April 2, 2020

OJIXM-200402-C-1410

NMOCD District 1

1625 N. French Drive

Hobbs, NM 88240

Re: Remediation Plan
Pogo Oil and Gas Operating, Inc.
Bagley SWD – 1RP-5716

RXSoil, Inc. is pleased to submit the remediation plan for the on-site remediation of impacted soil for the above release in Lea County, New Mexico.

Sincerely,

Jace Caraway
Chief Operating Officer
RXSoil, Inc.
(940) 210-2051

Zach Robbins
Technical and Engineering Analyst
RXSoil, Inc.
(210) 400-7645

Table of Contents

Figures

Appendix

I. Introduction

On behalf of Pogo Oil and Gas Operating, Inc., RXSoil, Inc. ("RXSoil") has prepared this work plan that describes remediation of the release of produced water.

The release occurred on 9/18/2019 in Unit Letter S, Section 34, Township 11S, Range 33E (see *Figure 1* for Vicinity Map) at approximate coordinates 33.31528, -103.60083. It was reported that 50 barrels of produced water were released and 50 barrels of produced water were recovered during the initial response.

II. Site Assessment/Characterization

1. **Site Map** – See *Figure 2*
2. **Depth to ground water** – Atkins Engineering was hired to determine groundwater at the site of the release. On 3/23/2020, an air rotor was used to drill down to 58' below ground surface (BGS) when the equipment stopped working. No groundwater was discovered at the time. On 3/27/2020 after allowing time to stabilize, water was discovered at 42.9' BGS. This work plan is proposing to adhere to closure criteria for depth to groundwater of <50' BGS.
3. **Wellhead protection area** – There are no known water sources within a half mile of the release (see *Figure 3*).
4. **Distance to nearest significant watercourse** – There is no significant watercourse within a half-mile of any horizontal boundary of the release (see *Figure 4*).
5. **Soil/waste characteristics** – An initial delineation was completed on 10/11/2019 by C&M Services, LLC. RXSoil returned to the site on 3/12/2020 to finish vertical delineation. Vertical delineation occurred until clean soil was discovered. Sample points are shown in *Figure 2* with results summarized in *Appendix B*. Lab data is displayed in *Appendix C*. Field notes are shown in *Appendix D*. As no TPH or BTEX traces were detected throughout delineation, RXSoil is requesting to only test for chlorides for the remainder of the remediation project. Excavation will consist of sampling sidewalls (composites representing <200 square feet) to verify each wall is below thresholds listed in NMAC 19.15.29.13.D.1 and Table I (600 mg/kg chloride). Excavation will be guided by field data and confirmed via laboratory results.

III. Remediation Plan

The delineation points can be seen in *Figure 2* with results in *Appendix B*.

RXSoil's core process of on-site remediation will be used to address the contamination. RXSoil will supervise all excavation with approval from area utilities owners via NM 811.

RXSoil will construct an above-ground treatment cell adjacent to the contaminated area (see *Figure 2* for projected placement). Berms will be placed around the perimeter of the cell area to a height of 4'. A 30-mil reinforced poly liner will be placed on the surface and up the sides of the berms to contain treatment. A proprietary drainage and collection system will be installed prior to filling the cells with

the contaminated soils. Nearby buried pipelines have been marked and go through the spill area. All excavation will be done with proper approvals and supervision from appropriate owners. It is anticipated that hydro-excavation will be required to safely excavate material around buried lines. Excavation will use delineation data in *Appendix B* and use field sampling and laboratory testing to confirm complete excavation where all bottom samples and sidewall samples test below 600 mg/kg chloride. RXSoil will utilize bottom sampling to guide vertical excavation in the vicinity of borings shown in *Figure 2* and additional sampling when excavation depth changes. An estimated 7,000 cubic yards is expected to be remediated.

Once all contaminated material is in the treatment cell, chemical treatment will begin. To confirm successful treatment, a grid of confirmation samples will be gathered at depth 36"-48" with one sample representing no more than 100 cubic yards. All samples will be field screened using Quantab Chloride Test Strips. If a sample tests above threshold, treatment will continue in that area until the soil tests clean, per strictest Table I guidelines for impacted soils. At least 50% of total samples will be transferred on ice to a third-party lab for confirmation testing using NMOCD approved testing methods. The 50% chosen will contain an approximately even distribution of the lowest, middle and highest contaminated samples based on field testing data. As all delineation samples tested below all thresholds for TPH and BTEX, RXSoil is requesting monitoring chlorides only for the remediation.

Sidewall and bottom samples will be taken using a stainless-steel hand shovel while remediation samples will be taken using a stainless-steel bucket auger. All tools are to be decontaminated before each sample, as specified in *Field Equipment Cleaning and Decontamination* (EPA, 2015). This includes wiping the equipment clean, water-rinsing the equipment, washing the equipment in detergent and water, and rinsing the equipment in water.

Samples will temporarily be transferred to a new plastic bag in the field. Once in a location safer for handling glass, the samples will be transferred to glass jars, supplied by an approved laboratory. The threads on all jars will be wiped clean to allow an air-tight seal. Samples will be transferred on ice to a third-party laboratory to ensure tests are completed within 28 days (as recommended for EPA methods 4500).

Remediation efforts will commence following the approval of this remediation plan and is estimated to take approximately 50 days.

IV. Restoration, Reclamation and Re-Vegetation

Following remediation, RXSoil will drill in seed at the discretion of the appropriate surface owners (SLO). RXSoil will continue to monitor this area to ensure growth.

