April 4, 2024

Andrew Verbonitz
EHS Remediation Specialist
Caerus Oil and Gas LLC (Operator 10456)
averbonitz@caerusoilandgas.com

Report of Work Completed – Flowline Release Investigation

ECMC Location Name (ID)	N. Parachute/EF P27 595 (335806)
Operator Location Name	P27-595 (1C-34)
ECMC Remediation Project ID	25158
Legal Description	SESE Sec. 27 T5S-R95W
Coordinates (Lat/Long)	39.579295 / -108.033164
County	Garfield County, Colorado

Mr. Verbonitz,

Confluence Compliance Companies, LLC (Confluence) prepared this Report of Work Completed (ROWC) for Caerus Oil and Gas LLC (Caerus) to document remedial investigation activities associated with a flowline release at the P27-595 well pad (Location). The Location is 8.8 miles north of Parachute, Colorado, in Garfield County as illustrated in the attached Topographic Map. Additional information on the Location and the associated remediation project is provided in the title block above, the attached Site Diagrams, and laboratory analytical reports. This ROWC provides background on the Location, methods used to complete the investigation, results of the investigation, and recommendations for how to proceed with this information.

Background

On April 21, 2022, Caerus observed an anomaly in the N. Parachute EF01F-34 P27595 (1C-34) well production data. Following pressure tests and inspections, a failure point was identified in the flowline at the first subsurface ninety-degree elbow downstream of the wellhead. The release was reported via Energy & Carbon Management Commission (ECMC) Form 19 Document 403023550 to open Spill/Release Point ID 482066. Form 27 Document 403149259 was later submitted to open Remediation Project 25158.

From April 26, 2022 through October 7, 2022, Caerus and a third party consultant completed multiple excavation and soil sampling events. Analytical results of the point of release (POR) characterization sample exceeded ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) for total petroleum hydrocarbons (TPH), sodium adsorption ratio (SAR), pH, and arsenic. Analytical results of the final excavation extents exceed Table 915-1 RSSLs for SAR, pH, and arsenic. One surface water sample (SW-01) was also collected from East Fork Parachute Creek downgradient from the Location. Analytical results of the water sample were within Table 915-1 groundwater allowable limits for all constituents of concern.

On June 21, 2023, Caerus submitted Form 27 Document 403224347 requesting to compare results of site investigation to Table 915-1 RSSLs and to remove pH and arsenic as constituents of concern based on background analytical results. The ECMC approved this form and associated requests on July 12, 2023.

On October 6, 2023, Caerus submitted Form 27 Document 403536509 requesting a reduced analyte list of SAR and requesting to remediate SAR impacts in place using a biological yucca extract containing natural saponin. The ECMC approved the form and associated requests on October 31, 2023.

On October 17, 2023, one remedial treatment well was installed adjacent to the N. Parachute EF01F-34 P27595 (1C-34) wellhead. The well was completed with a total depth of 5 feet bgs with 3 feet of slotted screen. No soil samples were collected during the well installation effort.

On November 21, 2023, Confluence completed the first in situ treatment event by gravity feeding saponin solution into the treatment well. Approximately 520 gallons of treatment solution were applied to the impacted area within 1 hour.

Methodology

On March 25, 2024, Confluence oversaw an additional in situ treatment event. Saponin solution was gravity fed to the subsurface via the treatment well. Approximately 520 gallons of solution infiltrated into the impacted area over the course of one day.

Analysis and Recommendations

Based on the results and analyses of site investigation to date, all soil samples collected from the final extents of the excavation are within Table 915-1 RSSLs or their respective alternative allowable limits except for SAR. SAR impacts have been delineated vertically and horizontally. Based on health and safety considerations associated with the proximity of the wellhead and pressurized lines, combined with the extent and level of SAR impacts, additional source removal is not recommended. Furthermore, due to the shallow depth of SAR impacts, this remediation project does not reasonably qualify to pursue closure via a 915.b. Reclamation Plan. The intent of the saponin solution is to increase water intake in soil and to accelerate the natural attenuation process. Caerus proposes to advance a soil boring in the previous location of the SAR exceedance and collect one or more soil samples to confirm SAR levels are compliant with ECMC allowable limits after in situ treatments.

