APPROVED
By Olivia Yu at 11:24 am, Sep 05, 2018

NMOCD approves
1RP-4715 for closure.

1RP-4715

REMEDIATION REPORT
Salado Draw Produced/ Brackish Water Release
Lea County, New Mexico

Latitude: 32.0225°
Longitude: -103.6436°

Project No. 17-0154-01

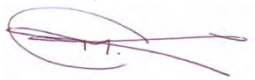
February 15, 2018

Prepared for:

Chevron USA Inc.
6301 Deauville Boulevard
Midland, Texas 79706

Prepared by:

Larson & Associates, Inc.
507 N. Marienfeld Street, Suite 205
Midland, Texas 79701



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Mark J. Larson, P.G.

Certified Professional Geologist #10490

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1.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this remediation report on behalf of Chevron USA Inc. (Chevron) for a produced/brackish water release from a frac flat hose in Unit I (NE/4, SE/4), Section 29, Township 26 South, Range 35 East, in Lea County, New Mexico (Site). The Site is located about 30 miles southwest of Jal, New Mexico. The geodetic position is 32.0225° and -103.6436°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

1.1 Background

The release occurred on May 26, 2017, after a tractor trailer ran over a 12 inch above-ground frac flat hose. Approximately 620 barrels (bbl) of produced water and brackish water was spilled with about 260 bbl recovered with a vacuum truck. The water was returned to the tanks. The spill occurred on the north side of a caliche lease road and flowed east to west adjacent the north side of the road for a distance of about 760 feet. The spill crossed over the lease road to the south flowed east to west for a distance of about 190 feet. The spill on the north side of the lease road was contained the lease road and berm of a high pressure gas pipeline for a lateral distance between about 2 and 15 feet. The spill area on the south side of the lease road was about 7 feet in width. No surface water or vegetation was affected from the spill. Chevron submitted the delineation report initial C-141 on June 7, 2017. The New Mexico Oil Conservation Division (OCD) District 1 assigned the release remediation permit number 1RP-4715. Chevron submitted an amended C-141 after an error was discovered in the GPS coordinate on the OCD approved C-141.

1.2 Physical Setting

The physical setting is as follows:

- The surface elevation is about 3,130feet above mean sea level (MSL);
- The topography slopes gently to the south and southeast;
- No surface water features are present within 1 mile of the Site;
- The surface soil is designated “Pyote and Maljamar fine sands” consisting of about 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches;
- The soil is sandy eolian deposits derived from sedimentary rock; and
- Groundwater occurs at about 150 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE) and U.S. Geological Survey.

1.2 Recommended Remediation Action Levels

Recommended remediation action levels (RRALs) were calculated for benzene, total BTEX (benzene, ethylbenzene, toluene and xylenes) and total petroleum hydrocarbons (TPH) based on the following criteria established by the New Mexico Oil Conservation Division (OCD) in *“Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993”*:

Criteria	*Result*	*Score*
Depth-to-Groundwater	>100 feet	0
Wellhead Protection Area	No	0
Distance to Surface Water Body	>1000 Horizontal Feet	0

The following RRAL apply to the release for ranking score: 0

- Benzene 10 mg/Kg
- BTEX 50 mg/Kg
- TPH 5,000 mg/Kg

Additionally, OCD requires vertical delineation to 600 mg/Kg for chloride where groundwater depth is greater than 100 feet.

1.2 Spill Delineation

The spill was qualitatively delineated with an electromagnetic (EM-38) terrain conductivity meter (EM-38) manufactured by Geonics, Ltd., in Toronto, Ontario, Canada. The EM-38 has exploration capabilities from approximately 0 to 4.9 feet bgs in the vertical dipole (VD) mode. The background conductivity was measured at location (S-5) southwest of the spill and measured 4.2 millimhos per meter (mmhos/m). The maximum EM-38 VD readings from the spill area on the north side of the lease road ranged from 54 mmhos/m near the spill origin (S-2) to 77.5 mmhos/m west of the spill at S-3. The EM-38 VD readings ranged between about 12 and 18 times background. The maximum EM-38 VD reading from the spill area on the south side of the lease road was 32.3 mmhos/m at S-7 located directly south of the spill origin. An EM-38 VD reading was collected about 50 feet south (S-6) to qualitatively assess the horizontal limit of the spill. The EM-38 VD reading at S-6 was 3.3 mmhhos/m and less than the background reading.

On June 6, 2017, LAI personnel used direct-push technology (DPT) to collect soil samples from seven (7) locations (DP-1 through DP-7) to a maximum depth of approximately 11 feet bgs near the spill origin (S-2). Chloride was reported above 600 milligrams per kilogram (mg/Kg) in the deepest samples from S-1 (657 mg/Kg) requiring further vertical delineation. On January 16, 2018, Harrison Cooper Drilling (HCD) used an air rotary rig to collect soil samples at DP-1 from 10, 15 and 20 feet bgs. The samples were analyzed for chloride and reported concentrations of 150 mg/Kg and less than the reporting limit (<1.04 mg/Kg) in samples from 15 and 20 feet bgs completing the delineation. On January 3, 2018, Chevron submitted a remediation request to OCD and the U.S. Bureau of Land Management (BLM) which was approved on January 8, 2018. Figure 3 presents a Site drawing. Table 1 presents the delineation soil sample analytical data summary. Appendix A presents OCD and BLM correspondence.

2.0 REMEDIATION

Remediation was performed on January 23 – 24, 208, in accordance with the OCD approved scope-of-work (SOW). The SOW required excavation soil from the spill area north of the lease road between about 1.0 and 1.5 feet bgs. The north excavation measured about eight (8) feet in width by about 650 feet in length between soil sample locations S-1 (east) and S-5 (west). Soil was excavated to between to about 1.5 feet bgs from the spill area on the south side of the lease road (S-7). The south excavation measured approximately 8 feet in width by approximately 75 feet in length. Approximately 430 cubic yards of soil was excavated for blending. Figure 4 presents a remediation area location map.

A layer of clean soil was spread to an even thickness of about 6 inches on the well pad west of Salado Draw (SD) WE Federal P 23 1H located southeast of the Site. Excavated soil was staged in approximate

48 cubic yard piles from which a 5 spot composite sample was collected and analyzed for chloride by Permian Basin Environmental Lab (PBEL) using EPA Method 300. The chloride concentrations ranged from 7.56 milligrams per kilogram (mg/Kg) in composite sample 9 (Comp 9) to 360 mg/Kg in composite sample 6 (Comp 6). Confirmation samples were collected at three (3) locations from the bottom of the south excavation and each sidewall. PBEL analyzed the samples for chloride and reported concentrations from less than the analytical method reporting limit to 25.1 mg/Kg. Table 2 presents the analytical data summary. Appendix B presents the laboratory report.

