0.01	36.0
9/28/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	207	98.9	11.0	0.189	<0.1	<0.1	1020	463	23.5	8.00	67.2	<0.1	10.6	<0.01	2.35	<0.01	70.3
12/1/2017	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	248	<1.0	22.6	0.267	0.752	<0.1	446	616	45.4	7.64	73.3	<0.1	14.2	<0.01	2.41	<0.01	44.9
3/29/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	317	<1.0	13.6	0.238	1.83	<0.1	438	688	24.4	7.64	91.2	<0.1	14.9	<0.01	1.65	<0.01	52.1
6/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	343	<1.0	11.1	0.257	2.94	<0.1	434	756	22.3	7.80	96.5	<0.1	15.7	<0.01	1.90	<0.01	59.2
9/25/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	248	<1.0	20.9	0.24	0.895	<0.1	NA	639	43.5	7.41	74.6	<0.1	14.4	<0.01	2.66	0.0108	46.4
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.1	248	NA	19.8	NA	NA	NA	NA	649	44.2	7.41	73.1	<0.1	14.0	<0.01	2.37	0.0110	46.5
MW-5																							
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.2	285	NA	7.58	NA	NA	NA	NA	642	17.9	7.40	91.0	<0.1	18.5	0.0198	1.59	<0.01	25.8
MW-6																							
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.2	324	NA	12.7	NA	NA	NA	NA	639	29.2	7.07	91.2	<0.1	18.1	1.03	4.39	<0.01	48.3
MW-7																							
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.2	266	NA	8.67	NA	NA	NA	NA	735	35.9	7.29	86.8	<0.1	16.8	0.0489	2.14	<0.01	24.0
MW-8																							
11/30/2018	<0.001	<0.001	<0.001	<0.003	<0.1	<0.103	260	NA	9.68	NA	NA	NA	NA	610	26.0	7.44	77.5	<0.1	16.1	0.200	3.21	<0.01	36.2
Pond 2																							
12/13/2018	NA	NA	NA	NA	NA	NA	773	58.7	8500	<0.1	<0.1	<0.1	NA	25000	25.9	7.29	185	NA	19.8	NA	43.1	NA	5530

Notes: MCL: maximum contaminant level NA: Not Applicable
mg/L: milligrams per liter

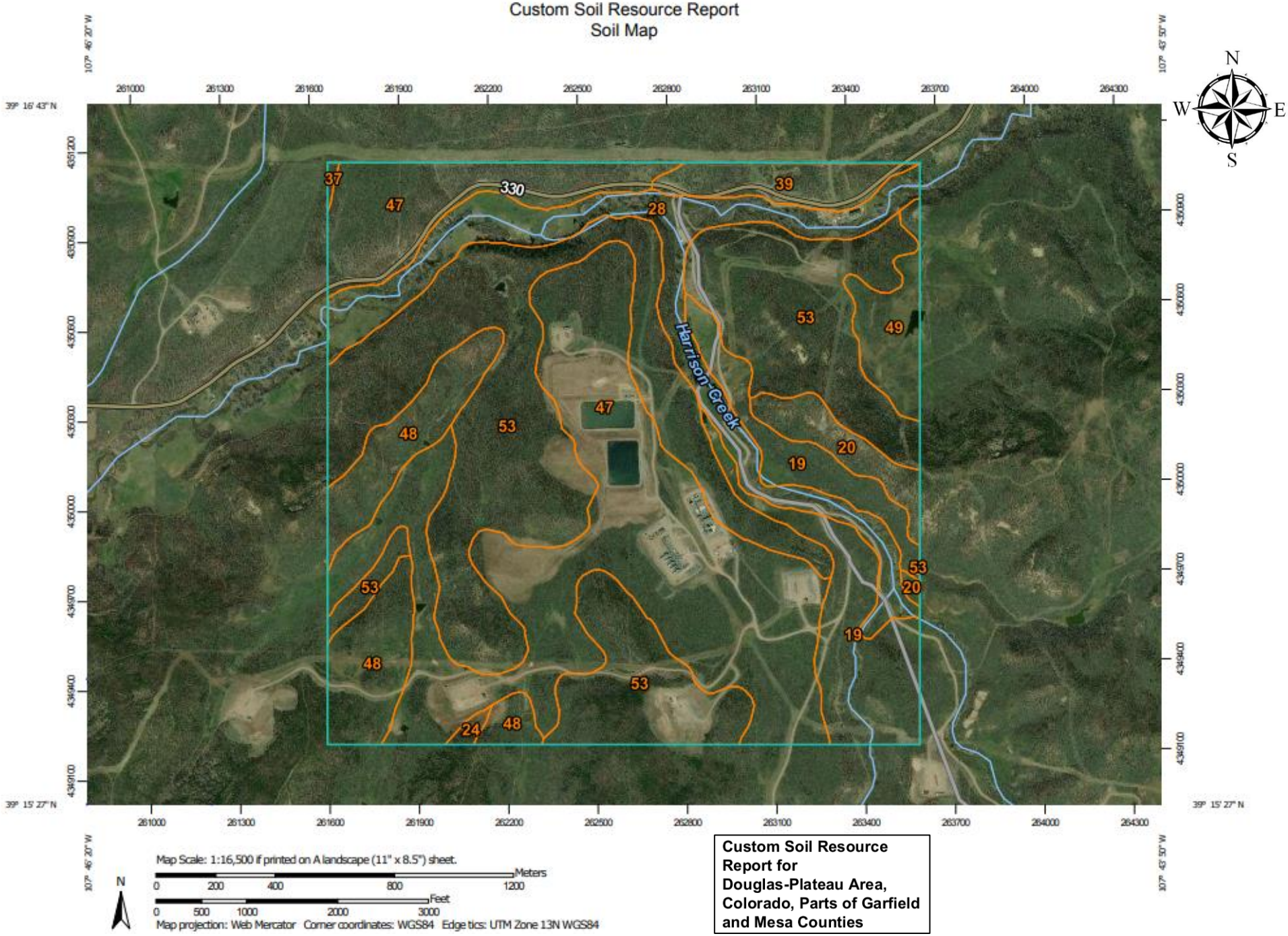
Figures

Project No. 018-089	Laramie Energy Harrison Creek Water Treatment Facility General Location Map	Legend Not Applicable	ENTRADA CONSULTING GROUP 330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure
Mapped By: BFB				1
Date: 11/14/18				



Project No. 018-089	Laramie Energy Harrison Creek Water Treatment Facility Regional Bedrock Geology USGS Carbondale 30' x 60' Quadrangle	Legend - Site Location and Access Road Tw – Wasatch Formation Qx – Quaternary Colluvium and Alluvium	ENTRADA CONSULTING GROUP 330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure
Mapped By: BFB				2
Date: 11/14/18				