Figure 1 - Vicinity Map

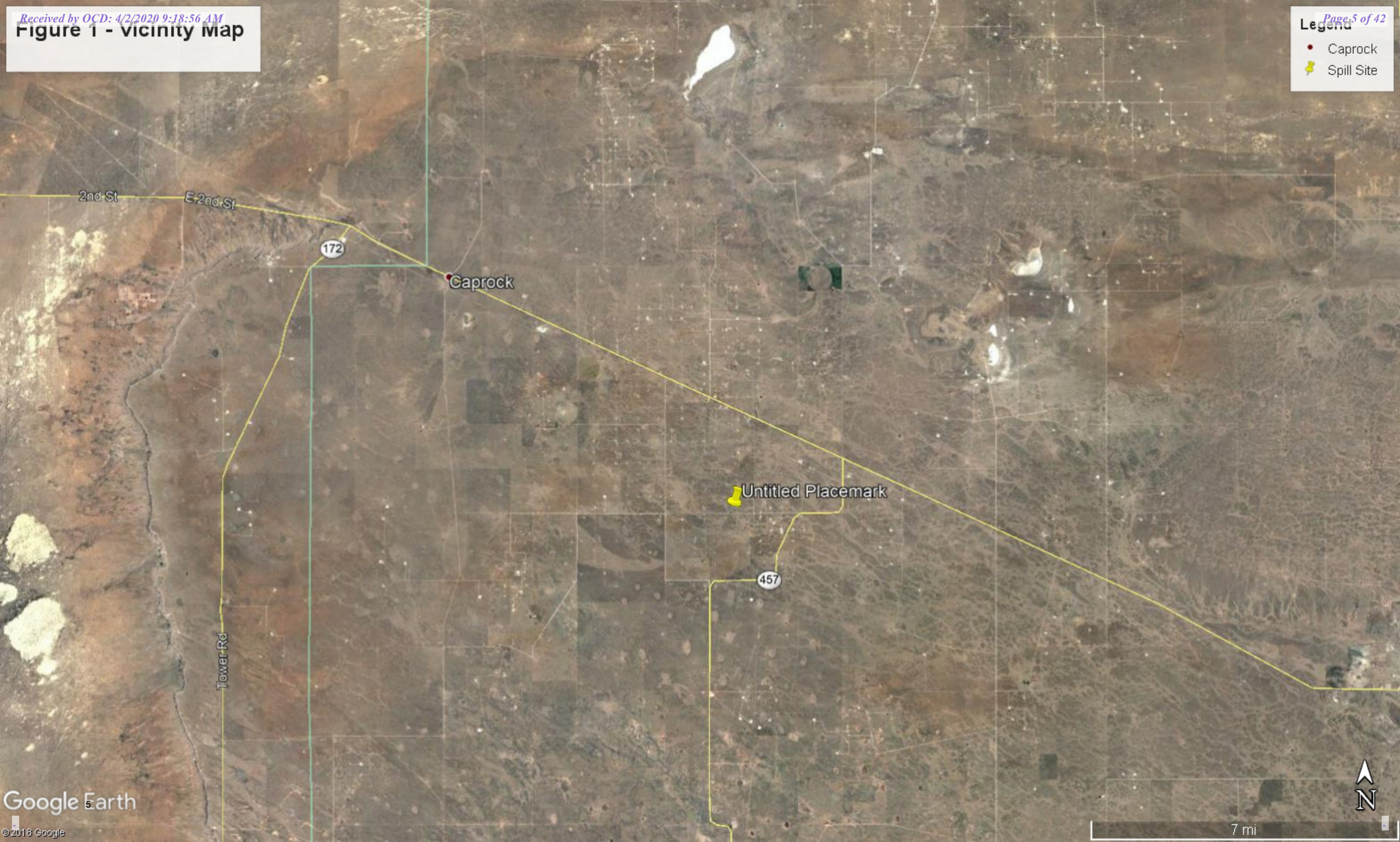
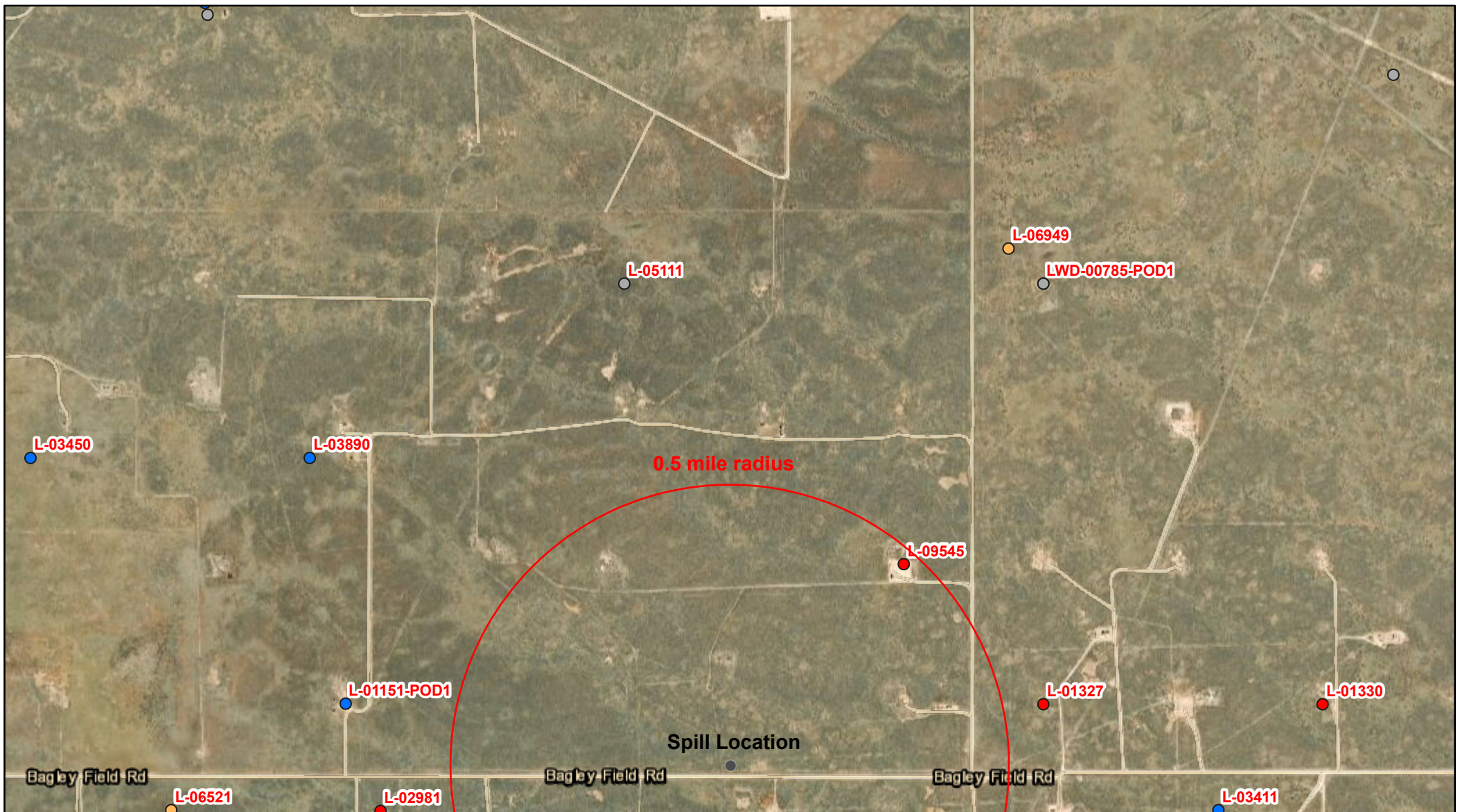


