



PO Box 1120  
 Carlsbad, New Mexico 88221  
 Phone (575) 236-6600

February 12, 2020

NMOCD District 2  
 Mr. Robert Hamlet  
 811 S. First Street  
 Artesia, New Mexico 88210

Dear Mr. Hamlet:

M&M Excavating, Inc. (MMX) has prepared this Remediation Closure Report for Devon Energy Production Company that describes the remediation of a release of liquids at the Cotton Draw Unit #084 SWD. The site is in Unit Letter I, Section 02, Township 25S, Range 31E, Latitude 32.1592751, Longitude -103.7438736, Eddy County, New Mexico, on Federal Land with State owned mineral rights. Figure 1 provides the vicinity and site location on an USGS 7.5-minute quadrangle map.

### **Site Information and Closure Criteria**

The Cotton Draw Unit #084 SWD is located approximately thirty-three (33) miles southeast of Loving, New Mexico on Federal land at an elevation of approximately 3,464 feet above mean sea level (amsl).

Based upon well water data. (Appendix B), depth to groundwater in the area is estimated to be 400 feet below grade surface (bgs). There are ten known water wells within ½ mile of the location, according to the New Mexico Office of the State Engineer (NMOSE) and USGS. The nearest significant watercourse is a freshwater pond 3320 feet to the southeast.

The site has wells within 1000 feet and has therefore been remediated to the applicable NMOCD Closure Criteria for groundwater less than 50 feet bgs. The site has been restored to meet the standards of Table I of 19.15.29.12 NMAC.

Table 2 demonstrates the Closure Criteria applicable to this location. Pertinent well data is attached in Appendix B.

<b>Release Information and Closure Criteria</b>			
Name	Cotton Draw Unit #084 SWD		
API Number	30-015-29728		
Incident Number	2RP-4325		
Source of Release	Frac Tank		
Released Material	Produced Water	Released Volume	65 BBLs
Recovered Volume	10 BBLs	Net Release	55BBLs
NMOCD Closure Criteria	<50 feet to groundwater		

### **Release Information**

On July 23, 2019, a release was discovered at the Cotton Draw Unit #084 SWD site due to a frac tank overflowing, which approximately 65 bbls of produced water released. Initial response

activities were conducted by the operator and included source elimination and site containment, which recovered approximately 10 bbls of produced water. The site has since begun plugging and abandonment activities, and most of the tanks and equipment have been removed. Figures 1 and 2 illustrate the vicinity and site location. Figure 3 illustrates the release location. The C-141 forms are included in Appendix A.

### **Release Characterization and Remediation Activities**

As little was known about the impacted area, on October 9, 2019, Vertex personnel arrived on site and conducted an Electromagnetic (EM) Survey across the entire Cotton Draw Unit #084 SWD pad in order to "identify anomalously conductive soils and infer changes in the soil characteristics and composition.". The full EM report is included in Appendix D.

Using the EM survey to guide to sampling, MMX personnel travelled to location on October 10<sup>th</sup> and again on November 26<sup>th</sup> and December 3, 2019 to collect soil samples around potential areas of concern. Figure 3 shows the sample locations georeferenced over the EM survey.

A total of three (3) sample locations were established and three (3) samples (L1, L2 and TB), were collected for laboratory analysis for total chloride using EPA Method 300.0; benzene, toluene, ethylbenzene and total xylenes (BTEX) using EPA Method 8021B; and motor, diesel and gasoline range organics (MRO, DRO, and GRO) by EPA Method 8015D. Samples were placed into laboratory supplied glassware, labeled, and maintained on ice until delivery to Hall Laboratories in Albuquerque, New Mexico (Appendix C).

As summarized in Table 3, none of the results exceeded Closure Criteria for the location. Final Laboratory results are summarized in Table 3. Laboratory reports are included in Appendix C.

On behalf of Devon Energy, MMX requests closure for the release associated with 2RP-4325.

Submitted by:  
M&M Excavating, Inc.

*Parker Kimbley*

Parker Kimbley

**ATTACHMENTS:**

**Figures:**

Figure 1: Vicinity and Well Head Protection Map

Figure 2: Surface Water Radius Map

Figure 3: Site and Sample Location Map

**Tables:**

Table 2: NMOCD Closure Criteria Justification

Table 3: Summary of Sample Results

**Appendices:**

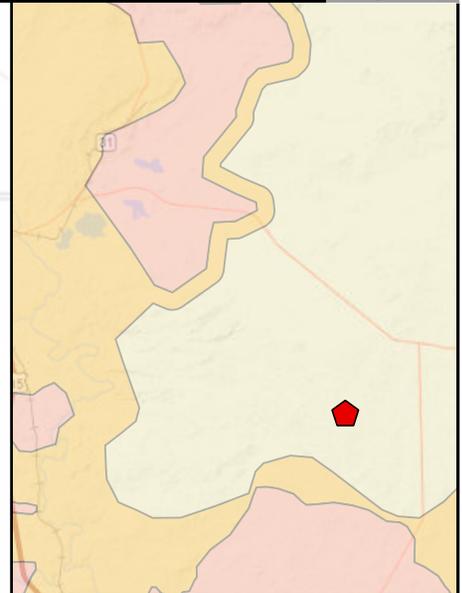
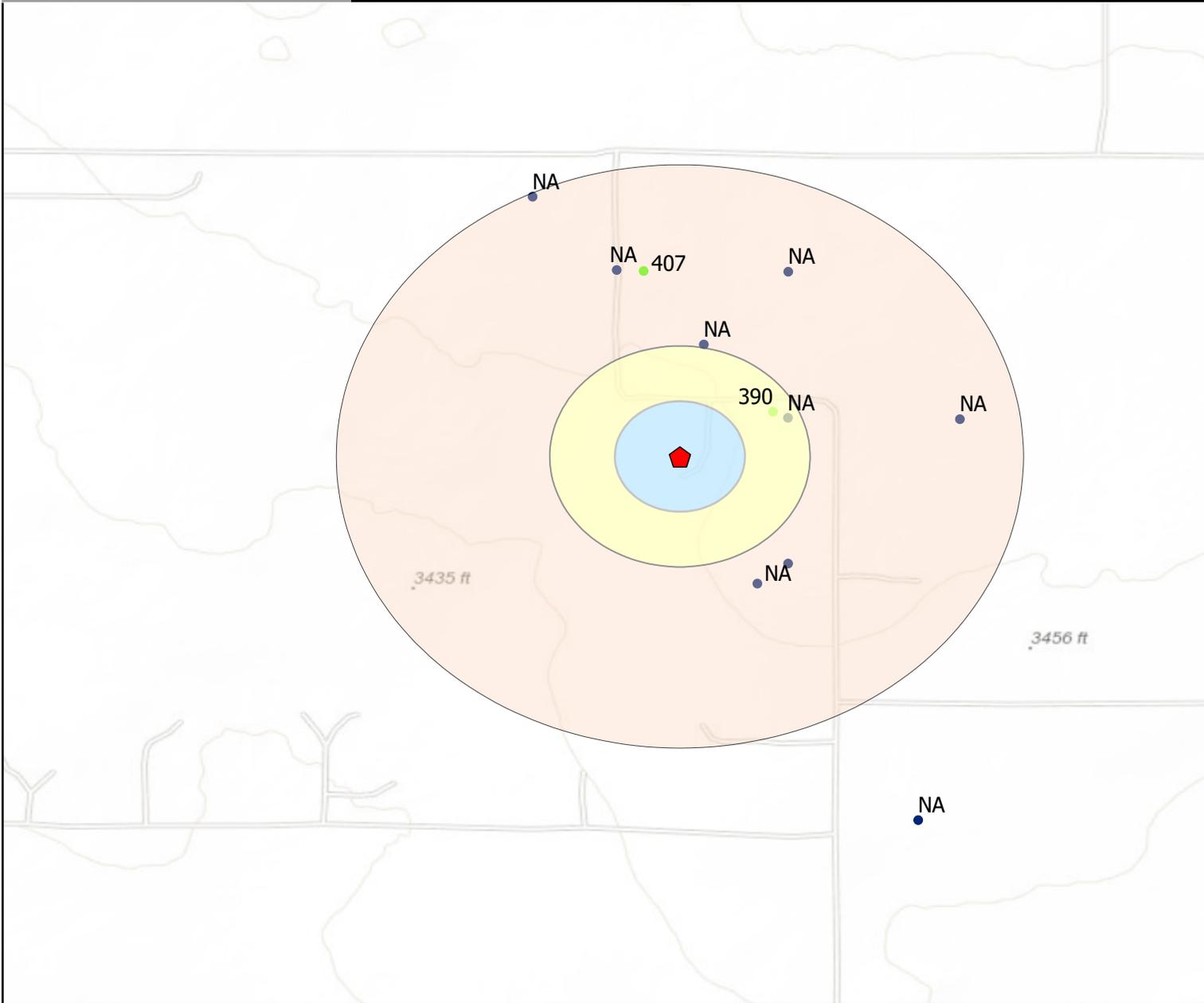
Appendix A: C141 Forms

Appendix B: Water Well Data

Appendix C: Laboratory Analytical Reports

Appendix D: Vertex Electromagnetic Survey Results & Interpretation for Cotton Draw Unit #084 SWD

## FIGURES



- Point of Release
- USGS Wells
- OSE Depth to GW

Buffer Distance

- .5 Mile
- 1000 Feet
- 500 Feet

Karst Potential

- Low
- Medium
- High

Point of Release 2,000

Feet

**N**

Regional Vicinity & Wellhead Protection Map  
 Cotton Draw Unit #084 SWD- Devon Energy  
 Sec 2 T25S R31E Eddy County, New Mexico

Figure 1

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Revisions		
By: _____	Date: _____	Descr: _____
By: _____	Date: _____	Descr: _____