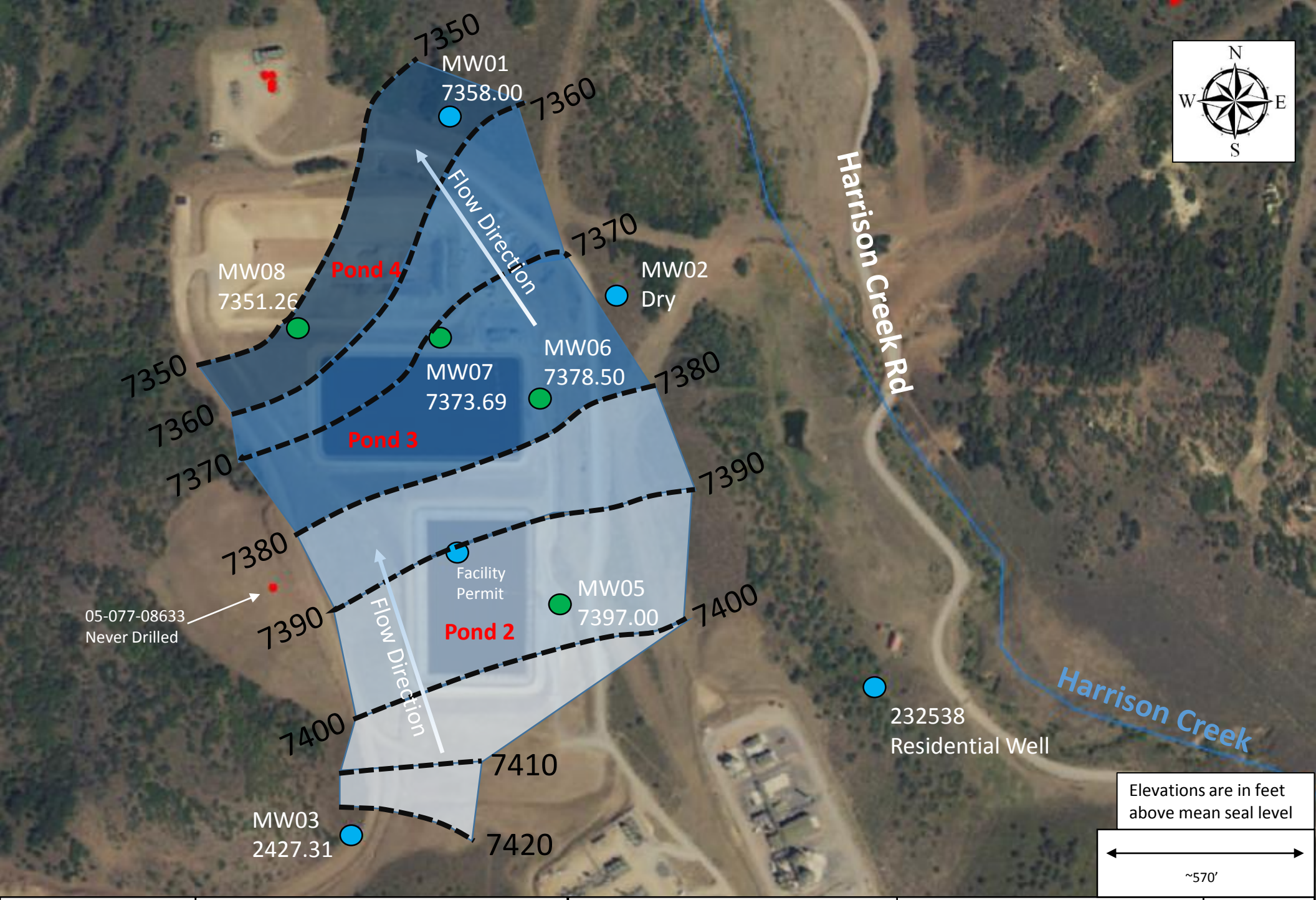
Custom Soil Resource Report
Soil Map



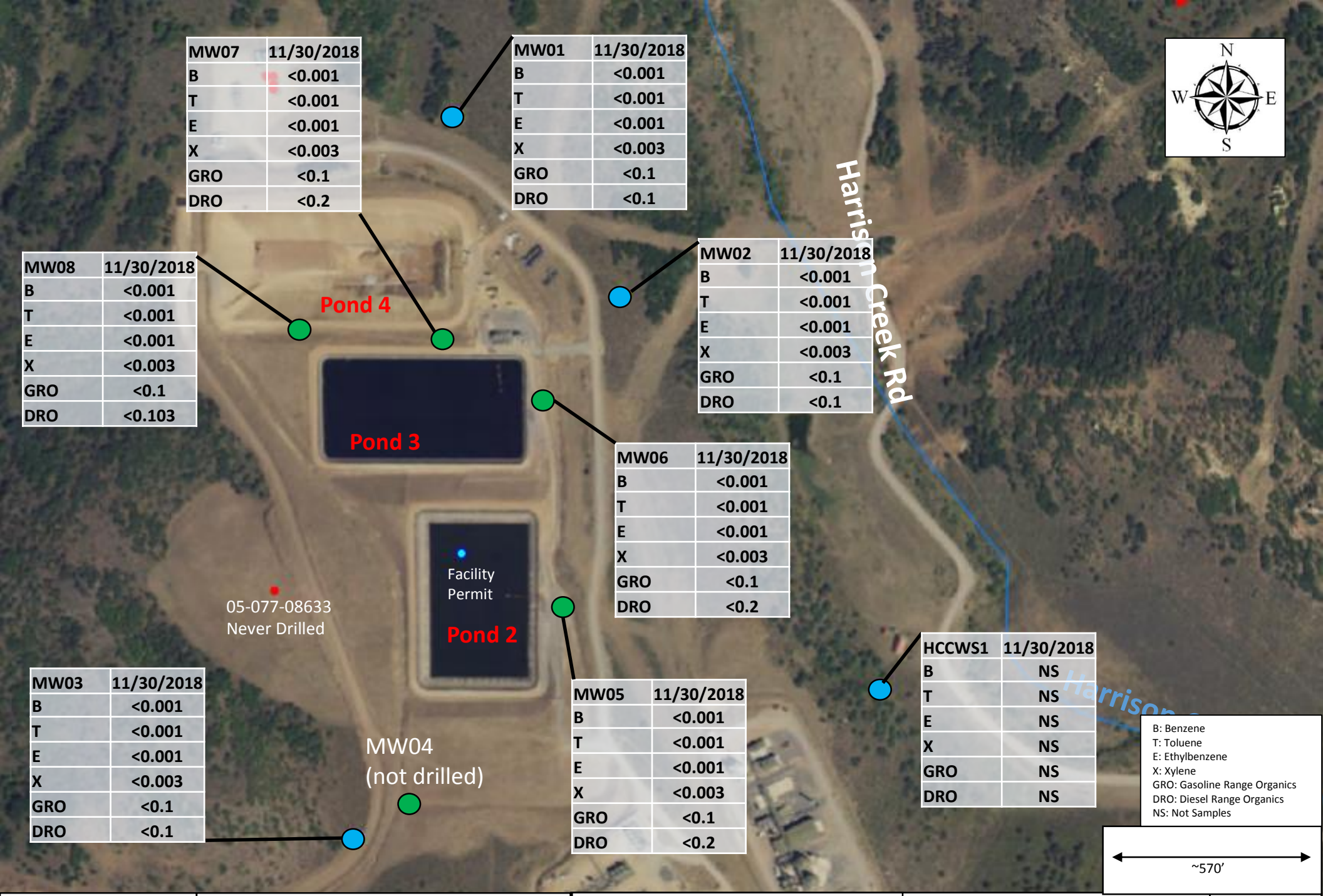
Map Scale: 1:16,500 if printed on A landscape (11" x 8.5") sheet.
Meters 0 200 400 800 1200
Feet 0 500 1000 2000 3000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

Custom Soil Resource Report for Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties

Project No. 018-089	Laramie Energy Harrison Creek Water Treatment Facility USDA-NRCS Custom Soil Resource Report Map	Legend 47 – Hesperus-Empedrado, moist-Pagoda complex 53 – Pagoda-Hesperus	ENTRADA CONSULTING GROUP 330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure 3
Mapped By: BFB				
Date: 11/14/18				



Project No. 018-089	Laramie Energy Harrison Creek Water Treatment Facility Potentiometric Surface Map November 2018	Legend 2015 Monitoring Well/Permit Location 2018 Monitoring Well/Permit Location Producing Well/Permit Location	ENTRADA CONSULTING GROUP 330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure
Mapped By: BFB				4
Date: 12/03/18				



Project No. 018-089	Laramie Energy Harrison Creek Water Treatment Facility Groundwater Analytical Results November 2018	Legend 2015 Monitoring Well/Permit Location 2018 Monitoring Well/Permit Location Producing Well/Permit Location	ENTRADA CONSULTING GROUP 330 Grand Avenue, Unit C Grand Junction, CO 81501 970-549-1015	Figure 5
Mapped By: BFB				
Date: 12/12/18				

Appendix A:

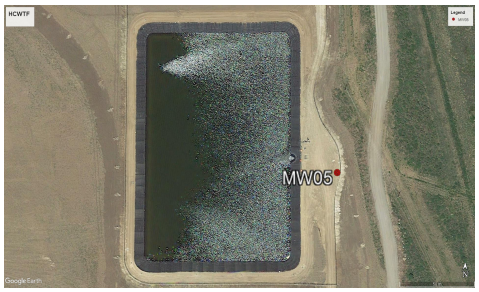
Boring Logs MW05, MW06, MW07, MW08

ENTRADA CONSULTING GROUP

Laramie Energy
760 Horizon Dr Suite 101
Grand Juntion, CO 81506

Harrison Creek WTF

MW05

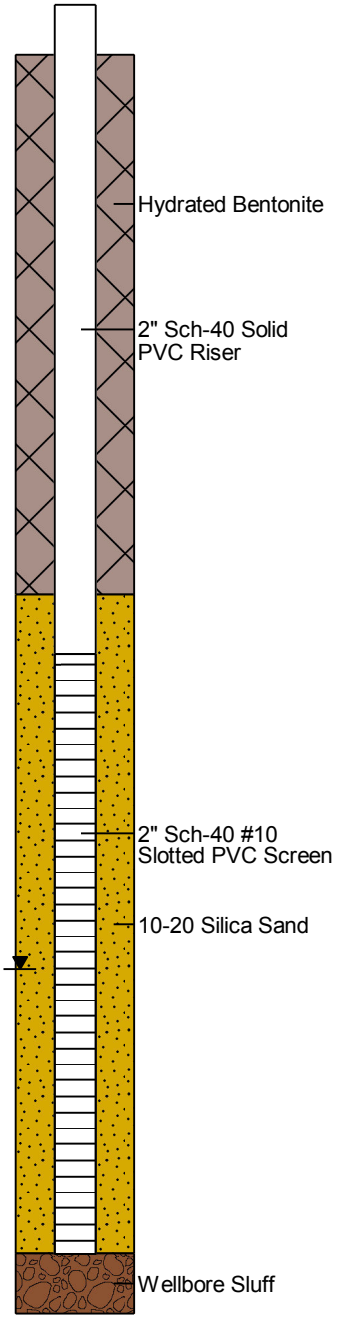


Date Started	: 11/19/18
Date Completed	: 11/19/18
Hole Diameter	: 4.25"
Drilling Method	: Solid Stem Auger
Sampling Method	: Split Spoon
Company Rep.	: L. Prescott
Northing Coord.	: 1530294.19 (NAD83 CO-N)
Easting Coord.	: 2362846.88
Survey By	: D.R. Griffin Assoc.
Logged By	: B. Baugh

Depth in Feet	Surf. Elev.7427.55	USCS	GRAPHIC	DESCRIPTION	Split Spoon Int.	Blow Count	Moisture	% Fines	PID (ppm)	Sample
0	7427.55			Surface Interval						
5	7422.55	GW		Light Brown dry medium grain sand w/gravel into red-brown moist medium grain sand	1	7 11 14	15	75	<20	
10	7417.55	CG		Angular sandy gravel into 6-8" well sorted medium grain sand. Moist	2	6 14 14	15	75	7.2	
15	7412.55	BR		Clayey Silt and fine sand w/andulgar gravel and cobbles. Basalt boulder likely encountered during drilling	3	15 40+	20	65	<1	
20	7407.55	GW		Compacted fine sand and silt, occasional gravel. Bottom 2" sandstone	4	32 32+	5	75	4.1	
25	7402.55	GW		Well sorted clayey silt and fine sand w/ trace gravels	5	6 8 24	25	90	4.1	
30	7397.55	GW		Well sorted medium grain sand, trace gravels. Very wet bottom 6"	6	4 23	100	90	1.8	
35	7392.55	SP		Very well sorted medium grain sand, trace gravels	7	3 3	100	90	22	
40	7387.55	SP		Silty clay into light brown silt, wet	8	8 9 20	100	95	0	
45										

Water at 30.5' below ground surface on 11/19/18
Water at 30.5' below ground surface on 11/21/18

MW05:
TOC Elev. 7430.22:



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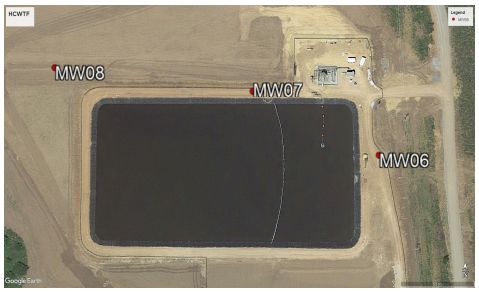
ENTRADA
CONSULTING GROUP

Laramie Energy
760 Horizon Dr Suite 101
Grand Juntion, CO 81506

Harrison Creek WTF

MW06

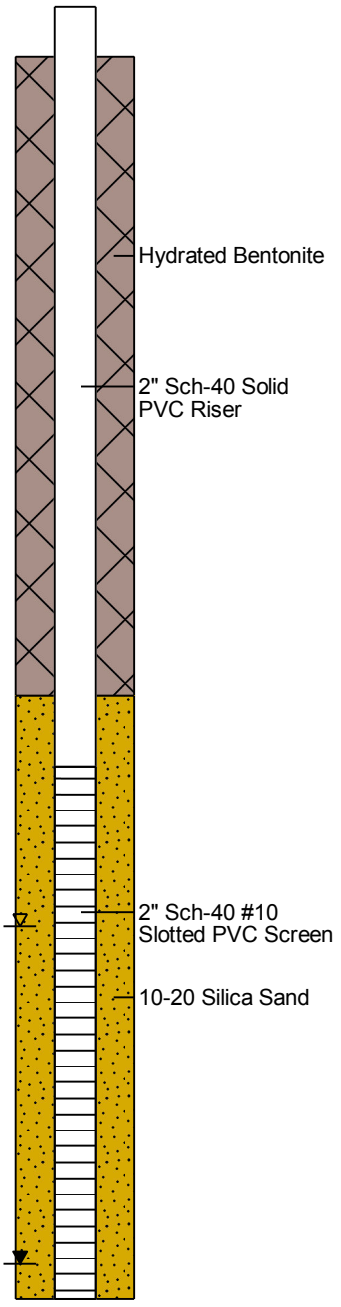


Date Started	: 11/19/18
Date Completed	: 11/19/18
Hole Diameter	: 4.25"
Drilling Method	: Solid Stem Auger
Sampling Method	: Split Spoon
Company Rep.	: L. Prescott
Northing Coord.	: 1530907.87 (NAD83 CO-N)
Easting Coord.	: 2362772.65
Survey By	: D.R. Griffin Assoc.
Logged By	: B. Baugh

Depth in Feet	Surf. Elev.7403.46	USCS	GRAPHIC	DESCRIPTION	Split Spoon Int.	Blow Count	Moisture	% Fines	PID (ppm)	Sample
0	7403.46			Surface Interval						
5	7398.46			Fine grain silty clay w/ trace evaporites. Highly plastic	1	2 2 3 4	20	90	<1	
10	7393.46			Fine grain very compacted silt and fine sand. Dry, high clay content	2	9 15 18	5	90	1.5	
15	7388.46	BR		Clayey silt and sand w/ angular gravels. Dry, low plasticity	3	8 18	10	75	3.4	
20	7383.46	GW		competent, Clayey sand w/gravel into well sorted medium grain channel sand. Basalt boulder likely encountered 17-20'	4	25 40+	20	60	<1	
25	7378.46			Split Spoon Refusal	5					
30	7373.46			Skipped sampling, subsurface too competent for split spoon	6					
35					7					

Water at 34' bgs 11/19/18
Water at 24.5' bgs 11/21/18

MW06:
TOC Elev. 7406.14:



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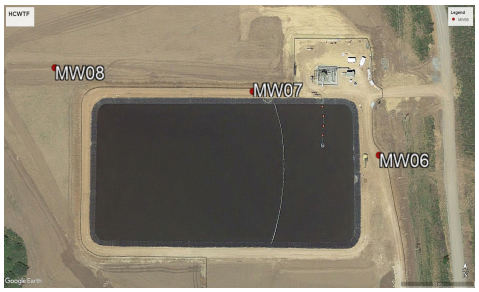
Grand Juntion, CO 81506