Figure 2 - Site Overview

Figure 3 - Point of Diversion Map



11/1/2019, 3:43:56 PM

OSE District Boundary

GIS WATERS PODs

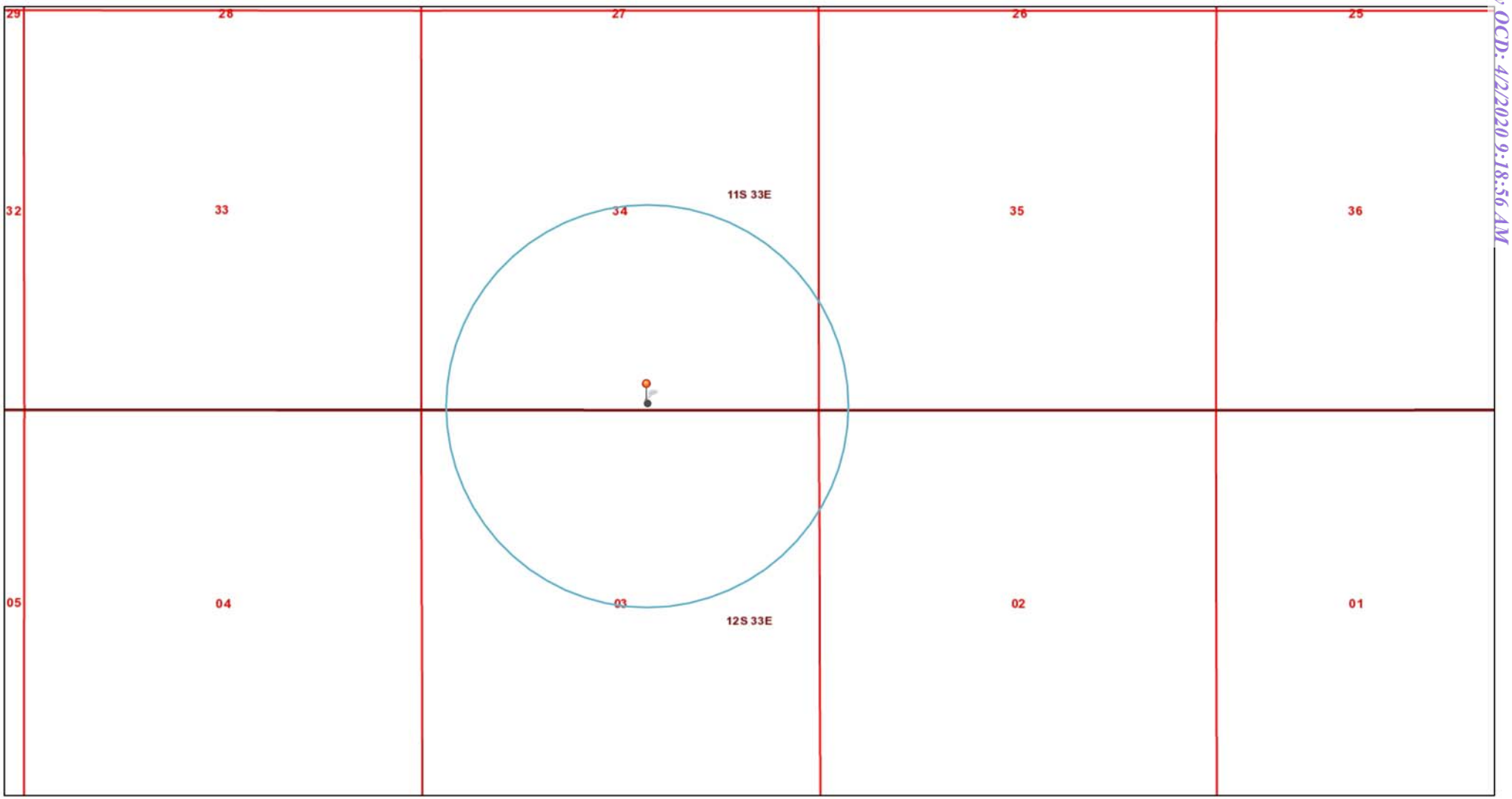
- Active
- Plugged
- Capped

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Figure 4 - Hydrology Map



11/1/2019, 5:03:59 PM

0.5 mile radius

Spill Location

OCD Districts

OCD District Offices

PLSS First Division

PLSS Townships

OSE Water-bodies

PLJV Probable Playas

OSE Streams

1:18,056

0 0.17 0.35 0.7 mi

0 0.3 0.6 1.2 km

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS

New Mexico Oil Conservation Division

NM OCD Oil and Gas Map. http://nm-emnrd.maps.arcgis.com/apps/webappviewer/: New Mexico Oil Conservation Division

APPENDIX A

C-141

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

Incident ID	NRM1927360423
District RP	1RP-5716
Facility ID	
Application ID	pRM1927359988

Remediation Plan

Remediation Plan Checklist: ***Each of the following items must be included in the plan.***

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: ***Each of the following items must be confirmed as part of any request for deferral of remediation.***

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Nicholas Holbrook Title: COO

Signature: Date: 3/31/2020

email: nick@pogoresources.com Telephone: 214-420-9189

OCD Only

Received by: Victoria Venegas Date: 04/02/2020

☐ Approved ☒ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: Date: 04/09/2020

APPENDIX B

DELINEATION SUMMARY TABLE

Appendix B. Delineation Data										
Borehole	Depth (ft)	Sample Date	Chloride		BTEX (8021B)		TPH (8015M)			
			Laboratory	Field Screen	Benzene	Total BTEX	GRO	DRO	EXT DRO	C6-C35
L1	1	10/11/2019	**4300**	**3674**	<0.025	<0.225	<5.0	<10	<50	<65
