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APPROVED
By Olivia Yu at 12:13 pm, Sep 20, 2018

July 25, 2018

NMOCD approves of the proposed additional site assessment activities for 1RP-4017.

Olivia Yu
Environmental Specialist
New Mexico Oil Conservation Division, District 1
1625 N. French Drive
Hobbs, NM 88240

Re: Chevron Lovington Paddock Unit No. 89 Well-Site
2017 Soil Assessment and Delineation Report
Case No. 1RP-4017
Lea County, New Mexico

Dear Ms. Yu,

Please find enclosed for your files copies of the following report:

- Lovington Paddock Unit No. 89 Well-Site – 2017 Soil Assessment Report, Unit E, Section 31, Township 16 South, Range 37 East; Lea County New Mexico.

The report was prepared by GHD Services (GHD) on behalf of Chevron Environmental Management Company (CEMC) to document on-going assessment activities throughout 2017 at the Site.

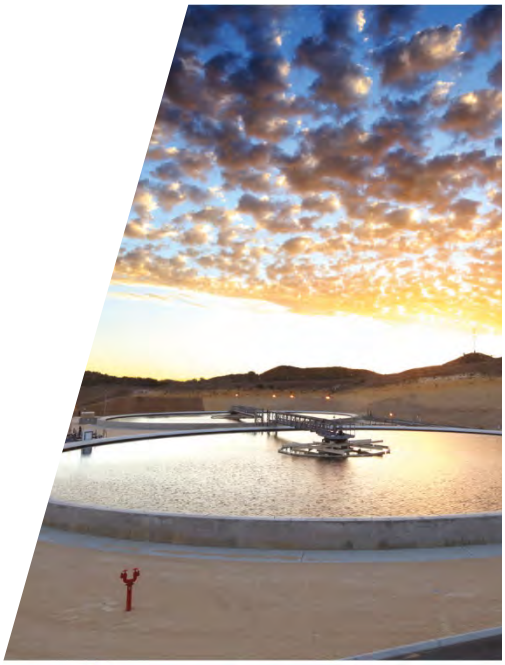
Please do not hesitate to call Scott Foord with GHD at 713-734-3090 or myself at 713-372-0289, should you have any questions.

Sincerely,

Jason Michelson

Encl. Lovington Paddock Unit No. 89 Well-Site – 2017 Soil Assessment and Delineation Activities Report

C.C. Amy Barnhill, Chevron/MCBU



Soil Assessment and Delineation Activities Report

Lovington Paddock Unit No. 89 Well-Site
1RP - 4017
Unit E, Section 31, Township 16 South, Range 37 East
Lovington, New Mexico

Chevron Environmental Management Company

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1. Introduction

GHD is pleased to present this soil assessment and delineation activities report to Chevron Environmental Management Company (CEMC) for the Lovington Paddock Unit No. 89 Well-Site location (hereafter referred to as the "Site"). The Site is located in Unit E, Section 31, Township 16 South, Range 37 East, approximately 5.00-miles southeast of the City of Lovington (COL), in eastern Lea County, New Mexico (Figure 1 and Figure 2). GHD understands the surface property is owned by the COL and the minerals are managed by the New Mexico State Land Office (NMSLO). The LPU No. 89 well was plugged and abandoned in July 2010. A dry hole marker is present at the location and surface equipment has been removed from the Site.

2. Project Information and Background

The initial scope of work for the Site included reclamation activities that were developed in personal correspondences between Chevron Midland, Chevron Lovington, COL, and the Bureau of Land Management. GHD did not participate in any landowner or regulatory agency discussions regarding specific requirements for the Site reclamation. GHD was responsible for the project management, general oversight of the reclamation activities, soil sample collection, and documentation of all site activities. Site reclamation activities began on June 6, 2011 and were completed on June 10, 2011.

On November 20, 2013, GHD and CEMC met in Midland, Texas to review the status of the Site. CEMC requested that GHD develop and submit a site reclamation activities report detailing the 2011 field activities and any path forward recommendations for the Site.