Upon receipt of the laboratory analysis of confirmation samples the blended soil was returned to the excavations and graded for drainage. On January 29, 2018, LAI personnel seeded the locations to with BLM seed mix 2. Appendix C presents photographs.

3.0 RECOMMENDATIONS

Chevron requests no further action for 1RP-4715. Appendix D presents the initial C-141, amended C-141 and final C-141.

Tables

Table 1
1RP-4715
Delineation Soil Sample Analytical Data Summary
Chevron North America E1, Salado Draw Produced Water Spill
UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East
Lea County, New Mexico

Sample	Depth (Feet)	Collection Date	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:			**10**	**50**				**5,000**	***600**
S-1	0 - 1	6/2/2017	<0.00109	<0.00761	<27.2	<27.2	<27.2	<27.2	354
	1 - 2	6/2/2017	--	--	--	--	--	--	417
	2 - 3	6/2/2017	--	--	--	--	--	--	616
	4 -5	6/2/2017	--	--	--	--	--	--	415
	5 - 6	6/2/2017	--	--	--	--	--	--	657
	10	1/16/2018							792
	15	1/16/2018							150
	20	1/16/2018							<1.04
S-2	0 - 1	6/2/2017	<0.00103	<0.00721	<25.8	<25.8	<25.8	<25.8	877
	1 - 2	6/2/2017	--	--	--	--	--	--	486
	2 - 3	6/2/2017	--	--	--	--	--	--	338
	4 -5	6/2/2017	--	--	--	--	--	--	784
	5 - 6	6/2/2017	--	--	--	--	--	--	625
	6 - 7	6/2/2017	--	--	--	--	--	--	12.5
	8 - 9	6/2/2017	--	--	--	--	--	--	<1.19
	9 - 10	6/2/2017	--	--	--	--	--	--	<1.06
	10 - 11	6/2/2017	--	--	--	--	--	--	<1.15
S-3	0 - 1	6/2/2017	<0.00118	<0.00824	<29.4	<29.4	<29.4	<29.4	332
	1 - 2	6/2/2017	--	--	--	--	--	--	843
	2 - 3	6/2/2017	--	--	--	--	--	--	873
	4 -5	6/2/2017	--	--	--	--	--	--	49.2
	5 - 6	6/2/2017	--	--	--	--	--	--	82.0
S-4	0 - 1	6/2/2017	<0.00104	<0.00724	<26.0	<26.0	<26.0	<26.0	811

Table 1
1RP-4715
Delineation Soil Sample Analytical Data Summary
Chevron North America E2, Salado Draw Produced Water Spill
UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East
Lea County, New Mexico
N32° 01' 21.19" W103° 38' 13.22"

Sample	Depth (Feet)	Collection Date	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:			**10**	**50**				**5,000**	***600**
	1 - 2	6/2/2017	--	--	--	--	--	--	608
	2 - 3	6/2/2017	--	--	--	--	--	--	692
	3 - 4	6/2/2017	--	--	--	--	--	--	691
	4 -5	6/2/2017	--	--	--	--	--	--	1,010
	5 - 6	6/2/2017	--	--	--	--	--	--	788
	10	1/16/2018	--	--	--	--	--	--	770
	15	1/16/2018	--	--	--	--	--	--	463
	20	1/16/2018	--	--	--	--	--	--	139
S-5	0 - 1	6/2/2017	<0.00100	<0.00700	<25.0	<25.0	<25.0	<25.0	<1.00
	1 - 2	6/2/2017	--	--	--	--	--	--	<1.01
	2 - 3	6/2/2017	--	--	--	--	--	--	<1.02
S-6	0 - 1	6/2/2017	--	--	--	--	--	--	<1.00
	1 - 2	6/2/2017	--	--	--	--	--	--	<1.14
	2 - 3	6/2/2017	--	--	--	--	--	--	<1.03
	4 -5	6/2/2017	--	--	--	--	--	--	<0.01
	5 - 6	6/2/2017	--	--	--	--	--	--	<1.04
S-7	0 - 1	6/2/2017	<0.00108	0.01	<26.9	<26.9	<26.9	<26.9	1,130
	1 - 2	6/2/2017	--	--	--	--	--	--	417
	2 - 3	6/2/2017	--	--	--	--	--	--	1,090
	4 -5	6/2/2017	--	--	--	--	--	--	121
	5 - 6	6/2/2017	--	--	--	--	--	--	30.6

Table 1
1RP-4715
Delineation Soil Sample Analytical Data Summary
Chevron North America E3, Salado Draw Produced Water Spill
UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East
Lea County, New Mexico
N32° 01' 21.19" W103° 38' 13.22"

Sample	Depth (Feet)	Collection Date	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:			**10**	**50**				**5,000**	***600**

Notes: Analysis performed by Xenco Laboratories, Lubbock, Texas and Permian Basin Lab, Midland, Texas, by EPA SW-846 Methods 8021B (BTEX), 8015M (TPH) and 300 (chloride).

*: OCD delineation limit

Depth in feet below ground surface (bgs)

mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

Table 2
1RP-4715
Remediation Soil Sample Analytical Data Summary
Chevron North America E1, Salado Draw Produced Water Spill
UL M (SW/4, SW/4), Section 24, Township 26 South, Range 32 East
Lea County, New Mexico
N32° 01' 21.19" W103° 38' 13.22"

Sample	Depth (Feet)	Collection Date	Benzene (mg/Kg)	BTEX (mg/Kg)	C6 - C12 (mg/Kg)	C12 - C28 (mg/Kg)	C28 - C35 (mg/Kg)	TPH (mg/Kg)	Chloride (mg/Kg)
RRAL:			**10**	**50**				**5,000**	***600**
S-7 Bottom D.	1.5	1/24/2018	--	--	--	--	--	--	1.15
S-7 Bottom E.	1.5	1/24/2018	--	--	--	--	--	--	<1.14
S-7 Bottom W.	1.5	1/24/2018	--	--	--	--	--	--	25.1
S-7 N. Side	1.0	1/24/2018	--	--	--	--	--	--	9.00
S-7 S. Side	1.0	1/24/2018	--	--	--	--	--	--	<1.08
S-7 E. Side	1.0	1/24/2018	--	--	--	--	--	--	19.2
S-7 W. Side	1.0	1/24/2018	--	--	--	--	--	--	6.84
Comp 1	Composite	1/23/2018	--	--	--	--	--	--	8.23
Comp 2	Composite	1/23/2018	--	--	--	--	--	--	34.2
Comp 3	Composite	1/23/2018	--	--	--	--	--	--	26.1
Comp 4	Composite	1/23/2018	--	--	--	--	--	--	75.3
Comp 5	Composite	1/23/2018	--	--	--	--	--	--	267
Comp 6	Composite	1/23/2018	--	--	--	--	--	--	360
Comp 7	Composite	1/24/2018	--	--	--	--	--	--	269
Comp 8	Composite	1/24/2018	--	--	--	--	--	--	260
Comp 9	Composite	1/24/2018	--	--	--	--	--	--	7.56