	2	10/11/2019	-	**2691**	-	-	-	-	-	-
	3	10/11/2019	-	**3441**	-	-	-	-	-	-
	4	10/11/2019	**3300**	**2072**	<0.025	<0.225	<5.0	380	190	570
	5	10/11/2019	-	**1031**	-	-	-	-	-	-
	6	10/11/2019	-	**1400**	-	-	-	-	-	-
	7	10/11/2019	-	**1572**	-	-	-	-	-	-
	9	10/11/2019	-	**1588**	-	-	-	-	-	-
	11	10/11/2019	-	**1269**	-	-	-	-	-	-
	12	3/12/2020	**2600**	**1708**	-	-	-	-	-	-
	14	3/12/2020	**2320**	**2384**	-	-	-	-	-	-
	16	3/12/2020	208	ND	-	-	-	-	-	-
	18	3/12/2020	64.0	ND	-	-	-	-	-	-
L2	1	10/11/2019	**4300**	**3708**	<0.025	<0.225	<5.0	<10	<50	<65
	2	10/11/2019	-	**2582**	-	-	-	-	-	-
	3	10/11/2019	-	**1750**	-	-	-	-	-	-
	4	10/11/2019	**1700**	**1618**	<0.025	<0.225	<5.0	<10	<50	<65
	5	10/11/2019	-	**1777**	-	-	-	-	-	-
	6	3/12/2020	272	192	-	-	-	-	-	-
	7	3/12/2020	512	300	-	-	-	-	-	-
	9	3/12/2020	**2280**	**1236**	-	-	-	-	-	-
	11	3/12/2020	**2040**	**1384**	-	-	-	-	-	-
	13	3/12/2020	448	536	-	-	-	-	-	-
	15	3/12/2020	320	164	-	-	-	-	-	-
L3	1	10/11/2019	**4500**	**3337**	<0.025	<0.225	<5.0	<10	<50	<65
	2	10/11/2019	-	**2925**	-	-	-	-	-	-
	3	10/11/2019	-	**1269**	-	-	-	-	-	-
	4	10/11/2019	**2100**	**1291**	<0.025	<0.225	<5.0	<10	<50	<65
	5	10/11/2019	-	**1330**	-	-	-	-	-	-
	8	10/11/2019	84	253	<0.025	<0.225	<5.0	<10	<50	<65
SW1	2	10/11/2019	-	243	-	-	-	-	-	-
	4	10/11/2019	-	491	-	-	-	-	-	-
SW2	2	10/11/2019	-	350	-	-	-	-	-	-
	4	10/11/2019	-	298	-	-	-	-	-	-
SW3	2	10/11/2019	-	292	-	-	-	-	-	-
	4	10/11/2019	-	363	-	-	-	-	-	-
SW4	2	10/11/2019	-	280	-	-	-	-	-	-
	4	10/11/2019	-	285	-	-	-	-	-	-
SW5	2	10/11/2019	-	256	-	-	-	-	-	-
	4	10/11/2019	-	306	-	-	-	-	-	-
SW6	2	10/11/2019	-	345	-	-	-	-	-	-
	4	10/11/2019	-	334	-	-	-	-	-	-
BG	2	10/11/2019	-	280	-	-	-	-	-	-
	4	10/11/2019	-	181	-	-	-	-	-	-
NMOCD Thresholds - GW <50' BGS				**600**	**10**	**50**				**100**