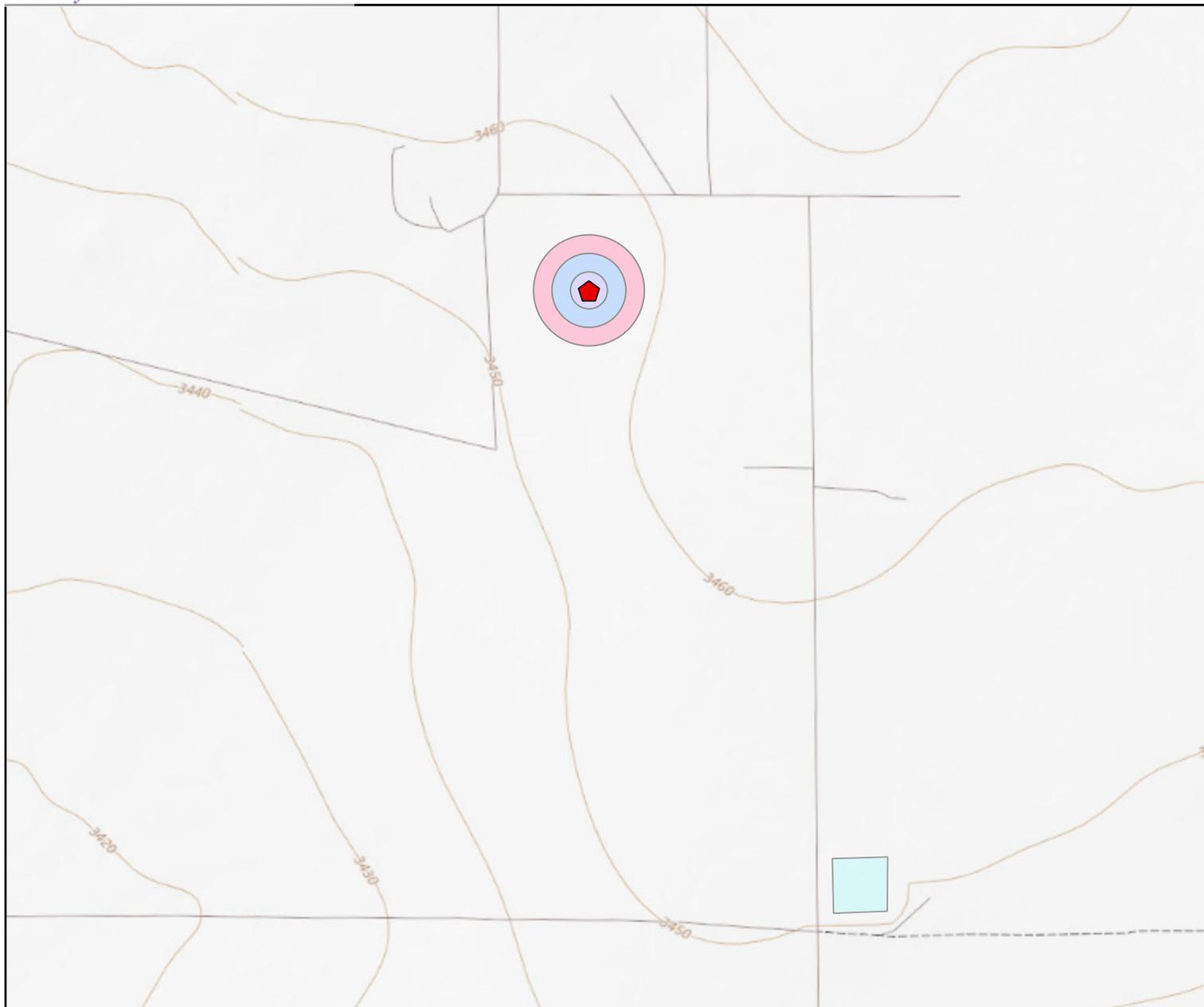
Date Saved: 2/4/2020

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Drawn	LC
Date	2/4/2020
Checked	_____
Approved	_____



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- Point of Release
- Springs Seeps
- Streams Canals
- Rivers
- NM Wetlands
- Lakes Playas
- FEMA Flood Zones 2011
- Buffer Distance**
- 100 Feet
- 200 Feet
- 300 Feet
- Release Area



0 425 850 1,700 Feet

Surface Water Protection Map  
 Cotton Draw Unit #084 SWD - Devon Energy  
 Sec 2 T25S R31E Eddy County, New Mexico

Figure 2

P:\5-MM Excavating (5128335)\GIS\ARCGIS\MMX\_MIT.aprx

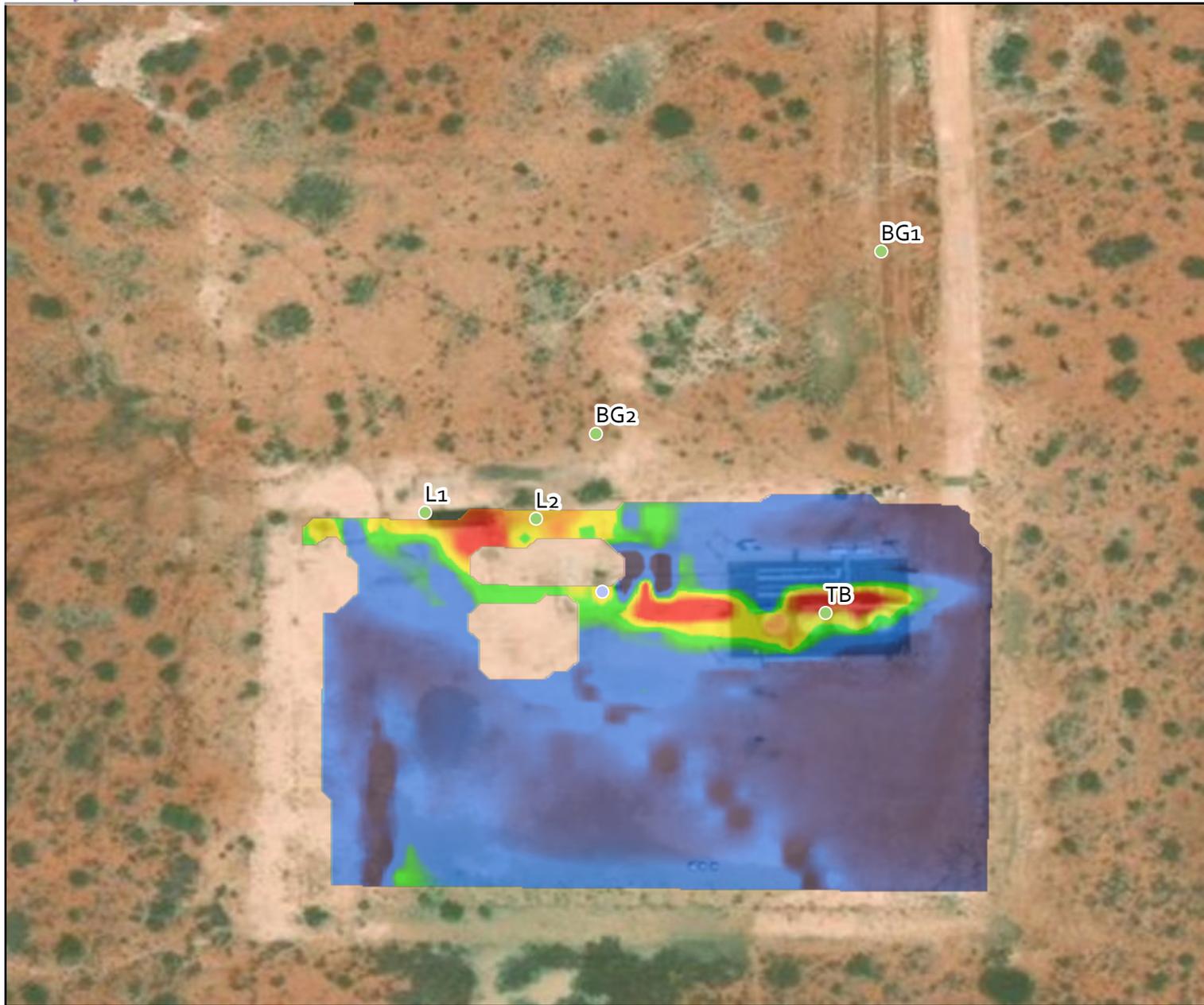
Revisions		
By: _____	Date: _____	Descr: _____
By: _____	Date: _____	Descr: _____

Date Saved: 7/18/2019  
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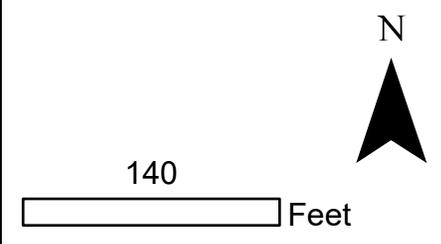
Drawn	<b>LC</b>
Date	7/18/2019
Checked	_____
Approved	_____



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- Point of Release
- Sample Locations



Site & Sample Locations  
Cotton Draw #84 SWD - Devon Energy

Figure 3

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Revisions		
By: _____	Date: _____	Descr: _____
By: _____	Date: _____	Descr: _____

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Drawn	LC
Date	11/20/2019
Checked	_____
Approved	_____



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Carlsbad, NM 88220  
(575) 236-6600

## TABLES

## Table 2: NMOCD Closure Criteria

Cotton Draw Unit #084 SWD  
Devon Energy Production Company

Site Information (19.15.29.11.A(2, 3, and 4) NMAC)		Source/Notes
Depth to Groundwater (feet bgs)	400	USGS (Appendix B)
Horizontal Distance From All Water Sources Within 1/2 Mile (ft)	--	10 OSE & USGS wells (see appendix B)
Horizontal Distance to Nearest Significant Watercourse (ft)	3320	Freshwater pond to the southeast

Closure Criteria (19.15.29.12.B(4) and Table 1 NMAC)						
Depth to Groundwater	Closure Criteria (units in mg/kg)					
	Chloride *numerical limit or background, whichever is greater	TPH	GRO + DRO	BTEX	Benzene	
Less than 50' BGS	X	600	100		50	10
51' to 100'		10000	2500	1000	50	10
Greater than 100'		20000	2500	1000	50	10
Surface Water	Yes	No	if yes, then			
Less than 300' from continuously flowing watercourse or other significant watercourse?		x	600	100	50	10
Less than 200' from lakebed, sinkhole or playa lake?		x				
Water Well or Water Source						
Less than 500 feet from spring or a private, domestic fresh water well used by less than 5 households for domestic or stock watering purposes?		x				
Less than 1000' from fresh water well or spring?	x					
Human and Other Areas						
Less than 300' from an occupied permanent residence, school, hospital, institution or church?		x				
Within incorporated municipal boundaries or within a defined municipal fresh water well field?		x				
Less than 100' from wetland?		x				
Within area overlying a subsurface mine		x				
Within an unstable area?		x				
Within a 100-year floodplain?		x				



**Table 3: Summary of Sample Results**

Cotton Draw Unit #084 SWD

Devon Energy Production Company  
2RP-4325

Sample ID	Sample Date	Depth (feet bgs)	BTEX	Benzene	GRO	DRO	MRO	Total TPH	Cl-
			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
<b>NMOCD Closure Criteria</b>			<b>50</b>	<b>10</b>				<b>100</b>	<b>600</b>
L1	11/26/2019	surface	<0.21	<0.023	<4.7	<9.0	<45	<58.7	350
		2	--	--	--	--	--	--	490
surface		<0.217	<0.024	<4.8	<9.4	<47	<61.2	120	
2		--	--	--	--	--	--	88	
TB	10/30/2019	surface	<0.215	<0.024	<4.8	<9.2	<46	<60.0	<60
		2	--	--	--	--	--	--	390
		6	--	--	--	--	--	--	78