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

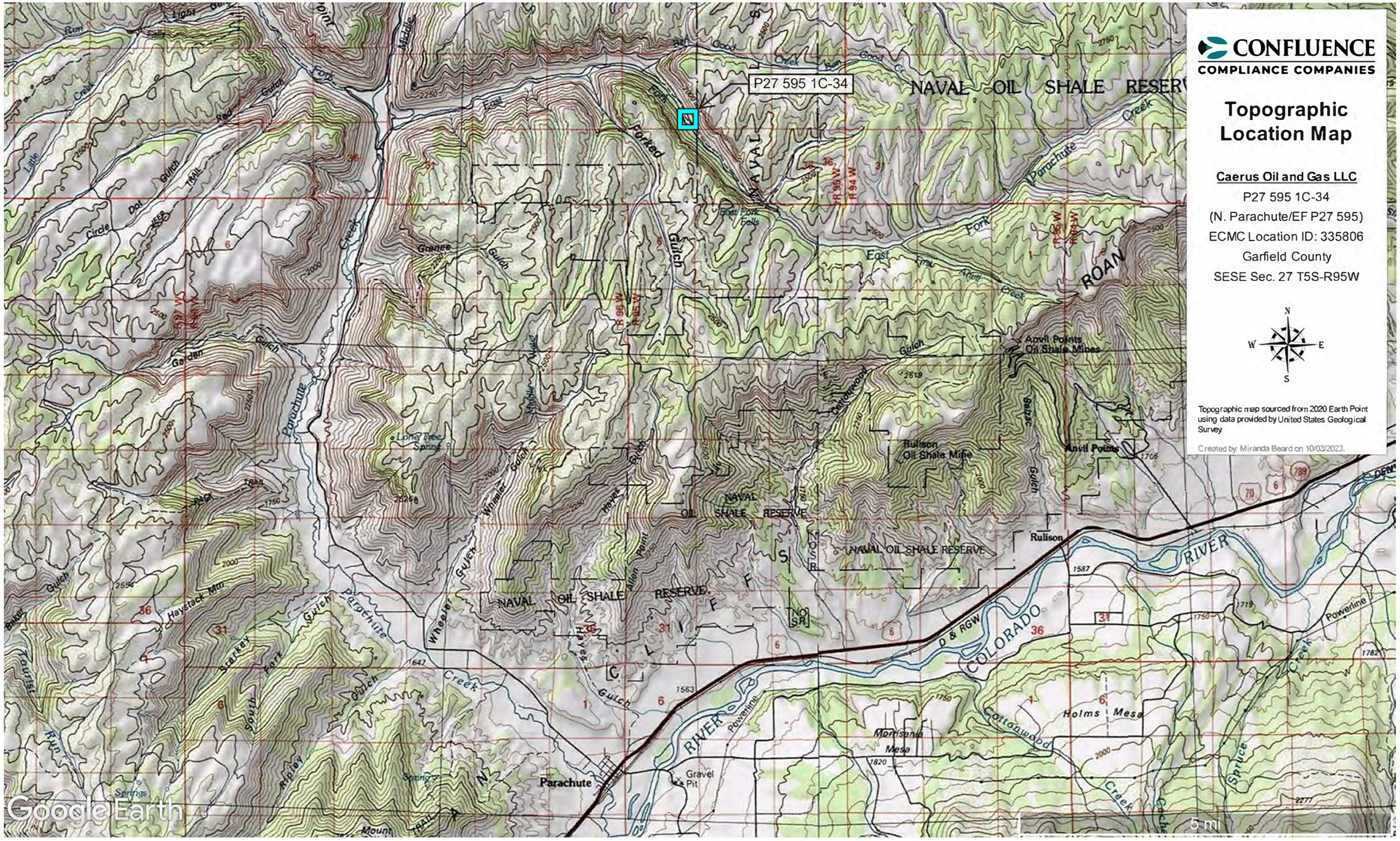
Regards,

Sage Maher
Project Manager
(404) 641-8912
sage.maher@confluence-cc.com

John Axelson
Program Manager
(720) 233-2927
john.axelson@confluence-cc.com

Attachments

- Topographic Location Diagram
- Site Diagram – Site Investigation
- Site Diagram – Background Samples
- Site Diagram – Surface Water Sample
- Laboratory Results Summary Table – Soil