In February 2014, GHD prepared and submitted a Site Reclamation Completion Report to CEMC detailing the 2011 site reclamation and sampling activities. Additionally, and based on analytical results of the soil sampling completed in June 2011, GHD recommended implementation of a soil boring program to assess elevated chloride concentrations at the Site. CEMC concurred with the recommendations outlined in GHD's 2014 report. On July 11, 2014, CEMC submitted a work plan to the COL attorney's office for the evaluation of subsurface conditions at the Site. GHD returned to the Site following Work Plan approval in 2015 to execute the proposed field activities.

In September 2015, under supervision of GHD, Harrison Cooper, Inc. (HCI) advanced four soil borings (SB-1 through SB-4) utilizing an air-rotary drilling rig. Soil borings SB-1, SB-3 and SB-4 were advanced to depths of 30 feet below ground surface (bgs), and SB-2 was advanced to a depth of 50 feet bgs. Soil samples were collected at five-foot intervals within each of the four soil borings. Soil samples were submitted to Xenco Laboratories in Midland, Texas for analysis of chloride by EPA Method 300.0.

Chloride was reported at concentrations above the Recommended Remediation Action Level (RRAL) soil standard of 250 milligrams per kilogram (mg/kg) in soil borings SB-1 and SB-3. All sample intervals within SB-2 and SB-4 were below the Site RRAL for chloride.

Following approval of a Work Plan submitted to NMOCD in August 2016, GHD and subcontractor Diamondback Services (Diamondback) initiated excavation activities at the Site in September 2016 to remove impacted soils within the well pad to a depth of approximately 4 feet bgs. Soil samples

were collected from the sidewalls of the excavation limits and field screened for chloride. During field screening activities, it was determined that horizontal delineation of the impacted soils had not been achieved. As such, additional site assessment/delineation activities were determined necessary and the excavation activities were suspended.

In 2017, a two phase geophysical investigation was completed and six additional soil borings were subsequently advanced (SB-5 through SB-10) at the Site. Soil samples were collected from each boring for analytical analyses in an attempt to further delineate the horizontal and vertical extents of the chloride impact. The results of the geophysical investigation and soil borings installed in 2017 are provided herein. Figure 3 depicts the soil boring locations installed between 2015 through 2017.

3. Remediation Standards

Information available from various sources including the Petroleum Recovery Research Center (PRRC) Mapping Portal, current GHD managed groundwater site(s) data, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:

a) the depth to groundwater from the deepest impacted soil at the Site is less than 50-feet bgs;

b) the nearest private domestic water source is greater than 200-feet from the release site;

c) the nearest public/municipal water source is greater than 1,000-feet from the release site; and

d) the release site lies more than 1,000 horizontal feet from the nearest surface water body.

Localized depth to groundwater was confirmed to be approximately 97 feet bgs in 2017 based on gauging information from monitoring wells MW-1 through MW-5 associated with the LPU-96 Site (RP-1665) located approximately 0.5 miles south/southwest of the Site.

Consequently, the NMOCD total ranking criteria score is twenty (20) for the Site as depth from chloride impacted soil to groundwater is estimated at less than 50 feet. The anticipated site-specific RRALs to be applied to this location by the NMOCD are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 100 mg/kg for total TPH, and 600 mg/kg for horizontal and 250 mg/kg for vertical delineation of chloride.

In an August 28, 2017 telephone conversation between Bernard Bockisch (GHD) and Jim Griswold (NMOCD Environmental Bureau Chief), GHD was informed that the NMOCD is accepting chloride concentrations of 600 mg/kg for the horizontal delineation assessment clean up levels.

4. Geophysical Survey – EM31 and ER

In June and August 2017, GHD completed a two-phase geophysical investigation at the Site. The purpose of the investigation was to delineate areas of elevated conductivity in order to map the extent of suspected chloride impacts to soil at the Site. The first phase of the investigation consisted of an electromagnetic (EM) survey to delineate the footprint of the suspected impacts. Based on the EM survey results, an electrical resistivity (ER) survey was completed to determine the vertical distribution of the suspected impacts. Survey coverage data are presented on attached Figure 4

(EM31 Geophysical Survey Map) and Figure 5 (Electrical Resistivity Survey Results and Historical Soil Analytical Data).