### Table 3: Summary of Sample Results

Cotton Draw Unit #084 SWD

Devon Energy Production Company

2RP-4325

Sample ID	Sample Date	Depth (feet bgs)	BTEX	Benzene	GRO	DRO	MRO	Total TPH	CI-	CI- Field Screens
			mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
<b>NMOCD Closure Criteria</b>			<b>50</b>	<b>10</b>				<b>100</b>	<b>600</b>	
L1	11/26/2019	surface	<0.21	<0.023	<4.7	<9.0	<45	<58.7	350	--
		2	--	--	--	--	--	--	490	--
L2	11/26/2019	surface	<0.217	<0.024	<4.8	<9.4	<47	<61.2	120	--
		2	--	--	--	--	--	--	88	--
TB	10/30/2019	surface	<0.215	<0.024	<4.8	<9.2	<46	<60.0	<60	180
		2	--	--	--	--	--	--	390	590
		6	--	--	--	--	--	--	78	170
BG1	11/6/2019	6	--	--	--	--	--	--	--	<130
		10	--	--	--	--	--	--	<60	<130
		12	--	--	--	--	--	--	--	<130
BG2	11/6/2019	4	--	--	--	--	--	--	390	830
		6	--	--	--	--	--	--	1500	1330
		10	--	--	--	--	--	--	1000	990



## Appendix A: C141 Forms

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

**NM OIL CONSERVATION**  
ARTESIA DISTRICT  
AUG 03 2017  
Submit Copy to appropriate District Office in accordance with 19.15.29 NMAC.  
**RECEIVED**

Form C-141  
Revised August 8, 2011

**Release Notification and Corrective Action**

**NAB1721952285**

**0137 OPERATOR**

Initial Report  Final Report

<b>Name of Company</b> Devon Energy Production Company	<b>Contact</b> Matt Nettles, Production Foreman
<b>Address</b> 6488 Seven Rivers Hwy Artesia, NM 88210	<b>Telephone No.</b> 575-513-5767
<b>Facility Name</b> Cotton Draw Unit 84	<b>Facility Type</b> Salt Water Disposal

<b>Surface Owner</b> Federal	<b>Mineral Owner</b> State	<b>API No</b> 30-015-29728
------------------------------	----------------------------	----------------------------

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
I	2	25S	31E	2615'	FSL	1160'	FEL	Eddy

**Latitude:** 32.1592751

**Longitude:** -103.7438736

**NATURE OF RELEASE**

<b>Type of Release</b> Produced Water	<b>Volume of Release</b> 65bbls	<b>Volume Recovered</b> 10bbls
<b>Source of Release</b> Frac tank on location	<b>Date and Hour of Occurrence</b> July 23, 2017 @ 11:30	<b>Date and Hour of Discovery</b> July 23, 2017 @ 11:30
<b>Was Immediate Notice Given?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	<b>If YES, To Whom?</b> Shelly Tucker, BLM Mike Bratcher/Crystal Weaver, OCD	
<b>By Whom?</b> Ray Carter, Asst. Production Foreman	<b>Date and Hour</b> Shelly Tucker, BLM July 23, 2017 @ 11:45 AM Mike Bratcher/Crystal Weaver, OCD July 23, 2017 @ 6:42 PM	
<b>Was a Watercourse Reached?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If YES, Volume Impacting the Watercourse</b> N/A	

**If a Watercourse was Impacted, Describe Fully.\***  
N/A

**Describe Cause of Problem and Remedial Action Taken.\***  
The casing was blown down and didn't get shut off completely, causing the frac tank to run over on the location. The 2 inch ball valve was shut to prevent any further release.

**Describe Area Affected and Cleanup Action Taken.\***  
Approximately 65bbls of produced water was released onto the Northwest corner of location. 0.5 bbls left the location and was release onto the adjacent pasture. A vacuum truck was dispatched and recovered approximately 10bbbs of produced water. An environmental contractor will be contacted to assist with the delineation and remediation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: <i>Sheila Fisher</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Sheila Fisher	Signed By <i>Mike Bratcher</i> Approved by Environmental Specialist:	
Title: <b>Field Admin Support</b>	Approval Date: <i>8/4/17</i>	Expiration Date: <i>N/A</i>
E-mail Address: <b>Sheila.fisher@dvn.com</b>	Conditions of Approval: <i>See attached</i>	Attached <input type="checkbox"/>
Date:	Phone: <b>575.748.1829</b>	

*2FRP4325*

*8/4/17 AB*

Operator/Responsible Party,

The OCD has received the form C-141 you provided on 8/3/2017 regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number IRP 4325 has been assigned. **Please refer to this case number in all future correspondence.**

It is the Division's obligation under both the Oil & Gas Act and Water Quality Act to provide for the protection of public health and the environment. Our regulations (19.15.29.11 NMAC) state the following,

*The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC. [emphasis added]*

Release characterization is the first phase of corrective action unless the release is ongoing or is of limited volume and all impacts can be immediately addressed. Proper and cost-effective remediation typically cannot occur without adequate characterization of the impacts of any release. Furthermore, the Division has the ability to impose reasonable conditions upon the efforts it oversees. **As such, the Division is requiring a workplan for the characterization of impacts associated with this release be submitted to the OCD District 2 office in ARTESIA on or before 9/3/2017. If and when the release characterization workplan is approved, there will be an associated deadline for submittal of the resultant investigation report. Modest extensions of time to these deadlines may be granted, but only with acceptable justification.**

The goals of a characterization effort are: 1) determination of the lateral and vertical extents along with the magnitude of soil contamination. 2) determine if groundwater or surface waters have been impacted. 3) If groundwater or surface waters have been impacted, what are the extents and magnitude of that impact. 4) The characterization of any other adverse impacts that may have occurred (examples: impacts on vegetation, impacts on wildlife, air quality, loss of use of property, etc.). To meet these goals as quickly as possible, the following items must, at a minimum, be addressed in the release characterization workplan and subsequent reporting:

- Horizontal delineation of soil impacts in each of the four cardinal compass directions. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C<sub>6</sub> thru C<sub>36</sub>), and for chloride by Method 300. This is not an exclusive list of potential contaminants. Analyzed parameters should be modified based on the nature of the released substance(s). Soil sampling must be both within the impacted area and beyond.
- Vertical delineation of soil impacts. Adsorbed soil contamination must be characterized for the following constituents using the associated laboratory methods: benzene, toluene, ethylbenzene, and total xylenes by either Method 8260 or 8021, total petroleum hydrocarbons by Method 8015 extended range (GRO+DRO+MRO; C<sub>6</sub> thru C<sub>36</sub>), and for chloride by Method 300. As above, this is not an exclusive list of potential contaminants and can be modified. Vertical characterization samples should be taken at depth intervals no greater than five feet apart. Lithologic description of encountered soils must also be provided. At least ten vertical feet of soils with contaminant concentrations at or below these values must be demonstrated as existing above the water table.
- Nominal detection limits for field and laboratory analyses must be provided.
- Composite sampling is not generally allowed.
- Field screening and assessment techniques are acceptable (headspace, titration, EC [include algorithm for validation purposes], EM, etc.), but the sampling and assay procedures must be clearly defined. Copies of field notes are highly desirable. A statistically significant set of split samples must be submitted for confirmatory laboratory analysis, including the laterally farthest and vertically deepest sets of soil samples. Make sure there are at least two soil samples submitted

for laboratory analysis from each borehole or test pit (highest observed contamination and deepest depth investigated). Copies of the actual laboratory results must be provided including chain of custody documentation.

- Probable depth to shallowest protectable groundwater and lateral distance to nearest surface water. If there is an estimate of groundwater depth, the information used to arrive at that estimate must be provided. If there is a reasonable assumption that the depth to protectable water is 50 feet or less, the responsible party should anticipate the need for at least one groundwater monitoring well to be installed in the area of likely maximum contamination.

- If groundwater contamination is encountered, an additional investigation workplan may be required to determine the extents of that contamination. Groundwater and/or surface water samples, if any, must be analyzed by a competent laboratory for volatile organic hydrocarbons (typically Method 8260 full list), total dissolved solids, pH, major anions and cations including chloride and sulfate, dissolved iron, and dissolved manganese. The investigation workplan must provide the groundwater sampling method(s) and sample handling protocols. To the fullest extent possible, aqueous analyses must be undertaken using nominal method detection limits. As with the soil analyses, copies of the actual laboratory results must be provided including chain of custody documentation.

- Accurately scaled and well-drafted site maps must be provided providing the location of borings, test pits, monitoring wells, potentially impacted areas, and significant surface features including roads and site infrastructure that might limit either the release characterization or remedial efforts. Field sketches may be included in subsequent reporting, but should not be considered stand-alone documentation of the site's layout. Digital photographic documentation of the location and fieldwork is recommended, especially if unusual circumstances are encountered.

**Nothing herein should be interpreted to preclude emergency response actions or to imply immediate remediation by removal cannot proceed as warranted. Nonetheless, characterization of impacts and confirmation of the effectiveness of remedial efforts must still be provided to the OCD before any release incident will be closed.**

**Jim Griswold**

OCD Environmental Bureau Chief  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505  
505-476-3465  
jim.griswold@state.nm.us

**Bratcher, Mike, EMNRD**

---

**From:** Fisher, Sheila <Sheila.Fisher@dvn.com>  
**Sent:** Thursday, August 3, 2017 12:37 PM  
**To:** Bratcher, Mike, EMNRD; Weaver, Crystal, EMNRD; Shelly Tucker (stucker@blm.gov); Amber Groves (agroves@slo.state.nm.us)  
**Cc:** Nettles, Matt; Carter, Ray; Shoemaker, Mike; Fulks, Brett  
**Subject:** Cotton Draw Unit 84\_65bbl pw\_7.23.17  
**Attachments:** Cotton Draw Unit 84\_65bbbls pw\_Initial C-141\_7.23.17.doc; Cotton Draw Unit 84\_65bbbls pw\_GIS Image\_7.23.17.pdf

Good Afternoon,

Attached please find the Initial C-141 and GIS Image for the 65bbl produced water release at the Cotton Draw Unit 84 on 7.23.17.

If you have any questions please feel free to contact me.