- Laboratory Results Summary Table – Surface Water



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Topographic Location Map

Caerus Oil and Gas LLC

P27 595 1C-34

(N. Parachute/EF P27 595)

ECMC Location ID: 335806

Garfield County

SESE Sec. 27 T5S-R95W

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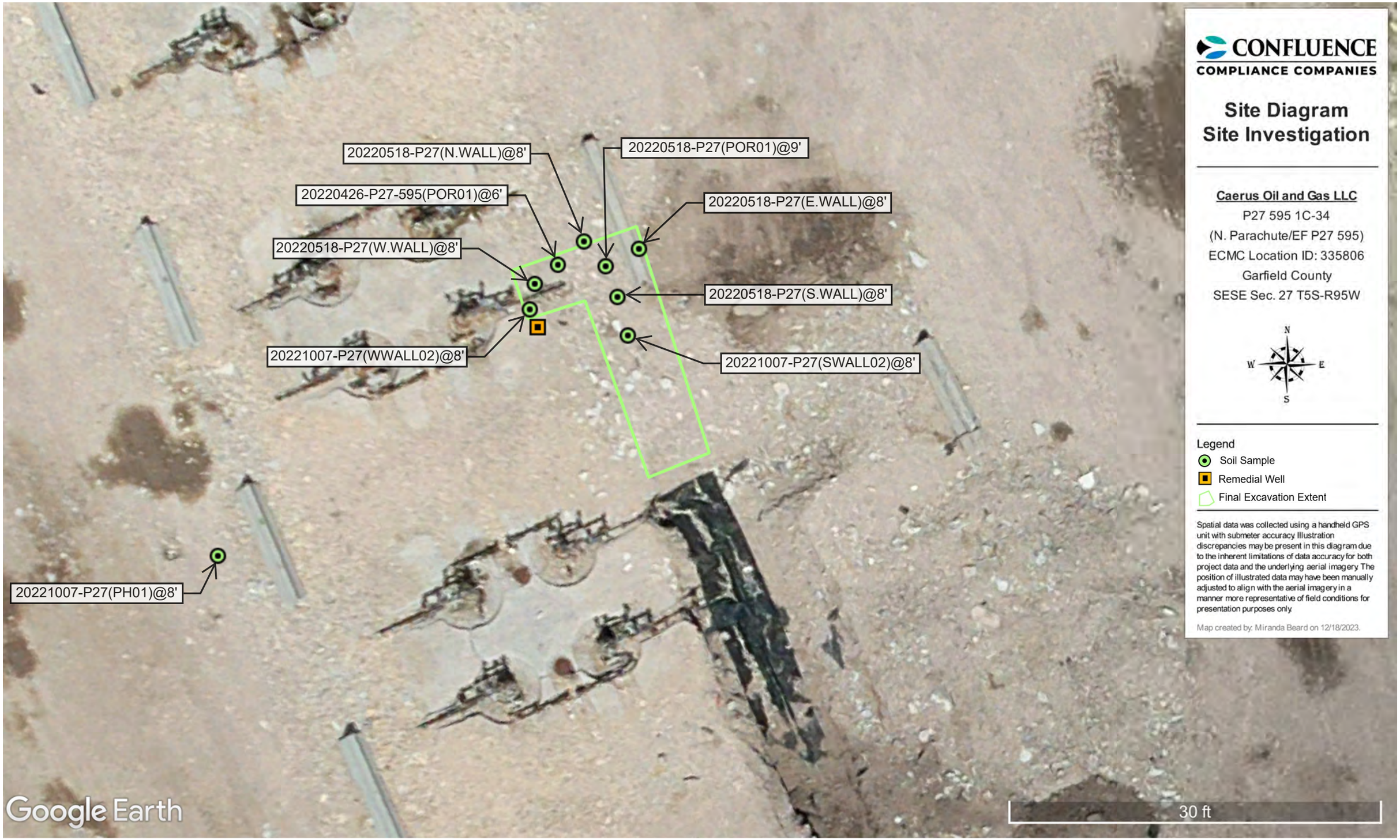
Topographic map sourced from 2020 Earth Point using data provided by United States Geological Survey