Harrison Creek WTF

MW07

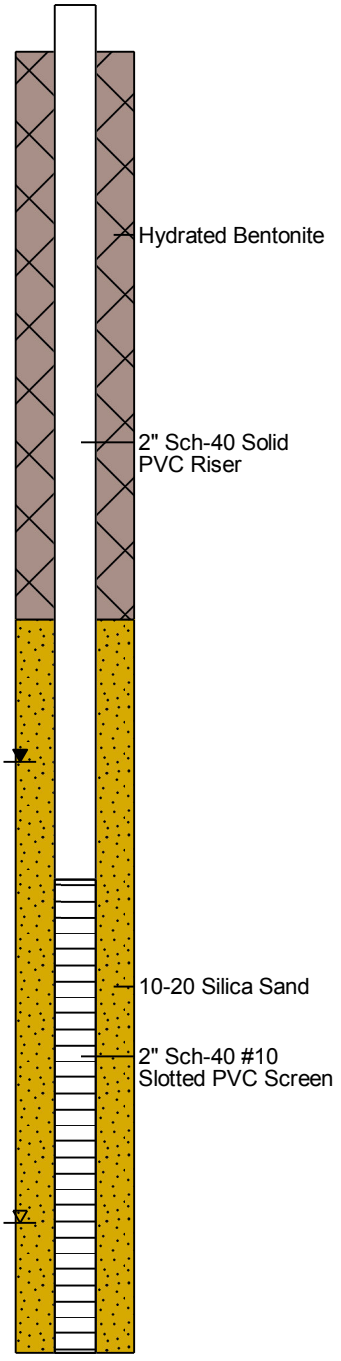


Date Started	: 11/20/18
Date Completed	: 11/20/18
Hole Diameter	: 4.25"
Drilling Method	: Solid Stem Auger
Sampling Method	: Split Spoon
Company Rep.	: L. Prescott
Northing Coord.	: 1531039.64 (NAD83 CO-N)
Easting Coord.	: 2362496.19
Survey By	: D.R. Griffin Assoc.
Logged By	: B. Baugh

Depth in Feet	Surf. Elev.7403.53	USCS	GRAPHIC	DESCRIPTION	Split Spoon Int.	Blow Count	Moisture	% Fines	PID (ppm)	Sample
0	7403.53			Surface Interval						
5	7398.53			homogenous brown clay, highly plastic, moist fill material	1	3 7 4	10	100	16.4	
10	7393.53			Dark brown homogenous silty clay, mild organic soil color and odor	2	6 8 6	15	90	<20	
15	7388.53	SP		Silty clay into very fine sand with trace gravels. Some modeling	3	5 5 8	5	90	<20	
20	7383.53	SW		Well sorted medium grain sand, moist. Basalt boulder likely encountered 17-18.5'	4	34+	15	15	<1	
25	7378.53			Skipped interval, subsurface too competent for split spoon	~~5~~					
30	7373.53			Clayey fine sand with trace subangular gravels, dry, competent	6	40+	15	70	23	
35	7368.53			light brown silty fine sand with trace gravels, dry	7	24	10	75	12	
40	7363.53			Competent gray siltstone, 1" revocery	8	40+	10	80	<1	
45	7358.53			Skipped interval, subsurface too competent for split spoon	~~9~~					
50	7353.53			Skipped interval, subsurface too competent for split spoon	~~10~~					
55					~~11~~					

Water at 48.5' bgs 11/20/18
Water at 30' bgs 11/21/18

MW07:
TOC Elev. 7406.68:



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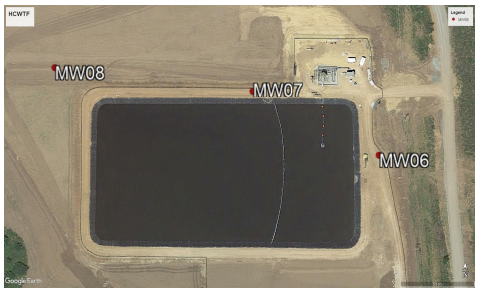
Grand Juntion, CO 81506

Harrison Creek WTF

MW08

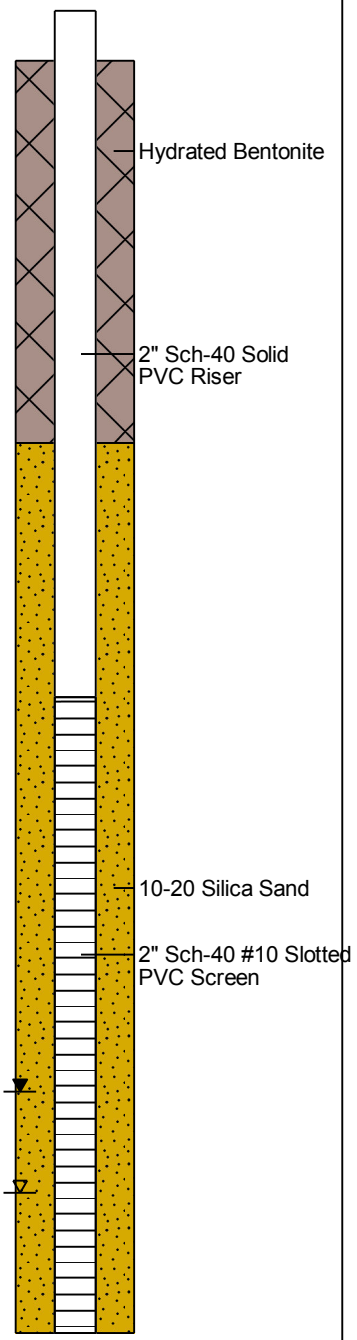


Date Started	: 11/21/18
Date Completed	: 11/21/18
Hole Diameter	: 4.25"
Drilling Method	: Solid Stem Auger
Sampling Method	: Split Spoon
Company Rep.	: L. Prescott
Northing Coord.	: 1531086.99 (NAD83 CO-N)
Easting Coord.	: 2362059.91
Survey By	: D.R. Griffin Assoc.
Logged By	: B. Baugh

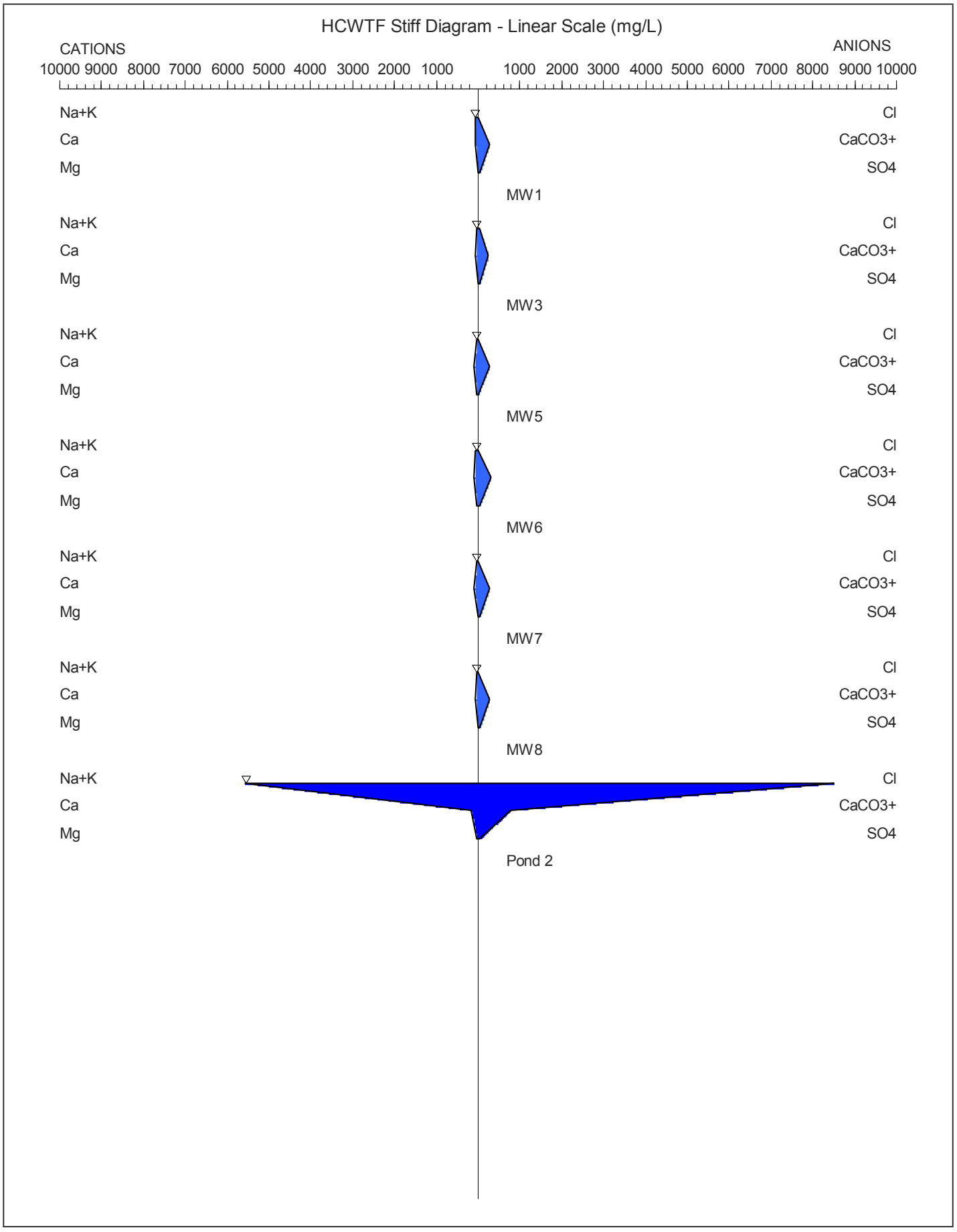
Depth in Feet	Surf. Elev.7392.92	USCS	GRAPHIC	DESCRIPTION	Split Spoon Int.	Blow Count	Moisture	% Fines	PID (ppm)	Sample
0	7392.92			Surface Interval						
5	7387.92	SP		brown fine sand, slight clay content with evaporite modeling. Dry	1	5 6 10	10	80	<20	
10	7382.92	GW		Fine sand with subrounded gravel, trace iron staining, 3" white sand lense	2	5 5 6	10	60	<20	
15	7377.92			Clayey fine sand with trace gravels, evaporite modeling, dry. Basalt boulder likely encountered 16-17'	3	5 6 22	10	75	29	
20	7372.92	GW		Fine to medium grain sand with trace gravels. 2" portion of basalt boulder. Moist, minor clay content	4	19 34+	15	75	8.7	
25	7367.92	SP		Well sorted, well rounded medium grain sand into 3" white quartz arenite sandstone	5	6 29	20	40	19	
30	7362.92	GW		Medium grain sand with trace gravels and angular basalt cobbles. No odor.	6	24 28+	15	50	66	
35	7357.92			Fine sand with trace gravels into 6" highly plastic clay	7	4 8 6	20	75	1.8	
40	7352.92	GW		Medium grain sand with basalt and sandstone gravels and cobbles	8	10 29	25	30	<1	
45	7347.92			Skipped interval, subsurface too competent for split spoon	9					
50		BR		Fine Sand and weathered bedrock, saturated	10	40+	100	30	<1	

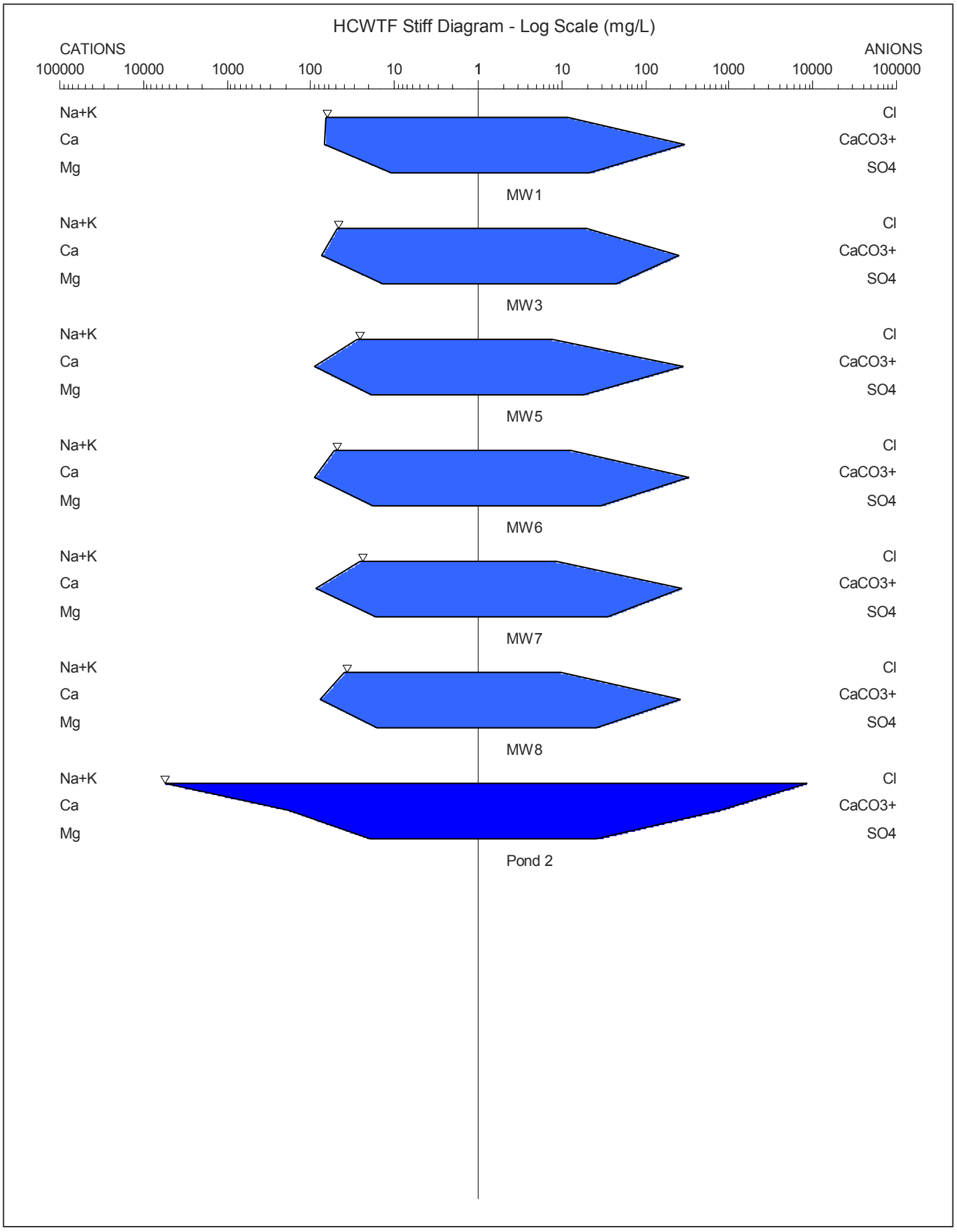
Water at 40.5' bgs 11/21/18
Water at 44.4' bgs 11/26/18