Thank you,

*Sheila Fisher*  
Field Admin Support  
Production  
B-Schedule

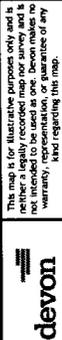
**Devon Energy Corporation**  
PO Box 250  
Artesia, NM 88211  
575 748 1829 Direct



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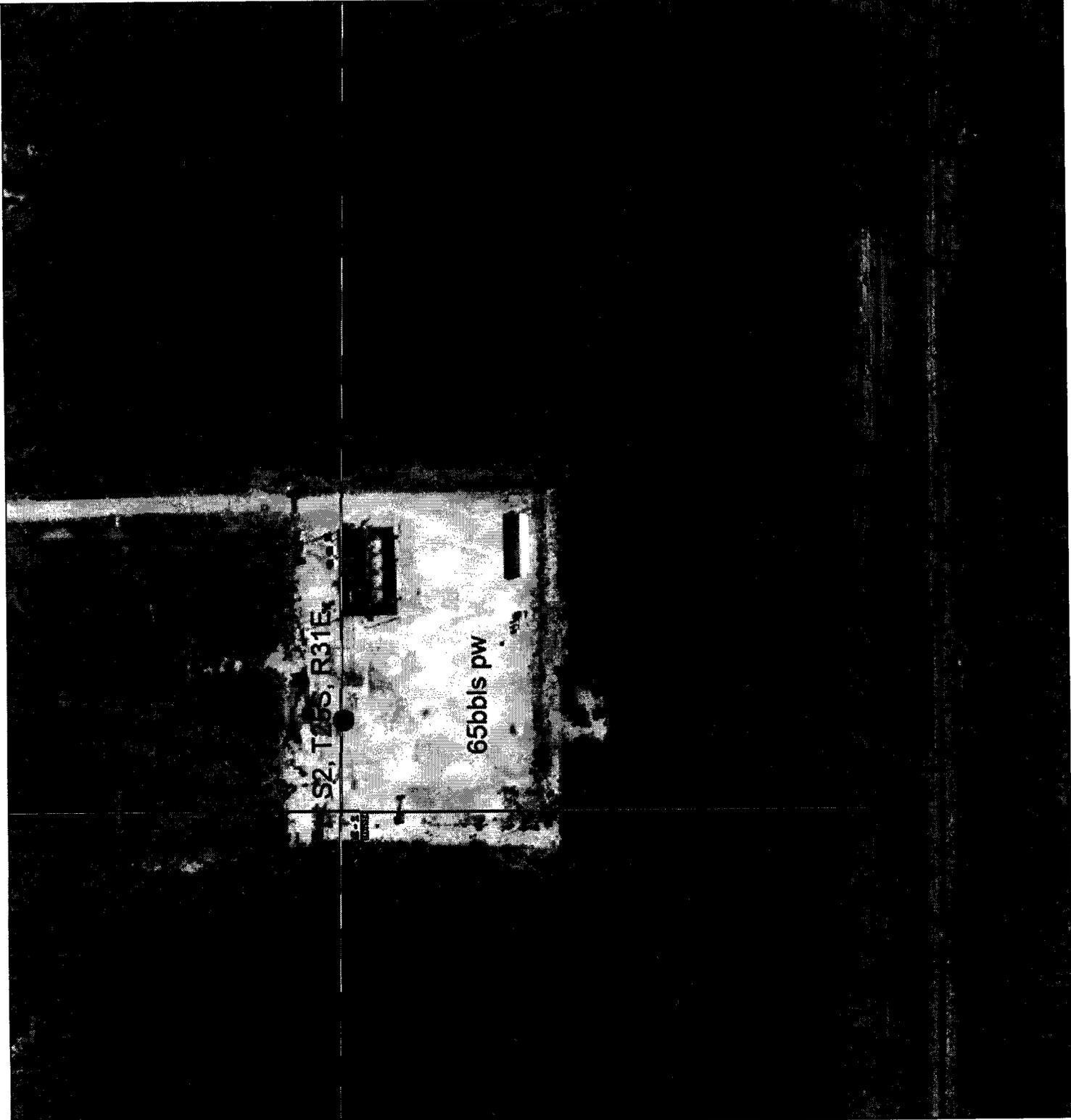
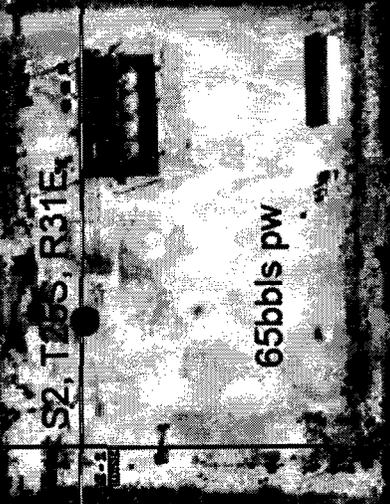
# Cotton Draw Unit 84

65bb1 pw\_7.23.17



This map is for illustrative purposes only and is neither a legally recorded map nor survey and is not intended to be used as one. Devon makes no warranty, representation or guarantee of any kind regarding this map.

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere  
Prepared by: Sheila Fisher  
Map is current as of: 24-Jul-2017



**Bratcher, Mike, EMNRD**

---

**From:** Shoemaker, Mike <Mike.Shoemaker@dvn.com>  
**Sent:** Sunday, July 23, 2017 6:42 PM  
**To:** Bratcher, Mike, EMNRD; Weaver, Crystal, EMNRD  
**Cc:** Fulks, Brett  
**Subject:** Spill at the CDU 84 SWD

Mike and Crystal,

Just wanted to make you aware of a release from earlier today. The assistant foreman tried to leave a message around 11:50 am but was unsuccessful. Shelly Tucker with BLM was also notified at 11:45 a.m. We had a Frac tank that over ran at the CDU 84 SWD the spill was approximately 65 bbl of PW. The casing was blown down yesterday and didn't get shut off completely, causing the frac tank to run over on the location. About 1/2 bbl went outside fence, but stayed on the pad surface and no fluids were lost into the pasture. A vacuum truck was dispatched and approximately 10bbbls of PW were recovered. A C-141 will be prepared and submitted.

Thanks,

**Mike Shoemaker**  
EHS Representative

**Devon Energy Corporation**  
6488 Seven Rivers Highway  
Artesia, New Mexico 88210  
575-746-5566 Office  
575-513-5035 Mobile



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## Appendix B: Water Well Data



## New Mexico Office of the State Engineer

# Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,  
O=orphaned,  
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 6	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	DepthWell	DepthWater	Water Column
<a href="#">C 02569</a>		CUB	ED	4	4	2	02	25S	31E	618699	3558891*	275	1016		
<a href="#">C 02573</a>		CUB	ED	1	4	2	02	25S	31E	618499	3559091*	313			
<a href="#">C 02570</a>		CUB	ED	4	2	4	02	25S	31E	618704	3558489*	390	895		
<a href="#">C 03830 POD1</a>		CUB	ED	4	2	4	02	25S	31E	618632	3558432	395	450		
<a href="#">C 02571</a>		CUB	ED	4	1	2	02	25S	31E	618292	3559294*	534	860		
<a href="#">C 02572</a>		CUB	ED	4	2	2	02	25S	31E	618695	3559294*	569	852		
<a href="#">C 02568</a>		CUB	ED	4	3	1	01	25S	31E	619103	3558892*	666	1025		
<a href="#">C 02574</a>		CUB	ED	1	1	2	02	25S	31E	618092	3559494*	795			
<a href="#">C 02250</a>		CUB	ED	3	1	4	21	25S	31E	614912	3553620*	6255	400	390	10

Average Depth to Water: **390 feet**

Minimum Depth: **390 feet**

Maximum Depth: **390 feet**

**Record Count:** 9

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 618446

**Northing (Y):** 3558782

**Radius:** 7000

\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

7/18/19 12:19 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER



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## National Water Information System: Web Interface

USGS Water Resources

<b>Data Category:</b> Groundwater	<b>Geographic Area:</b> United States	GO
--------------------------------------	--	----

Click to hide News Bulletins

- [Introducing The Next Generation of USGS Water Data for the Nation](#)
- [Full News](#) 

Groundwater levels for the Nation

### Search Results -- 1 sites found

site\_no list =

- 320932103443801

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

### USGS 320932103443801 25S.31E.02.23441

Available data for this site

Eddy County, New Mexico

Hydrologic Unit Code 13070001

Latitude 32°09'37.4", Longitude 103°44'29.6" NAD83

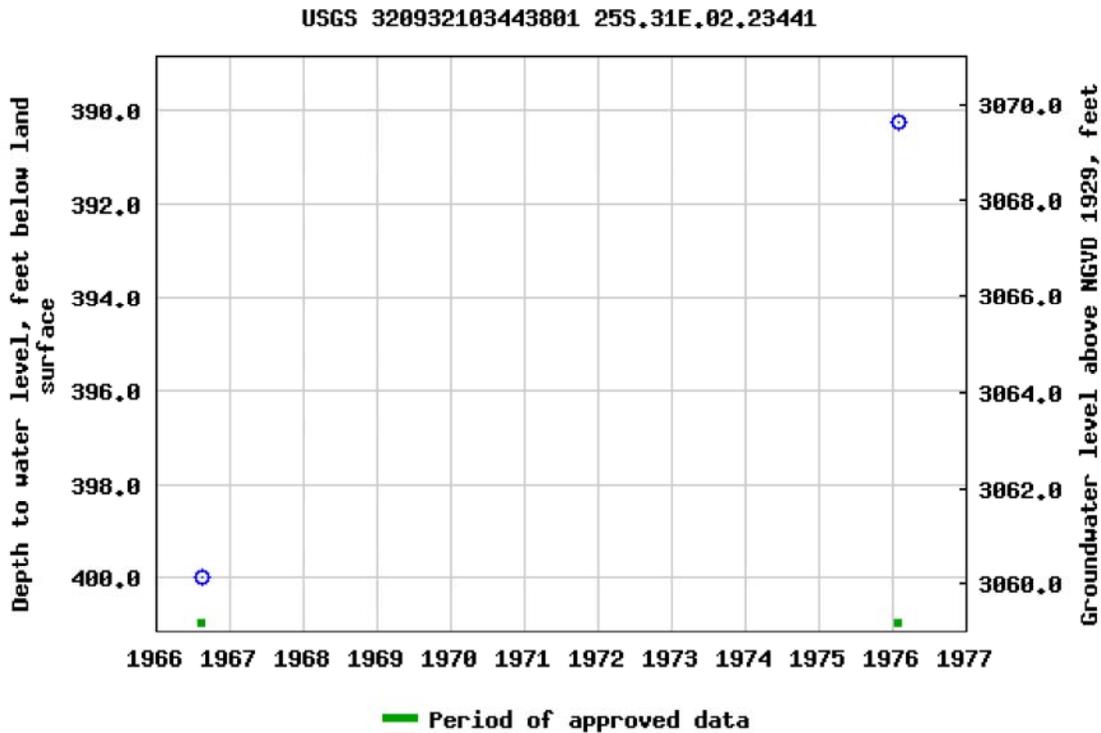
Land-surface elevation 3,460.00 feet above NGVD29

The depth of the well is 1,016 feet below land surface.

This well is completed in the Rustler Formation (312RSLR) local aquifer.

#### Output formats

<a href="#">Table of data</a>
<a href="#">Tab-separated data</a>
<a href="#">Graph of data</a>
<a href="#">Reselect period</a>



Breaks in the plot represent a gap of at least one year between field measurements.