Created by: Miranda Beard on 10/03/2023.



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Site Diagram
Site Investigation

Caerus Oil and Gas LLC
P27 595 1C-34
(N. Parachute/EF P27 595)
ECMC Location ID: 335806
Garfield County
SESE Sec. 27 T5S-R95W

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Legend
- Soil Sample
- Remedial Well
- Final Excavation Extent

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

Map created by: Miranda Beard on 12/18/2023.

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Site Diagram
Background Samples

Caerus Oil and Gas LLC

P27 595 1C-34

(N. Parachute/EF P27 595)

ECMC Location ID: 335806

Garfield County

SESE Sec. 27 T5S-R95W

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Legend

- Point of Release
- Background Soil Sample

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

Map created by: Miranda Beard on 10/03/2023.

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Site Diagram
Surface Water Sample

Caerus Oil and Gas LLC
P27 595 1C-34
(N. Parachute/EF P27 595)
ECMC Location ID: 335806
Garfield County
SESE Sec. 27 T5S-R95W

N
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Legend
- Surface Water Sample
- Final Excavation Extent

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

Map created by: Miranda Beard on 01/03/2024.

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Laboratory Results Summary Table - Soil
P27-595 1C Wellhead

10/3/2023

					Organic Compounds (mg/kg (ppm))																									
			ECMC Soil Screening Levels																											
			ECMC Table 915-1 Residential -->	NA	500	NA	NA	NA	1.2	490	5.8	58	30	27	360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	18	24	2	180
Sample Date	Soil/Soil Source (Equipment) [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	Depth - Z (feet) (NEGATIVE VALUE) below ground surface (bgs)	Sample ID	PID (ppm)	TPH (total volatile and extractable petroleum hydrocarbons) (GRO+DRO+ORO)	TPH-GRO (C6-C10) Low Fraction	TPH-DRO (C10-C28) High Fraction	TPH-ORO (C28-C36) High Fraction	Benzene	Toluene	Ethylbenzene	Xylenes - total (sum of o-, m-, p- isomers)	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	Acenaphthene	Anthracene	Benzo(A)anthracene	Benzo(A)pyrene	Benzo(B)fluoranthene	Benzo(K)fluoranthene	Chrysene	Dibenz(A,H)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3,C,D)pyrene	1- Methylnaphthalene	2- Methylnaphthalene	Naphthalene	Pyrene
4/26/2022	Wellhead	-6	20220426-P27-595 (POR01) @ 6	260	3074	291	2460	323	0.617	2.70	0.213	8.61	3.2	5.61	0.185	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.00840	0.610	<0.00600	2.19	6.30	1.90	0.0110
5/18/2022	Wellhead	-9	20220518-P27(POR01)@9'	83.2	73.8	1.08	20.7	52.0	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	0.00983	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600
5/18/2022	Wellhead	-8	20220518-P27(E.WALL)@8'	12.7	56.0	0.196	11.1	44.8	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	<0.00500	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600
5/18/2022	Wellhead	-8	20220518-P27(N.WALL)@8'	1.0	72.0	0.204	33.7	38.1	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	0.00620	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600
5/18/2022	Wellhead	-8	20220518-P27(S.WALL)@8'	27.4	59.3	0.248	15.2	43.9	<0.00100	<0.00500	<0.00250	<0.00650	<0.00500	0.00635	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	<0.0200	<0.0200	<0.00600
5/18/2022	Wellhead	-8	20220518-P27(W.WALL)@8'	15.6	64.4	0.690	26.5	37.2	<0.00100	<0.00500	<0.00250	0.0267	0.00507	0.0728	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.0200	0.0307	<0.0200	<0.00600
10/7/2022	Wellhead	-8	20221007-P27(PH01)@8'	0.0	48.5	0.208	16.0	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/7/2022	Wellhead	-8	20221007-P27(SWALL02)@8'	0.0	237	0.211	73.6	163	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/7/2022	Wellhead	-10	20221007-P27(WWALL02)@8'	0.0	133.6	1.39	40.2	92.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/26/2022	Background	-2	20220426-P27-595 (BG-N) @ 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4/26/2022	Background	-3	20220426-P27-595 (BG-S) @ 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/22/2022	Background	-13	20220622-OIL SHALE BG5 11-13'	9.0	1296	2.15	539	755	0.00710	0.346	0.0177	0.846	0.0159	0.0110	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.0343	0.25	0.0381	0.0118
6/22/2022	Background	-31	20220622-OIL SHALE BG5 30-31'	7.3	1599	1.26	609	989	0.00908	0.375	0.0190	0.795	0.0121	0.00641	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600	0.0234	0.163	0.0325	<0.00600

Orange Fill = Exceedance
Dark Gray Italics = Below Reporting Detection Limit (RDL)
"NA" = Not Analyzed
mg/kg = milligrams per kilogram / parts per million

Confluence Compliance Companies, LLC
info@confluence-cc.com

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Laboratory Results Summary Table - Soil
P27-595 1C Wellhead