Notes: Analysis performed by Xenco Laboratories, Lubbock, Texas and Permian Basin Lab, Midland, Texas, by EPA SW-846 Methods 8021B (BTEX), 8015M (TPH) and 300 (chloride).
*: OCD delineation limit
Depth in feet below ground surface (bgs)
mg/Kg: milligrams per kilogram equivalent to parts per million (ppm)

Figures

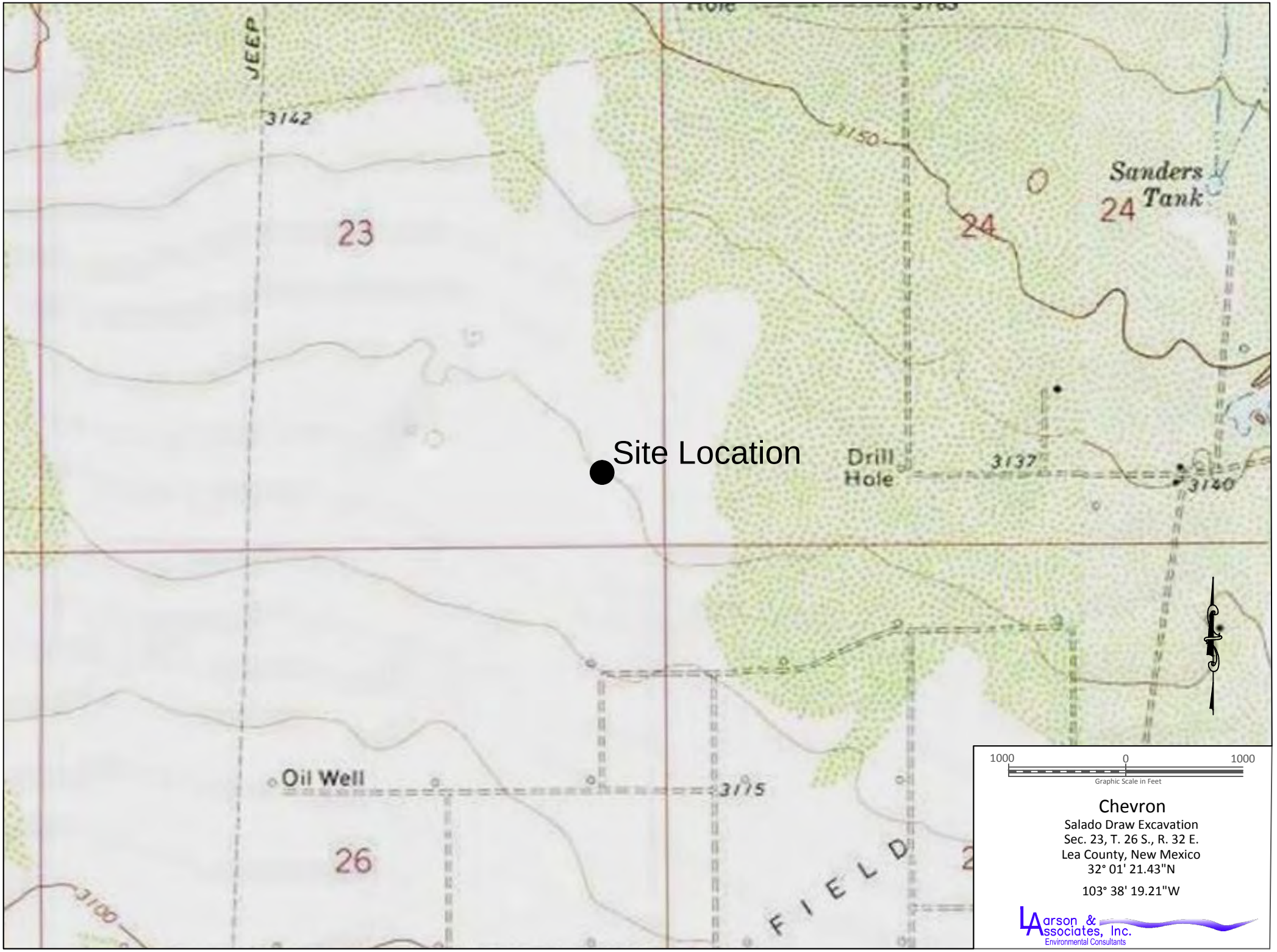


Figure 1 - Topographic Map

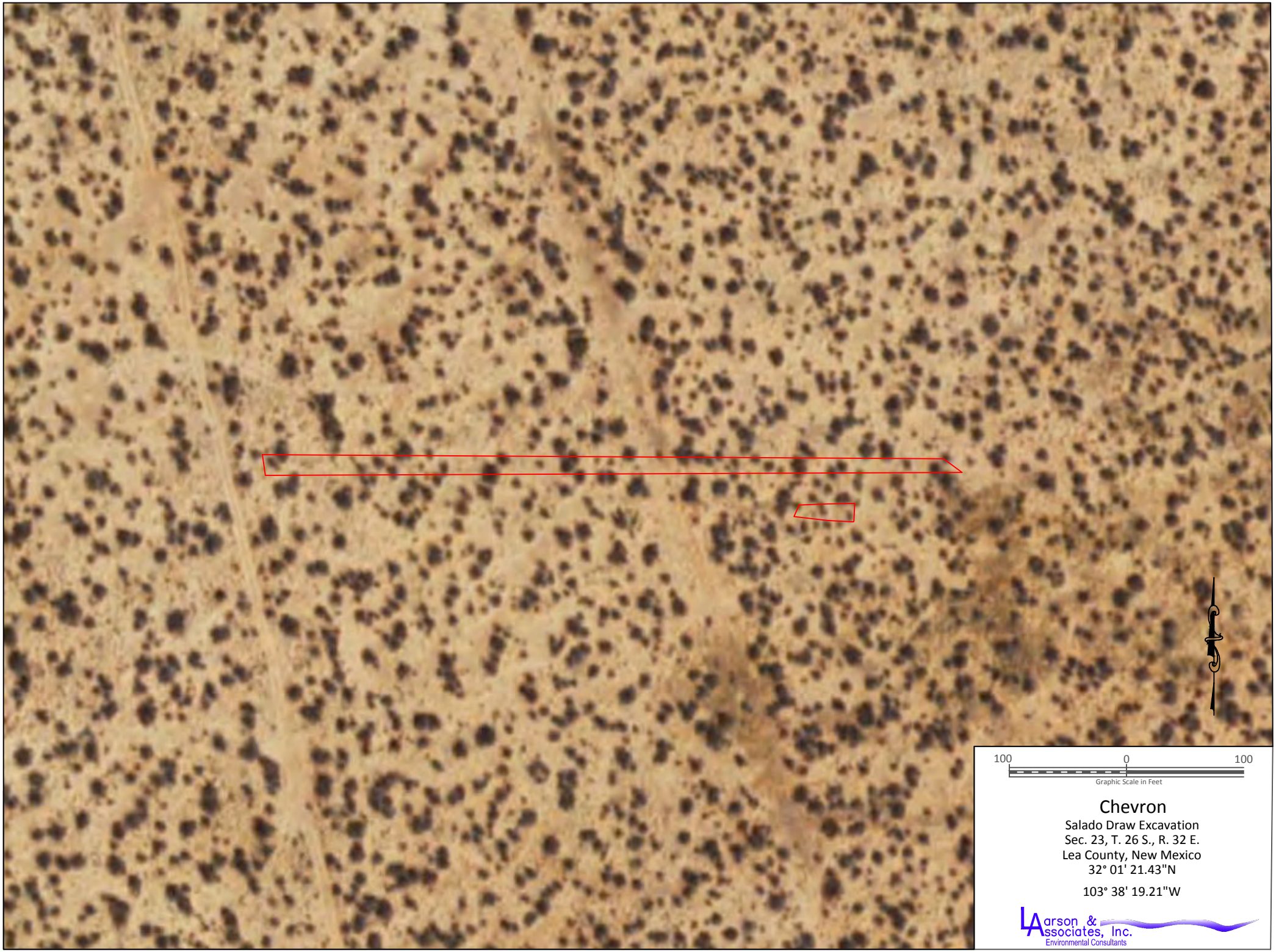
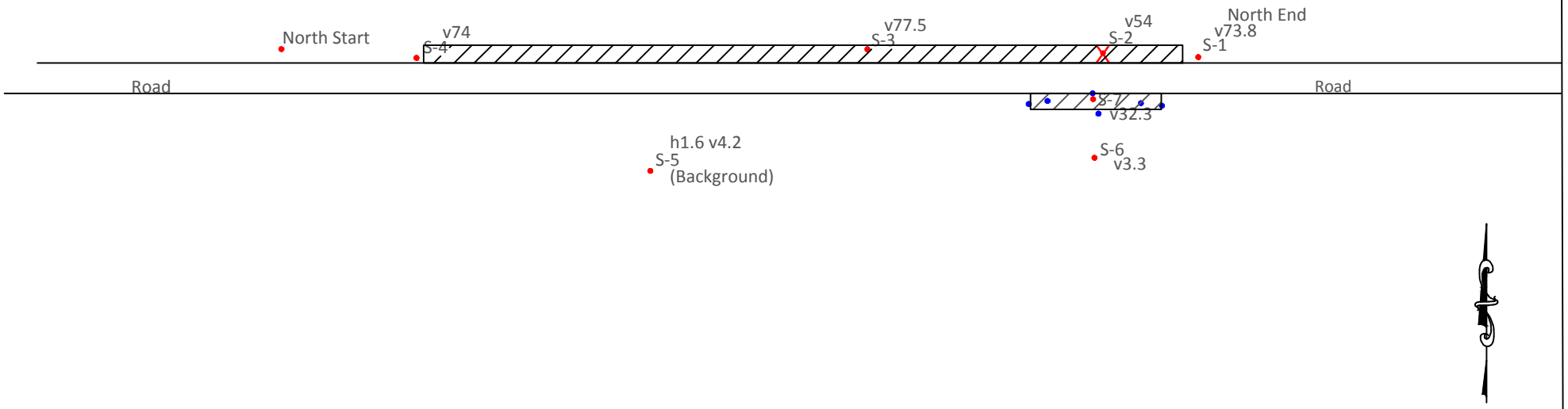


Figure 2 - Aerial Map with Excavation Area



Legend

- Direct Push Sample Location and EM-38 Measurement Station, Vertical Dipole (4.9 feet), mmhos/m
- Soil Excavation
- Confirmation Sample Location (approximate), January 24, 2018

100 0 100

Graphic Scale in Feet

Chevron

Salado Draw Spill
Lea County, New Mexico
Unit P (SE 1/4 SE 1/4), Sec. 23, T.26S, R.32E
32° 1' 21.19"N
103° 38' 13.22"W

Larson & Associates, Inc.
Environmental Consultants

Figure 3 - Site Map Showing Excavations and Confirmation Sample Locations

Appendix A
Regulatory Communications

From: Yu, Olivia, EMNRD [Olivia.Yu@state.nm.us]
Sent: Monday, January 08, 2018 10:22 AM
To: Grubbs, Richard T
Cc: Mark Larson; Tucker, Shelly
Subject: RE: Chevron 1RP-4715 and 1RP-4818

Mr. Grubbs:

NMOCD approves of the proposed additional delineation for 1RP-4818 and look forward to reviewing the formal submission of the delineation report.

NMOCD approves of the proposed additional delineation for 1RP-4715 with these stipulations:

1. Blended soil must be tested every 50 cubic yards for chlorides using EPA Method 300.
2. Based on the data provided from the delineation report dated from July 18, 2017, permissible level of chloride is not obtained until 4-5 ft. bgs for the area represented by S-7. Laboratory analyses of discrete confirmation bottom and sidewall samples are required for at least 2 sample locations.
3. Imported soil must demonstrate chloride levels <= 600 mg/kg and with similar soil characteristics.

Please confirm or inform for clarification.

Thanks,
Olivia

From: Grubbs, Richard T [mailto:rtgrubbs@chevron.com]
Sent: Wednesday, January 3, 2018 9:28 AM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>; Tucker, Shelly <stucker@blm.gov>
Subject: Chevron 1RP-4715 and 1RP-4818

Dear Ms. Yu,

Regarding your responses below in your November 29, 2017 email.