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**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: 2019-07-18 14:51:17 EDT

1.07 1.03 nadww01



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## National Water Information System: Web Interface

USGS Water Resources

<b>Data Category:</b> Groundwater	<b>Geographic Area:</b> United States	GO
--------------------------------------	--	----

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Groundwater levels for the Nation

### Search Results -- 1 sites found

site\_no list =

- 320952103444401

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

### USGS 320952103444401 25S.31E.02.214411

Available data for this site

Eddy County, New Mexico

Hydrologic Unit Code 13070001

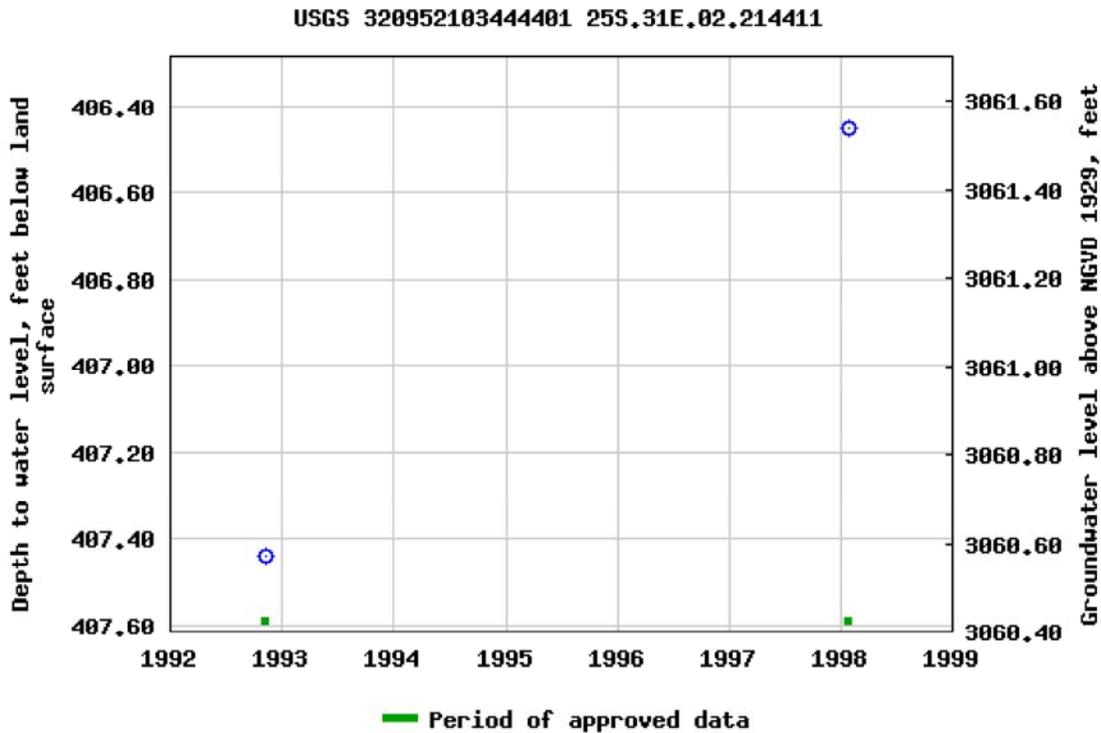
Latitude 32°09'50.0", Longitude 103°44'41.2" NAD83

Land-surface elevation 3,468.0 feet above NGVD29

This well is completed in the Azotea Tongue of Seven Rivers Formation (313AZOT) local aquifer.

#### Output formats

<a href="#">Table of data</a>
<a href="#">Tab-separated data</a>
<a href="#">Graph of data</a>
<a href="#">Reselect period</a>



Breaks in the plot represent a gap of at least one year between field measurements.

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**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: 2019-07-18 15:51:15 EDT

0.95 0.9 nadww01

## Appendix C: Laboratory Analytical Reports

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1910F64

Date Reported:

CLIENT: Souder, Miller & Associates

Client Sample ID: TB-Surf

Project: 84 SWD TB

Collection Date: 10/30/2019 9:45:00 AM

Lab ID: 1910F64-001

Matrix: SOIL

Received Date: 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	ND	60		mg/Kg	20	11/1/2019 9:21:37 PM	48547
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	11/4/2019 12:02:20 PM	48543
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	11/4/2019 12:02:20 PM	48543
Surr: DNOP	81.8	70-130		%Rec	1	11/4/2019 12:02:20 PM	48543
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Surr: BFB	105	77.4-118		%Rec	1	11/1/2019 1:19:18 PM	48515
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Toluene	ND	0.048		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Ethylbenzene	ND	0.048		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Xylenes, Total	ND	0.095		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	1	11/1/2019 1:19:18 PM	48515

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1910F64

Date Reported:

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** TB 2'

**Project:** 84 SWD TB

**Collection Date:** 10/30/2019 9:55:00 AM

**Lab ID:** 1910F64-002

**Matrix:** SOIL

**Received Date:** 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	390	60		mg/Kg	20	11/1/2019 9:34:01 PM	48547

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1910F64

Date Reported:

CLIENT: Souder, Miller & Associates

Client Sample ID: TB 6'

Project: 84 SWD TB

Collection Date: 10/30/2019 10:15:00 AM

Lab ID: 1910F64-003

Matrix: SOIL

Received Date: 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: MRA
Chloride	78	60		mg/Kg	20	11/1/2019 10:11:14 PM	48547

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 Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		



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

November 05, 2019

Melodie Sanjari  
Souder, Miller & Associates  
201 S Halagueno  
Carlsbad, NM 88221  
TEL:  
FAX

RE: 84 SWD TB

OrderNo.: 1910F64

Dear Melodie Sanjari:

Hall Environmental Analysis Laboratory received 3 sample(s) on 10/31/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1910F64

Date Reported: 11/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** TB-Surf

**Project:** 84 SWD TB

**Collection Date:** 10/30/2019 9:45:00 AM

**Lab ID:** 1910F64-001

**Matrix:** SOIL

**Received Date:** 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	ND	60		mg/Kg	20	11/1/2019 9:21:37 PM	48547
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.2		mg/Kg	1	11/4/2019 12:02:20 PM	48543
Motor Oil Range Organics (MRO)	ND	46		mg/Kg	1	11/4/2019 12:02:20 PM	48543
Surr: DNOP	81.8	70-130		%Rec	1	11/4/2019 12:02:20 PM	48543
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Surr: BFB	105	77.4-118		%Rec	1	11/1/2019 1:19:18 PM	48515
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Toluene	ND	0.048		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Ethylbenzene	ND	0.048		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Xylenes, Total	ND	0.095		mg/Kg	1	11/1/2019 1:19:18 PM	48515
Surr: 4-Bromofluorobenzene	111	80-120		%Rec	1	11/1/2019 1:19:18 PM	48515

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1910F64

Date Reported: 11/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** TB 2'

**Project:** 84 SWD TB

**Collection Date:** 10/30/2019 9:55:00 AM

**Lab ID:** 1910F64-002

**Matrix:** SOIL

**Received Date:** 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	390	60		mg/Kg	20	11/1/2019 9:34:01 PM	48547

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1910F64**

Date Reported: **11/5/2019**

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** TB 6'

**Project:** 84 SWD TB

**Collection Date:** 10/30/2019 10:15:00 AM

**Lab ID:** 1910F64-003

**Matrix:** SOIL

**Received Date:** 10/31/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	78	60		mg/Kg	20	11/1/2019 10:11:14 PM	48547

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1910F64

05-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD TB

Sample ID: <b>MB-48547</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>48547</b>	RunNo: <b>64181</b>								
Prep Date: <b>11/1/2019</b>	Analysis Date: <b>11/1/2019</b>	SeqNo: <b>2196221</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-48547</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>48547</b>	RunNo: <b>64181</b>								
Prep Date: <b>11/1/2019</b>	Analysis Date: <b>11/1/2019</b>	SeqNo: <b>2196222</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	97.7	90	110			

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1910F64

05-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD TB

Sample ID: <b>MB-48543</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>48543</b>	RunNo: <b>64192</b>								
Prep Date: <b>11/1/2019</b>	Analysis Date: <b>11/4/2019</b>	SeqNo: <b>2196675</b>	Units: <b>mg/Kg</b>							
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	11		10.00		107	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 Quantitative 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#: 1910F64

05-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD TB

Sample ID: <b>MB-48515</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>48515</b>		RunNo: <b>64170</b>							
Prep Date: <b>10/31/2019</b>	Analysis Date: <b>11/1/2019</b>		SeqNo: <b>2195837</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	1000		1000		102	77.4	118			

Sample ID: <b>LCS-48515</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>48515</b>		RunNo: <b>64170</b>							
Prep Date: <b>10/31/2019</b>	Analysis Date: <b>11/1/2019</b>		SeqNo: <b>2195838</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	92.9	80	120			
Surr: BFB	1200		1000		118	77.4	118			S

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1910F64

05-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD TB

Sample ID: <b>MB-48515</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>48515</b>	RunNo: <b>64170</b>								
Prep Date: <b>10/31/2019</b>	Analysis Date: <b>11/1/2019</b>	SeqNo: <b>2195868</b>	Units: <b>mg/Kg</b>							
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	1.1		1.000		109	80	120			

Sample ID: <b>LCS-48515</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>48515</b>	RunNo: <b>64170</b>								
Prep Date: <b>10/31/2019</b>	Analysis Date: <b>11/1/2019</b>	SeqNo: <b>2195869</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.025	1.000	0	100	80	120			
Toluene	1.0	0.050	1.000	0	101	80	120			
Ethylbenzene	1.0	0.050	1.000	0	100	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		112	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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

**Sample Log-In Check List**

Client Name: SMA-CARLSBAD

Work Order Number: 1910F64

RcptNo: 1

Received By: *Juan Rojas* 10/31/2019 8:50:00 AM

Completed By: Leah Baca 10/31/2019 9:16:26 AM

Reviewed By: *DM 10/31/19*

*Leah Baca*

**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? Yes  No   
 (Note discrepancies on chain of custody)  
 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? Yes  No   
 (If no, notify customer for authorization.)

# of preserved bottles checked for pH: \_\_\_\_\_  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: DAD 10/31/19

**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	1.4	Good	Yes			
2	1.1	Good	Yes			

# Chain-of-Custody Record

Client: SMA - Carlsbad.

Mailing Address:

Turn-Around Time:

Standard  Rush 2 days

Project Name:

84 SWD TB

Project #:

Phone #:

email or Fax#:

QA/QC Package:

Standard  Level 4 (Full Validation)

Accreditation:  Az Compliance

NELAC  Other

EDD (Type)

Project Manager:

Melodie Sanjari

Sampler: MRS KSP

On Ice:  Yes  No

# of Coolers: 2

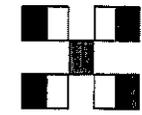
Cooler Temp (including CE): 15-0.1-1.4 (°C)

Container Type and #

4oz.   
 -001   
 -002   
 -003

Preservative Type

12-0.1-1.1   
 HEAL No   
 191164



# HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

## Analysis Request

TFH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl <sup>-</sup> , Br <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , NO <sub>2</sub> <sup>-</sup> , PO <sub>4</sub> <sup>3-</sup> , SO <sub>4</sub> <sup>2-</sup>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
BTEX / MTBE / TMB's (8021)								

Remarks:

MMX

Received by: [Signature] Date: 10/30/08 Time: 1500

Received by: [Signature] Date: 10/31/08 Time: 850

Date: 10/30/08 Time: 1500

Date: 10/31/08 Time: 1900

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.



