Souder, Miller & Associates♦201 S. Halagueno St.♦Carlsbad, NM 88220
(575) 689-8801

APPROVED
By Olivia Yu at 3:15 pm, Jan 29, 2018

January 9, 2018

#5E26700-BG1

Devon Energy Corporation
Mike Shoemaker
6488 Seven Rivers Highway
Artesia, New Mexico 88210

NMOCD approves of the delineation completed and proposed remediation for 1RP-4868 with conditions indicated in email correspondence.

SUBJECT: SOIL REMEDIATION WORK PLAN FOR THE INCIDENT REFERRED TO AS "TRANSFER LINE FROM URSULA FRAC POND TO NORTH THISTLE 2 STATE 2H" (1RP-4868), LEA COUNTY, NEW MEXICO

Dear Mr. Shoemaker,

On behalf of Terra Oil Services, Souder, Miller & Associates (SMA) has prepared this WORK PLAN that describes the assessment, initial delineation and proposed remediation for five related releases referred to as "Transfer line from Ursula Frac Pond to North Thistle 2 State 2H releases" (hereafter "North Thistle 2 State 2H Releases"). The release sites are in Sections 2 and 11, Township 23S, Range 33E, NMPM, Lea County, New Mexico, on Bureau of Land Management (BLM) and State of New Mexico land. Figure 1 illustrates the vicinity and location of the sites.

Table 1, below, summarizes information regarding the releases.

Table 1: Release information and Site Ranking	
Name	Transfer line from Ursula Frac Pond to North Thistle 2 State 2H
Company	Devon Energy Production Co LP (6137)
RP Number	1RP-4868
API Number	30-025-42821
Location	32.326430, -103.549980
Estimated Date of Release	10/23/17
Date Reported to NMOCD	10/23/17
Land Owner	State / Federal
Reported To	Olivia Yu
Source of Release	Lay Flat Hose
Released Material	Treated Produced Water
Released Volume	355 bbls
Recovered Volume	250 bbls
Net Release	105 bbls
Nearest Waterway	25 Miles from Salt Lake
Depth to Groundwater	Estimated to be greater than 100'
Nearest Domestic Water Source	Greater than 1,000 feet
NMOCD Ranking	0

1.0 Background

On October 23, 2017, a lay flat hose, operated by Terra Oil Services, was transferring treated produced water from the Ursula frac pond to the North Thistle 2 State 2H well pad (Site 5). The frac went from flush and then shut down, releasing produced water to the ground. Repairs were made to the hose and completion activities resumed. However, four additional failures along the line were later discovered.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 25 miles east of the Salt Lake, with an elevation of approximately 3,400 feet above sea level. SMA searched the New Mexico State Engineer's Office (NMOSE) online water well database for water wells near the release. Five wells with sufficient data are located within a three-mile radius of the site. According to CP00872, and adjusting for elevation, the estimated depth to ground water is 393 feet below ground surface (bgs) in the release area. After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to be greater than 100 bgs.

Recommended Remediation Action Levels (RRALs) are determined by the site ranking according to the NMOCD *Guidelines for Remediation of Leaks, Spills, and Releases* (1993). Below in Table 2 are the remediation standards and the site ranking for this location. Justification for this site ranking is found in Figure 1 and Appendix B.

Table 2.

Soil Remediation Standards	0 to 9	10 to 19	>19
Benzene	10 PPM	10 PPM	10 PPM
BTEX	50 PPM	50 PPM	50 PPM
TPH	5000 PPM	1000 PPM	100 PPM

Depth to Groundwater	NMOCD Numeric Rank
< 50 BGS = 20	
50' to 99' = 10	
>100' = 0	0
Distance to Nearest Surface Water	**NMOCD Numeric Rank**
< 200' = 20	
200' - 1000' = 10	
>1000' = 0	0
Well Head Protection	**NMOCD Numeric Rank**
<1000' (or <200' domestic) = 20	
> 1000' = 0	0
Total Site Ranking	**0**

3.0 Release Characterization

On November 30, 2016, SMA personnel were on site to evaluate all the release areas Site 1-5 shown in Figures 2 and 3. Site 1- Site 4 occurred in pasture area and Site 5 occurred on a well pad. The releases area was mapped using a Goble Positioning System (GPS). Along with field screening with a mobile titration unit (EPA 4500).

Site 1: Is an affected area west of a well pad estimated to be 389 yds^3 of contaminated soil. Site 2: affected area is east of a lease road estimated to be 41 yds^3 of contaminated soil. Site 3: affected area is east of lease road estimated to be 58 yds^3 of contaminated soil. Site 4: Lab samples show no evidence of contaminated soil is this area. Site 5 affected area is North Thistle 2 State 2H well pad with an affected area estimated to be 352 yds^3 of contaminated soil. Site 1,2,3,5 will be excavated at different depth below ground surface shown in Table 3.

The total surface impact is estimated to be 1,008 square yards (yds^2). Sites 2 and 4 appear to be impacted on the surface only, so the total impacted area is estimated to be approximately 840 cubic yds (yds^3). Table 3 below demonstrates each of the sites with the associated estimated impacted area.

Table 3

Location	Surface Impact (yds^2)	Depth of Impact (yds)	Estimated Total Volume (yds^3)
Site 1	197	1.8	389
Site 2	235	0.16	41
Site 3	44	.33	58
Site 4	0	0	0
Site 5	532	0.6	352

4.0 Soil Remediation Workplan

After approval from area utilities owners via 811 and NMOCD, SMA will oversee excavation to remove affected soils. SMA will continuously guide the excavation activities by collecting discrete soil samples and field screening for chlorides with a mobile titration unit (EPA 4500). Table 3 above shows the estimated yards of affected soil to be removed for each site.