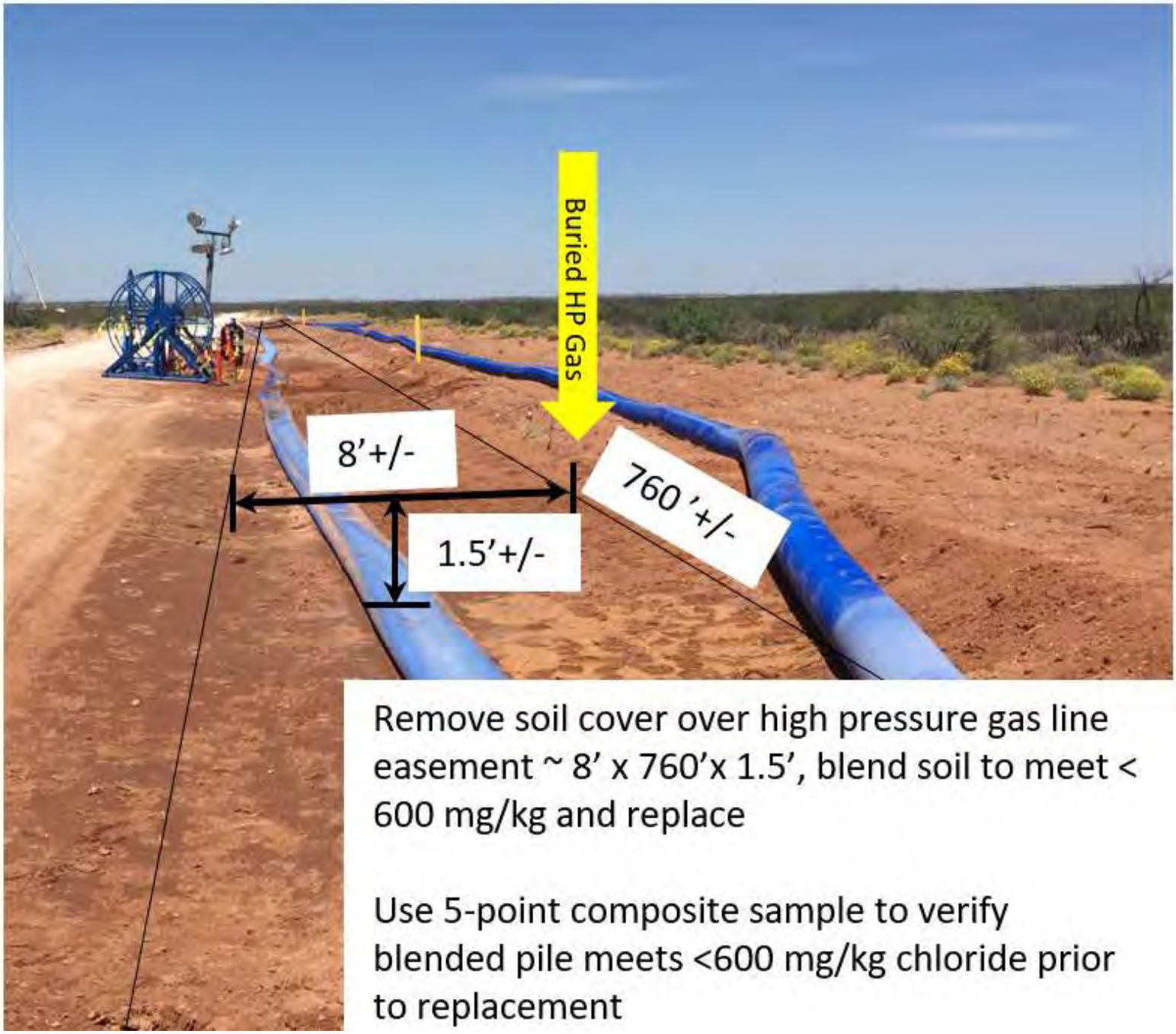
Chevron will complete delineation of 1RP-4818 and submit a delineation report with remediation plan. We will attempt to compete the delineation drilling in early January.

Regarding your response for RP-4715, Chevron proposes the following alternative as remediation. If NMOCD is in alignment with this remediation approach, Chevron will revise the RP-4715 delineation report for formal approval.
Chevron will complete the delineation of S-1 and S4 to 5-foot below 600 mg/kg. Due to the complications of working in the easement of the high pressured gas line, Chevron would prefer to compete this delineation concurrent to the proposed remediation work below.

- The majority of the spill impacted a high pressure buried gas line easement between the north edge of road and 8 to 10-foot north of the edge of road that was previously disturbed with no vegetation.
- Due to the concern with excavation along and over this high pressure gas line, Chevron requests the option to remove the top layer of soil already disturbed in this easement, to the depth of 1 to 1.5-foot of soil, blend the soil, and replace it along the length and width of the impacted area (approximately 760-foot from east end near S-1 to the west end near S-4, and approximately 8-foot wide). Prior to replacement, a 5-point composite sample of blended

soil would be completed to verify that blended soil is <600 mg/kg. Imported top soil would be used, as required, to achieve <600 mg/kg chloride. (see the diagram below)

- Shelley Tucker (cced) with the BLM has been contacted and is in alignment with this approach for this particular location along the road and over the high pressure gas line easement.
- On the south side of the Soil > 600mg/kg in the location of S-7 will be removed and replaced with imported fill.



Please let me know if you are in agreement with this approach so the work may be scheduled in the upcoming weeks.

Regards,

Richard T. Grubbs, P.E.

Water and Waste Advisor

Chevron NA Exploration & Production Company
MCBU
760 Horizon Drive Suite 401
Grand Junction, CO 81506
Office: 970-257-6021
Cell: 913-748-9815
rtgrubbs@chevron.com

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Thursday, December 07, 2017 4:20 PM
To: Grubbs, Richard T <rtgrubbs@chevron.com>
Cc: Mark Larson <Mark@laenvironmental.com>; Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Subject: [**EXTERNAL**] RE: Chevron 1RP-4715 and 1RP-4818

Mr. Grubbs:

Your patience in regards to the subsequent course of action for 1RP-4715 and 1RP-4818 is appreciated. NMOCD determines that additional vertical delineation is necessary for 1RP-4715 (S-1 and S-4) and 1RP-4818 (S-2). Nonetheless, NMOCD is willing to compromise on delineation.

For 1RP-4715, NMOCD may consider no additional delineation at S-1 and S-4 if the areas represented S-2, S-3, S-4, and S-7 have soil depths that exceed 600 mg/kg removed. NMOCD may consider soil blending as an option.

For 1RP-4818, further vertical delineation at S-2 will be required. Also, remediation will be necessary unless the structural integrity of the two ponds comprising 1RC-11 will be negatively impacted. Based on the data presented, 2-3 feet of soil must be removed with the area represented by S-11 lined with a properly keyed 20 mil liner.

Please inform of decision.

Thanks,
Olivia

From: Grubbs, Richard T [mailto:rtgrubbs@chevron.com]
Sent: Wednesday, November 29, 2017 9:57 AM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>
Subject: RE: Chevron 1RP-4715 and 1RP-4818

Olivia,

Thank you for your consideration in this matter. To add to the discussion regarding additional drilling for 1RP-4715, we

have received information from our locater that due to the proximity of the high pressure gas line in the easement where drilling would be required, significant shut-in activity and loss of production will be required to accommodate this activity.

Regards
Rich

From: Yu, Olivia, EMNRD [mailto:Olivia.Yu@state.nm.us]
Sent: Wednesday, November 29, 2017 7:20 AM
To: Grubbs, Richard T <rtgrubbs@chevron.com>
Cc: Mark Larson <Mark@laenvironmental.com>
Subject: [**EXTERNAL**] RE: Chevron 1RP-4715 and 1RP-4818

Good morning Mr. Grubbs:

Thank you for the below synopsis. I spoke with NMOCD-Santa Fe after our call and we will get back to you shortly on the optimal path forward.

