December 5, 2019

NMOCD District 1

1625 N. French Drive

Hobbs, NM 88240

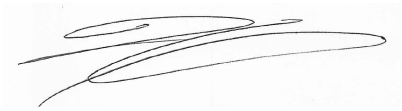
Re: Remediation Plan

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** – USGS 331845103365701 is the nearest water well with data in the past 25 years (listed in *Appendix A*) and has a reported depth to water of 52', recorded in January of 2001. This well is approximately 0.89 miles from the spill area. The nearest POD is L 01331 and lists a depth to groundwater of 68' from 1952. This work plan is proposing to adhere to closure criteria for depth to groundwater of 51' – 100'.
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 October 11, 2019 by C&M Services, LLC. Sample points are shown in *Figure 2* with results summarized in *Appendix B*. Lab data is displayed in *Appendix* C. Horizontal 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 (600 mg/kg chloride) and Table I (2,500 mg/kg TPH, 1,000 mg/kg GRO+DRO, 50 mg/kg BTEX, 10 mg/kg benzene). Vertical delineation will continue throughout the spill area to clean material per Table I. Per NMAC 19.15.29.11 A. (5) (c), vertical delineation will continue at sample locations L1 and L2 until chloride readings are below 600 mg/kg. Excavation will be guided by field data.

III. Remediation Plan

The delineation points can be seen in *Figure 2* with results in *Appendix B*. As stated in **Section II**, further delineation will be conducted throughout excavation.

RXSoil's core process of on-site remediation was used to address the contamination. RXSoil supervised 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. A 20-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 estimated 3,000 cubic yards of 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.

Once all contaminated material is in the treatment cell, chemical and biological 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 30 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