BOLD results indicate results above RRAL

- indicates tests were not ran

All units in mg/kg unless otherwise noted

APPENDIX C.1

LABORATORY REPORTS

INITIAL DELINEATION

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-001 **Matrix:** SOIL

Client Sample ID: L1 @1
Collection Date: 10/11/2019 10:25:00 AM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	4300	150		mg/Kg	50	10/22/2019 9:42:03 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	8.9		mg/Kg	1	10/19/2019 5:11:20 AM	48215
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	10/19/2019 5:11:20 AM	48215
Surr: DNOP	8.36	70-130	S	%Rec	1	10/19/2019 5:11:20 AM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/18/2019 7:51:04 PM	48209
Surr: BFB	89.8	77.4-118		%Rec	1	10/18/2019 7:51:04 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	10/18/2019 7:51:04 PM	48209
Toluene	ND	0.048		mg/Kg	1	10/18/2019 7:51:04 PM	48209
Ethylbenzene	ND	0.048		mg/Kg	1	10/18/2019 7:51:04 PM	48209
Xylenes, Total	ND	0.095		mg/Kg	1	10/18/2019 7:51:04 PM	48209
Surr: 4-Bromofluorobenzene	93.4	80-120		%Rec	1	10/18/2019 7:51:04 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-002 **Matrix:** SOIL

Client Sample ID: L1 @4
Collection Date: 10/11/2019 11:10:00 AM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	3300	150		mg/Kg	50	10/22/2019 9:54:28 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	380	19		mg/Kg	2	10/21/2019 7:22:50 PM	48215
Motor Oil Range Organics (MRO)	190	96		mg/Kg	2	10/21/2019 7:22:50 PM	48215
Surr: DNOP	102	70-130		%Rec	2	10/21/2019 7:22:50 PM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 8:14:27 PM	48209
Surr: BFB	89.2	77.4-118		%Rec	1	10/18/2019 8:14:27 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	10/18/2019 8:14:27 PM	48209
Toluene	ND	0.050		mg/Kg	1	10/18/2019 8:14:27 PM	48209
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 8:14:27 PM	48209
Xylenes, Total	ND	0.10		mg/Kg	1	10/18/2019 8:14:27 PM	48209
Surr: 4-Bromofluorobenzene	89.9	80-120		%Rec	1	10/18/2019 8:14:27 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-003 **Matrix:** SOIL

Client Sample ID: L2 @1
Collection Date: 10/11/2019 1:00:00 PM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	4300	150		mg/Kg	50	10/22/2019 10:31:41 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/19/2019 5:54:53 AM	48215
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/19/2019 5:54:53 AM	48215
Surr: DNOP	11.2	70-130	S	%Rec	1	10/19/2019 5:54:53 AM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	10/18/2019 8:37:54 PM	48209
Surr: BFB	94.3	77.4-118		%Rec	1	10/18/2019 8:37:54 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.023		mg/Kg	1	10/18/2019 8:37:54 PM	48209
Toluene	ND	0.047		mg/Kg	1	10/18/2019 8:37:54 PM	48209
Ethylbenzene	ND	0.047		mg/Kg	1	10/18/2019 8:37:54 PM	48209
Xylenes, Total	ND	0.093		mg/Kg	1	10/18/2019 8:37:54 PM	48209
Surr: 4-Bromofluorobenzene	97.7	80-120		%Rec	1	10/18/2019 8:37:54 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-004 **Matrix:** SOIL

Client Sample ID: L2 @4
Collection Date: 10/11/2019 1:10:00 PM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	1700	60		mg/Kg	20	10/21/2019 7:05:55 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.5		mg/Kg	1	10/19/2019 6:16:31 AM	48215
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/19/2019 6:16:31 AM	48215
Surr: DNOP	9.46	70-130	S	%Rec	1	10/19/2019 6:16:31 AM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	10/18/2019 9:01:19 PM	48209
Surr: BFB	89.6	77.4-118		%Rec	1	10/18/2019 9:01:19 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	10/18/2019 9:01:19 PM	48209
Toluene	ND	0.048		mg/Kg	1	10/18/2019 9:01:19 PM	48209
Ethylbenzene	ND	0.048		mg/Kg	1	10/18/2019 9:01:19 PM	48209
Xylenes, Total	ND	0.096		mg/Kg	1	10/18/2019 9:01:19 PM	48209
Surr: 4-Bromofluorobenzene	93.5	80-120		%Rec	1	10/18/2019 9:01:19 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-005 **Matrix:** SOIL

Client Sample ID: L3 @1
Collection Date: 10/11/2019 1:30:00 PM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	4500	150		mg/Kg	50	10/22/2019 10:44:06 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	10/21/2019 7:44:49 PM	48215
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	10/21/2019 7:44:49 PM	48215
Surr: DNOP	87.4	70-130		%Rec	1	10/21/2019 7:44:49 PM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/18/2019 9:24:49 PM	48209
Surr: BFB	91.2	77.4-118		%Rec	1	10/18/2019 9:24:49 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.024		mg/Kg	1	10/18/2019 9:24:49 PM	48209
Toluene	ND	0.049		mg/Kg	1	10/18/2019 9:24:49 PM	48209
Ethylbenzene	ND	0.049		mg/Kg	1	10/18/2019 9:24:49 PM	48209
Xylenes, Total	ND	0.097		mg/Kg	1	10/18/2019 9:24:49 PM	48209
Surr: 4-Bromofluorobenzene	93.7	80-120		%Rec	1	10/18/2019 9:24:49 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-006 **Matrix:** SOIL