Olivia

From: Grubbs, Richard T [mailto:rtgrubbs@chevron.com]
Sent: Tuesday, November 28, 2017 5:57 PM
To: Yu, Olivia, EMNRD <Olivia.Yu@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>
Subject: Chevron 1RP-4715 and 1RP-4818

Olivia,

Thank you for taking my call this afternoon to discuss further delineation request specifically for 1RP-4715, and further discuss 1RP-4818 that you have only seen the delineation plan for.

Regarding 1RP-4715, When Larson Environmental delineated the spill they encountered two locations where their hydraulic hammer sampler was rejected at elevations of about 6'+/- in Samples S2 and S4 due to caliche boundary. At the rejection point, chlorides in S2 were 657 mg/kg and 788 mg/kg, respectively.

On October 05, 2017, as follow up on the Chevron's submittal of the 1RP-4715 delineation report, you requested that we complete Samples S2 and S4 to the depth of 5' below 600 mg/kg. In order to do this, large drill equipment is required. Prior to mobilizing that equipment, I wanted to verify that this level of delineation is needed in order to make reasonable judgement on the reclamation requirements for this site as well as the 1RP-4818 spill location.

Please find attached laboratory analytical data tables and sample location drawings for the two (2) Chevron Salado Draw sites. At your request I have also included a photo of the 1RP-4715 location. The following are brief summary of the investigations and physical setting for both sites.

Summary 1RP-4715

Approximately 620 (bbl of treated produced water and brackish water was spilled with about 260 bbl recovered with a vacuum truck;

- The spill occurred on the north side of a caliche lease road and flowed east to west adjacent the north side of the road for a distance of about 760 feet;
- The spill crossed over the lease road to the south flowed east to west for a distance of about 190 feet;
- The spill on the north side of the lease road was contained the lease road and berm of a high pressure gas pipeline for a lateral distance between about 2 and 15 feet;
- The spill area on the south side of the lease road was about 7 feet in width. No surface water or vegetation was affected from the spill;
- LAI used an EM-38 conductivity meter to assess the spill to a depth of about 4.9 feet bgs;
- The background conductivity (S-5) was 4.2 mmhos/m and the maximum EM-38 VD readings on the north side of the lease road ranged from 54 mmhos/m near the spill origin (S-2) to 77.5 mmhos/m west of the spill at S-3 or between about 12 and 18 times background;
- The maximum EM-38 VD reading from the spill area on the south side of the lease road was 32.3 mmhos/m at S-7 located directly south of the spill origin;
- Soil samples were collected with direct-push technology (DPT) at six (6) locations (S-1 through S-6);
- Chloride was delineated below 600 mg/Kg at location S-2 where the release occurred;
- Chloride was 657 mg/Kg at S-1, 5'-6' and 788 mg/Kg at S-4, 5'-6;
- The surface elevation is about 3,130feet above mean sea level (MSL);
- The topography slopes gently to the south and southeast;
- No surface water features are present within 1 mile of the Site;
- The surface soil is designated "Pyote and Maljamar fine sands" consisting of about 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches;
- The soil is sandy eolian deposits derived from sedimentary rock; and
- Groundwater occurs at about 150 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE) and U.S. Geological Survey

This delineation work and analytical results indicate that additional drilling through the caliche that caused the previous rejection of the hydraulic hammer sampler, would most likely reveal that soil below this boundary zone and at the additional depths requested is not impacted, and would be similar to other samples at the same depth for this location.

After receiving your correspondence of October 5, 2017, and concurrent to delineation effort of the subsequent spill at the recycle facility recycle containment ponds 1RP-4818, we encountered 1 sample (S2) of 11 samples, where the hydraulic hammer sampler was rejected due to caliche. While the results from this delineation have not been officially submitted in the delineation report, the data attached is for your review in discussing the need for additional drilling below the caliche zone.

Summary 1RP-4818

- The spill was caused by a leak in a hose on the recirculation system;
- This leak released approximately 1,105 bbl of treated produced water with approximately 500 bbl recovered with a vacuum truck;
- The spill occurred between two (2) ponds (North and South) containing treated water;
- The spill flowed north to a low area between the ponds and to the east and west for a distance of about 600 feet;
- Soil samples were collected with direct-push technology (DPT) at twelve (11) locations (S-1 through S-12, S-5 was omitted due to sampling error);
- Chloride was delineated below 600 mg/Kg at all locations but S-2 located in the low area north of the release point;
- Chloride is S-2 was 1,240 mg/Kg at 6 to 7 feet bgs;

Surface elevation is approximately 3,150 feet above mean sea level (MSL);

- The topography slopes towards the south and southwest;
- The nearest surface water features is a seasonal playa located approximately 3,900 feet southeast of the Site.
- The surface soils are designated as “Pyote and Maljamar fine sands” which consist of approximately 30 inches of fine sand underlain by fine sandy loam to approximately 60 inches below ground surface(bgs);
- The soil is sandy eolian deposits derived from sedimentary rocks and underlain by cemented material (caliche);
- Groundwater occurs at roughly 150 feet below ground surface (bgs) according to records from the New Mexico Office of the State Engineer (NMOSE) and the U.S. Geological Survey.

Again, based on the results of the other samples in the area, additional drilling through the caliche that caused the rejection of the hydraulic hammer sampler at S2, would most likely reveal that soil below this boundary zone and at the additional depths requested is not impacted, and would be similar to other samples at the same depth for this location.

Chevron feels these spills are adequately delineated and respectfully requests the NMOCD to accept the previously submitted 1RP-4515 without additional drilling and respectfully requests approval to submit the final delineation report for 1RP-4818 without additional drilling at location S2. Please contact me if you have any additional questions or concerns.

Best Regards,

Richard T. Grubbs, P.E.
Water and Waste Advisor

Chevron NA Exploration & Production Company
MCBU
760 Horizon Drive Suite 401
Grand Junction, CO 81506
Office: 970-257-6021
Cell: 913-748-9815
rtgrubbs@chevron.com

Appendix B

Laboratory Reports

PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701

PBELAB

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Chevron Soledo Draw

Project Number: 17-0154-01

Location:

Lab Order Number: 8A24003

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704516-17-8

Report Date: 01/25/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Soledo Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Comp 1	8A24003-01	Soil	01/23/18 12:10	01-24-2018 08:25
Comp 2	8A24003-02	Soil	01/23/18 12:35	01-24-2018 08:25
Comp 3	8A24003-03	Soil	01/23/18 12:55	01-24-2018 08:25
Comp 4	8A24003-04	Soil	01/23/18 13:15	01-24-2018 08:25
Comp 5	8A24003-05	Soil	01/23/18 13:40	01-24-2018 08:25
Comp 6	8A24003-06	Soil	01/23/18 14:15	01-24-2018 08:25

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Soledo Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Comp 1

8A24003-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**8.23**	1.05	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**5.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Soledo Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 2