Once field-screening indicates contaminated soil has been removed to NMOCD RRALs, discrete samples will be collected from the sidewalls and base of the excavation. The samples will be sent under chain-of-custody protocols to Hall Environmental Analysis Laboratory for analyses including chlorides by Method 300.0, volatile organics (BTEX) by Method 8021B, and MRO, DRO, and GRO by EPA Method 8015D.

5.0 Scope and Limitations

The scope of our services consisted of the performance of assessment sampling, verification of release stabilization, regulatory liaison, and preparation of this work plan. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact either Austin Weyant at 575-689-8801 or Shawna Chubbuck at 505-325-7535.

Submitted by:
SOUDER, MILLER & ASSOCIATES

Austin Weyant
Project Scientist

Reviewed by:

Shawna Chubbuck
Senior Scientist

ATTACHMENTS:

Figures:

Figure 1: Site Vicinity and NMOSE Well Location Map
Figure 2: Site 1-5 Location Map
Figure 3: Site1-5 Sample Location Map

Tables:

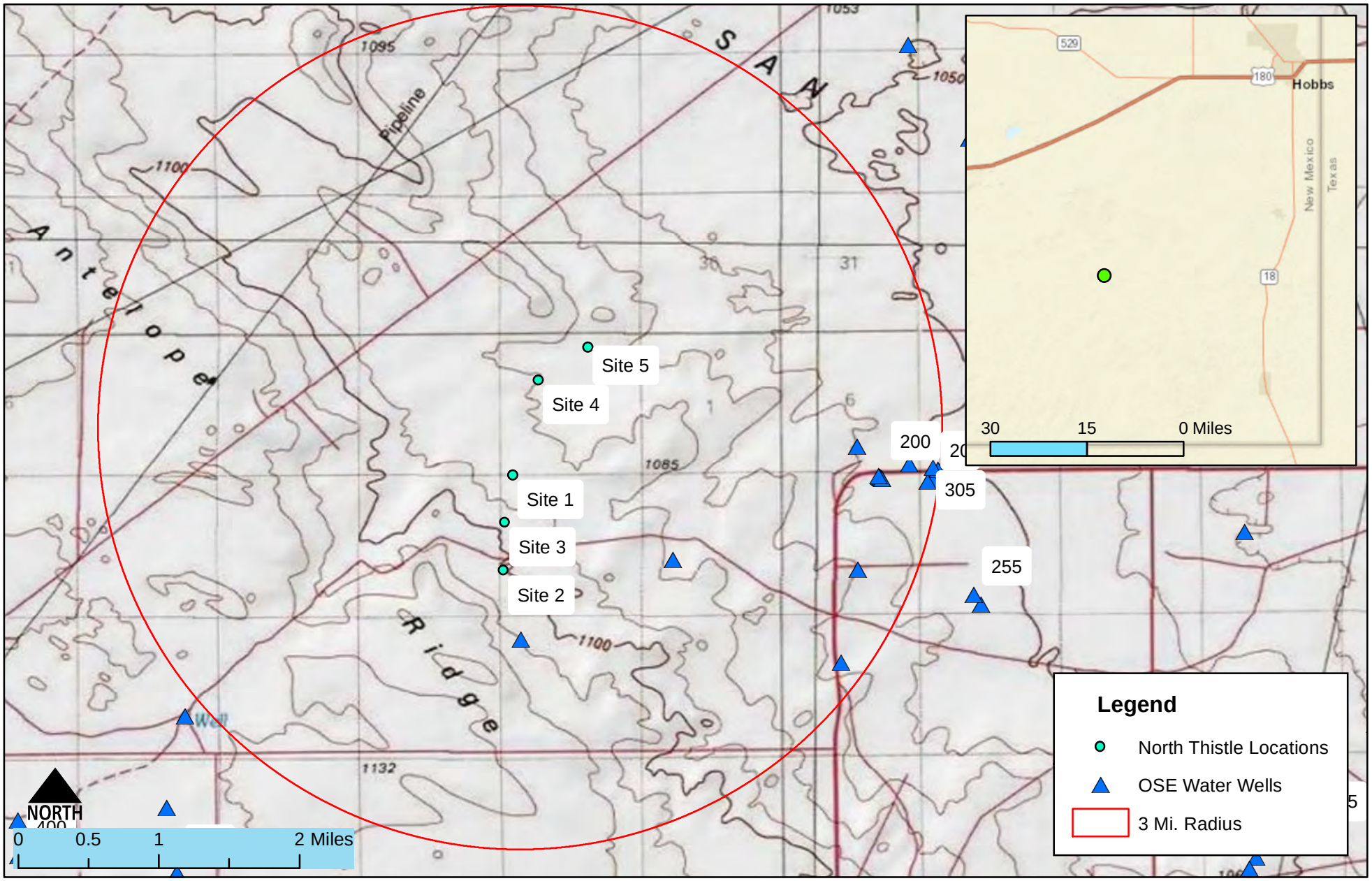
Table 4: Summary of Sample Results

Appendices:

Appendix A: Form C141 Initial
Appendix B: NMOSE Wells Report
Appendix C: Laboratory Analytical Reports
Appendix D: Field Notes

FIGURE 1:

SITE VICINITY AND NMOSE WELL LOCATION MAP



Site Vicinity & NMOSE Well Location Map
North Thistle Sites 1-5 - Devon Energy
S2,11 T23S,R33E Lea County, New Mexico

Figure 1

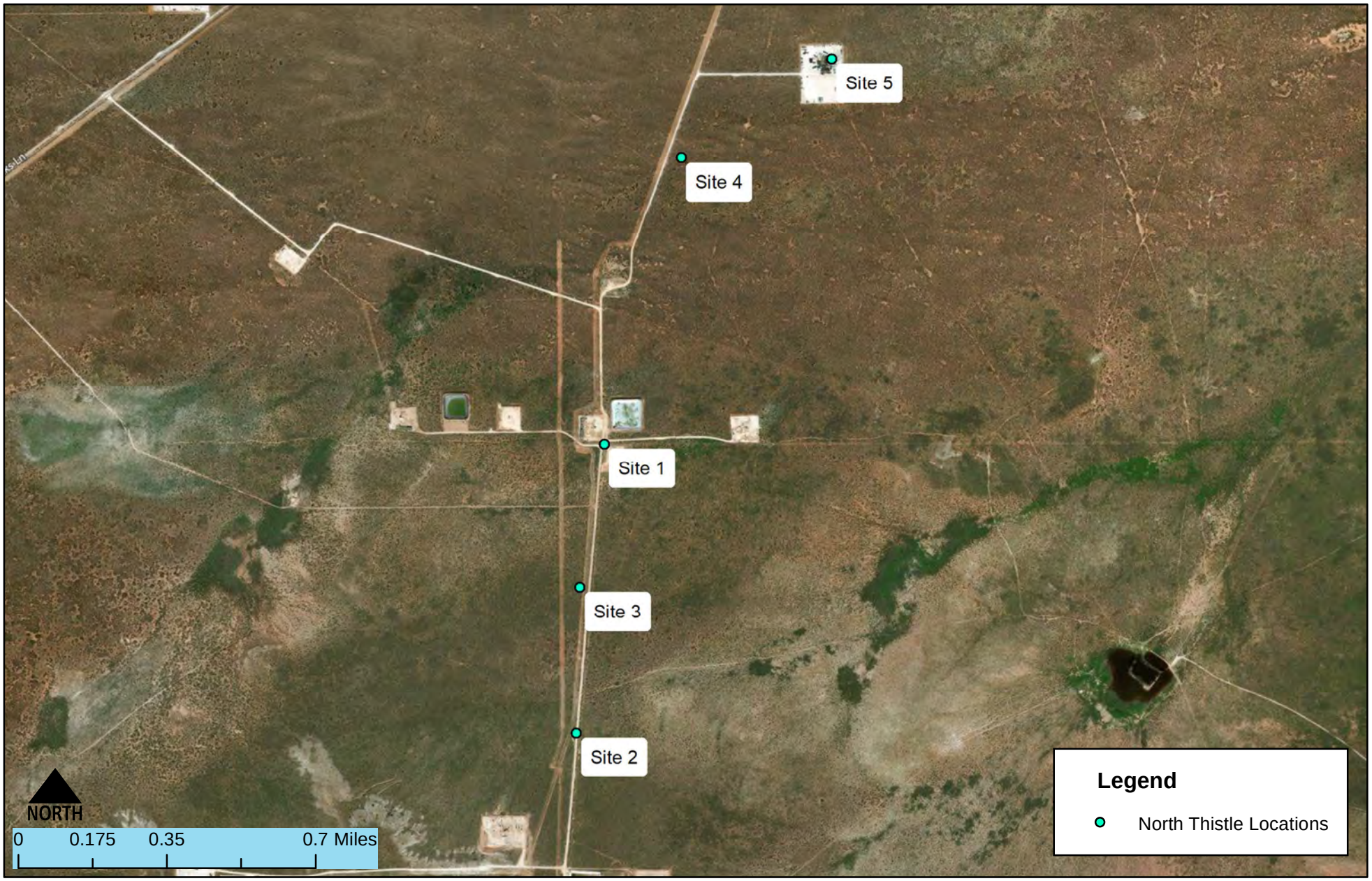
Document: C:\Users\mrs\Documents\GISdata\Maps\Terra - North Thistle.mxd
Date Saved: 12/11/2017

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

Drawn Melodie Sanjari
Checked
Approved

SMA
201 South Halaguena Street
Carlsbad, New Mexico 88221
(575) 689.7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

FIGURE 2:
SITE 1-5 LOCATION MAP



Sites 1-5 Location Map
North Thistle Sites 1-5 - Devon Energy
S2,11 T23S,R33E Lea County, New Mexico

Figure 2

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

Drawn Melodie Sanjari
Checked
Approved

201 South Halaguena Street
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Date Saved: 12/11/2017

Document: C:\Users\mrs\Documents\GIS\data\Maps\North Thistle Figure 2.mxd

FIGURE 3:
SITE1-5 SAMPLE LOCATION MAP

Sites 1-5 Location Map
North Thistle Sites 1-5 - Devon Energy
S2,11 T23S,R33E Lea County, New Mexico