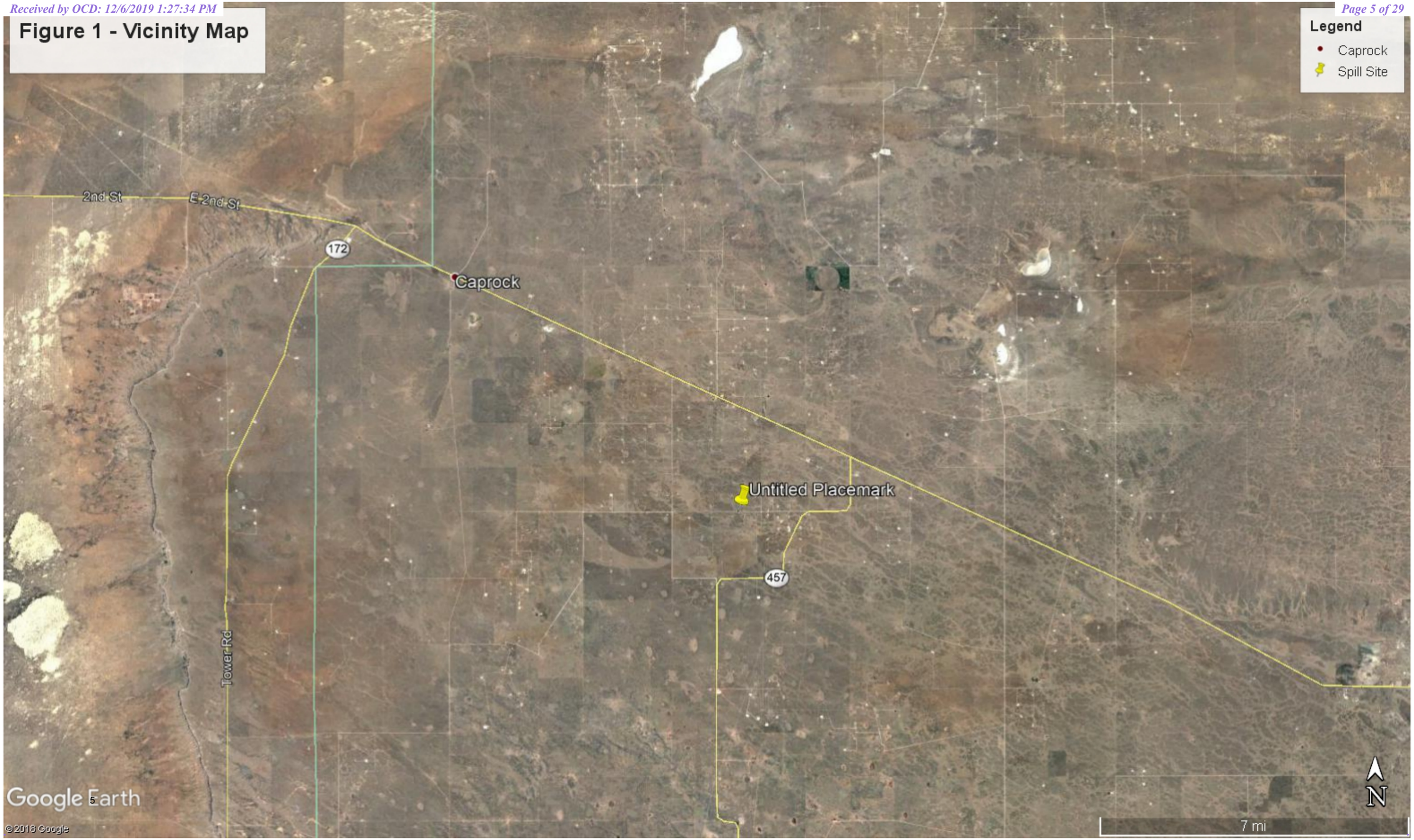


Figure 