MW08:
TOC Elev. 7395.84:



Appendix B:
Stiff Diagrams


HCWTF Stiff Diagram - Linear Scale (mg/L)
CATIONS
ANIONS
10000 9000 8000 7000 6000 5000 4000 3000 2000 1000
1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
Na+K
Ca
Mg
Cl
CaCO3+
SO4
MW1
MW3
MW5
MW6
MW7
MW8
Pond 2


HCWTF Stiff Diagram - Log Scale (mg/L)
CATIONS
ANIONS
100000
10000
1000
100
10
1
10
100
1000
10000
100000
Na+K
Ca
Mg
Cl
CaCO3+
SO4
MW1
MW3
MW5
MW6
MW7
MW8
Pond 2

Appendix C:

Custom USDA Soil Resource Report

United States Department of Agriculture

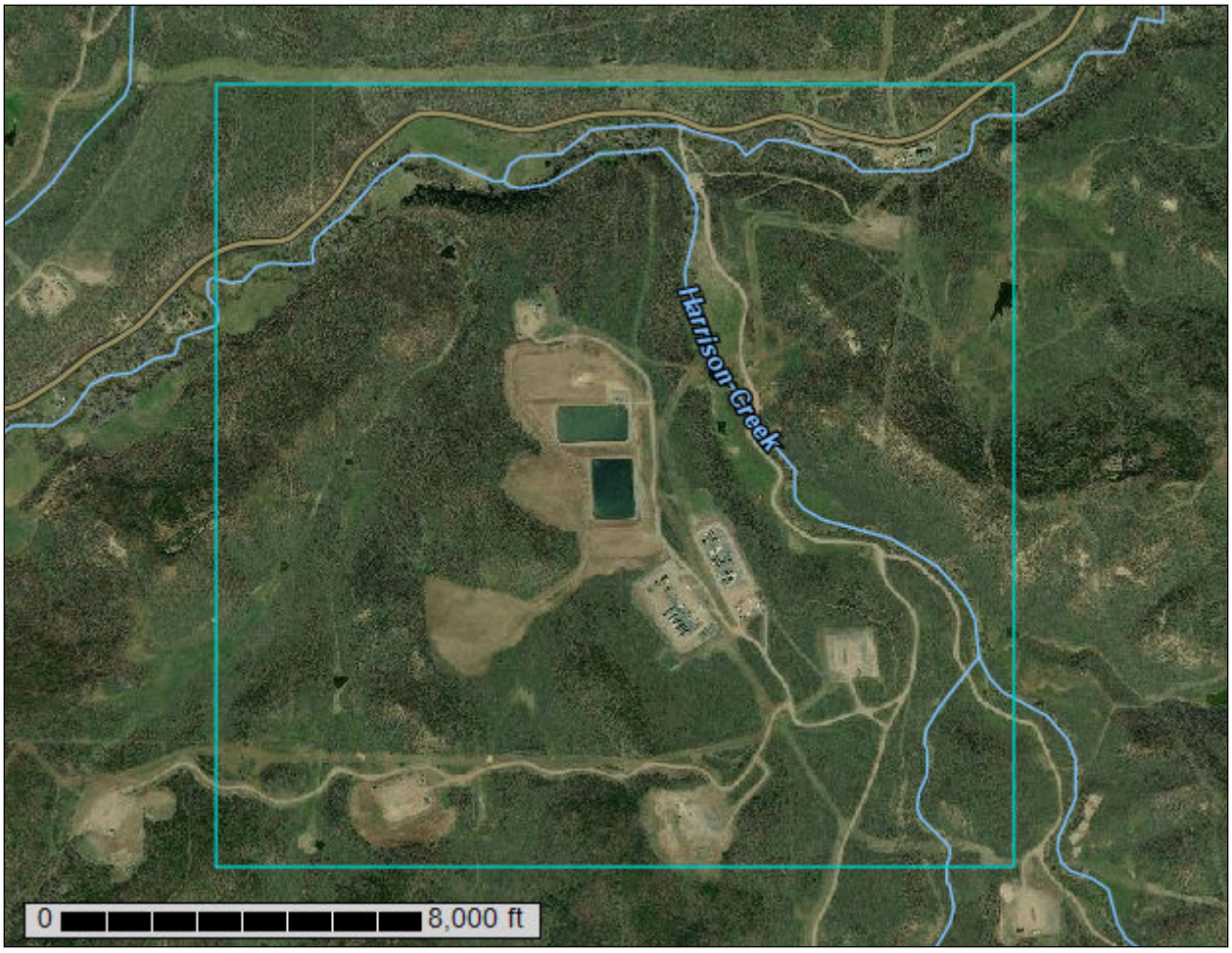
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties

HCWTF Soils Report



November 13, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

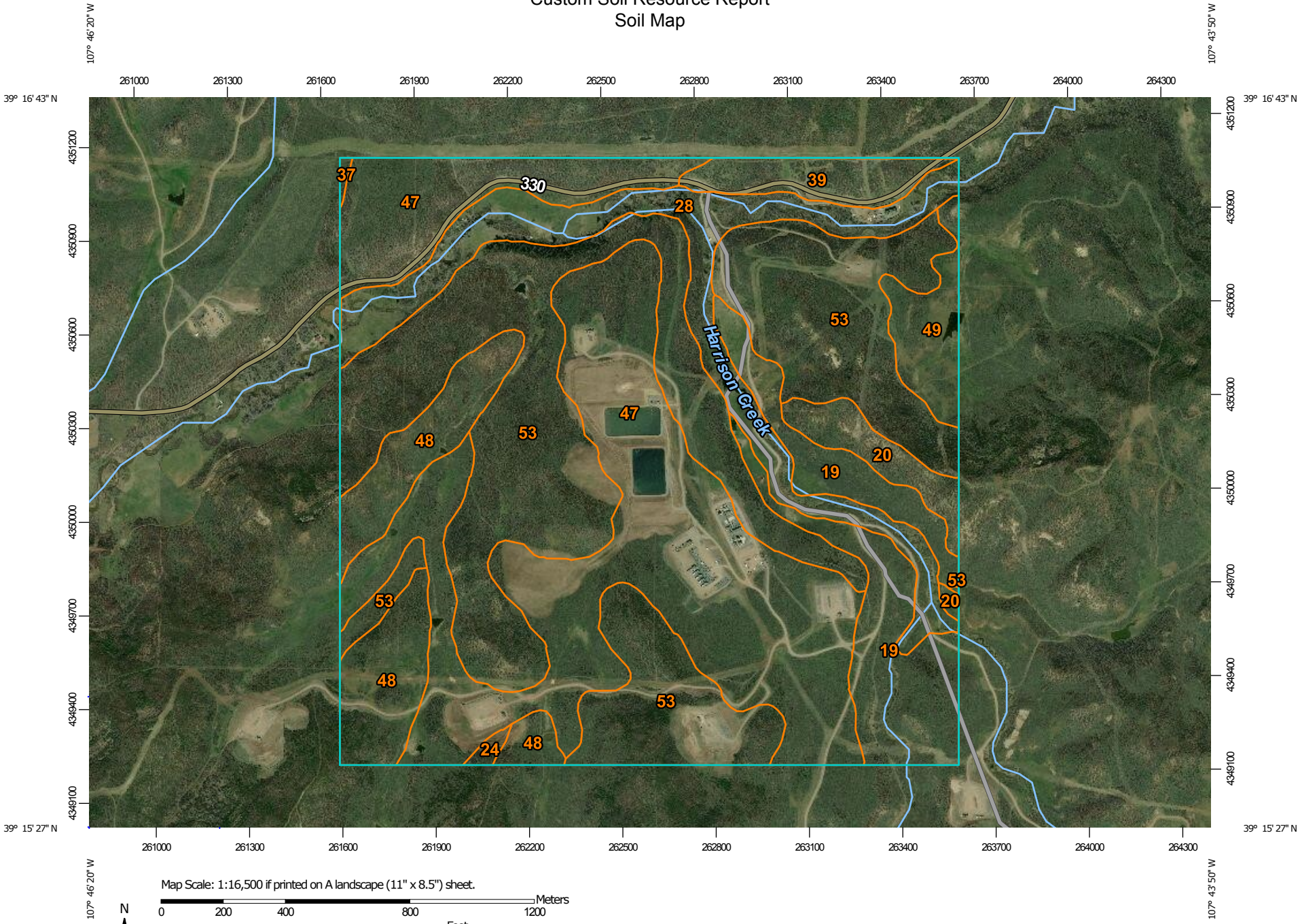
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:16,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties
Survey Area Data: Version 11, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jul 29, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Cerro silty clay loam, 6 to 12 percent slopes	82.7	8.6%
20	Cerro silty clay loam, 12 to 25 percent slopes	20.5	2.1%
24	Cochetopa-Clayburn complex, 12 to 40 percent slopes	2.0	0.2%
28	Cumulic Haploborolls, 1 to 3 percent slopes	96.6	10.1%
37	Fughes clay loam, 2 to 6 percent slopes	0.9	0.1%
39	Fughes-Hesperus complex, 3 to 12 percent slopes	24.4	2.5%
47	Hesperus-Empedrado, moist-Pagoda complex 5 to 35 percent slopes	302.8	31.6%
48	Hesperus-Empedrado, moist-Pagoda complex, 35 to 55 percent slopes	70.3	7.3%
49	Hesperus-Pagoda complex, 3 to 12 percent slopes	23.9	2.5%
53	Pagoda-Hesperus complex, 12 to 40 percent slopes	335.4	35.0%
Totals for Area of Interest		**959.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Douglas-Plateau Area, Colorado, Parts of Garfield and Mesa Counties

19—Cerro silty clay loam, 6 to 12 percent slopes

Map Unit Setting

National map unit symbol: jntw
Elevation: 6,600 to 7,000 feet
Frost-free period: 80 to 90 days
Farmland classification: Not prime farmland

Map Unit Composition

Cerro and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cerro

Setting

Landform: Hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Marine shales of the wasatch formation colluvium and/or marine shales of the wasatch formation residuum

Typical profile

H1 - 0 to 7 inches: silty clay loam
H2 - 7 to 12 inches: silty clay loam
H3 - 12 to 35 inches: silty clay
H4 - 35 to 60 inches: silty clay loam

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Deep Clay Loam (R048AY247CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 30 percent
Hydric soil rating: No

20—Cerro silty clay loam, 12 to 25 percent slopes

Map Unit Setting

National map unit symbol: jnty
Elevation: 7,500 to 8,000 feet
Mean annual precipitation: 14 to 22 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 65 to 110 days
Farmland classification: Not prime farmland