Figure 3

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

Drawn Lucas Middleton
Checked
Approved

201 South Halaguena Street
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Date Saved: 12/21/2017

Document: C:\Users\lcm.CBO\Documents\GIS DATA\MAPS\north thistle.mxd

TABE 4:
SUMMARY OF SAMPLE RESULTS

North Thistle Sample Summary Table

Table 4

	Sample Number on Figure 3	Sample Date	Depth (feet bgs)	Action Taken	BTEX ppm	Benzene mg/Kg	GRO mg/Kg	DRO mg/Kg	MRO mg/Kg	**Total TPH** mg/Kg	Cl- Field Screens (ppm)	Cl- Laboratory mg/Kg
	NMOCD RRAL's for Site Ranking 0				50 mg/Kg	10 mg/Kg				5000 mg/Kg		
Site 1	1-S	11/30/2017	surface		--	--	--	--	--	--	21,000	--
	1-1'	11/30/2017	1		--	--	--	--	--	--	7089	--
	1-2'	11/30/2017	2		--	--	--	--	--	--	5472	--
	1-4'	11/30/2017	4		--	--	--	--	--	--	6656	7600
	1-5'	11/30/2017	5		<0.207	<0.023	<4.6	<9.4	<47	<61	5501	18000
	1-5.5'	11/30/2017	5.5		--	--	--	--	--	--	1041	--
	1-6'	11/30/2017	6		--	--	--	--	--	--	<132	440
Site 2	2-1'	11/30/2017	1		<0.216	<0.024	<4.8	<9.4	<47	<61.2	<132	<30
Site 3	3-S	11/30/2017	surface		<0.21	<0.023	<4.7	<9.6	<48	<62.3	13944	15000
	3-1'	11/30/2017	1		--	--	--	--	--	--	479	500
Site 4	4A-S	11/30/2017	surface		<.217	<0.024	<4.8	20	<44	20	<132	<30
	4A-1'	11/30/2017	1		--	--	--	--	--	--	<132	<30
	4C-2'	11/30/2017	2		--	--	--	--	--	--	<132	--
Site 5	5-S	11/30/2017	surface		--	--	--	--	--	--	12,000	--
	5-1'	11/30/2017	1		<0.21	<0.023	<4.7	<9.6	<48	<62.3	825	930
	5-2'	11/30/2017	2		--	--	--	--	--	--	204	290
	5-3'	11/30/2017	3		--	--	--	--	--	--	132	--

exceeds RRAL's

excavated

"--" = Not Analyzed

APPENDIX A:
FORM C141 INITIAL

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 April 3, 2017

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company Devon Energy Production Co LP (6137)	Contact Stephen Richards, Devon Completions Foreman
Address PO BOX 250, Artesia, NM 88211	Telephone No. (575) 252-3717
Facility Name: Transfer line from Ursula Frac Pond to North Thistle 2 State 2H	Facility Type Oil well

Surface Owner: See Page 2 Location of Release	Mineral Owner: See Page 2 Location of Release	API No. 30-025-42821

LOCATION OF RELEASE: Please see Page 2 for locations of the spills related to this incident.

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
		23S	33E					Lea

Latitude See Page 2 Location of Release **Longitude** See Page 2 Location of Release

NATURE OF RELEASE

Type of Release: Treated Produced Water	Volume of Release: 355 bbls total (pad and pasture)	Volume Recovered: 250 bbls (on pad)
Source of Release: Lay Flat Hose	Date and Hour of Occurrence: 10/23/2017, 6:00 & 7:30 PM	Date and Hour of Discovery 10/23/2017, 6:00 & 7:30 PM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? OCD: Olivia Yu BLM: Shelly Tucker	RECEIVED By Olivia Yu at 7:48 am, Nov 17, 2017
By Whom? Mike Shoemaker, EHS Professional	Date and Hour: OCD: 10/25/17, 7:24 AM BLM: 10/25/17, 7:24 AM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse. NA	

If a Watercourse was Impacted, Describe Fully.* NA

Describe Cause of Problem and Remedial Action Taken.*
At 6:00 PM, the lay flat hose transferring treated produced water from the Ursula frac pond to location failed at Site #1 (see attached GIS map). The frac went from flush and then shut down, releasing produced water to the ground. Repairs were made to the hose and completion activities resumed. At 7:30 PM, there were four additional failures along the line. Completion activities shut down. The line is being replaced.

Describe Area Affected and Cleanup Action Taken.* There were a total of five different spill sites from the pond to the pad location along the lay flat line, which are identified on the attached GIS map with their respective chronologic number. The estimated square footage affected be each release is as follows: 1) 5,600' 2) 7,744' 3) 400' 4) 1,974' 5) 115,480'. An estimated 355 barrels total of treated produced water were spilled and 250 barrels were recovered from the combined locations. A remediation contractor will be contacted to assist with the delineation and remediation efforts.

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: Denise Menoud	OIL CONSERVATION DIVISION
Printed Name: Denise Menoud	Approved by Environmental Specialist:
Title: Admin Field Support	Approval Date: 11/17/2017 Expiration Date:
E-mail Address: denise.menoud@dvn.com	Conditions of Approval: see attached directive Attached ☑
Date: 10/25/2017 Phone: (575)746-5544	

* Attach Additional Sheets If Necessary

1RP-4868 nOY1732130408 pOY1732130912

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
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1000 Rio Brazos Road, Aztec, NM 87410
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Form C-141
Revised April 3, 2017

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

Release Notification and Corrective Action
- PAGE 2

OPERATOR ☒ Initial Report ☐ Final Report

Name of Company Devon Energy Production Co LP (6137)	Contact Stephen Richards, Devon Completions Foreman
Address PO BOX 250, Artesia, NM 88211	Telephone No. (575) 252-3717
Facility Name: Transfer line from Ursula Frac Pond to North Thistle 2 State 2H	Facility Type Oil well