10/3/2023

ECMC Soil Screening Levels					Soil Suitability for Reclamation				Metals (mg/kg [ppm])										
ECMC Table 915-1 Residential -->				NA	4	6	6-8.3	2	0.68	15000	71	0.3	3100	400	1500	390	390	23000
Sample Date	**Solid/Soil Source (Equipment)** [Vault/Sump, Separator, Tank Battery, Dump Line, Pit, Cuttings, Background, etc.]	**Depth - Z** (feet) **(NEGATIVE VALUE)** below ground surface (bgs)	**Sample ID**	**PID** (ppm)	**EC (Specific Conductance) (millimhos/centimeter) (by saturated paste method)**	**SAR (Sodium Adsorption Ratio) (calculation) (by saturated paste method)**	**pH (pH Units) (by saturated paste method)**	**Boron - Hot Water Soluble (mg/L)**	**Arsenic**	**Barium**	**Cadmium (mg/kg)**	**Chromium (VI)**	**Copper**	**Lead**	**Nickel**	**Selenium**	**Silver**	**Zinc**
4/26/2022	Wellhead	-6	**20220426-P27-595 (POR01) @ 6**	**260**	**1.190**	**9.88**	**8.42**	**0.664**	**14.2**	**1390**	*<0.500*	*<1.00*	**28.4**	**14.5**	**15.1**	*<2.00*	*<1.00*	**50.0**
5/18/2022	Wellhead	-9	**20220518-P27(POR01)@9'**	**83.2**	**1.570**	**4.96**	**8.49**	**1.07**	**23.2**	**343**	*<0.500*	*<1.00*	**27.0**	**15.7**	**18.2**	*<2.00*	*<1.00*	**51.5**
5/18/2022	Wellhead	-8	**20220518-P27(E.WALL)@8'**	**12.7**	**0.374**	**3.38**	**8.25**	**0.818**	**24.7**	**270**	*<0.500*	*<1.00*	**19.8**	**9.18**	**13.5**	*<2.00*	*<1.00*	**38.1**
5/18/2022	Wellhead	-8	**20220518-P27(N.WALL)@8'**	**1.0**	**1.670**	**5.20**	**7.92**	**0.906**	**14.7**	**233**	*<0.500*	*<1.00*	**22.3**	**13.7**	**16.9**	*<2.00*	*<1.00*	**48.6**
5/18/2022	Wellhead	-8	**20220518-P27(S.WALL)@8'**	**27.4**	**0.591**	**6.07**	**8.23**	**1.57**	**20.3**	**266**	*<0.500*	*<1.00*	**25.9**	**16.5**	**19.2**	*<2.00*	*<1.00*	**51.5**
5/18/2022	Wellhead	-8	**20220518-P27(W.WALL)@8'**	**15.6**	**4.330**	**28.6**	**8.01**	**1.08**	**14.1**	**477**	*<0.500*	*<1.00*	**25.8**	**13.1**	**17.0**	*<2.00*	*<1.00*	**51.6**
10/7/2022	Wellhead	-8	**20221007-P27(PH01)@8'**	0.0	**0.298**	**3.11**	**8.56**	*NA*	**30.2**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