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

December 05, 2019

Melodie Sanjari  
Souder, Miller & Associates  
201 S Halagueno  
Carlsbad, NM 88221  
TEL: (575) 689-8801  
FAX

RE: 84 SWD

OrderNo.: 1911D03

Dear Melodie Sanjari:

Hall Environmental Analysis Laboratory received 4 sample(s) on 11/30/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1911D03

Date Reported: 12/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** L1-Surface

**Project:** 84 SWD

**Collection Date:** 11/26/2019 1:30:00 PM

**Lab ID:** 1911D03-001

**Matrix:** SOIL

**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	350	60		mg/Kg	20	12/4/2019 2:33:43 PM	49148
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.0		mg/Kg	1	12/3/2019 3:51:05 PM	49089
Motor Oil Range Organics (MRO)	ND	45		mg/Kg	1	12/3/2019 3:51:05 PM	49089
Surr: DNOP	81.2	70-130		%Rec	1	12/3/2019 3:51:05 PM	49089
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/3/2019 12:05:33 PM	49082
Surr: BFB	82.1	77.4-118		%Rec	1	12/3/2019 12:05:33 PM	49082
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.023		mg/Kg	1	12/3/2019 12:05:33 PM	49082
Toluene	ND	0.047		mg/Kg	1	12/3/2019 12:05:33 PM	49082
Ethylbenzene	ND	0.047		mg/Kg	1	12/3/2019 12:05:33 PM	49082
Xylenes, Total	ND	0.093		mg/Kg	1	12/3/2019 12:05:33 PM	49082
Surr: 4-Bromofluorobenzene	101	80-120		%Rec	1	12/3/2019 12:05:33 PM	49082

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1911D03

Date Reported: 12/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** L1-2'

**Project:** 84 SWD

**Collection Date:** 11/26/2019 1:35:00 PM

**Lab ID:** 1911D03-002

**Matrix:** SOIL

**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	490	60		mg/Kg	20	12/4/2019 2:46:04 PM	49148

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1911D03

Date Reported: 12/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** L2-Surface

**Project:** 84 SWD

**Collection Date:** 11/26/2019 1:45:00 PM

**Lab ID:** 1911D03-003

**Matrix:** SOIL

**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	120	60		mg/Kg	20	12/4/2019 2:58:24 PM	49148
<b>EPA METHOD 8015M/D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BRM</b>
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	12/3/2019 4:55:35 PM	49093
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/3/2019 4:55:35 PM	49093
Surr: DNOP	79.1	70-130		%Rec	1	12/3/2019 4:55:35 PM	49093
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/3/2019 12:51:02 PM	49082
Surr: BFB	83.8	77.4-118		%Rec	1	12/3/2019 12:51:02 PM	49082
<b>EPA METHOD 8021B: VOLATILES</b>							Analyst: <b>NSB</b>
Benzene	ND	0.024		mg/Kg	1	12/3/2019 12:51:02 PM	49082
Toluene	ND	0.048		mg/Kg	1	12/3/2019 12:51:02 PM	49082
Ethylbenzene	ND	0.048		mg/Kg	1	12/3/2019 12:51:02 PM	49082
Xylenes, Total	ND	0.097		mg/Kg	1	12/3/2019 12:51:02 PM	49082
Surr: 4-Bromofluorobenzene	103	80-120		%Rec	1	12/3/2019 12:51:02 PM	49082

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1911D03

Date Reported: 12/5/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** L2-2'

**Project:** 84 SWD

**Collection Date:** 11/26/2019 1:55:00 PM

**Lab ID:** 1911D03-004

**Matrix:** SOIL

**Received Date:** 11/30/2019 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	88	60		mg/Kg	20	12/4/2019 3:10:44 PM	49148

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D03

05-Dec-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>MB-49148</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>49148</b>	RunNo: <b>64920</b>								
Prep Date: <b>12/4/2019</b>	Analysis Date: <b>12/4/2019</b>	SeqNo: <b>2227355</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-49148</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>49148</b>	RunNo: <b>64920</b>								
Prep Date: <b>12/4/2019</b>	Analysis Date: <b>12/4/2019</b>	SeqNo: <b>2227356</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	95.1	90	110			

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D03

05-Dec-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>LCS-49089</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>49089</b>		RunNo: <b>64876</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2224924</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.9	63.9	124			
Surr: DNOP	4.1		5.000		82.7	70	130			

Sample ID: <b>MB-49089</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>							
Client ID: <b>PBS</b>	Batch ID: <b>49089</b>		RunNo: <b>64876</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2224925</b>		Units: <b>mg/Kg</b>					
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	8.5		10.00		85.3	70	130			

Sample ID: <b>1911D03-003AMS</b>	SampType: <b>MS</b>		TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>							
Client ID: <b>L2-Surface</b>	Batch ID: <b>49093</b>		RunNo: <b>64876</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2225753</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	38	8.8	43.98	2.262	81.9	57	142			
Surr: DNOP	3.2		4.398		72.7	70	130			

Sample ID: <b>1911D03-003AMSD</b>	SampType: <b>MSD</b>		TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>							
Client ID: <b>L2-Surface</b>	Batch ID: <b>49093</b>		RunNo: <b>64876</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2225754</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	39	9.9	49.36	2.262	75.1	57	142	2.79	20	
Surr: DNOP	3.3		4.936		67.1	70	130	0	0	S

Sample ID: <b>LCS-49093</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>49093</b>		RunNo: <b>64876</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2225772</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	10	50.00	0	88.2	63.9	124			
Surr: DNOP	3.7		5.000		74.5	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 Quantitative 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#: 1911D03

05-Dec-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>MB-49093</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8015M/D: Diesel Range Organics</b>								
Client ID: <b>PBS</b>	Batch ID: <b>49093</b>	RunNo: <b>64876</b>								
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>	SeqNo: <b>2225773</b>			Units: <b>mg/Kg</b>					
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	7.9		10.00		79.3	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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D03

05-Dec-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>mb-49082</b>	SampType: <b>MBLK</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>PBS</b>	Batch ID: <b>49082</b>		RunNo: <b>64903</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2225312</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	880		1000		88.3	77.4	118			

Sample ID: <b>ics-49082</b>	SampType: <b>LCS</b>		TestCode: <b>EPA Method 8015D: Gasoline Range</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>49082</b>		RunNo: <b>64903</b>							
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>		SeqNo: <b>2225313</b>		Units: <b>mg/Kg</b>					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	97.2	80	120			
Surr: BFB	970		1000		96.8	77.4	118			

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911D03

05-Dec-19

**Client:** Souder, Miller & Associates  
**Project:** 84 SWD

Sample ID: <b>mb-49082</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>PBS</b>	Batch ID: <b>49082</b>	RunNo: <b>64903</b>								
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>	SeqNo: <b>2225359</b>	Units: <b>mg/Kg</b>							
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	1.1		1.000		110	80	120			

Sample ID: <b>LCS-49082</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>49082</b>	RunNo: <b>64903</b>								
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>	SeqNo: <b>2225360</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.98	0.025	1.000	0	98.4	80	120			
Toluene	0.98	0.050	1.000	0	97.7	80	120			
Ethylbenzene	0.98	0.050	1.000	0	98.4	80	120			
Xylenes, Total	3.0	0.10	3.000	0	99.1	80	120			
Surr: 4-Bromofluorobenzene	1.1		1.000		110	80	120			

Sample ID: <b>1911D03-001AMS</b>	SampType: <b>MS</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>L1-Surface</b>	Batch ID: <b>49082</b>	RunNo: <b>64903</b>								
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>	SeqNo: <b>2225363</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.025	0.9980	0.006303	98.4	76	123			
Toluene	1.0	0.050	0.9980	0.006816	99.6	80.3	127			
Ethylbenzene	1.0	0.050	0.9980	0.008553	100	80.2	131			
Xylenes, Total	3.0	0.10	2.994	0.01962	100	78	133			
Surr: 4-Bromofluorobenzene	1.0		0.9980		102	80	120			

Sample ID: <b>1911d03-001amsd</b>	SampType: <b>MSD</b>	TestCode: <b>EPA Method 8021B: Volatiles</b>								
Client ID: <b>L1-Surface</b>	Batch ID: <b>49082</b>	RunNo: <b>64903</b>								
Prep Date: <b>12/2/2019</b>	Analysis Date: <b>12/3/2019</b>	SeqNo: <b>2225364</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.90	0.024	0.9506	0.006303	94.3	76	123	9.05	20	
Toluene	0.92	0.048	0.9506	0.006816	95.8	80.3	127	8.69	20	
Ethylbenzene	0.92	0.048	0.9506	0.008553	96.1	80.2	131	8.79	20	
Xylenes, Total	2.8	0.095	2.852	0.01962	97.4	78	133	7.82	20	
Surr: 4-Bromofluorobenzene	0.99		0.9506		104	80	120	0	0	

**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 Quantitative 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

**Sample Log-In Check List**

Client Name: SMA-CARLSBAD

Work Order Number: 1911D03

RcptNo: 1

Received By: Erin Melendrez

11/30/2019 11:10:00 AM

*EM*

Completed By: Erin Melendrez

11/30/2019 2:05:52 PM

*EM*

Reviewed By: ENM

12/2/19

**Chain of Custody**

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

**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? Yes  No   
 (Note discrepancies on chain of custody)
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? Yes  No   
 (If no, notify customer for authorization.)

# of preserved bottles checked for pH: \_\_\_\_\_  
 (<2 or >12 unless noted)  
 Adjusted? \_\_\_\_\_  
 Checked by: *Om 12/2/19*

**Special Handling (if applicable)**

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

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

16. Additional remarks:

**17. Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.0	Good	Yes			
2	3.6	Good	Yes			

# Chain-of-Custody Record

Client: 8MA-Carlsbad

Mailing Address:

Phone #:

email or Fax#:

Turn-Around Time:  
 Standard  Rush 3 day  
 Project Name: 84 SWD  
 Project #:

QA/QC Package:  
 Standard  Level 4 (Full Validation)  
 Accreditation:  AZ Compliance  
 NELAC  Other  
 EDD (Type)

Project Manager:  
Melodic Sanjari  
 Sampler: MES  
 On Ice:  Yes  No  
 # of Coolers: 2  
 Cooler Temp (using 3.0-0(CF) = 3.0(CF)  
 Container Type and #  
 Preservative Type  
 HEAL No.  
1911DD3

Date	Time	Matrix	Sample Name
11/20	1:30	807	L1-Surface
	1:35		L1-2'
	1:45		L2-Surface
	1:55		L2-2'

Container Type and #	Preservative Type	HEAL No.
402.	-001	
	-002	
	-003	
	-004	

Analysis Request	
<input checked="" type="checkbox"/>	BTEX / MTBE / TMB's (8021)
<input checked="" type="checkbox"/>	TPH:8015D(GRO / DRO / MRO)
<input type="checkbox"/>	8081 Pesticides/8082 PCBs
<input type="checkbox"/>	EDB (Method 504.1)
<input type="checkbox"/>	PAHs by 8310 or 8270SIMS
<input type="checkbox"/>	RCRA 8 Metals
<input checked="" type="checkbox"/>	Cl <sup>-</sup> , Br <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , NO <sub>2</sub> <sup>-</sup> , PO <sub>4</sub> <sup>3-</sup> , SO <sub>4</sub> <sup>2-</sup>
<input type="checkbox"/>	8260 (VOA)
<input type="checkbox"/>	8270 (Semi-VOA)
<input type="checkbox"/>	Total Coliform (Present/Absent)

Received by: Cheryl Lee Date: 11/27 Time: 14:30  
 Received by: WLF Date: 11/30/19 Time: 11:00  
 Remarks:  
email results to melodic.sanjari@sundenmiller.com  
direct bill to devon.