Client Sample ID: L3 @4
Collection Date: 10/11/2019 1:55:00 PM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	2100	60		mg/Kg	20	10/21/2019 7:30:36 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	10/19/2019 7:00:08 AM	48215
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	10/19/2019 7:00:08 AM	48215
Surr: DNOP	9.82	70-130	S	%Rec	1	10/19/2019 7:00:08 AM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	10/18/2019 9:48:21 PM	48209
Surr: BFB	88.6	77.4-118		%Rec	1	10/18/2019 9:48:21 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	10/18/2019 9:48:21 PM	48209
Toluene	ND	0.049		mg/Kg	1	10/18/2019 9:48:21 PM	48209
Ethylbenzene	ND	0.049		mg/Kg	1	10/18/2019 9:48:21 PM	48209
Xylenes, Total	ND	0.098		mg/Kg	1	10/18/2019 9:48:21 PM	48209
Surr: 4-Bromofluorobenzene	91.1	80-120		%Rec	1	10/18/2019 9:48:21 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Analytical Report
Lab Order **1910895**
Date Reported: **10/23/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: CM Services
Project: Bagley SWD
Lab ID: 1910895-007 **Matrix:** SOIL

Client Sample ID: L3 @8
Collection Date: 10/11/2019 2:10:00 PM
Received Date: 10/16/2019 8:55:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	84	60		mg/Kg	20	10/21/2019 7:42:58 PM	48289
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **BRM**	
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	10/19/2019 7:21:53 AM	48215
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	10/19/2019 7:21:53 AM	48215
Surr: DNOP	6.83	70-130	S	%Rec	1	10/19/2019 7:21:53 AM	48215
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **RAA**	
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	10/18/2019 10:11:56 PM	48209
Surr: BFB	90.7	77.4-118		%Rec	1	10/18/2019 10:11:56 PM	48209
EPA METHOD 8021B: VOLATILES						Analyst: **RAA**	
Benzene	ND	0.025		mg/Kg	1	10/18/2019 10:11:56 PM	48209
Toluene	ND	0.050		mg/Kg	1	10/18/2019 10:11:56 PM	48209
Ethylbenzene	ND	0.050		mg/Kg	1	10/18/2019 10:11:56 PM	48209
Xylenes, Total	ND	0.099		mg/Kg	1	10/18/2019 10:11:56 PM	48209
Surr: 4-Bromofluorobenzene	93.6	80-120		%Rec	1	10/18/2019 10:11:56 PM	48209

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910895**
23-Oct-19

Client: CM Services
Project: Bagley SWD

Sample ID: **MB-48289**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **PBS**	Batch ID: **48289**	RunNo: **63862**							
Prep Date: **10/21/2019**	Analysis Date: **10/21/2019**	SeqNo: **2183303**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: **LCS-48289**	SampType: **lcs**	TestCode: **EPA Method 300.0: Anions**							
Client ID: **LCSS**	Batch ID: **48289**	RunNo: **63862**							
Prep Date: **10/21/2019**	Analysis Date: **10/21/2019**	SeqNo: **2183304**	Units: **mg/Kg**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910895**
23-Oct-19

Client: CM Services
Project: Bagley SWD

Sample ID: **LCS-48250** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **48250** RunNo: **63789**
Prep Date: **10/18/2019** Analysis Date: **10/18/2019** SeqNo: **2180890** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.5		5.000		110	70	130			

Sample ID: **MB-48250** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **48250** RunNo: **63789**
Prep Date: **10/18/2019** Analysis Date: **10/18/2019** SeqNo: **2180891** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		112	70	130			

Sample ID: **LCS-48215** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **48215** RunNo: **63789**
Prep Date: **10/17/2019** Analysis Date: **10/19/2019** SeqNo: **2181675** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	59	10	50.00	0	119	63.9	124			
Surr: DNOP	2.2		5.000		43.0	70	130			S

Sample ID: **LCSD-48250** SampType: **LCSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS02** Batch ID: **48250** RunNo: **63789**
Prep Date: **10/18/2019** Analysis Date: **10/18/2019** SeqNo: **2181676** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.6		5.000		111	70	130	0	0	

Sample ID: **LCS-48254** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **48254** RunNo: **63833**
Prep Date: **10/18/2019** Analysis Date: **10/21/2019** SeqNo: **2182087** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	3.9		5.000		78.0	70	130			

Sample ID: **MB-48254** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **48254** RunNo: **63833**
Prep Date: **10/18/2019** Analysis Date: **10/21/2019** SeqNo: **2182088** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.3		10.00		83.3	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910895**
23-Oct-19

Client: CM Services
Project: Bagley SWD

Sample ID: **MB-48215**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **48215**	RunNo: **63833**
Prep Date: **10/17/2019**	Analysis Date: **10/21/2019**	SeqNo: **2182089** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	8.1		10.00		80.9	70	130			

Sample ID: **LCS-48247**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **48247**	RunNo: **63841**
Prep Date: **10/18/2019**	Analysis Date: **10/21/2019**	SeqNo: **2183635** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.7		5.000		94.4	70	130			

Sample ID: **MB-48247**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **48247**	RunNo: **63841**
Prep Date: **10/18/2019**	Analysis Date: **10/21/2019**	SeqNo: **2183636** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.1		10.00		91.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910895**
23-Oct-19

Client: CM Services
Project: Bagley SWD

Sample ID: **LCS-48209**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **48209**	RunNo: **63829**
Prep Date: **10/16/2019**	Analysis Date: **10/18/2019**	SeqNo: **2181748** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	22	5.0	25.00	0	89.4	80	120			
Surr: BFB	1000		1000		102	77.4	118			