2 - Site Overview

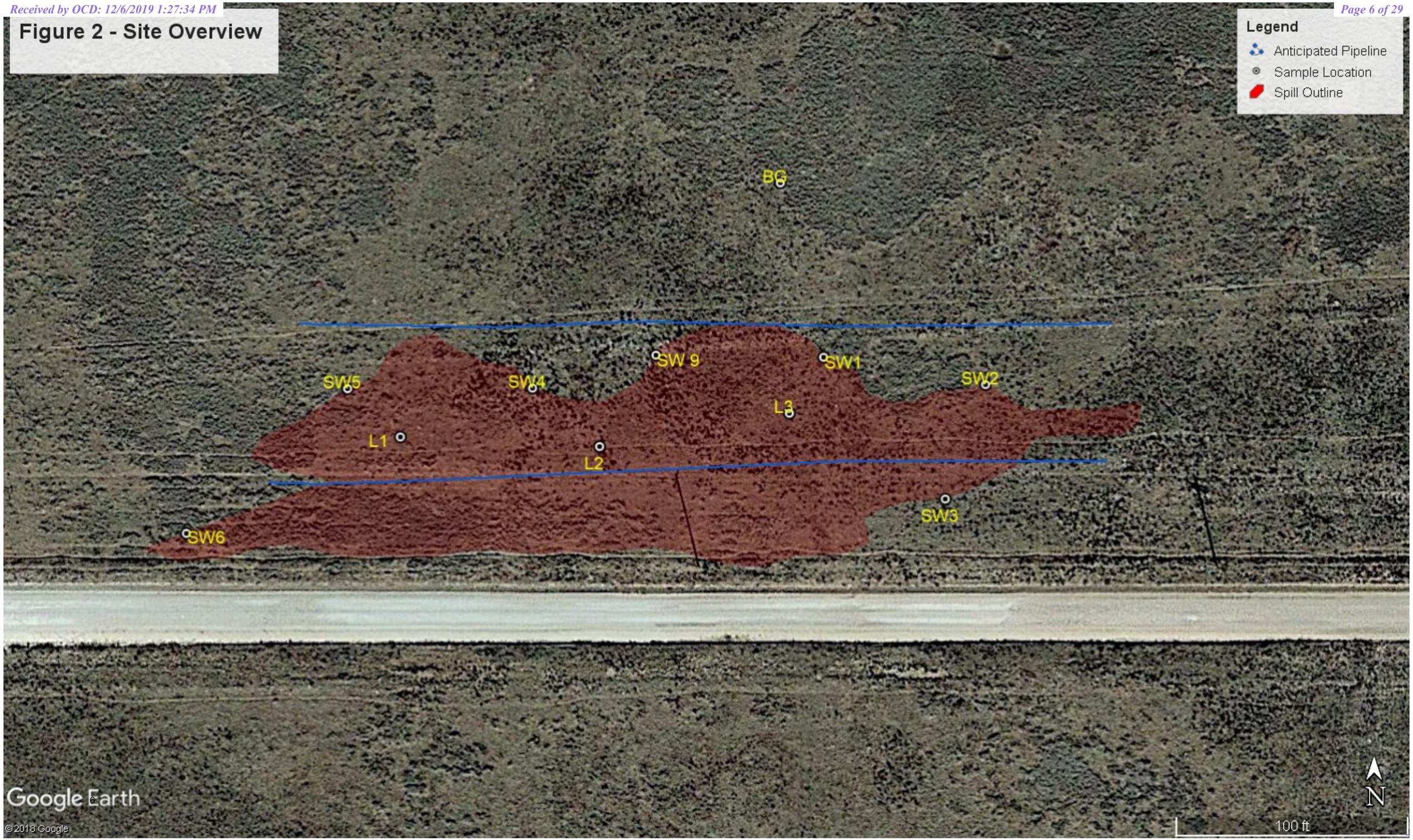