Map Unit Composition

Cerro and similar soils: 80 percent
Fughes and similar soils: 10 percent
Pagoda and similar soils: 5 percent
Wrayha and similar soils: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cerro

Setting

Landform: Hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Marine shales of the wasatch formation colluvium and/or marine shales of the wasatch formation residuum

Typical profile

A - 0 to 7 inches: silty clay loam
Bt1 - 7 to 12 inches: silty clay loam
Bt2 - 12 to 35 inches: silty clay
Bk - 35 to 60 inches: stony silty clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Deep Clay Loam (R048AY247CO)
Hydric soil rating: No

Description of Fughes

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from shale and/or localized mudflow deposits derived from shale

Typical profile

A - 0 to 7 inches: clay loam
Bt1 - 7 to 18 inches: clay loam
Bt2 - 18 to 50 inches: clay loam
C - 50 to 60 inches: silty clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6c
Hydrologic Soil Group: C
Ecological site: Brushy Loam (R048AY238CO)
Hydric soil rating: No

Description of Pagoda

Setting

Landform: Mudflows
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium derived from shale and/or colluvium derived from shale

Typical profile

A - 0 to 7 inches: clay loam
Bt1 - 7 to 17 inches: clay loam

Bt2 - 17 to 27 inches: clay
Bk - 27 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Brushy Loam (R048AY238CO)
Hydric soil rating: No

Description of Wrayha

Setting

Landform: Ridges
Landform position (two-dimensional): Footslope, backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Linear, concave
Across-slope shape: Convex, linear
Parent material: Wasatch formation residuum weathered from shale

Typical profile

A - 0 to 4 inches: stony sandy loam
C1 - 4 to 28 inches: clay loam
C2 - 28 to 60 inches: silty clay loam

Properties and qualities

Slope: 12 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Mountain Pinyon (F048AY448CO)
Hydric soil rating: No

24—Cochetopa-Clayburn complex, 12 to 40 percent slopes

Map Unit Setting

National map unit symbol: jnv2
Elevation: 7,800 to 8,800 feet
Mean annual precipitation: 22 to 25 inches
Frost-free period: 55 to 70 days
Farmland classification: Not prime farmland

Map Unit Composition

Cochetopa and similar soils: 50 percent
Clayburn and similar soils: 20 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cochetopa

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Toeslope, footslope, backslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Concave, convex
Across-slope shape: Linear
Parent material: Localized alluvium derived from shale and/or colluvium derived from shale

Typical profile

H1 - 0 to 20 inches: clay loam
H2 - 20 to 33 inches: clay loam
H3 - 33 to 45 inches: clay
H4 - 45 to 60 inches: clay loam

Properties and qualities

Slope: 12 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Clayburn

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Mountainflank, side slope
Down-slope shape: Convex, concave
Across-slope shape: Linear
Parent material: Colluvium derived from sandstone and shale

Typical profile

H1 - 0 to 13 inches: loam
H2 - 13 to 46 inches: clay loam
H3 - 46 to 60 inches: loam

Properties and qualities

Slope: 12 to 40 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 30 percent
Hydric soil rating: No

28—Cumulic Haploborolls, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: jnv6
Elevation: 5,800 to 7,400 feet

Appendix D:
Laboratory Results

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 17, 2018

Entrada Consulting Group

Sample Delivery Group:	L1048912
Samples Received:	12/01/2018
Project Number:	
Description:	HCWTF
Site:	HCWTF
Report To:	Robert Stockton 240 Mesa Avenue Grand Junction, CO 81501

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

MW-1 L1048912-01 GW

Collected by: Robert Stockton | Collected date/time: 11/30/18 00:00 | Received date/time: 12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 12:34	12/14/18 12:34	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1210127	1	12/12/18 18:42	12/12/18 18:42	MJA
Wet Chemistry by Method 9056A	WG1204881	1	12/04/18 22:30	12/04/18 22:30	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 14:55	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1206845	1	12/07/18 21:42	12/07/18 21:42	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204722	1	12/03/18 15:25	12/03/18 15:25	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1205276	1	12/04/18 10:32	12/06/18 12:53	TH

MW-3 L1048912-02 GW

Collected by: Robert Stockton | Collected date/time: 11/30/18 00:00 | Received date/time: 12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 12:51	12/14/18 12:51	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1204684	1	12/02/18 11:10	12/02/18 11:10	KK
Wet Chemistry by Method 9056A	WG1204881	1	12/04/18 22:41	12/04/18 22:41	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 14:58	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1206845	1	12/07/18 22:04	12/07/18 22:04	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204722	1	12/03/18 15:45	12/03/18 15:45	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1205276	1	12/04/18 10:32	12/06/18 13:11	TH

MW-5 L1048912-03 GW

Collected by: Robert Stockton | Collected date/time: 11/30/18 00:00 | Received date/time: 12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 12:59	12/14/18 12:59	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1204684	1	12/02/18 11:10	12/02/18 11:10	KK
Wet Chemistry by Method 9056A	WG1204881	1	12/04/18 22:52	12/04/18 22:52	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 19:47	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1206845	1	12/07/18 22:27	12/07/18 22:27	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204722	1	12/03/18 16:06	12/03/18 16:06	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1205276	2	12/04/18 10:32	12/06/18 13:28	TH

MW-6 L1048912-04 GW

Collected by: Robert Stockton | Collected date/time: 11/30/18 00:00 | Received date/time: 12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 13:07	12/14/18 13:07	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1204684	1	12/02/18 11:10	12/02/18 11:10	KK
Wet Chemistry by Method 9056A	WG1204881	1	12/04/18 23:03	12/04/18 23:03	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 19:50	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1206845	1	12/07/18 22:50	12/07/18 22:50	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204722	1	12/03/18 17:40	12/03/18 17:40	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1205276	2	12/04/18 10:32	12/06/18 13:46	TH

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

MW-7 L1048912-05 GW

Collected by	Collected date/time	Received date/time
Robert Stockton	11/30/18 00:00	12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 13:15	12/14/18 13:15	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1204684	1	12/02/18 11:10	12/02/18 11:10	KK
Wet Chemistry by Method 9056A	WG1204881	1	12/04/18 23:35	12/04/18 23:35	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 19:53	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1206845	1	12/07/18 23:13	12/07/18 23:13	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204558	1	12/03/18 05:45	12/03/18 05:45	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1205276	2	12/04/18 10:32	12/06/18 14:03	TH

MW-8 L1048912-06 GW

Collected by	Collected date/time	Received date/time
Robert Stockton	11/30/18 00:00	12/01/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1210554	1	12/14/18 13:23	12/14/18 13:23	GB
Wet Chemistry by Method 9040C	WG1205705	1	12/05/18 14:13	12/05/18 14:13	KBW
Wet Chemistry by Method 9050A	WG1204684	1	12/02/18 11:10	12/02/18 11:10	KK
Wet Chemistry by Method 9056A	WG1204881	1	12/05/18 00:08	12/05/18 00:08	ELN
Metals (ICP) by Method 6010B	WG1205359	1	12/05/18 09:15	12/05/18 19:56	ST
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1208006	1	12/10/18 08:39	12/10/18 08:39	JAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1204558	1	12/03/18 06:04	12/03/18 06:04	TJJ
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG1206891	1.03	12/06/18 22:38	12/07/18 16:29	MTJ

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 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	287		20.0	1	12/14/2018 12:34	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 12:34	WG1210554

Sample Narrative:

L1048912-01 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.61	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-01 WG1205705: 7.61 at 14.4C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	673		10.0	1	12/12/2018 18:42	WG1210127

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	11.7		1.00	1	12/04/2018 22:30	WG1204881
Sulfate	21.1		5.00	1	12/04/2018 22:30	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	68.4		1.00	1	12/05/2018 14:55	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 14:55	WG1205359
Magnesium,Dissolved	10.8		1.00	1	12/05/2018 14:55	WG1205359
Manganese,Dissolved	ND		0.0100	1	12/05/2018 14:55	WG1205359
Potassium,Dissolved	2.28		1.00	1	12/05/2018 14:55	WG1205359
Selenium,Dissolved	ND		0.0100	1	12/05/2018 14:55	WG1205359
Sodium,Dissolved	62.7		1.00	1	12/05/2018 14:55	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/07/2018 21:42	WG1206845
(S) a,a,a-Trifluorotoluene(FID)	*97.1*		*78.0-120*		*12/07/2018 21:42*	WG1206845

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 15:25	WG1204722
Toluene	ND		0.00100	1	12/03/2018 15:25	WG1204722
Ethylbenzene	ND		0.00100	1	12/03/2018 15:25	WG1204722
Total Xylenes	ND		0.00300	1	12/03/2018 15:25	WG1204722
(S) Toluene-d8	*98.6*		*80.0-120*		*12/03/2018 15:25*	WG1204722
(S) Dibromofluoromethane	*96.7*		*75.0-120*		*12/03/2018 15:25*	WG1204722
(S) a,a,a-Trifluorotoluene	*102*		*80.0-120*		*12/03/2018 15:25*	WG1204722
(S) 4-Bromofluorobenzene	*104*		*77.0-126*		*12/03/2018 15:25*	WG1204722

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		0.100	1	12/06/2018 12:53	WG1205276
(S) o-Terphenyl	*94.2*		*31.0-160*		*12/06/2018 12:53*	WG1205276

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	248		20.0	1	12/14/2018 12:51	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 12:51	WG1210554

Sample Narrative:

L1048912-02 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.41	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-02 WG1205705: 7.41 at 14.4C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	649		10.0	1	12/02/2018 11:10	WG1204684

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	19.8		1.00	1	12/04/2018 22:41	WG1204881
Sulfate	44.2		5.00	1	12/04/2018 22:41	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	73.1		1.00	1	12/05/2018 14:58	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 14:58	WG1205359
Magnesium,Dissolved	14.0		1.00	1	12/05/2018 14:58	WG1205359
Manganese,Dissolved	ND		0.0100	1	12/05/2018 14:58	WG1205359
Potassium,Dissolved	2.37		1.00	1	12/05/2018 14:58	WG1205359
Selenium,Dissolved	0.0110		0.0100	1	12/05/2018 14:58	WG1205359
Sodium,Dissolved	46.5		1.00	1	12/05/2018 14:58	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/07/2018 22:04	WG1206845
(S) a,a,a-Trifluorotoluene(FID)	*97.0*		*78.0-120*		*12/07/2018 22:04*	WG1206845

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 15:45	WG1204722
Toluene	ND		0.00100	1	12/03/2018 15:45	WG1204722
Ethylbenzene	ND		0.00100	1	12/03/2018 15:45	WG1204722
Total Xylenes	ND		0.00300	1	12/03/2018 15:45	WG1204722
(S) Toluene-d8	*99.3*		*80.0-120*		*12/03/2018 15:45*	WG1204722
(S) Dibromofluoromethane	*96.9*		*75.0-120*		*12/03/2018 15:45*	WG1204722
(S) a,a,a-Trifluorotoluene	*103*		*80.0-120*		*12/03/2018 15:45*	WG1204722
(S) 4-Bromofluorobenzene	*109*		*77.0-126*		*12/03/2018 15:45*	WG1204722

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) High Fraction	ND		0.100	1	12/06/2018 13:11	WG1205276
(S) o-Terphenyl	*93.2*		*31.0-160*		*12/06/2018 13:11*	WG1205276

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	285		20.0	1	12/14/2018 12:59	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 12:59	WG1210554

Sample Narrative:

L1048912-03 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.40	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-03 WG1205705: 7.4 at 14.5C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	642		10.0	1	12/02/2018 11:10	WG1204684

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	7.58		1.00	1	12/04/2018 22:52	WG1204881
Sulfate	17.9		5.00	1	12/04/2018 22:52	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	91.0		1.00	1	12/05/2018 19:47	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 19:47	WG1205359
Magnesium,Dissolved	18.5		1.00	1	12/05/2018 19:47	WG1205359
Manganese,Dissolved	0.0198		0.0100	1	12/05/2018 19:47	WG1205359
Potassium,Dissolved	1.59		1.00	1	12/05/2018 19:47	WG1205359
Selenium,Dissolved	ND		0.0100	1	12/05/2018 19:47	WG1205359
Sodium,Dissolved	25.8		1.00	1	12/05/2018 19:47	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/07/2018 22:27	WG1206845
(S) a,a,a-Trifluorotoluene(FID)	*97.3*		*78.0-120*		*12/07/2018 22:27*	WG1206845