Sample ID: **MB-48209**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **48209**	RunNo: **63829**
Prep Date: **10/16/2019**	Analysis Date: **10/18/2019**	SeqNo: **2181750** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	940		1000		93.7	77.4	118			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1910895**
23-Oct-19

Client: CM Services
Project: Bagley SWD

Sample ID: **LCS-48209**	SampType: **LCS**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **LCSS**	Batch ID: **48209**	RunNo: **63829**
Prep Date: **10/16/2019**	Analysis Date: **10/18/2019**	SeqNo: **2181898** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.6	80	120			
Toluene	0.95	0.050	1.000	0	95.4	80	120			
Ethylbenzene	0.96	0.050	1.000	0	96.5	80	120			
Xylenes, Total	2.9	0.10	3.000	0	97.4	80	120			
Surr: 4-Bromofluorobenzene	1.0		1.000		102	80	120			

Sample ID: **MB-48209**	SampType: **MBLK**	TestCode: **EPA Method 8021B: Volatiles**
Client ID: **PBS**	Batch ID: **48209**	RunNo: **63829**
Prep Date: **10/16/2019**	Analysis Date: **10/18/2019**	SeqNo: **2181900** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.95		1.000		95.5	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CM SERVICES Work Order Number: 1910895 RcptNo: 1

Received By: Juan Rojas 10/16/2019 8:55:00 AM

Completed By: Yazmine Garduno 10/16/2019 10:16:07 AM Yazmine Garduno

Reviewed By: DM 10/16/19

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Courier		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: DAD 10/16/19

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good				
2	2.6	Good				
3	1.4	Good				

Chain-of-Custody Record

Client: C&M Services LLC

27

Mailing Address: 312 N. Canal St Suite C Carlsbad, NM 88220

Phone #:

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☐ Standard ☒ Rush 5 day

Project Name: Bagley SWD

Project #:

Project Manager: J. Harris

Sampler: LEB

On Ice: ☑ Yes ☐ No

# of Coolers:

Cooler Temp(including CF): See Remarks (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 1910845	BTEX / MTBE / TMB's (8021)	TPH 8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
10.11.19	10:25	soil	L1@1	4oz		-001	X	X					X			
	11:10		L1@4			-002	X	X					X			
	1:00		L2@1			-003	X	X					X			
	1:10		L2@4			-004	X	X					X			
	1:30		L3@1			-005	X	X					X			
	1:55		L3@4			-006	X	X					X			
	2:10		L3@8			-007	X	X					X			

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
10.15.19	10:00	Samantha Watson			10/15/19	1400
10/15/19	1900			carrier	10-16-19	8:55

Remarks: POGO

Temp = 3.2 + 0.2 = 3.4
2.4 + 0.2 = 2.6
1.2 + 0.2 = 1.4

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX C.2

LABORATORY REPORTS

FOLLOW-UP DELINEATION

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

March 16, 2020

ZACH ROBBINS

RX-SOIL INC.

201 MAIN STREET, SUITE 1360

FORT WORTH, TX 76102

RE: POGO

Enclosed are the results of analyses for samples received by the laboratory on 03/12/20 16:25.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

RX-SOIL INC.
ZACH ROBBINS
201 MAIN STREET, SUITE 1360
FORT WORTH TX, 76102
Fax To: NA

Received:	03/12/2020	Sampling Date:	03/12/2020
Reported:	03/16/2020	Sampling Type:	Soil
Project Name:	POGO	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	BAGLEY FIELD		

Sample ID: L1 - 12 (H000784-01)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2600**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L1 - 14 (H000784-02)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2320**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L1 - 16 (H000784-03)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**208**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L1 - 18 (H000784-04)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**64.0**	16.0	03/16/2020	ND	432	108	400	7.69	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

RX-SOIL INC.
ZACH ROBBINS
201 MAIN STREET, SUITE 1360
FORT WORTH TX, 76102
Fax To: NA

Received:	03/12/2020	Sampling Date:	03/12/2020
Reported:	03/16/2020	Sampling Type:	Soil
Project Name:	POGO	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	BAGLEY FIELD		

Sample ID: L2 - 6 (H000784-05)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**272**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L2 - 7 (H000784-06)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**512**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L2 - 9 (H000784-07)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2280**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L2 - 11 (H000784-08)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2040**	16.0	03/16/2020	ND	432	108	400	7.69	

Sample ID: L2 - 13 (H000784-09)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**448**	16.0	03/16/2020	ND	432	108	400	7.69	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

RX-SOIL INC.
ZACH ROBBINS
201 MAIN STREET, SUITE 1360
FORT WORTH TX, 76102
Fax To: NA

Received:	03/12/2020	Sampling Date:	03/12/2020
Reported:	03/16/2020	Sampling Type:	Soil
Project Name:	POGO	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	BAGLEY FIELD		

Sample ID: L2 - 15 (H000784-10)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: GM**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**320**	16.0	03/16/2020	ND	432	108	400	7.69	

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Rx Soil	**BILL TO**	ANALYSIS REQUEST
Project Manager:	Zach Robbins	P.O. #:	
Address:		Company:	
City:	Fort Worth	State: Tx Zip: 76102	Attn:
Phone #:	210-400-7645	Fax #:	Address:
Project #:		Project Owner:	City:
Project Name:	POGO		State: Zip:
Project Location:	Bagley Field		Phone #:
Sampler Name:	Nate Vaquera		Fax #:

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	CHLORIDES
H000784															
1	L1-12					✓							3/12		✓
2	L1-14					✓							3/12		✓
3	L1-16					✓							3/12		✓
4	L1-18					✓							3/12		✓
5	L2-6					✓							3/12		✓
6	L2-7					✓							3/12		✓
7	L2-9					✓							3/12		✓
8	L2-11					✓							3/12		✓
9	L2-13					✓							3/12		✓
10	L2-15					✓							3/12		✓