The EM survey was completed with an EM31 terrain conductivity meter. Prior to conducting the EM31 survey, a grid consisting of parallel lines was established over the proposed area of investigation indicated on Figure 4. Measurements of EM31 data were collected along 30-foot spaced grid lines over the area of investigation, with station spacings of approximately 4 feet on all grid lines. The ER survey line location was chosen based on the EM31 survey results, and transected the EM31 conductivity anomaly. The configuration of the electrodes (also called an array) and the electrode spacings were optimized to achieve an approximate depth of investigation of approximately 70 feet bgs, and the electrode spacing on all grid lines was on the order of 6.6 feet (i.e. 2 meters).

4.1 EM31 Survey Methodology

The EM31 survey was completed to determine the horizontal extent or limits of chloride impacts in the shallow subsurface soils at the Site. The EM31 consists of transmitter and receiver coils located at opposite ends of a rigid boom. The coil separation for the EM31 is approximately 13 feet, which yields an approximate depth of penetration of 18 feet bgs in vertical dipole mode. Measurements of terrain conductivity from the EM31 were used to assess the extent of chloride impacts at the Site. The data for the EM31 survey were then processed as a colored contour plot. The plot was superimposed on an aerial image of the Site plan, and was used to locate elevated conductivity responses indicative of chloride-impacted areas relative to the Site features. Figure 4 depicts the EM31 survey results.

4.2 EM31 Survey Results

The colored contour conductivity plot presented on Figure 4 reveals that the highest intensity conductivity responses are colored red to purple, while areas of low response are colored blue. All remaining intermediate responses correspond to the color scale presented on the figure. Results from non-impacted areas within the survey coverage indicate that background conductivity responses were approximately 20 milliSiemens/meter (mS/m). Anomalous responses relative to background were generally 1.5 to 10 times higher, and ranged from approximately 30 to 200 mS/m. The EM31 survey results delineated two main areas of suspected brine-impacted soils (on the southwest and west side of the Site). The response area on the southwest portion of the Site is believed a former pit area. The area to the west is an anomaly and will be investigated further. A third lower intensity conductive zone was detected south of the previously excavation, near the middle of the Site.

4.3 ER Survey Methodology

The ER survey profile was completed in August 2017 to determine the vertical extent of chloride-impact in soil on one selected survey line located along the southeastern section of the Site. This area exhibited strong responses during the EM31 survey and included the location of a suspected former pit (see Figure 4). The ER survey was conducted with a dual-function resistivity meter, which operates simultaneously as a transmitter and receiver. The survey utilized two multi-electrode cables yielding a total spread of 72 electrodes. The receiver was programmed to automatically “switch”

between measured quadripoles, yielding a pseudosection of apparent resistivity. The apparent resistivity data were then imported into an inversion software program, and processed to yield a modeled profile section of resistivity.

4.4 ER Survey Results

The electrical resistivity results for the survey line are presented on Figure 5. These results are based on the measured apparent resistivity values for various depths along the survey line. Calculations of measured apparent resistivity values include the type of ER array (Wenner), the electrode spacing, and raw field data (i.e., applied current and measured voltage for each data point).

The measured apparent resistivity data were processed with the inversion program RES2DINV, to yield the modeled resistivity section presented on Figure 5. The modeled section represents the resistance of earth materials in the shallow subsurface, and thus provides an interpretation of the overburden sequences and areas of suspected brine impacts along the survey line. The highest resistivity values are colored dark blue, while areas of low resistivity (or conversely, high conductivity) are colored yellow to red. All remaining intermediate responses correspond to the color scale presented on the bottom of each section.

The colored plot reveals that the contour intervals ranged from 2.25 to 1,000 Ohm.meters (Ohm.m). The intermediate contour intervals were determined by applying a normalized distribution curve to the data such that the entire range of responses could be identified by discrete colors. The interpreted colored contoured plot suggests that suspected brine-impacted soils can be likely characterized by modeled responses of approximately 2.25 to 40 Ohm.m.

4.5 Geophysical Survey Correlations/Conclusions

- The geophysical investigation successfully delineated the horizontal and vertical extents of suspected brine-impacted areas in the shallow subsurface.
- The EM31 survey delineated three areas of suspected brine-impacted soils at the Site.
- In general, the ER survey results indicate the zone of suspected brine impact is a surficial zone, affecting soils at surface down to approximately 40 feet bgs.
- The suspected brine impacts appear confined to near surface areas that correlate well with soil sample analytical results for chlorides from the previous assessment activities.