Surface Owner: State / Federal	Mineral Owner: State / Federal	API No. 30-025-42821

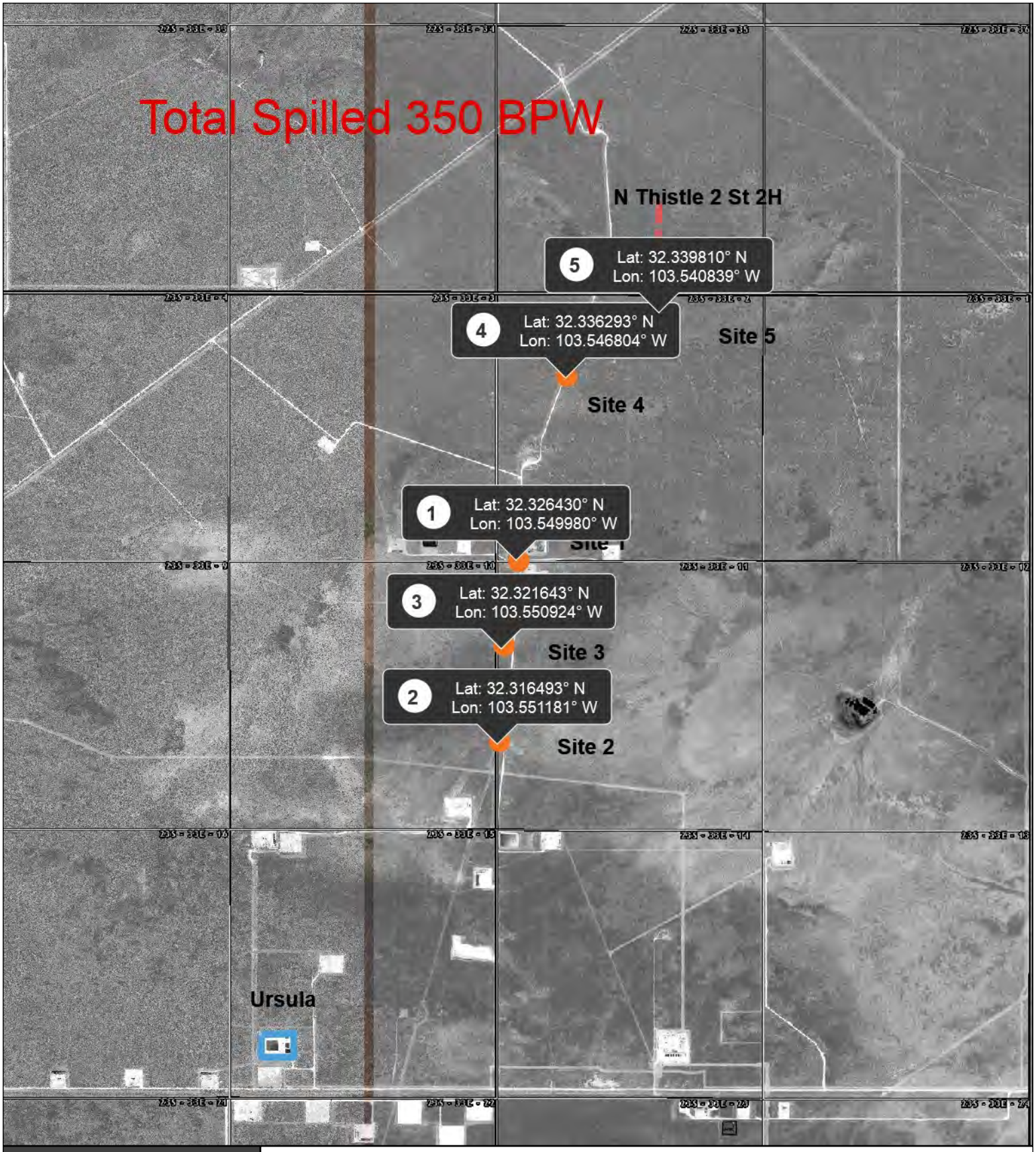
LOCATION OF RELEASES:

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line		County
		23S	33E						Lea

SITE 1) M-02-23S-33E, 32.326430 N, 103.549980 W (Surface Owner-State, Mineral Owner-Federal) 11-D	
SITE 2) L-11-23S-33E, 32.316493 N, 103.551181 W (Surface Owner-State, Mineral Owner-Federal)	
SITE 3) E-11-23S-33E, 32.321643 N, 103.550924 W (Surface Owner-State, Mineral Owner-Federal)	
SITE 4) F-02-23S-33E, 32.336293 N, 103.546804 W (Surface Owner-State, Mineral Owner-State)	
SITE 5) B-02-23S-33E, 32.339810 N, 103.540839 W(Surface Owner-State, Mineral Owner-State)	

Signature: Denise Menoud	OIL CONSERVATION DIVISION Approved by Environmental Specialist:	
Printed Name: Denise Menoud		
Title: Admin Field Support	Approval Date:	Expiration Date:
E-mail Address: denise.menoud@dvn.com	Conditions of Approval:	Attached ☐
Date: 10/25/2017 Phone: (575)746-5544		

* Attach Additional Sheets If Necessary



N Thistle 2 St 2H Spill

10/23/2017

devon

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: Menoud
Map is current as of: 25-Oct-2017

N

Miles
0 0.14 0.28 0.56 1:28,457

Devon Maintained City Boundaries
Devon Maintained City ETJ

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _11/6/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4868__ 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 _1_ office in __Hobbs____ on or before _12/17/2017_. 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_6 thru C_{36}), 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_6 thru C_{36}), 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