Relinquished By:	Date: 3-12-20	Received By:	Verbal Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 1625		All Results are emailed. Please provide Email address:
Relinquished By:	Date:	Received By:	REMARKS:
	Time:		

Delivered By: (Circle One)	Observed Temp. °C 4.2c	Sample Condition	CHECKED BY:	Turnaround Time: Standard ☒ Rush ☐
Sampler - UPS - Bus - Other:	Corrected Temp. °C	Cool: ☒ Yes ☐ No Intact: ☐ Yes ☐ No	(Initials) NJ	Thermometer ID #97 Correction Factor + 0.4 °C

Bacteria (only) Sample Condition: Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No — Observed Temp. °C — Corrected Temp. °C

FORM-006 R 3.0

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com

APPENDIX D

FIELD NOTES

Easley 10.11.19 .36 acres Lyndsey B & Samantha C

onsite @ 10:20 am Chloride levels 0-4' = 600 mg/k

POLO Met: Shane Ferguson (POGO) on site 4'> = 10,000 mg/k

Objective of visit:

Vertically & horizontally delineate release

- Released material: Produced water
- Apprx. amount released: 50 bbls

Backhoe on site

operator: Raul

Helper: Kenneth

- Release occurred from buried poly and released material between fence line & buried steel pipeline
- Mapped release area: collected L1, L2, & L3 and SW

L1 = 1', 2', 3', 4', 5', 6', 7', 9', 11' (backhoe couldn't go deeper)

L2 = 1', 2', 3', 4', 5'

L3 = 1', 2', 3', 4', 5', 8' (cleared at 8')

SW 1, 2, 3, 4, 5, & 6 = 2' & 4'

BG = 2' & 4'

Take BG!

LRB SEW

Soil Sample Field Screening Results

Location Name: POGO - Bagley Date: 10-11-19

Sample Name:	Collection Time:	EC (mS)	Temp (°C)	PID Reading	Petroflag Reading	Soil Color	Primary Soil Type	Moisture Level	Notes
L1@1	10:25	2.35	12.2		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	3674
L1@2	10:30	1.66	11.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	2691
L1@3	10:50	2.18	11.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	3441
L1@4	11:10	1.27	13.2		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	2072
L1@5	11:30	0.54	12.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1031
L1@6	11:50	0.83	13.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1400
L1@7	12:00	0.93	13.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1572
L1@9	12:15	0.98	14.7		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1588

L1@11 12:30 0.72 13.4

as far as can go

1269

Soil Sample Field Screening Results

Location Name: PDGO Bagley

Date: 10.11.19

Sample Name:	Collection Time:	EC (mS)	Temp (°C)	PID Reading	Petroflag Reading	Soil Color	Primary Soil Type	Moisture Level	Notes
L2@1'	1:00	2.47	15.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	3708
L2@2'	1:03	1.75	17.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	2582
L2@3'	1:06	1.05	13.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1750
L2@4'	1:10	0.98	14.0		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1618
L2@5'	1:24	1.09	14.0		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1777
L3@1	1:30	2.18	14.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	3337
L3@2	1:35	1.87	13.5		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	2925
L3@3	1:45	0.75	14.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	1269.

L3@4 1:55 0.75 13.9 1291

L3@5 2:00 0.75 13.0 1330

Soil Sample Field Screening Results

Location Name: POGO Bagley Date: 10.11.19

Sample Name:	Collection Time:	EC (mS)	Temp (°C)	PID Reading	Petroflag Reading	Soil Color	Primary Soil Type	Moisture Level	Notes
L3@8	2:10	0.07	15.2		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	253
~~SW1@2 (1st)~~	2:30	0.39	15.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	711
~~SW1@4 (1st)~~	2:35	0.44	14.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	800
BG@2	2:40	0.05	13.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	280
BG@4	2:45	0.05	16.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	181
SW1@2 2nd	3:00	0.03	14.1		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	243
SW1@4 2nd	3:15	0.19	13.7		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	491
SW2@2	3:25	0.08	13.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	350
SW2@4	3:35	0.05	13.5						298

Soil Sample Field Screening Results

Location Name: Bagley

Date: 10-11-19

Sample Name:	Collection Time:	EC (mS)	Temp (°C)	PID Reading	Petroflag Reading	Soil Color	Primary Soil Type	Moisture Level	Notes
SW3@2	3:45	0.04	12.5		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	292
SW3@4	3:47	0.05	12.0		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	363
SW4@2	3:55	0.05	13.9		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	280
SW4@4	4:00	0.05	13.8		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	285
SW5@2	4:05	0.03	13.8		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	256
SW5@4	4:10	0.05	13.3		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	306
SW6@2	4:25	0.05	12.4		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	345
SW6@4	4:35	0.06	13.0		MRO: DRO: GRO:	Light Dark Tan Brown Gray Olive Yellow Red	Gravel Rock Sand Silt Clay	Dry Moist Wet	334

POGO

	L2	L	H	EC
6		2.2 48-192	/	0.91
7		2.8 75-300	/	1.04
9		5.2 240-960	2.4 309-1236	2.16
11		6.0 317-1268	2.6 346-1384	2.20
13		3.8 134-536	/	0.95
15		2.0 41-164	/	0.86
17				
19				
21				

	L1	L	H	EC
12		6.2 368-1472	3.0 427-1708	2.53
14		7.2 523-2092	3.6 569-2384	2.81
16		0.6 N/D	/	0.29
18		0.6 N/D	/	1.42
20				

END OF REPORT