8A24003-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**34.2**	1.08	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Soledo Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 3

8A24003-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**26.1**	1.08	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Soledo Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 4

8A24003-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**75.3**	1.04	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Soledo Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 5

8A24003-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**267**	1.03	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**3.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Soledo Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 6

8A24003-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**360**	1.04	mg/kg dry	1	P8A2402	01/24/18	01/24/18	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P8A2501	01/25/18	01/25/18	ASTM D2216	

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P8A2402 - * DEFAULT PREP *** **										
Blank (P8A2402-BLK1)				Prepared & Analyzed: 01/24/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8A2402-BS1)				Prepared & Analyzed: 01/24/18						
Chloride	418	1.00	mg/kg wet	400		105	80-120			
LCS Dup (P8A2402-BSD1)				Prepared & Analyzed: 01/24/18						
Chloride	420	1.00	mg/kg wet	400		105	80-120	0.463	20	
Duplicate (P8A2402-DUP1)		**Source: 8A24003-01**		Prepared & Analyzed: 01/24/18						
Chloride	11.2	1.05	mg/kg dry		8.23			30.2	20	R2
Matrix Spike (P8A2402-MS1)		**Source: 8A24003-01**		Prepared & Analyzed: 01/24/18						
Chloride	1130	1.05	mg/kg dry	1050	8.23	106	80-120			
Batch P8A2501 - * DEFAULT PREP *** **										
Blank (P8A2501-BLK1)				Prepared & Analyzed: 01/25/18						
% Moisture	ND	0.1	%							
Duplicate (P8A2501-DUP1)		**Source: 8A24003-06**		Prepared & Analyzed: 01/25/18						
% Moisture	3.0	0.1	%		4.0			28.6	20	R2

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Soledo Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

R2	The RPD exceeded the acceptance limit.
BULK	Samples received in Bulk soil containers
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By:  Date: 1/25/2018

Brent Barron, Laboratory Director/Technical Director

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: Mark Larson

DATE: 01-23-2018 PAGE 1 OF

PO #: LAB WORK ORDER #: 18A24003

PROJECT LOCATION OR NAME: Chevron / Salado Draw

LAI PROJECT #: 17-0154-01 COLLECTOR: ML

TRRP report? ☐ Yes ☑ No

TIME ZONE: Time zone/State: Mtn/NM

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR OT=OTHER

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
Comp 1	1	01/23/18	12:10	S	1					✓		
Comp 2	2		12:35	S	1					✓		
Comp 3	3		12:55	S	1					✓		
Comp 4	4		13:15	S	1					✓		
Comp 5	5		13:40	S	1					✓		
Comp 6	6		14:15	S	1					✓		
TOTAL												

ANALYSES: BTEX ☐ MTBE ☐ | TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☐ | DIESEL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLOPAH ☐ | 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TCLP - METALS (RCRA) ☐ TCLP VOC ☐ | TCLP - PEST ☐ HERB ☐ SemiVOC ☐ | TOTAL METALS (RCRA) ☐ OTHER LIST ☐ | LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐ | RCI ☐ TOX ☐ FLASHPOINT ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | pH ☐ HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ PECHLORATE ☐ | CHLORIDE ☐ ANIONS ☐ ALKALINITY ☐ | 300

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature) DATE/TIME RECEIVED BY: (Signature) 1-24-18 825

PDEL

TURN AROUND TIME
NORMAL ☐
1 DAY ☑
2 DAY ☐
OTHER ☐ Rush

LABORATORY USE ONLY:
RECEIVING TEMP: 5.0 +.4 THERM #:
CUSTODY SEALS - ☐ BROKEN ☑ INTACT ☐ NOT USED
☐ CARRIER BILL #
☑ HAND DELIVERED

PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701

PBELAB

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Chevron Salado Draw

Project Number: 17-0154-01

Location: NM

Lab Order Number: 8A25001

NELAP ACCREDITED TNI LABORATORY

NELAP/TCEQ # T104704516-17-8

Report Date: 01/25/18

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Salado Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Comp 7	8A25001-01	Soil	01/24/18 11:40	01-25-2018 09:20
Comp 8	8A25001-02	Soil	01/24/18 11:50	01-25-2018 09:20
Comp 9	8A25001-03	Soil	01/24/18 11:58	01-25-2018 09:20
S-7 Bottom C.	8A25001-04	Soil	01/24/18 12:34	01-25-2018 09:20
S-7 Bottom E.	8A25001-05	Soil	01/24/18 12:34	01-25-2018 09:20
S-7 Bottom W.	8A25001-06	Soil	01/24/18 12:35	01-25-2018 09:20
S-7 N. Side	8A25001-07	Soil	01/24/18 12:35	01-25-2018 09:20
S-7 S. Side	8A25001-08	Soil	01/24/18 12:36	01-25-2018 09:20
S-7 E. Side	8A25001-09	Soil	01/24/18 12:36	01-25-2018 09:20
S-7 W. Side	8A25001-10	Soil	01/24/18 12:37	01-25-2018 09:20

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Salado Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Comp 7

8A25001-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**296**	1.11	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 8

8A25001-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**260**	1.10	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**9.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

Comp 9

8A25001-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**7.56**	1.11	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 Bottom C.

8A25001-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**1.15**	1.12	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**11.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 Bottom E.

8A25001-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	ND	1.14	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**12.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 Bottom W.

8A25001-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**25.1**	1.15	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**13.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 N. Side

8A25001-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**9.00**	1.10	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**9.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 S. Side

8A25001-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	ND	1.08	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**7.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 E. Side

8A25001-09 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**19.2**	1.10	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**9.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

Larson & Associates, Inc.	Project: Chevron Salado Draw	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 17-0154-01	
Midland TX, 79710	Project Manager: Mark Larson	

S-7 W. Side

8A25001-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Permian Basin Environmental Lab, L.P.									
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**6.84**	1.11	mg/kg dry	1	P8A2504	01/25/18	01/25/18	EPA 300.0	
% Moisture	**10.0**	0.1	%	1	P8A2505	01/25/18	01/25/18	ASTM D2216	