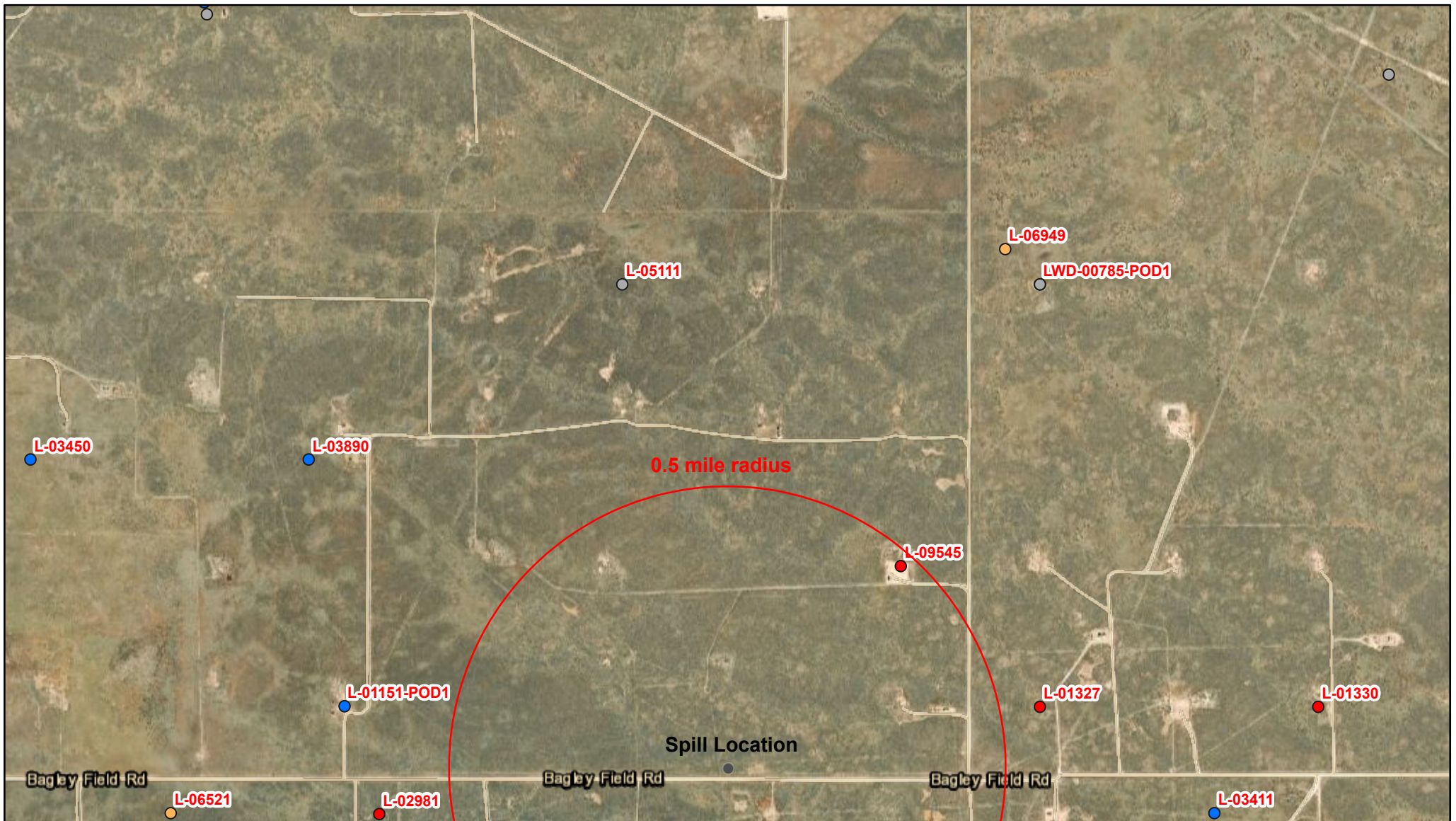