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 16:06	WG1204722
Toluene	ND		0.00100	1	12/03/2018 16:06	WG1204722
Ethylbenzene	ND		0.00100	1	12/03/2018 16:06	WG1204722
Total Xylenes	ND		0.00300	1	12/03/2018 16:06	WG1204722
(S) Toluene-d8	*102*		*80.0-120*		*12/03/2018 16:06*	WG1204722
(S) Dibromofluoromethane	*95.7*		*75.0-120*		*12/03/2018 16:06*	WG1204722
(S) a,a,a-Trifluorotoluene	*105*		*80.0-120*		*12/03/2018 16:06*	WG1204722
(S) 4-Bromofluorobenzene	*105*		*77.0-126*		*12/03/2018 16:06*	WG1204722

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) High Fraction	ND		0.200	2	12/06/2018 13:28	WG1205276
(S) o-Terphenyl	*69.0*		*31.0-160*		*12/06/2018 13:28*	WG1205276

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	324		20.0	1	12/14/2018 13:07	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 13:07	WG1210554

Sample Narrative:

L1048912-04 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.07	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-04 WG1205705: 7.07 at 15.9C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	639		10.0	1	12/02/2018 11:10	WG1204684

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.7		1.00	1	12/04/2018 23:03	WG1204881
Sulfate	29.2		5.00	1	12/04/2018 23:03	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	91.2		1.00	1	12/05/2018 19:50	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 19:50	WG1205359
Magnesium,Dissolved	18.1		1.00	1	12/05/2018 19:50	WG1205359
Manganese,Dissolved	1.03		0.0100	1	12/05/2018 19:50	WG1205359
Potassium,Dissolved	4.39		1.00	1	12/05/2018 19:50	WG1205359
Selenium,Dissolved	ND		0.0100	1	12/05/2018 19:50	WG1205359
Sodium,Dissolved	48.3		1.00	1	12/05/2018 19:50	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/07/2018 22:50	WG1206845
(S) a,a,a-Trifluorotoluene(FID)	*97.5*		*78.0-120*		*12/07/2018 22:50*	WG1206845

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 17:40	WG1204722
Toluene	ND		0.00100	1	12/03/2018 17:40	WG1204722
Ethylbenzene	ND		0.00100	1	12/03/2018 17:40	WG1204722
Total Xylenes	ND		0.00300	1	12/03/2018 17:40	WG1204722
(S) Toluene-d8	*100*		*80.0-120*		*12/03/2018 17:40*	WG1204722
(S) Dibromofluoromethane	*94.9*		*75.0-120*		*12/03/2018 17:40*	WG1204722
(S) a,a,a-Trifluorotoluene	*104*		*80.0-120*		*12/03/2018 17:40*	WG1204722
(S) 4-Bromofluorobenzene	*107*		*77.0-126*		*12/03/2018 17:40*	WG1204722

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) High Fraction	ND		0.200	2	12/06/2018 13:46	WG1205276
(S) o-Terphenyl	*76.5*		*31.0-160*		*12/06/2018 13:46*	WG1205276

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	266		20.0	1	12/14/2018 13:15	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 13:15	WG1210554

Sample Narrative:

L1048912-05 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.29	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-05 WG1205705: 7.29 at 16.5C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	735		10.0	1	12/02/2018 11:10	WG1204684

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	8.67		1.00	1	12/04/2018 23:35	WG1204881
Sulfate	35.9		5.00	1	12/04/2018 23:35	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	86.8		1.00	1	12/05/2018 19:53	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 19:53	WG1205359
Magnesium,Dissolved	16.8		1.00	1	12/05/2018 19:53	WG1205359
Manganese,Dissolved	0.0489		0.0100	1	12/05/2018 19:53	WG1205359
Potassium,Dissolved	2.14		1.00	1	12/05/2018 19:53	WG1205359
Selenium,Dissolved	ND		0.0100	1	12/05/2018 19:53	WG1205359
Sodium,Dissolved	24.0		1.00	1	12/05/2018 19:53	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/07/2018 23:13	WG1206845
(S) a,a,a-Trifluorotoluene(FID)	*97.3*		*78.0-120*		*12/07/2018 23:13*	WG1206845

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 05:45	WG1204558
Toluene	ND		0.00100	1	12/03/2018 05:45	WG1204558
Ethylbenzene	ND		0.00100	1	12/03/2018 05:45	WG1204558
Total Xylenes	ND		0.00300	1	12/03/2018 05:45	WG1204558
(S) Toluene-d8	*103*		*80.0-120*		*12/03/2018 05:45*	WG1204558
(S) Dibromofluoromethane	*99.1*		*75.0-120*		*12/03/2018 05:45*	WG1204558
(S) a,a,a-Trifluorotoluene	*106*		*80.0-120*		*12/03/2018 05:45*	WG1204558
(S) 4-Bromofluorobenzene	*102*		*77.0-126*		*12/03/2018 05:45*	WG1204558

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) High Fraction	ND		0.200	2	12/06/2018 14:03	WG1205276
(S) o-Terphenyl	*192*	J1	*31.0-160*		*12/06/2018 14:03*	WG1205276

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	260		20.0	1	12/14/2018 13:23	WG1210554
Alkalinity,Carbonate	ND		20.0	1	12/14/2018 13:23	WG1210554

Sample Narrative:

L1048912-06 WG1210554: Endpoint pH 4.5 headspace

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.44	T8	1	12/05/2018 14:13	WG1205705

Sample Narrative:

L1048912-06 WG1205705: 7.44 at 16.5C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	610		10.0	1	12/02/2018 11:10	WG1204684

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.68		1.00	1	12/05/2018 00:08	WG1204881
Sulfate	26.0		5.00	1	12/05/2018 00:08	WG1204881

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium,Dissolved	77.5		1.00	1	12/05/2018 19:56	WG1205359
Iron,Dissolved	ND		0.100	1	12/05/2018 19:56	WG1205359
Magnesium,Dissolved	16.1		1.00	1	12/05/2018 19:56	WG1205359
Manganese,Dissolved	0.200		0.0100	1	12/05/2018 19:56	WG1205359
Potassium,Dissolved	3.21		1.00	1	12/05/2018 19:56	WG1205359
Selenium,Dissolved	ND		0.0100	1	12/05/2018 19:56	WG1205359
Sodium,Dissolved	36.2		1.00	1	12/05/2018 19:56	WG1205359

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
TPH (GC/FID) Low Fraction	ND		0.100	1	12/10/2018 08:39	WG1208006
(S) a,a,a-Trifluorotoluene(FID)	*105*		*78.0-120*		*12/10/2018 08:39*	WG1208006

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	12/03/2018 06:04	WG1204558
Toluene	ND		0.00100	1	12/03/2018 06:04	WG1204558
Ethylbenzene	ND		0.00100	1	12/03/2018 06:04	WG1204558
Total Xylenes	ND		0.00300	1	12/03/2018 06:04	WG1204558
(S) Toluene-d8	*109*		*80.0-120*		*12/03/2018 06:04*	WG1204558
(S) Dibromofluoromethane	*93.8*		*75.0-120*		*12/03/2018 06:04*	WG1204558
(S) a,a,a-Trifluorotoluene	*109*		*80.0-120*		*12/03/2018 06:04*	WG1204558
(S) 4-Bromofluorobenzene	*105*		*77.0-126*		*12/03/2018 06:04*	WG1204558

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		0.103	1.03	12/07/2018 16:29	WG1206891
(S) o-Terphenyl	*27.5*	J2	*31.0-160*		*12/07/2018 16:29*	WG1206891

Method Blank (MB)

(MB) R3368791-1 12/14/18 12:12

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	3.37	J	2.71	20.0
Alkalinity,Carbonate	U		2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1048912-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1048912-01 12/14/18 12:34 • (DUP) R3368791-3 12/14/18 12:43

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	287	285	1	0.940		20
Alkalinity,Carbonate	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

L1051069-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1051069-03 12/14/18 15:52 • (DUP) R3368791-6 12/14/18 15:59

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	7.57	7.78	1	2.73	J	20
Alkalinity,Carbonate	U	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3368791-5 12/14/18 13:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	97.2	97.2	85.0-115	

Laboratory Control Sample (LCS)

(LCS) R3368791-5 12/14/18 13:45

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier

Sample Narrative:

LCS: Endpoint pH 4.5

L1048854-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1048854-02 12/05/18 14:13 • (DUP) R3365495-3 12/05/18 14:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.39	7.31	1	1.09	J3	1

Sample Narrative:

OS: 7.39 at 16.7C

DUP: 7.31 at 17.1C

L1049333-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1049333-01 12/05/18 14:13 • (DUP) R3365495-4 12/05/18 14:13

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.04	8.06	1	0.248		1

Sample Narrative:

OS: 8.04 at 17.5C

DUP: 8.06 at 17.5C

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

(LCS) R3365495-1 12/05/18 14:13 • (LCSD) R3365495-2 12/05/18 14:13

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	su	su	su	%	%	%			%	%
pH	10.0	9.97	9.97	99.7	99.7	99.0-101			0.000	1

Sample Narrative:

LCS: 9.97 at 16.6C

LCSD: 9.97 at 17C

Method Blank (MB)

(MB) R3364669-1 12/02/18 11:10

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

L1048764-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1048764-01 12/02/18 11:10 • (DUP) R3364669-3 12/02/18 11:10

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	591	619	1	4.63		20

Laboratory Control Sample (LCS)

(LCS) R3364669-2 12/02/18 11:10

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	877	864	98.5	90.0-110	

Method Blank (MB)

(MB) R3367889-1 12/12/18 18:42

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

L1048912-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1048912-01 12/12/18 18:42 • (DUP) R3367889-3 12/12/18 18:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	673	669	1	0.596		20

L1052034-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1052034-02 12/12/18 18:42 • (DUP) R3367889-4 12/12/18 18:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	umhos/cm	umhos/cm		%		%
Specific Conductance	807	804	1	0.372		20

Laboratory Control Sample (LCS)

(LCS) R3367889-2 12/12/18 18:42

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	umhos/cm	umhos/cm	%	%	
Specific Conductance	877	875	99.8	90.0-110	

Method Blank (MB)

(MB) R3365401-1 12/04/18 18:27

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.0519	1.00
Sulfate	U		0.0774	5.00

L1048912-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1048912-05 12/04/18 23:35 • (DUP) R3365401-5 12/04/18 23:46

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8.67	9.05	1	4.36		15
Sulfate	35.9	36.3	1	1.26		15

L1048864-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1048864-07 12/04/18 21:25 • (DUP) R3365401-7 12/05/18 10:30

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	16.3	16.4	1	0.250		15
Sulfate	28.5	28.5	1	0.133		15

Laboratory Control Sample (LCS)

(LCS) R3365401-2 12/04/18 18:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.7	99.3	80.0-120	
Sulfate	40.0	39.7	99.3	80.0-120	

L1048864-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1048864-07 12/04/18 21:25 • (MS) R3365401-3 12/04/18 21:47 • (MSD) R3365401-4 12/04/18 21:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	16.3	63.6	64.3	94.5	95.9	1	80.0-120			1.07	15
Sulfate	50.0	28.5	73.7	73.3	90.4	89.5	1	80.0-120			0.582	15

L1048912-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1048912-05 12/04/18 23:35 • (MS) R3365401-6 12/04/18 23:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	8.67	56.8	96.3	1	80.0-120	
Sulfate	50.0	35.9	80.3	88.8	1	80.0-120	

Method Blank (MB)

(MB) R3365588-1 12/05/18 14:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium,Dissolved	U		0.0463	1.00
Iron,Dissolved	U		0.0141	0.100
Magnesium,Dissolved	0.0154	J	0.0111	1.00
Manganese,Dissolved	U		0.00120	0.0100
Potassium,Dissolved	U		0.102	1.00
Selenium,Dissolved	U		0.00740	0.0100
Sodium,Dissolved	0.212	J	0.0985	1.00

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

(LCS) R3365588-2 12/05/18 14:36 • (LCSD) R3365588-3 12/05/18 14:38

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 %
Calcium,Dissolved	10.0	9.27	9.27	92.7	92.7	80.0-120			0.0131	20
Iron,Dissolved	10.0	9.66	9.60	96.6	96.0	80.0-120			0.649	20
Magnesium,Dissolved	10.0	8.96	8.97	89.6	89.7	80.0-120			0.0233	20
Manganese,Dissolved	1.00	0.969	0.967	96.9	96.7	80.0-120			0.235	20
Potassium,Dissolved	10.0	9.28	9.24	92.8	92.4	80.0-120			0.405	20
Selenium,Dissolved	1.00	1.01	1.02	101	102	80.0-120			0.408	20
Sodium,Dissolved	10.0	9.67	9.66	96.7	96.6	80.0-120			0.0948	20