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P8A2504 - * DEFAULT PREP *** **										
Blank (P8A2504-BLK1)				Prepared & Analyzed: 01/25/18						
Chloride	ND	1.00	mg/kg wet							
LCS (P8A2504-BS1)				Prepared & Analyzed: 01/25/18						
Chloride	386	1.00	mg/kg wet	400		96.6	80-120			
LCS Dup (P8A2504-BSD1)				Prepared & Analyzed: 01/25/18						
Chloride	388	1.00	mg/kg wet	400		97.0	80-120	0.400	20	
Duplicate (P8A2504-DUP1)		**Source: 8A25001-01**		Prepared & Analyzed: 01/25/18						
Chloride	330	1.11	mg/kg dry		296			10.7	20	
Duplicate (P8A2504-DUP2)		**Source: 8A18003-27**		Prepared & Analyzed: 01/25/18						
Chloride	ND	1.16	mg/kg dry		ND				20	
Matrix Spike (P8A2504-MS1)		**Source: 8A25001-01**		Prepared & Analyzed: 01/25/18						
Chloride	1440	1.11	mg/kg dry	1110	296	103	80-120			
Batch P8A2505 - * DEFAULT PREP *** **										
Blank (P8A2505-BLK1)				Prepared & Analyzed: 01/25/18						
% Moisture	ND	0.1	%							
Duplicate (P8A2505-DUP1)		**Source: 8A25001-10**		Prepared & Analyzed: 01/25/18						
% Moisture	11.0	0.1	%		10.0			9.52	20	
Duplicate (P8A2505-DUP2)		**Source: 8A25002-07**		Prepared & Analyzed: 01/25/18						
% Moisture	5.0	0.1	%		6.0			18.2	20	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chevron Salado Draw
Project Number: 17-0154-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

BULK	Samples received in Bulk soil containers
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By:  Date: 1/25/2018

Brent Barron, Laboratory Director/Technical Director

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to: Mark Larson

DATE: 1-24-2018 PAGE 1 OF

PO #: LAB WORK ORDER #: 18A2500

PROJECT LOCATION OR NAME: Chevron/Salado Flow

LAI PROJECT #: 17-0154-01 COLLECTOR: ML

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: Mtn/NM

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR OT=OTHER

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES	FIELD NOTES
Comp 7		1/24/18	11:40	S	1					✓		
Comp 8			11:56	S	1					✓		
Comp 9			11:58	S	1					✓		
S-7 Bottom C.			12:34	S	1					✓		
S-7 Bottom E.			12:34	S	1					✓		
S-7 Bottom W			12:35	S	1					✓		
S-7 N. Side			12:35	S	1					✓		
S-7 S. Side			12:36	S	1					✓		
S-7 E. Side			12:36	S	1					✓		
S-7 W Side			12:37	S	1					✓		
TOTAL												

ANALYSES: BTEX ☐ MTBE ☐ | TRPH 418.1 ☐ | TPH 1005 ☐ TPH 1006 ☐ | GASOLINE MOD 8015 ☐ | DIESEL - MOD 8015 ☐ | VOC 8260 ☐ | SVOC 8270 ☐ PAH 8270 ☐ HOLDPAH ☐ | 8081 PESTICIDES ☐ 8151 HERBICIDES ☐ | 8082 PCBS ☐ | TCLP - METALS (RCRA) ☐ TCLP VOC ☐ | TCLP - PEST ☐ HERB ☐ Semi-VOC ☐ | TOTAL METALS (RCRA) ☐ OTHER LIST ☐ | LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐ | RCI ☐ TOX ☐ FLASHPOINT ☐ | TDS ☐ TSS ☐ % MOISTURE ☐ CYANIDE ☐ | pH ☐ HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ PECHLORATE ☐ | CHLORIDE Cl 300 ANIONS ☐ ALKALINITY ☐

RELINQUISHED BY:(Signature) DATE/TIME 1/25/2018 09:26 RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) DATE/TIME 1/25/18 920 RECEIVED BY: (Signature)

PbEL

TURN AROUND TIME
NORMAL ☐
1 DAY ☐
2 DAY ☐
OTHER ☒ Rush

LABORATORY USE ONLY:
RECEIVING TEMP: 2.2 +4 THERM #:
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☒ HAND DELIVERED

Appendix C

Photographs

Direct Push Soil Sampling at Location S-2 (Spill Origin) Viewing West

Direct Push Soil Sampling at Location S-2 (Spill Origin) Viewing South

Damaged Frac Flat Hose and Spill Area Viewing West (Soil Sample Point S-4 in Background)

Soil Sample Location S-7 Viewing South

North Area (S-1 to S-4) Viewing West, January 24, 2018

North Area (S-1 to S-4) Viewing West, January 24, 2018

North Area (S-1 to S-4) Viewing East, January 24, 2018

South Area (S-7) Viewing West, January 24, 2018

South Area (S-7) Viewing East, January 24, 2018

Blending Area West of SD WE 24 Federal P23 1H Viewing West, January 24, 2018

Blending Soil West of SD WE 24 Federal P23 1H Viewing West, January 24, 2018

Blending Soil West of SD WE 24 Federal P23 1H Viewing North, January 24, 2018

North Area (S-1 to S-4) Backfilled and Seeded Viewing West, January 29, 2018

South Area (S-7) Backfilled and Seeded Viewing East, January 29, 2018

Appendix D

Initial and Final C-141

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

Name of Company Chevron USA Inc.	Contact Josepha DeLeon
Address 6301 Deauville Blvd., Midland, TX. 79706	Telephone No. 575-263-0424 Cell – 432-425-1528
Facility Name Salado Draw Area	Facility Type: Lease Road

Surface Owner	Mineral Owner	API No's.
Federal	Private	Not Applicable; spill occurred on lease road

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
I	29	26S	35E					Lea

Latitude 32.012119 **Longitude** -103.381322 INCORRECT GPS COORDINATES

NATURE OF RELEASE

Type of Release: Spill	Volume of Release: 620 barrels produced/brackish water	Volume Recovered: 260 barrels produced/brackish water
Source of Release: 12" frac flat hose	Date and Hour of Occurrence: 05/26/2017; 06:00 PM	Date and Hour of Discovery 05/26/2017; 06:00 PM
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Olivia Yu; Maxey Brown – NMOCD Jim Amos - BLM	
By Whom? Amy Barnhill	Date and Hour: 05/27/2017; 03:20 PM	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

RECEIVED
By Olivia Yu at 9:15 am, Jun 08, 2017

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

Describe Cause of Problem and Remedial Action Taken.*
A tractor trailer ran over above-ground 12" frac flat hose, releasing 620 barrels produced/brackish water on land. Recovered 260 barrels.

Describe Area Affected and Cleanup Action Taken.*
The spill to land was on disturbed ditch and did not impact vegetation nor flow to any sensitive habitat, or water way. Vacuum truck recovered 260 barrels. Remediation plan will be submitted.

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: JdeLeon

Printed Name: Josepha DeLeon

Title: HES Compliance Support - Environmental

E-mail Address: jdxd@chevron.com

Date: 06/7/2017 Phone: 575-263-0424

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: MJ

Approval Date: 6/8/2017 Expiration Date:

Conditions of Approval: see attached directive

Attached ☑

* Attach Additional Sheets If Necessary

1RP-4715 fOY1716526248 nOY1716526342

pOY1716526704

Operator/Responsible Party,

The OCD has received the form C-141 you provided on _6/7/2017_ regarding an unauthorized release. The information contained on that form has been entered into our incident database and remediation case number _1RP-4715__ 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 _7/8/2017_. 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