APPENDIX B:
NMOSE WELLS REPORT

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	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 03582 POD1	C	LE	4	1	1	14	23S	33E	636583	3575666	1878	590		
CP 01130 POD1	CP	LE	2	1	2	07	23S	34E	640662	3577558	4181	27		
CP 01130 POD2	CP	LE	2	1	2	07	23S	34E	640674	3577549	4192	27		
CP 00872 POD1	CP	LE	1	1	1	08	23S	34E	641225	3577504*	4744	494	305	189
CP 01075 POD1	CP	LE		1	1	08	23S	34E	641278	3577525	4796	430	20	410

Average Depth to Water: **162 feet**

Minimum Depth: **20 feet**

Maximum Depth: **305 feet**

Record Count: 5

UTMNAD83 Radius Search (in meters):

Easting (X): 636480.96 **Northing (Y):** 3577542.55 **Radius:** 4828

***UTM location was derived from PLSS - see Help**

APPENDIX C:

LABORATORY ANALYTICAL REPORTS

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

December 13, 2017

Austin Weyant
Souder, Miller & Associates
201 S Halagueno
Carlsbad, NM 88221
TEL: (575) 689-7040
FAX

RE: North Thistle Devon OrderNo.: 1712184

Dear Austin Weyant:

Hall Environmental Analysis Laboratory received 10 sample(s) on 12/5/2017 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 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 #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1712184**
Date Reported: **12/13/2017**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #1-5
Project: North Thistle Devon
Collection Date: 11/30/2017 12:17:00 PM
Lab ID: 1712184-001 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	18000	1500		mg/Kg	1E	12/11/2017 3:56:01 PM	35435
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	12/7/2017 1:12:29 AM	35334
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/7/2017 1:12:29 AM	35334
Surr: DNOP	92.9	70-130		%Rec	1	12/7/2017 1:12:29 AM	35334
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.6		mg/Kg	1	12/8/2017 2:21:11 AM	35335
Surr: BFB	85.5	15-316		%Rec	1	12/8/2017 2:21:11 AM	35335
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/8/2017 2:21:11 AM	35335
Toluene	ND	0.046		mg/Kg	1	12/8/2017 2:21:11 AM	35335
Ethylbenzene	ND	0.046		mg/Kg	1	12/8/2017 2:21:11 AM	35335
Xylenes, Total	ND	0.092		mg/Kg	1	12/8/2017 2:21:11 AM	35335
Surr: 4-Bromofluorobenzene	78.8	80-120	S	%Rec	1	12/8/2017 2:21:11 AM	35335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #1-4
Project: North Thistle Devon
Collection Date: 11/30/2017 3:00:00 PM
Lab ID: 1712184-002 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	7600	300		mg/Kg	200	12/11/2017 4:08:26 PM	35435

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #1-6
Project: North Thistle Devon
Collection Date: 11/30/2017 3:11:00 PM
Lab ID: 1712184-003 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	440	30		mg/Kg	20	12/11/2017 3:18:48 PM	35435

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #2-1
Project: North Thistle Devon
Collection Date: 11/30/2017 11:41:00 AM
Lab ID: 1712184-004 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	12/11/2017 3:31:12 PM	35435
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.4		mg/Kg	1	12/7/2017 1:34:23 AM	35334
Motor Oil Range Organics (MRO)	ND	47		mg/Kg	1	12/7/2017 1:34:23 AM	35334
Surr: DNOP	90.2	70-130		%Rec	1	12/7/2017 1:34:23 AM	35334
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/8/2017 2:43:55 AM	35335
Surr: BFB	84.6	15-316		%Rec	1	12/8/2017 2:43:55 AM	35335
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.024		mg/Kg	1	12/8/2017 2:43:55 AM	35335
Toluene	ND	0.048		mg/Kg	1	12/8/2017 2:43:55 AM	35335
Ethylbenzene	ND	0.048		mg/Kg	1	12/8/2017 2:43:55 AM	35335
Xylenes, Total	ND	0.096		mg/Kg	1	12/8/2017 2:43:55 AM	35335
Surr: 4-Bromofluorobenzene	80.5	80-120		%Rec	1	12/8/2017 2:43:55 AM	35335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #3-5
Project: North Thistle Devon
Collection Date: 11/30/2017 12:13:00 PM
Lab ID: 1712184-005 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	15000	750		mg/Kg	500	12/11/2017 4:20:50 PM	35435
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/7/2017 1:56:07 AM	35334
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/7/2017 1:56:07 AM	35334
Surr: DNOP	95.6	70-130		%Rec	1	12/7/2017 1:56:07 AM	35334
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/8/2017 3:06:41 AM	35335
Surr: BFB	84.5	15-316		%Rec	1	12/8/2017 3:06:41 AM	35335
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/8/2017 3:06:41 AM	35335
Toluene	ND	0.047		mg/Kg	1	12/8/2017 3:06:41 AM	35335
Ethylbenzene	ND	0.047		mg/Kg	1	12/8/2017 3:06:41 AM	35335
Xylenes, Total	ND	0.093		mg/Kg	1	12/8/2017 3:06:41 AM	35335
Surr: 4-Bromofluorobenzene	81.5	80-120		%Rec	1	12/8/2017 3:06:41 AM	35335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #3-1
Project: North Thistle Devon
Collection Date: 11/30/2017 12:15:00 PM
Lab ID: 1712184-006 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	500	30		mg/Kg	20	12/11/2017 12:59:44 PM	35445