L1049342-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1049342-01 12/05/18 14:41 • (MS) R3365588-5 12/05/18 14:47 • (MSD) R3365588-6 12/05/18 14:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium,Dissolved	10.0	7.94	17.2	16.9	92.2	89.8	1	75.0-125			1.42	20
Iron,Dissolved	10.0	ND	9.85	9.64	98.5	96.4	1	75.0-125			2.18	20
Magnesium,Dissolved	10.0	3.69	12.6	12.4	89.4	86.9	1	75.0-125			2.02	20
Manganese,Dissolved	1.00	0.0116	0.975	0.960	96.4	94.9	1	75.0-125			1.53	20
Potassium,Dissolved	10.0	2.30	12.0	11.8	96.6	94.7	1	75.0-125			1.58	20
Selenium,Dissolved	1.00	ND	1.09	1.05	109	105	1	75.0-125			3.41	20
Sodium,Dissolved	10.0	461	462	462	15.6	8.73	1	75.0-125	V	V	0.149	20

Method Blank (MB)

(MB) R3366519-2 12/07/18 13:03

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	0.0634	J	0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*95.6*			*78.0-120*

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

(LCS) R3366519-3 12/07/18 11:57 • (LCSD) R3366519-1 12/07/18 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 %
TPH (GC/FID) Low Fraction	5.50	4.87	4.74	88.5	86.2	72.0-127			2.68	20
(S) a,a,a-Trifluorotoluene(FID)				*98.9*	*98.6*	*78.0-120*				

Method Blank (MB)

(MB) R3366623-3 12/10/18 02:44

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	0.0471	J	0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*106*			*78.0-120*

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

(LCS) R3366623-1 12/10/18 01:37 • (LCSD) R3366623-2 12/10/18 01:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.97	5.90	109	107	72.0-127			1.23	20
(S) a,a,a-Trifluorotoluene(FID)				*110*	*110*	*78.0-120*				

Method Blank (MB)

(MB) R3364779-3 12/02/18 23:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*99.1*			*80.0-120*
(S) Dibromofluoromethane	*92.4*			*75.0-120*
(S) a,a,a-Trifluorotoluene	*112*			*80.0-120*
(S) 4-Bromofluorobenzene	*102*			*77.0-126*

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

(LCS) R3364779-1 12/02/18 22:30 • (LCSD) R3364779-2 12/02/18 22:50

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0203	0.0203	81.1	81.3	70.0-123			0.218	20
Ethylbenzene	0.0250	0.0225	0.0232	89.9	92.9	79.0-123			3.29	20
Toluene	0.0250	0.0221	0.0225	88.5	89.8	79.0-120			1.51	20
Xylenes, Total	0.0750	0.0702	0.0730	93.6	97.3	79.0-123			3.91	20
(S) Toluene-d8				*98.8*	*105*	*80.0-120*				
(S) Dibromofluoromethane				*90.9*	*92.9*	*75.0-120*				
(S) a,a,a-Trifluorotoluene				*107*	*114*	*80.0-120*				
(S) 4-Bromofluorobenzene				*108*	*95.7*	*77.0-126*				

Method Blank (MB)

(MB) R3365930-2 12/03/18 13:41

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*101*			*80.0-120*
(S) Dibromofluoromethane	*96.4*			*75.0-120*
(S) a,a,a-Trifluorotoluene	*102*			*80.0-120*
(S) 4-Bromofluorobenzene	*104*			*77.0-126*

Laboratory Control Sample (LCS)

(LCS) R3365930-1 12/03/18 12:59

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.0250	0.0225	90.1	70.0-123	
Ethylbenzene	0.0250	0.0205	82.2	79.0-123	
Toluene	0.0250	0.0217	86.9	79.0-120	
Xylenes, Total	0.0750	0.0618	82.4	79.0-123	
(S) Toluene-d8			*95.2*	*80.0-120*	
(S) Dibromofluoromethane			*96.5*	*75.0-120*	
(S) a,a,a-Trifluorotoluene			*101*	*80.0-120*	
(S) 4-Bromofluorobenzene			*101*	*77.0-126*	

Method Blank (MB)

(MB) R3365656-1 12/05/18 16:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) High Fraction	0.0612	J	0.0247	0.100
(S) o-Terphenyl	*92.5*			*31.0-160*

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

(LCS) R3365656-2 12/05/18 16:47 • (LCSD) R3365656-3 12/05/18 17:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	1.50	1.61	1.56	107	104	50.0-150			3.15	20
(S) o-Terphenyl				*94.5*	*92.0*	*31.0-160*				

Method Blank (MB)

(MB) R3366358-1 12/07/18 15:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) High Fraction	0.107		0.0247	0.100
(S) o-Terphenyl	*85.5*			*31.0-160*

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

(LCS) R3366358-2 12/07/18 15:45 • (LCSD) R3366358-3 12/07/18 16:07

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	1.50	1.27	1.28	84.7	85.3	50.0-150			0.784	20
(S) o-Terphenyl				*98.0*	*93.0*	*31.0-160*				

Guide to Reading and Understanding Your Laboratory Report

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

Abbreviations and Definitions

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

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits.
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

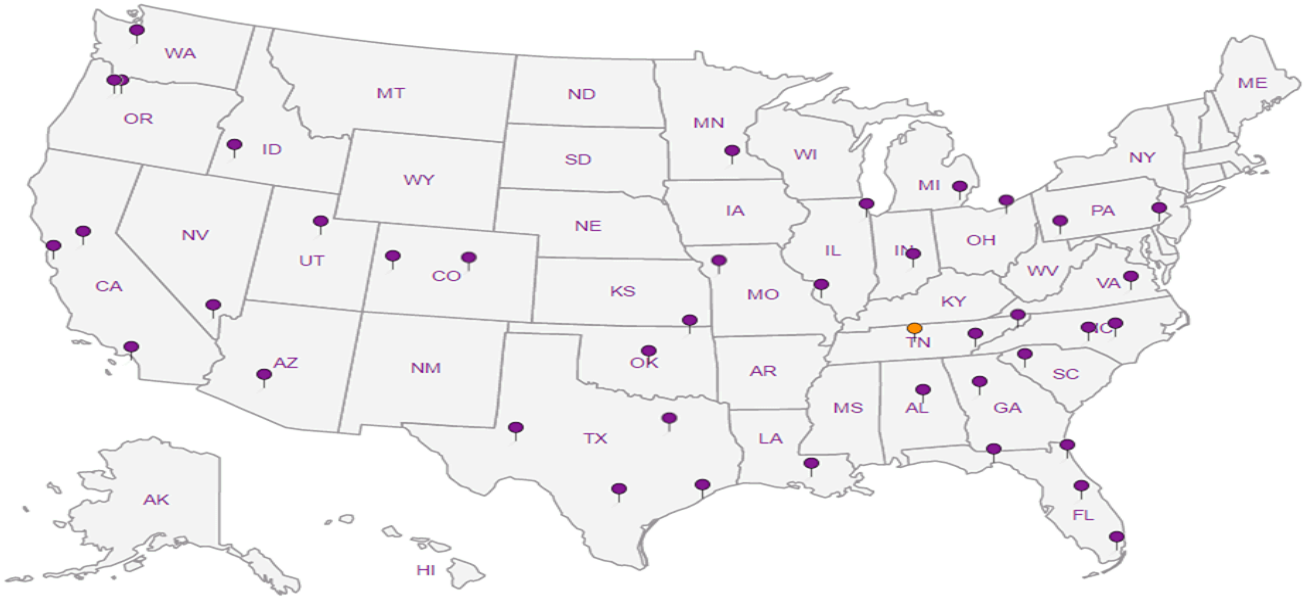
Third Party Federal Accreditations

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

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company Name/Address:
Entrada Consulting Group
330 Grand Avenue, Unit C
Grand Junction, CO 81501

Billing Information:

Report to: **Robert Stockton**

Email To: **rstockton@entradainc.com**

Project Description: HCWTF

City/State Collected: **CO**

Phone: **(970) 640-0568**

Fax:

Client Project #

Lab Project #

Collected by (print): Robert Stockton

Site/Facility ID #: HCWTF

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1048912

F186

Acctnum:
Template:
Prelogin:
TSR:
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	V8260BTEX (2 - 40ml vials w/ HCL)	GRO (2 - 40ml vials w/ HCL)	DROLVI (2 - 40ml vials w/ HCL)	Diss. metals (.5L HDPE, no pres,Ca,Fe,Mg,Mn,K,Se,Na	SPCON, pH, (500 ml HDPE, no pres)	Chlorides, Sulfates	** - Ca, Fe, Mg, Mn, K, Se, Na	Rem./Contaminant	Sample # (lab only)
MW-1	Grab	GW			11/30/18	9	✓	✓	✓	✓	✓	✓			-01
MW-3	Grab	GW				9	✓	✓	✓	✓	✓	✓			02
MW-5	Grab	GW				9	✓	✓	✓	✓	✓	✓			03
MW-6	Grab	GW				9	✓	✓	✓	✓	✓	✓			04
MW-7	Grab	GW				9	✓	✓	✓	✓	✓	✓			05
MW-8	Grab	GW			11/30/18	9	✓	✓	✓	✓	✓	✓			06

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: 7135 2664 0039

pH _____ Temp _____

Flow _____ Other _____

RAD SCREEN: <0.5 mR/hr

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11-30-18	1620	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11 30 18	1700	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

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

Temp: 2.1+2.2=2.3 °C Bottles Received: 54

Date: 12/1/18 Time: 0845

Condition: (lab use only) OK

COC Seal Intact: ___Y ___N ✓NA

pH Checked: NCF:

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: ENTCONGJCO	SDG#	L1048912	
Cooler Received/Opened On: 12/ 1 /18	Temperature:	2.3	
Received By: Eric Struck			
Signature: Eric Struck			

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?		✓	
Preservation Correct / Checked?			

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 21, 2018

Entrada Consulting Group

Sample Delivery Group:	L1053058
Samples Received:	12/14/2018
Project Number:	
Description:	HCWTF
Site:	HCWTF
Report To:	Robert Stockton 240 Mesa Avenue Grand Junction, CO 81501

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

POND 2 L1053058-01 GW

Collected by	Collected date/time	Received date/time
Robert Stockton	12/13/18 11:25	12/14/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1212481	1	12/19/18 21:13	12/19/18 21:13	GB
Wet Chemistry by Method 9040C	WG1211088	1	12/14/18 14:55	12/14/18 14:55	EEM
Wet Chemistry by Method 9050A	WG1214382	1	12/21/18 11:25	12/21/18 11:25	MJA
Wet Chemistry by Method 9056A	WG1210790	1	12/14/18 23:38	12/14/18 23:38	ELN
Wet Chemistry by Method 9056A	WG1210790	100	12/14/18 23:54	12/14/18 23:54	ELN
Wet Chemistry by Method 9056A	WG1211292	1	12/15/18 20:58	12/15/18 20:58	MAJ
Metals (ICP) by Method 6010B	WG1213961	1	12/20/18 15:03	12/21/18 12:38	CCE
Metals (ICP) by Method 6010B	WG1213961	10	12/20/18 15:03	12/21/18 12:56	CCE

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 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	773		20.0	1	12/19/2018 21:13	WG1212481
Alkalinity,Carbonate	ND		20.0	1	12/19/2018 21:13	WG1212481

Sample Narrative:

L1053058-01 WG1212481: Endpoint pH 4.5 HEADSPACE

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.29	T8	1	12/14/2018 14:55	WG1211088

Sample Narrative:

L1053058-01 WG1211088: 7.29 at 12.8C

Wet Chemistry by Method 9050A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	umhos/cm		umhos/cm		date / time	
Specific Conductance	25000		10.0	1	12/21/2018 11:25	WG1214382

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	58.7		1.00	1	12/14/2018 23:38	WG1210790
Chloride	8500		100	100	12/14/2018 23:54	WG1210790
Fluoride	ND		0.100	1	12/14/2018 23:38	WG1210790
Nitrate as (N)	ND	T8	0.100	1	12/15/2018 20:58	WG1211292
Nitrite as (N)	ND	T8	0.100	1	12/15/2018 20:58	WG1211292
Sulfate	25.9		5.00	1	12/14/2018 23:38	WG1210790