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.



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



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

November 19, 2019

Melodie Sanjari  
Souder, Miller & Associates  
201 S Halagueno  
Carlsbad, NM 88221  
TEL:  
FAX:

RE: 84 SWD

OrderNo.: 1911494

Dear Melodie Sanjari:

Hall Environmental Analysis Laboratory received 1 sample(s) on 11/12/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1911494

Date Reported: 11/19/2019

**CLIENT:** Souder, Miller & Associates

**Client Sample ID:** BG 1-10

**Project:** 84 SWD

**Collection Date:** 11/6/2019 2:10:00 PM

**Lab ID:** 1911494-001

**Matrix:** SOIL

**Received Date:** 11/12/2019 8:50:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>MRA</b>
Chloride	ND	60		mg/Kg	20	11/15/2019 1:23:34 PM	48819

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 Quantitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911494

19-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>MB-48819</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>48819</b>	RunNo: <b>64555</b>								
Prep Date: <b>11/15/2019</b>	Analysis Date: <b>11/15/2019</b>	SeqNo: <b>2210471</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-48819</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>48819</b>	RunNo: <b>64555</b>								
Prep Date: <b>11/15/2019</b>	Analysis Date: <b>11/15/2019</b>	SeqNo: <b>2210472</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	16	1.5	15.00	0	104	90	110			

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |



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: SMA-CARLSBAD

Work Order Number: 1911494

RcptNo: 1

Received By: **Isaiah Ortiz** 11/12/2019 8:50:00 AM *IO*

Completed By: **Desiree Dominguez** 11/12/2019 10:05:45 AM *DD*

Reviewed By: *A 11/12/19*

### 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? Yes  No   
 (Note discrepancies on chain of custody)

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? Yes  No   
 (If no, notify customer for authorization.)

*IO*  
*11/12/19*

# of preserved bottles checked for pH. \_\_\_\_\_  
 (<2 or >12 unless noted)

Adjusted? \_\_\_\_\_

Checked by: \_\_\_\_\_

### 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	1.6	Good	Yes			

# Chain-of-Custody Record

Client: SMA - Gertsbad

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

Standard  Level 4 (Full Validation)

Accreditation:  Az Compliance

NELAC  Other

EDD (Type)

Turn-Around Time:

Standard  Rush Soday

Project Name:

B4 SWP

Project #:

Project Manager:

Melodie Sanjari

Sampler: MRS/MJP

On Ice:  Yes  No

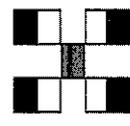
# of Coolers: 1

Cooler Temp (including CP): 1.802/16.16(C)

Container Type and # 402

Preservative Type HEAL No. 191199H

-001



# HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

## Analysis Request

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	☉ F, Br, NO <sub>3</sub> , NO <sub>2</sub> , PO <sub>4</sub> , SO <sub>4</sub>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
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Remarks:

Direct bill

MMX

Received by: [Signature] Date: 11/11/19 Time: 1500

Received by: [Signature] Date: 11/11/19 Time: 0550

Relinquished by: [Signature] Date: 11/11/19 Time: 1500

Relinquished by: [Signature] Date: 11/11/19 Time: 1900

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.



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

November 19, 2019

Melodie Sanjari  
Souder, Miller & Associates  
201 S Halagueno  
Carlsbad, NM 88221  
TEL:  
FAX:

RE: 84 SWD

OrderNo.: 1911495

Dear Melodie Sanjari:

Hall Environmental Analysis Laboratory received 3 sample(s) on 11/12/2019 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman  
Laboratory Manager  
4901 Hawkins NE  
Albuquerque, NM 87109

# Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order: 1911495

Date Reported: 11/19/2019

**CLIENT:** Souder, Miller & Associates

**Lab Order:** 1911495

**Project:** 84 SWD

**Lab ID:** 1911495-001

**Collection Date:** 11/6/2019 3:00:00 PM

**Client Sample ID:** BG 2-4

**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 300.0: ANIONS</b>							
Chloride	390	60		mg/Kg	20	11/15/2019 2:00:37 PM	48819

Analyst: MRA

**Lab ID:** 1911495-002

**Collection Date:** 11/6/2019 3:15:00 PM

**Client Sample ID:** BG 2-6

**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 300.0: ANIONS</b>							
Chloride	1500	60		mg/Kg	20	11/15/2019 3:02:19 PM	48819

Analyst: MRA

**Lab ID:** 1911495-003

**Collection Date:** 11/6/2019 3:30:00 PM

**Client Sample ID:** BG 2-10

**Matrix:** SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch ID
<b>EPA METHOD 300.0: ANIONS</b>							
Chloride	1000	60		mg/Kg	20	11/15/2019 3:14:39 PM	48819

Analyst: MRA

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

<b>Qualifiers:</b>	*	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 Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1911495

19-Nov-19

**Client:** Souder, Miller & Associates

**Project:** 84 SWD

Sample ID: <b>MB-48819</b>	SampType: <b>mblk</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>PBS</b>	Batch ID: <b>48819</b>	RunNo: <b>64555</b>								
Prep Date: <b>11/15/2019</b>	Analysis Date: <b>11/15/2019</b>	SeqNo: <b>2210471</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID: <b>LCS-48819</b>	SampType: <b>ics</b>	TestCode: <b>EPA Method 300.0: Anions</b>								
Client ID: <b>LCSS</b>	Batch ID: <b>48819</b>	RunNo: <b>64555</b>								
Prep Date: <b>11/15/2019</b>	Analysis Date: <b>11/15/2019</b>	SeqNo: <b>2210472</b>	Units: <b>mg/Kg</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	16	1.5	15.00	0	104	90	110			

**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 Quantitative Limit                        | RL Reporting Limit                                |
| S % Recovery outside of range due to dilution or matrix |   |



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: SMA-CARLSBAD

Work Order Number: 1911495

RcptNo: 1

Received By: **Isaiah Ortiz**

11/12/2019 8:50:00 AM

*IO*

Completed By: **Desiree Dominguez**

11/12/2019 10:13:30 AM

*DD*

Reviewed By: *AT 11/12/19*

### 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? Yes  No

(Note discrepancies on chain of custody)

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? Yes  No

(If no, notify customer for authorization.)

*IO*

# of preserved bottles checked for pH: 11/12/19

(≥2 or >12 unless noted)

Adjusted? \_\_\_\_\_

Checked by: \_\_\_\_\_

### Special Handling (if applicable)

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

Person Notified:		Date:	
By Whom:		Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> 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	1.6	Good	Yes			

# Chain-of-Custody Record

Client: SMA - Carlsbad

Mailing Address:

Phone #:

email or Fax#:

QA/QC Package:

Standard  Level 4 (Full Validation)

Accreditation:  AZ Compliance

NELAC  Other

EDD (Type)

Turn-Around Time:

Standard  Rush

Project Name:

84 SWID

Project #:

Project Manager:

Melanie Sanchez

Sampler: MRS/MJP

On Ice:  Yes  No

# of Coolers: 1

Cooler Temp (including CP): 128-02/16 (°C)

Container Type and #

4oz

Preservative Type

-001

HEAL No

1911495

4oz

-002

-003

4oz

-003

-003

Date: 11/11

Relinquished by: [Signature]

Received by: [Signature]

Date: 11/11/19

Time: 0800

Date: 11/11/19

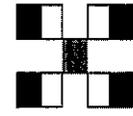
Relinquished by: [Signature]

Received by: [Signature]

Date: 11/11/19

Time: 0800

Remarks: Direct Bill MMX



# HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

## Analysis Request

TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl <sup>-</sup> , Br <sup>-</sup> , NO <sub>3</sub> <sup>-</sup> , NO <sub>2</sub> <sup>-</sup> , PO <sub>4</sub> <sup>-</sup> , SO <sub>4</sub> <sup>-</sup>	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
BTEX / MTBE / TMB's (8021)								

Appendix D: Vertex Electromagnetic Survey Results & Interpretation for Cotton Draw  
Unit #084 SWD



November 6, 2019

Vertex Project #: 19E-03788

Devon Energy Corporation  
6488 7 Rivers Highway  
Artesia, New Mexico 88210

Attention: Amanda Davis

Re: Electromagnetic Survey Results and Interpretation for Cottonwood Draw #084 SWD

Ms. Davis,

Devon Energy Corporation (Devon) retained Vertex Resource Services Inc. (Vertex) to conduct an electromagnetic (EM) survey at Cottonwood Draw #084 SWD (hereafter referred to as the "site"). The site is located approximately 34 miles southeast of Carlsbad, New Mexico. Vertex personnel conducted the EM survey on October 9, 2019. This letter reviews the results of the EM survey at the site and discusses the apparent conductivity anomalies that were observed.

## Method

The fixed-frequency EM method was used to map variations in ground conductivity to identify anomalously conductive soils and infer changes in the soil characteristics and composition. This method uses portable instrumentation consisting of a transmitter coil and a receiver coil. A primary magnetic field from the transmitter coil induces subsurface eddy currents, which in turn generate a secondary magnetic field that is intercepted by the receiver coil. The ratio of the primary and secondary magnetic fields is related to ground conductivity.

Ground conductivity is influenced by the following:

- Concentration of total dissolved solids (TDS) within the groundwater
- Type of substrate
- Soil grain size (fine-grained clay is more electrically conductive than coarse-grained material such as sand or gravel)
- Soil temperature (conductivity decreases as soil temperature approaches freezing)

Ground conductivity measurements were acquired using the Geonics EM31 Terrain Conductivity Meter. Data were collected continuously along transects spaced approximately 5 yards across the site. Data were logged using a Juniper Systems Archer2 Data Logger with an integrated global positioning system (GPS).

The effective depth of investigation for the EM31, as operated during this investigation, is approximately 16 feet. The conductivity values are not specific values from discrete depths; they are weighted averages of conductivity

between the surface and the depth of exploration of the EM field, and are termed 'apparent conductivities'. The apparent conductivity values obtained are in units of millisiemens per metre (mS/m).

## Interpretation

The results of the EM31 survey are presented as an apparent conductivity contour map on Figure 1. Pertinent features and anomalies are identified and discussed in the table below. At the time of the survey, all infrastructure (as observed on the aerial image in Figure 1) had been removed from the site and there were pipe and debris piles in the northwest part of the site, as indicated on Figure 1.