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #4A-5
Project: North Thistle Devon
Collection Date: 11/30/2017 12:43:00 PM
Lab ID: 1712184-007 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**MRA**
Chloride	ND	30		mg/Kg	20	12/11/2017 1:36:57 PM	35445
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst:	**TOM**
Diesel Range Organics (DRO)	20	8.8		mg/Kg	1	12/7/2017 2:17:52 AM	35334
Motor Oil Range Organics (MRO)	ND	44		mg/Kg	1	12/7/2017 2:17:52 AM	35334
Surr: DNOP	81.8	70-130		%Rec	1	12/7/2017 2:17:52 AM	35334
EPA METHOD 8015D: GASOLINE RANGE						Analyst:	**NSB**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	12/8/2017 3:29:24 AM	35335
Surr: BFB	82.9	15-316		%Rec	1	12/8/2017 3:29:24 AM	35335
EPA METHOD 8021B: VOLATILES						Analyst:	**NSB**
Benzene	ND	0.024		mg/Kg	1	12/8/2017 3:29:24 AM	35335
Toluene	ND	0.048		mg/Kg	1	12/8/2017 3:29:24 AM	35335
Ethylbenzene	ND	0.048		mg/Kg	1	12/8/2017 3:29:24 AM	35335
Xylenes, Total	ND	0.097		mg/Kg	1	12/8/2017 3:29:24 AM	35335
Surr: 4-Bromofluorobenzene	80.4	80-120		%Rec	1	12/8/2017 3:29:24 AM	35335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #4A-1
Project: North Thistle Devon
Collection Date: 11/30/2017 12:33:00 PM
Lab ID: 1712184-008 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	ND	30		mg/Kg	20	12/11/2017 1:49:22 PM	35445

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #5-1
Project: North Thistle Devon
Collection Date: 11/30/2017 1:41:00 PM
Lab ID: 1712184-009 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	930	30		mg/Kg	20	12/11/2017 2:01:47 PM	35445
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	12/7/2017 2:39:45 AM	35334
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	12/7/2017 2:39:45 AM	35334
Surr: DNOP	93.6	70-130		%Rec	1	12/7/2017 2:39:45 AM	35334
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	12/8/2017 3:52:08 AM	35335
Surr: BFB	82.7	15-316		%Rec	1	12/8/2017 3:52:08 AM	35335
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.023		mg/Kg	1	12/8/2017 3:52:08 AM	35335
Toluene	ND	0.047		mg/Kg	1	12/8/2017 3:52:08 AM	35335
Ethylbenzene	ND	0.047		mg/Kg	1	12/8/2017 3:52:08 AM	35335
Xylenes, Total	ND	0.093		mg/Kg	1	12/8/2017 3:52:08 AM	35335
Surr: 4-Bromofluorobenzene	79.6	80-120	S	%Rec	1	12/8/2017 3:52:08 AM	35335

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

Qualifiers:

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

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: N.Thistle #5-2
Project: North Thistle Devon
Collection Date: 11/30/2017 1:54:00 PM
Lab ID: 1712184-010 **Matrix:** SOIL **Received Date:** 12/5/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **MRA**	
Chloride	290	30		mg/Kg	20	12/11/2017 2:14:12 PM	35445

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

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1712184**

13-Dec-17

Client: Souder, Miller & Associates

Project: North Thistle Devon

Sample ID	**MB-35445**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**35445**		RunNo:	**47703**				
Prep Date:	**12/11/2017**	Analysis Date:	**12/11/2017**		SeqNo:	**1524845**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-35445**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**35445**		RunNo:	**47703**				
Prep Date:	**12/11/2017**	Analysis Date:	**12/11/2017**		SeqNo:	**1524846**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.6	90	110			

Sample ID	**MB-35435**	SampType:	**mblk**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**PBS**	Batch ID:	**35435**		RunNo:	**47666**				
Prep Date:	**12/11/2017**	Analysis Date:	**12/11/2017**		SeqNo:	**1524960**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-35435**	SampType:	**lcs**		TestCode:	**EPA Method 300.0: Anions**				
Client ID:	**LCSS**	Batch ID:	**35435**		RunNo:	**47666**				
Prep Date:	**12/11/2017**	Analysis Date:	**12/11/2017**		SeqNo:	**1524961**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.5	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 Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1712184**

13-Dec-17

Client: Souder, Miller & Associates

Project: North Thistle Devon

Sample ID	**LCS-35333**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**35333**		RunNo:	**47491**				
Prep Date:	**12/5/2017**	Analysis Date:	**12/6/2017**		SeqNo:	**1518687**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.4		5.000		88.5	70	130			

Sample ID	**MB-35333**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**35333**		RunNo:	**47491**				
Prep Date:	**12/5/2017**	Analysis Date:	**12/6/2017**		SeqNo:	**1518689**	Units:	**%Rec**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.6		10.00		95.5	70	130			

Sample ID	**LCS-35334**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**LCSS**	Batch ID:	**35334**		RunNo:	**47491**				
Prep Date:	**12/5/2017**	Analysis Date:	**12/6/2017**		SeqNo:	**1520256**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	45	10	50.00	0	89.3	73.2	114			
Surr: DNOP	3.6		5.000		71.7	70	130			

Sample ID	**MB-35334**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range Organics**				
Client ID:	**PBS**	Batch ID:	**35334**		RunNo:	**47491**				
Prep Date:	**12/5/2017**	Analysis Date:	**12/6/2017**		SeqNo:	**1520258**	Units:	**mg/Kg**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	7.8		10.00		78.0	70	130			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1712184**