10/7/2022	Wellhead	-8	**20221007-P27(SWALL02)@8'**	0.0	**0.414**	**2.94**	**8.68**	*NA*	**21.2**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
10/7/2022	Wellhead	-10	**20221007-P27(WWALL02)@8'**	0.0	**2.380**	**15.6**	**8.26**	*NA*	**18.0**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4/26/2022	Background	-2	**20220426-P27-595 (BG-N) @ 2**	*NA*	**0.452**	**0.145**	**7.54**	**1.03**	**16.0**	**300**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4/26/2022	Background	-3	**20220426-P27-595 (BG-S) @ 3**	*NA*	**0.217**	**0.110**	**7.97**	**0.557**	**14.5**	**232**	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6/22/2022	Background	-13	**20220622-OIL SHALE BG5 11-13'**	**9.0**	**0.317**	*NA*	**8.71**	*NA*	**28.0**	**470**	**0.563**	*<1.00*	**27.2**	**15.3**	**17.6**	*<2.00*	*<1.00*	**49.2**
6/22/2022	Background	-31	**20220622-OIL SHALE BG5 30-31'**	**7.3**	**0.283**	**0.836**	**8.08**	**0.235**	**30.6**	**409**	**0.587**	*<1.00*	**29.9**	**17.8**	**17.0**	*<2.00*	*<1.00*	**48.4**

Orange Fill = Exceedance
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mg/kg = milligrams per kilogram / parts per million

Confluence Compliance Companies, LLC
info@confluence-cc.com

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Laboratory Results Summary Table - Surface Water
P27-595 1C Wellhead

1/4/2024

ECMC Allowable Concentration (915-Groundwater)		Organic Compounds (µg/L)							Inorganics (mg/L)		
		5	560-1,000	700	1,400-10,000	140	67	67	1.25xBG	250 or 1.25xBG	250 or 1.25xBG
Sample Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes - total	Naphthalene	1,2,4-trimethylbenzene	1,3,5-trimethylbenzene	TDS 1.25 x background	Chlorides 1.25 x background	Sulfates 1.25 x background
4/26/22	**20220426-P27-595 (SW-01)**	*<1.00*	*<1.00*	*<1.00*	*<3.00*	*<5.00*	*<1.00*	*<1.00*	**225**	**1.80**	**16.3**

Blue Fill = Exceedance
Dark Gray Italics = Below Reporting Detection Limit (RDL)
"NA" = Not Analyzed
mg/L= milligrams per liter / parts per million

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