Anomaly	Conductivity Range (mS/m)	Description
A	10 – 30	Low conductivity regions (blue contours) possibly representative of background conditions.
B	70 – 180	Elevated conductivity region (green to red contours) along the north fence line. May be attributable to increased TDS, increased clay content, and/or metal influence. Elevated conductivity extends beyond the northern limits of the plotted EM grid.
C	70 – 110	Elevated conductivity region (green to yellow contours) in the northwest corner of the site. May be attributable to increased TDS, increased clay content, and/or metal influence. Elevated conductivity extends beyond the northern limits of the plotted EM grid.
D1, D2	70 – 195	Elevated conductivity regions (green to red contours) east of the debris, in the northeast part of the site. Anomaly D2 is coincident with former infrastructure, as observed on the aerial image in Figure 1. May be attributable to increased TDS, increased clay content, and/or metal influence.
E-E' F-F'	Oscillating Values	Linear anomalies possibly attributable to subsurface metal influence.
G	Oscillating Values	Typical metal response located east of the debris.

If it is determined that the elevated conductivity anomalies are coincident with elevated chlorides, an electrical resistivity tomography (ERT) investigation is recommended to determine the vertical extent of the anomalies.

Any subsequent investigations should include areas of apparent background conductivity, as well as potentially impacted areas.

Devon Energy Corporation  
Cottonwood Draw #084 SWD

EM Survey Results and Interpretation  
November 2019

---

Should you have any questions or concerns, please do not hesitate to contact the undersigned at 587.316.1793 or lpankratow@vertex.ca.

Sincerely,



Laurie Pankratow, B.Sc., P.Geoph.  
GEOPHYSICIST  
APEGA PERMIT TO PRACTICE #10647

## List of Figures

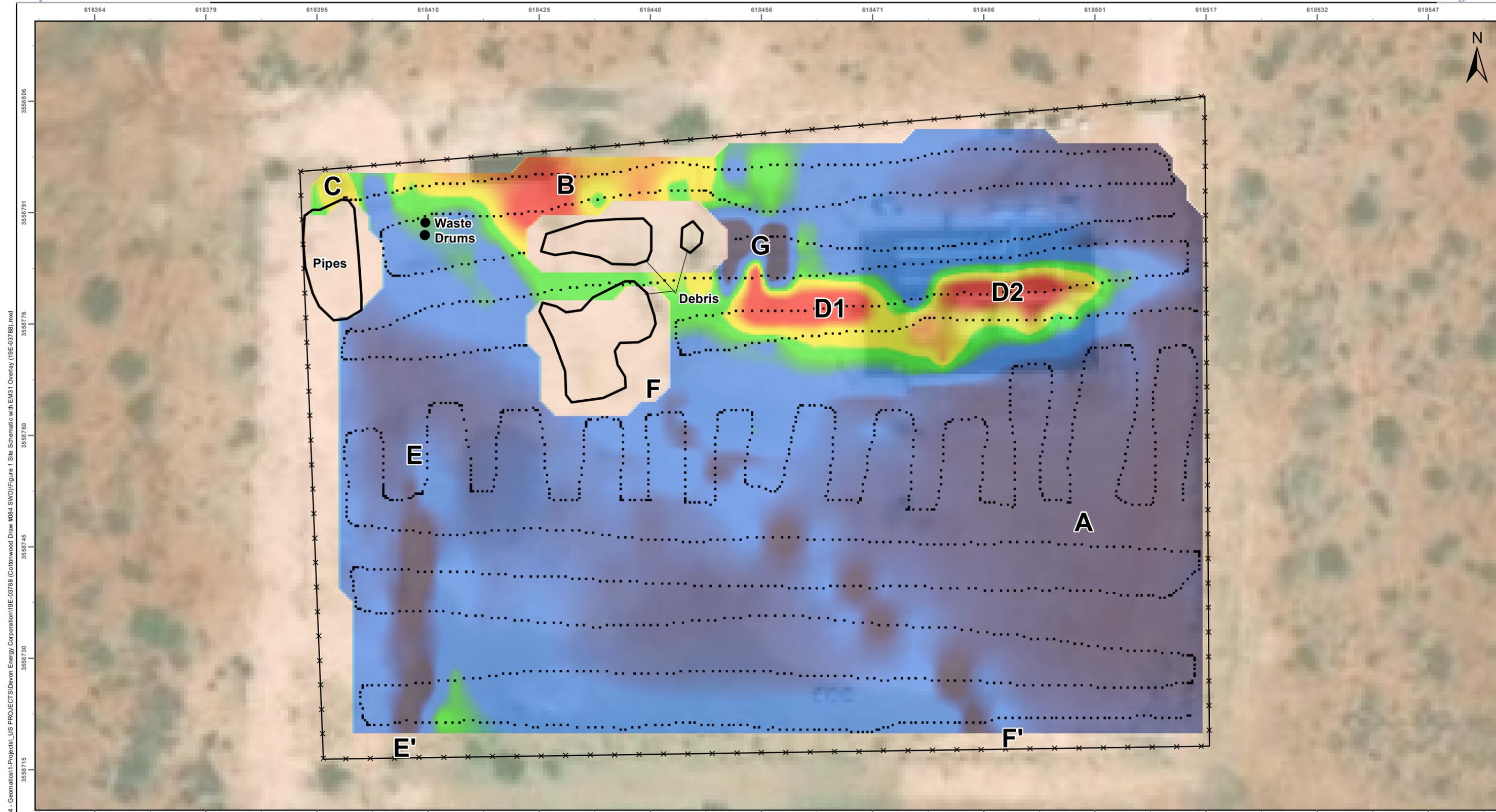
Figure 1. Site Schematic with EM31 Apparent Conductivity Overlay

## **Limitations**

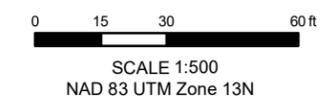
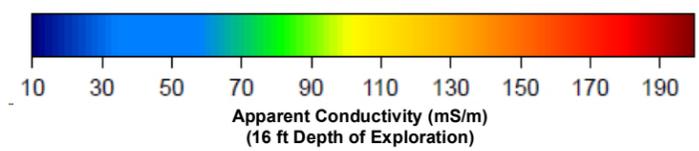
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The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.

## FIGURES



- Legend**
- A** Anomaly
  - Survey Track
  - x--- Fence



	<b>Site Schematic with EM31 Apparent Conductivity Overlay Cottondraw #084 SWD</b>	
		DRAWN: LP APPROVED: --- DATE: NOV 05/19

Notes: Aerial Image from ESRI, 2017

Document Path: \\vks-fs01.cop.internat.hared\ps04 - Geomatics\1-Projects\US PROJECTS\Devon Energy Corporation\19E-03786 Cottonwood Draw #084 SWD\Figure 1 Site Schematic with EM31 Overlay (19E-03786).mxd

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
811 S. First St., Artesia, NM 88210  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy Minerals and Natural Resources  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

### Release Notification and Corrective Action

**OPERATOR**  Initial Report  Final Report

<b>Name of Company</b> Devon Energy Production Company	<b>Contact</b> Matt Nettles, Production Foreman
<b>Address</b> 6488 Seven Rivers Hwy Artesia, NM 88210	<b>Telephone No.</b> 575-513-5767
<b>Facility Name</b> Cotton Draw Unit 84	<b>Facility Type</b> Salt Water Disposal
<b>Surface Owner</b> Federal	<b>Mineral Owner</b> State
<b>API No</b> 30-015-29728	

### LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
I	2	25S	31E	2615'	FSL	1160'	FEL	Eddy

**Latitude:** 32.1592751 **Longitude:** -103.7438736

### NATURE OF RELEASE

<b>Type of Release</b> Produced Water	<b>Volume of Release</b> 65bbbls	<b>Volume Recovered</b> 10bbbls
<b>Source of Release</b> Frac tank on location	<b>Date and Hour of Occurrence</b> July 23, 2017 @ 11:30	<b>Date and Hour of Discovery</b> July 23, 2017 @ 11:30
<b>Was Immediate Notice Given?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	<b>If YES, To Whom?</b> Shelly Tucker, BLM Mike Bratcher/Crystal Weaver, OCD	
<b>By Whom?</b> Ray Carter, Asst. Production Foreman	<b>Date and Hour</b> Shelly Tucker, BLM July 23, 2017 @ 11:45 AM Mike Bratcher/Crystal Weaver, OCD July 23, 2017 @ 6:42 PM	
<b>Was a Watercourse Reached?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>If YES, Volume Impacting the Watercourse</b> N/A	

**If a Watercourse was Impacted, Describe Fully.\***

N/A

**Describe Cause of Problem and Remedial Action Taken.\***

The casing was blown down and didn't get shut off completely, causing the frac tank to run over on the location. The 2 inch ball valve was shut to prevent any further release.

**Describe Area Affected and Cleanup Action Taken.\***

Approximately 65bbbls of produced water was released onto the Northwest corner of location. 0.5 bbls left the location and was release onto the adjacent pasture. A vacuum truck was dispatched and recovered approximately 10bbbls of produced water. An environmental contractor will be contacted to assist with the delineation and remediation.

This well has been plugged and abandoned, and all remediation activities were completed alongside the reclamation activities. Closure report attached.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: <i>Sheila Fisher</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Sheila Fisher	Approved by Environmental Specialist:	
Title: <b>Field Admin Support</b>	Approval Date:	Expiration Date:
E-mail Address: <b>Sheila.fisher@dvn.com</b>	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 2/12/20	Phone: <b>575.748.1829</b>	

\* Attach Additional Sheets If Necessary

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State of New Mexico  
Energy Minerals and Natural  
Resources Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-141  
Revised August 24, 2018  
Submit to appropriate OCD District office

Incident ID	
District RP	2RP-4325
Facility ID	
Application ID	

## Site Assessment/Characterization

*This information must be provided to the appropriate district office no later than 90 days after the release discovery date.*

What is the shallowest depth to groundwater beneath the area affected by the release?	>100 (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

**Characterization Report Checklist:** *Each of the following items must be included in the report.*

- Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- Field data
- Data table of soil contaminant concentration data
- Depth to water determination
- Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- Boring or excavation logs
- Photographs including date and GIS information
- Topographic/Aerial maps
- Laboratory data including chain of custody

State of New Mexico  
Oil Conservation Division

Page 2

Incident ID	
District RP	2RP-4325
Facility ID	
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If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

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: Amanda Davis Title: EHS Professional

Signature: *Amanda Davis* Date: \_\_\_\_\_

email: Amanda.Davis@dvn.com Telephone: 575-748-0176

**OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

Incident ID	
District RP	2RP-4325
Facility ID	
Application ID	

## 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: Amanda Davis Title: EHS Professional

Signature: Amanda Davis Date: \_\_\_\_\_

email: Amanda.Davis@dvn.com Telephone: 575-748-0176

**OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

- Approved       Approved with Attached Conditions of Approval       Denied       Deferral Approved

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Incident ID	
District RP	2RP-4325
Facility ID	
Application ID	

## Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist:** *Each of the following items must be included in the closure report.*

- A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)
- Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- Description of remediation activities

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. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Amanda Davis Title: EHS Professional

Signature: Amanda Davis Date: \_\_\_\_\_

email: Amanda.Davis@dvn.com Telephone: 575-748-0176

**OCD Only**

Received by: \_\_\_\_\_ Date: \_\_\_\_\_

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Printed Name: \_\_\_\_\_ Title: \_\_\_\_\_