13-Dec-17

Client: Souder, Miller & Associates

Project: North Thistle Devon

Sample ID	**MB-35335**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBS**	Batch ID:	**35335**	RunNo:	**47603**
Prep Date:	**12/5/2017**	Analysis Date:	**12/7/2017**	SeqNo:	**1521404** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		86.4	15	316			

Sample ID	**LCS-35335**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSS**	Batch ID:	**35335**	RunNo:	**47603**
Prep Date:	**12/5/2017**	Analysis Date:	**12/7/2017**	SeqNo:	**1521405** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.3	75.9	131			
Surr: BFB	1100		1000		105	15	316			

Qualifiers:

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1712184**

13-Dec-17

Client: Souder, Miller & Associates

Project: North Thistle Devon

Sample ID	**MB-35335**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBS**	Batch ID:	**35335**	RunNo:	**47603**					
Prep Date:	**12/5/2017**	Analysis Date:	**12/7/2017**	SeqNo:	**1521440**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	0.81		1.000		81.4	80	120			

Sample ID	**LCS-35335**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSS**	Batch ID:	**35335**	RunNo:	**47603**					
Prep Date:	**12/5/2017**	Analysis Date:	**12/7/2017**	SeqNo:	**1521441**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.025	1.000	0	91.2	77.3	128			
Toluene	0.91	0.050	1.000	0	90.9	79.2	125			
Ethylbenzene	0.90	0.050	1.000	0	90.2	80.7	127			
Xylenes, Total	2.7	0.10	3.000	0	91.2	81.6	129			
Surr: 4-Bromofluorobenzene	0.85		1.000		85.2	80	120			

Qualifiers:

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

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: SMA-CARLSBAD Work Order Number: 1712184 RcptNo: 1

Received By: Erin Melendrez 12/5/2017 9:30:00 AM

Completed By: Isaiah Ortiz 12/5/2017 10:59:12 AM

Reviewed By: DDS 12/5/17

Chain of Custody

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

Log In

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

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

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. 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: _____

17. Additional remarks:

18. **Cooler Information**

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

Chain-of-Custody Record

Client: SMA - Carlsbad

Mailing Address: 201 S. Halagueno

Phone #:

email or Fax#:

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☐ Standard ☒ Rush 5day

Project Name: North Thistle - Devon

Project #:

Project Manager: Austin Weyant

Sampler: MRS (CAN)

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.1°

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1712184	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
11/30/17	12:17	Soil	N. Thistle #1-5	4oz		-001	✓		✓					✓				
	3:00		N. Thistle #1-4'			-002								✓				
	3:11		N. Thistle #1-6'			-003								✓				
	11:41		N. Thistle #2-1'			-004	✓		✓					✓				
	12:13		N. Thistle #3-5			-005	✓		✓					✓				
	12:15		N. Thistle. #3-1'			-006								✓				
	12:43		N. Thistle #4A-5			-007	✓		✓					✓				
	12:33		N. Thistle. #4A-1'			-008								✓				
	1:41		N. Thistle #5-1'			-009	✓		✓					✓				
	1:54		N. Thistle. #5-2'			-010								✓				

Analysis Request

Date	Time	Relinquished by:	Received by:	Date	Time
12/4/17	2:00			12/4/17	1410
12/4/17	1900			12/5/17	0930

Remarks:

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

APPENDIX D:
FIELD NOTES

Devon / Terra

11/30/17
CCM / MRS

North Thistle #2 11:30

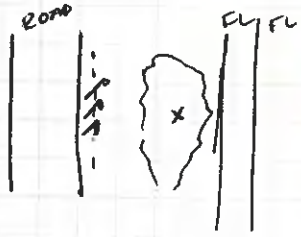
- sandy
- some disturbance → truck? / backhoe?
- 1' sample EC: 0.03 @ 11:41

S- BTEX TPH

North Thistle #3 11:48

- flags on right hand side; GPS on left
- in ditch.

- fire tracks / disturbance
- maybe flow line was previously there
- impact in the ditch & patches in pasture; native soil looks somewhat white as well.
- Surface & 1' samples.



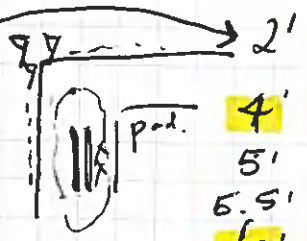
BTEX TPH
S- 9.85 @ 12:13
1'- 0.52 @ 12:15

110 S Halagueno Suite 5 10.

North Thistle #1 12:12

- disturbance; plants dead
- Crusty surface

TPH BTEX — S 19.68 @ 12:17
1' 5.1 @ 12:21



N. Thistle #4 ~ 12:33

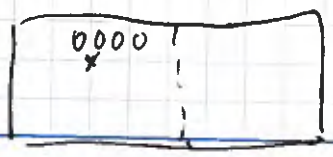
- salty crust.
- right by road; followed low lying ravine to B & C (east) (low lying / pooling areas. Older crust on surface.

BTEX TPH

North Thistle #5 @ 1:00

- impact around tanks
- Surface @ 1:22

BTEX TPH — 1' 0.76 @ 1:47
2' 0.33 @ 1:54
3' 0.28 @ 2:01



B
C-2'
0.04
12:40
1'
0.02
12:37

BY CHECKED DATE PROJECT PAGE BY CLIENT SUBJECT