Figure 3 - Point of Diversion Map



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

OSE District Boundary

GIS WATERS PODs

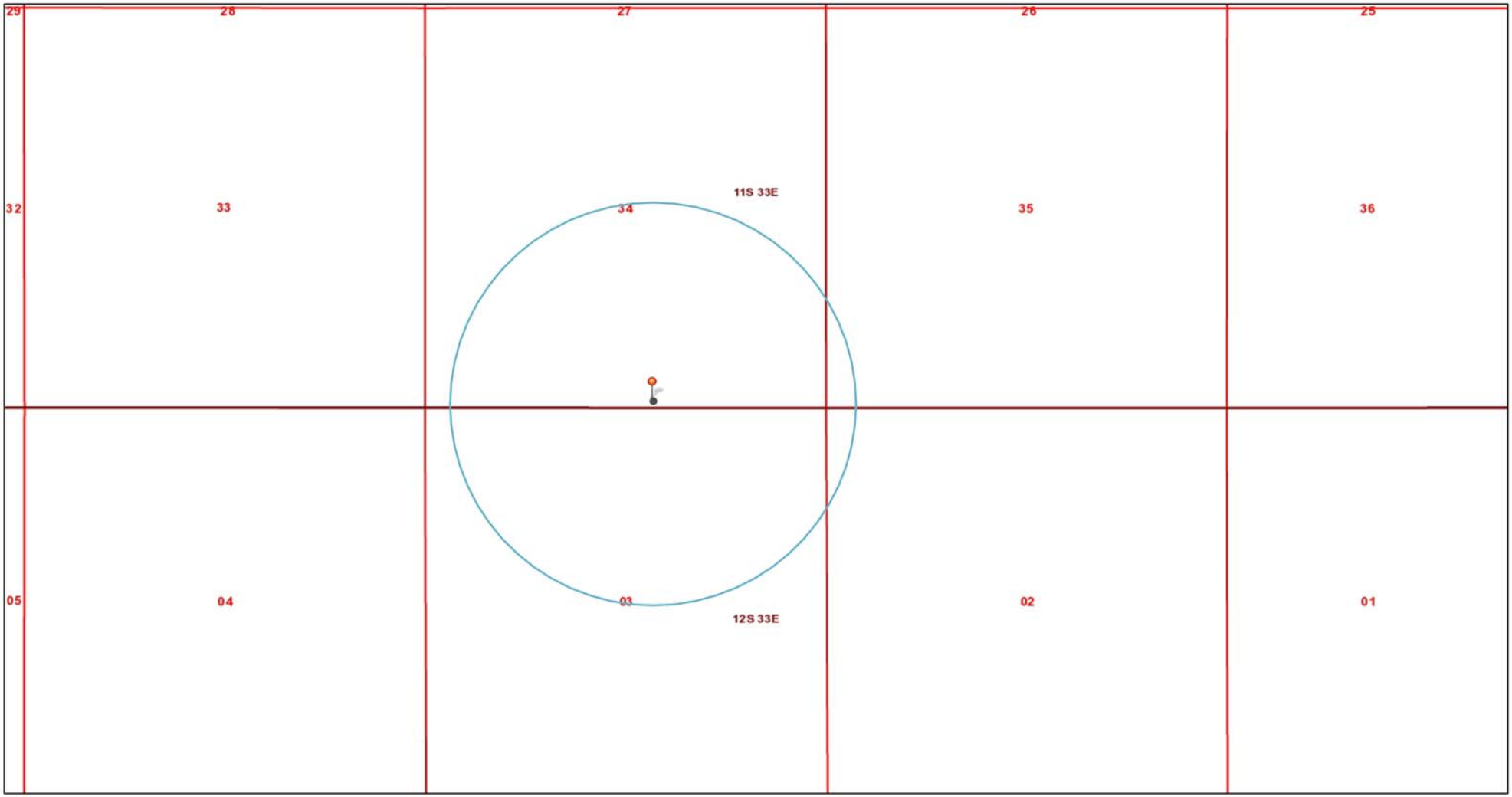
- Active
- Plugged
- Capped

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

NEAREST WATER WELL DATA

Click to hideNews Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 331845103365701

Minimum number of levels = 1
Save file of selected sites to local disk for future upload

USGS 331845103365701 11S.33E.33.433442

Lea County, New Mexico
Latitude 33°18'55", Longitude 103°37'03" NAD27
Land-surface elevation 4,268.50 feet above NGVD29
The depth of the well is 80 feet below land surface.
This well is completed in the Ogallala Formation (121OGLL) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period

Date	Time	? Water-level date-time accuracy	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Water-level accuracy	? Status	? Method of measurement	? Measuring agency	? Source of measureme
1961-01-19		D	54.37			2		U		
1966-02-09		D	54.90			2		U		
1971-03-18		D	54.42			2		U		
1976-05-26		D	54.95			2		U		
1981-02-13		D	56.02			2		U		
1984-05-09		D	55.08			2		U		
1986-01-09		D	54.67			2		U		
1990-11-29		D	53.54			2		U		
1996-01-23		D	52.53			2		S		
2001-01-04		D	51.91			2		S		

Explanation

Section	Code	Description
Water-level date-time accuracy	D	Date is accurate to the Day
Water-level accuracy	2	Water level accuracy to nearest hundredth of a foot
Status		The reported water-level measurement represents a static level
Method of measurement	S	Steel-tape measurement.
Method of measurement	U	Unknown method.
Measuring agency		Not determined

Section	Code	Description
Source of measurement	U	Source is unknown.
Water-level approval status	A	Approved for publication -- Processing and review completed.

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Accessibility Plug-Ins FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2019-11-01 18:17:45 EDT
0.22 0.19 nadww01

APPENDIX B

DELINEATION SUMMARY TABLE

Appendix B. Delineation Data										
Borehole	Depth (ft)	Sample Date	Chloride		BTEX (8021B)		TPH (8015M)			
			M300	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	-	-	-	-	-	-
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	-	-	-	-	-	-
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 - Top 4'				**600**	**10**	**50**				**2500**
NMOCD Thresholds - GW 51'-100'				**10000**						

BOLD results indicate results above RRAL

- indicates tests were not ran

All units in mg/kg unless otherwise noted

APPENDIX C

LABORATORY REPORTS

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.	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: 1910895-002 **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.
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: 1910895-004 **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
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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.
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: **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.	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		

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
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

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: LRB

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.

END OF REPORT