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium	185		1.00	1	12/21/2018 12:38	WG1213961
Magnesium	19.8		1.00	1	12/21/2018 12:38	WG1213961
Potassium	43.1		1.00	1	12/21/2018 12:38	WG1213961
Sodium	5530		10.0	10	12/21/2018 12:56	WG1213961

Method Blank (MB)

(MB) R3369933-1 12/19/18 18:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Alkalinity	2.76	J	2.71	20.0
Alkalinity,Carbonate	U		2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1052450-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1052450-01 12/19/18 19:04 • (DUP) R3369933-2 12/19/18 19:13

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	228	194	1	16.2		20
Alkalinity,Carbonate	U	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 HEADSPACE

DUP: Endpoint pH 4.5

L1053062-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1053062-02 12/19/18 21:42 • (DUP) R3369933-4 12/19/18 21:50

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Alkalinity	284	213	1	28.5	J3	20
Alkalinity,Carbonate	ND	0.000	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5 HEADSPACE

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3369933-3 12/19/18 19:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Alkalinity	100	96.9	96.9	85.0-115	

Laboratory Control Sample (LCS)

(LCS) R3369933-3 12/19/18 19:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier

Sample Narrative:

LCS: Endpoint pH 4.5

L1052987-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1052987-08 12/14/18 14:55 • (DUP) R3368380-2 12/14/18 14:55

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.28	8.29	1	0.121		1

Sample Narrative:

OS: 8.28 at 7.6C

DUP: 8.29 at 7.8C

L1053062-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1053062-01 12/14/18 14:55 • (DUP) R3368380-3 12/14/18 14:55

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.79	7.79	1	0.000		1

Sample Narrative:

OS: 7.79 at 12.6C

DUP: 7.79 at 12.9C

Laboratory Control Sample (LCS)

(LCS) R3368380-1 12/14/18 14:55

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

Sample Narrative:

LCS: 9.92 at 19.5C

Method Blank (MB)

(MB) R3370391-1 12/21/18 11:25

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

L1054104-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1054104-01 12/21/18 11:25 • (DUP) R3370391-3 12/21/18 11:25

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	1940	1910	1	1.25		20

L1054326-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1054326-06 12/21/18 11:25 • (DUP) R3370391-4 12/21/18 11:25

Analyte	Original Result umhos/cm	DUP Result umhos/cm	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Specific Conductance	2150	2150	1	0.233		20

Laboratory Control Sample (LCS)

(LCS) R3370391-2 12/21/18 11:25

Analyte	Spike Amount umhos/cm	LCS Result umhos/cm	LCS Rec. %	Rec. Limits %	LCS Qualifier
Specific Conductance	877	875	99.8	90.0-110	

Method Blank (MB)

(MB) R3368521-1 12/14/18 10:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Bromide	U		0.0790	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Sulfate	U		0.0774	5.00

L1052855-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1052855-01 12/14/18 14:45 • (DUP) R3368521-3 12/14/18 15:00

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0.863	1	0.000		15
Chloride	80.5	80.7	1	0.239		15
Fluoride	0.315	0.319	1	1.07		15
Sulfate	44.6	44.7	1	0.261		15

L1053041-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1053041-02 12/14/18 21:40 • (DUP) R3368521-6 12/14/18 21:56

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0.000		15
Chloride	8.09	8.12	1	0.360		15
Fluoride	0.0833	0.0715	1	15.2	J P1	15
Sulfate	0.352	0.347	1	1.35	J	15

Laboratory Control Sample (LCS)

(LCS) R3368521-2 12/14/18 11:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Bromide	40.0	38.7	96.6	80.0-120	
Chloride	40.0	38.6	96.6	80.0-120	
Fluoride	8.00	7.89	98.6	80.0-120	
Sulfate	40.0	39.2	98.0	80.0-120	

L1052855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1052855-01 12/14/18 14:45 • (MS) R3368521-4 12/14/18 15:15 • (MSD) R3368521-5 12/14/18 15:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	47.5	47.9	93.3	94.0	1	80.0-120			0.717	15
Chloride	50.0	80.5	126	127	92.0	92.9	1	80.0-120	E	E	0.355	15
Fluoride	5.00	0.315	5.15	5.19	96.8	97.5	1	80.0-120			0.738	15
Sulfate	50.0	44.6	92.3	92.7	95.4	96.3	1	80.0-120			0.478	15

L1053041-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1053041-02 12/14/18 21:40 • (MS) R3368521-7 12/14/18 22:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	U	46.7	93.5	1	80.0-120	
Chloride	50.0	8.09	56.4	96.7	1	80.0-120	
Fluoride	5.00	0.0833	4.87	95.8	1	80.0-120	
Sulfate	50.0	0.352	47.4	94.1	1	80.0-120	

Method Blank (MB)

(MB) R3368945-1 12/15/18 08:33

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Nitrate	U		0.0227	0.100
Nitrite	U		0.0277	0.100

L1053354-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1053354-02 12/15/18 10:57 • (DUP) R3368945-3 12/15/18 11:08

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate	ND	0.000	1	0.000		15
Nitrite	ND	0.000	1	0.000		15

L1053526-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1053526-02 12/15/18 20:03 • (DUP) R3368945-6 12/15/18 20:14

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Nitrate	ND	0.000	1	0.000		15
Nitrite	ND	0.000	1	0.000		15

Laboratory Control Sample (LCS)

(LCS) R3368945-2 12/15/18 08:44

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nitrate	8.00	8.12	102	80.0-120	
Nitrite	8.00	8.17	102	80.0-120	

L1053354-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1053354-02 12/15/18 10:57 • (MS) R3368945-4 12/15/18 11:19 • (MSD) R3368945-5 12/15/18 11:52

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nitrate	5.00	ND	5.76	5.74	115	115	1	80.0-120			0.468	15
Nitrite	5.00	ND	5.29	5.24	106	105	1	80.0-120			1.02	15

L1053526-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1053526-02 12/15/18 20:03 • (MS) R3368945-7 12/15/18 20:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Nitrate	5.00	ND	6.62	132	1	80.0-120	J5
Nitrite	5.00	ND	5.12	102	1	80.0-120	

Method Blank (MB)

(MB) R3370415-1 12/21/18 12:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.0463	1.00
Magnesium	0.0600	J	0.0111	1.00
Potassium	0.134	J	0.102	1.00
Sodium	0.531	J	0.0985	1.00

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

(LCS) R3370415-2 12/21/18 12:21 • (LCSD) R3370415-3 12/21/18 12:24

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 %
Calcium	10.0	9.89	9.92	98.9	99.2	80.0-120			0.287	20
Magnesium	10.0	9.90	9.99	99.0	99.9	80.0-120			0.874	20
Potassium	10.0	9.84	9.85	98.4	98.5	80.0-120			0.120	20
Sodium	10.0	9.92	9.93	99.2	99.3	80.0-120			0.126	20

L1054751-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1054751-12 12/21/18 12:27 • (MS) R3370415-5 12/21/18 12:33 • (MSD) R3370415-6 12/21/18 12:35

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	10.0	87.6	95.9	95.5	83.1	79.3	1	75.0-125			0.402	20
Magnesium	10.0	83.3	90.5	90.7	72.2	74.2	1	75.0-125	V	V	0.225	20
Potassium	10.0	12.6	21.9	22.3	92.8	97.1	1	75.0-125			1.95	20
Sodium	10.0	646	640	640	0.000	0.000	1	75.0-125	V	V	0.0653	20

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.

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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

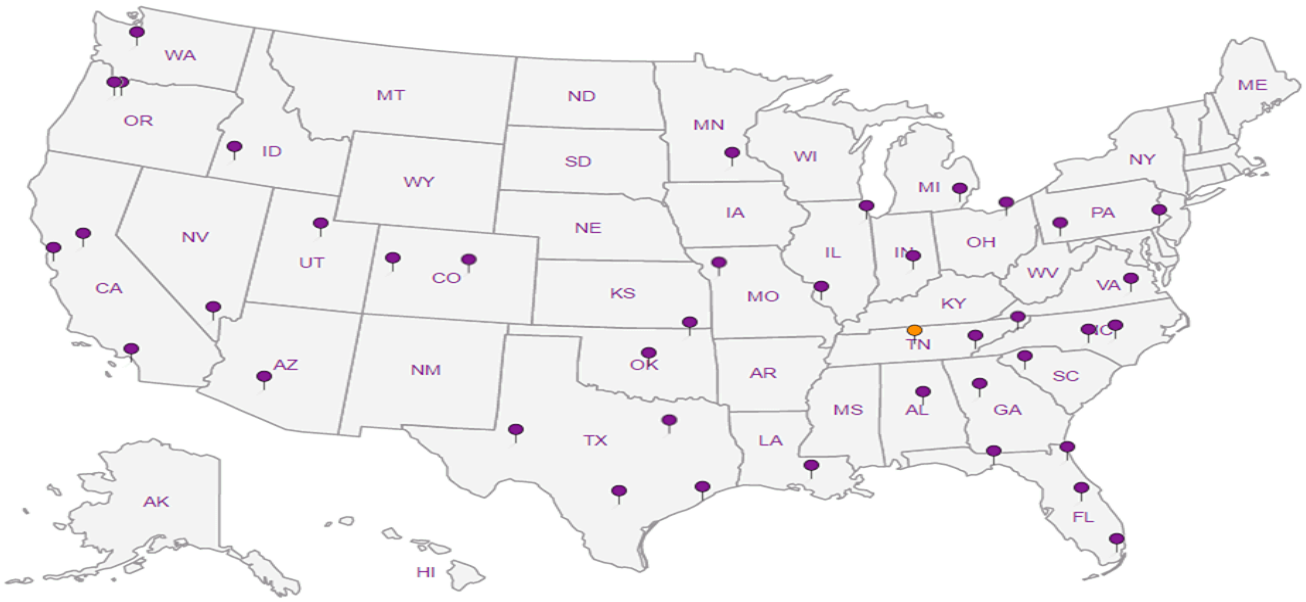
Third Party Federal Accreditations

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

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

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Entrada Consulting Group

330 Grand Avenue, Unit C
Grand Junction, CO 81501

Billing Information:

Pres Chk

Report to: **Robert Stockton**

Email To: **rstockton@entradainc.com**

Project Description: **HCWTF**

City/State Collected: **,CO**

Phone: **(970) 640-0568**
Fax:

Client Project #

Lab Project #

Collected by (print): **Robert Stockton**

Site/Facility ID # **HCWTF**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Date Results Needed

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	8260 BTEX (2 - 40 mL VOA)	GRO (2 - 40 mL VOA)	DRO (2 - 40 mL VOA)	Dissolved Metals (500 mL poly)	Br, Cl, F, NO2, NO3, SO4 (500 mL poly)	SPCON,	Total Alkalinity (500 mL poly)	Chlorides, Sulfates	pH		
MW-1	G	GW		12/13/18	1055	1		HOLD			~~X~~	~~X~~		HOLD			
Pond 2	G	GW		12/13/18	1125	3					X	X	X	X	X		-01

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

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

L# L1053058

A085

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Remarks | Sample # (lab only)

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

Remarks:

RAD SC[illegible] ~~-~~9/hr

pH _____ Temp _____

Flow _____ Other _____

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

Tracking # 1430 3423 8146

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

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	12/13/18	1630	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	12/13/18	1735	
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 0.7+0.3 °C Bottles Received: 4

Date: 12/14/18 Time: 8:45

If preservation required by Login: Date/Time

12-0069

Condition: NCF / OK

Andy Vann

From: Chris Ward
Sent: Thursday, December 20, 2018 10:38 AM
To: Login
Cc: Due Metals; Sample Storage; Wetlab Secondary Review
Subject: L1053058 *ENTCONGJCO* Rush additions

Importance: High

Login,

Please add the following to this SDG, due tomorrow 12/21. Client used incorrect COC. Use leftover volume from wetchem to run for metals
ALKCA
NAICP
MGICP
KICP
CAICP

Wetlab,
Please capture for ALKCA as well when completing this ALK analysis

Thanks,

Chris Ward
Project Manager
Pace Analytical National Center for Testing & Innovation
12065 Lebanon Road | Mt. Juliet, TN 37122
cward@pacenational.com | www.pacenational.com
615.773.9712

ESC Lab Sciences is now Pace Analytical National Center for Testing & Innovation! Please make note of my new email address and website