5. Soil Assessment

In order to further define the horizontal and vertical extent of chloride impact, six additional soil borings (SB-6 though SB-10) were installed using an air rotary drilling rig. Prior to mobilizing drilling equipment to the Site, the boring locations were marked and an initial New Mexico One Call utility locate ticket was submitted on October 11, 2017. GHD's contracted service provider, HCI, a New Mexico-licensed water well driller, and GHD mobilized to the Site to begin drilling activities on October 24, 2017. Each boring location was cleared for underground utilities with the use of an air

knife up to a depth of 5.0 feet bgs or refusal. SB-5 though SB-9 were advanced to 50 feet bgs and SB-10 was advanced to 60 feet bgs. Site details and boring locations are shown on Figure 3.

The chloride screening was accomplished in the field by mixing soil samples with distilled water, then testing the rinsate using Hach chloride test strips. The soil types observed during drilling of SB-6 through SB-10 consisted primarily of silty sands. The soils were logged in accordance with the Unified Soil Classification System, and soil boring logs are provided in Appendix A.

Soil samples were collected at 0.5-1 feet bgs, 4-5 feet bgs, and then ten-foot intervals starting at 9-10 feet bgs within each of the six soil borings. Soil samples were placed in laboratory-supplied sample containers on ice, labeled, and submitted to Xenco Laboratories in Midland, Texas for analysis of chlorides by EPA Method 300. Groundwater was not encountered in any of the soil borings. Following completion of activities, the soil cuttings were returned to their respective boreholes and backfilled with hydrated bentonite pellets from 10 feet bgs to the ground surface.

5.1 Soil Sampling Analytical Results - 2017

Analytical results associated with the soil boring activities of October 2017 are included in Appendix B and discussed in the following section. Based on analytical results from the shallow soil samples, some deeper soil samples collected during this assessment were not analyzed at the direction of GHD. Analytical results are presented in Table 1, shown in map view on Figure 6, and are summarized below:

- Soil samples collected from SB-5 and SB-6 demonstrated chloride concentrations below the site specific RRAL of 250 mg/kg for chloride from 0.5 to 20 feet bgs. As such, the deeper interval soil samples collected (20 to 50 feet bgs) were not analyzed.
- SB-7 exhibited chloride concentrations exceeding the RRAL beginning at sample interval 4-5 feet bgs (1630 mg/kg), and continued through to the soil boring terminal depth at 49-50 feet bgs (371 mg/kg).
- SB-8 demonstrated chloride concentrations below the site specific RRAL in all but one sample interval (9-10 feet bgs at 347 mg/kg).
- SB-9 exhibited chloride concentrations exceeding the RRAL in sample intervals beginning at 4-5 feet bgs (365 mg/kg), continuing through 19-20 feet bgs (669 mg/kg). The highest concentration reported was 680 mg/kg at the 9-10 feet bgs interval.
- SB-10 exhibited chloride concentrations exceeding the RRAL in all sample intervals (0.5-1 feet bgs at 418 mg/kg through 59-60 feet bgs at 297 mg/kg). The highest reported concentration was 1,420 mg/kg at the 9-10 feet bgs interval.

6. Conclusions

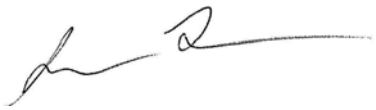
Analytical results associated with assessment activities conducted in 2017 indicate the horizontal extents of the chloride impact in soil have not been fully delineated. The vertical extent of chloride impact appears delineated to concentrations protective of groundwater, and confined to shallow soils less than 60 feet bgs.

7. 2018 Assessment Activities

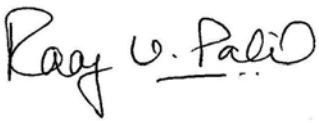
On February 13, 2018, GHD and Chevron representatives met with NMOCD and NMSLO to discuss further assessment activities addressing the presence of chloride in soil at the Site. Additional soil assessment activities based on those discussions are summarized in the Work Plan included in Appendix C of this report.

All of Which is Respectfully Submitted,

GHD

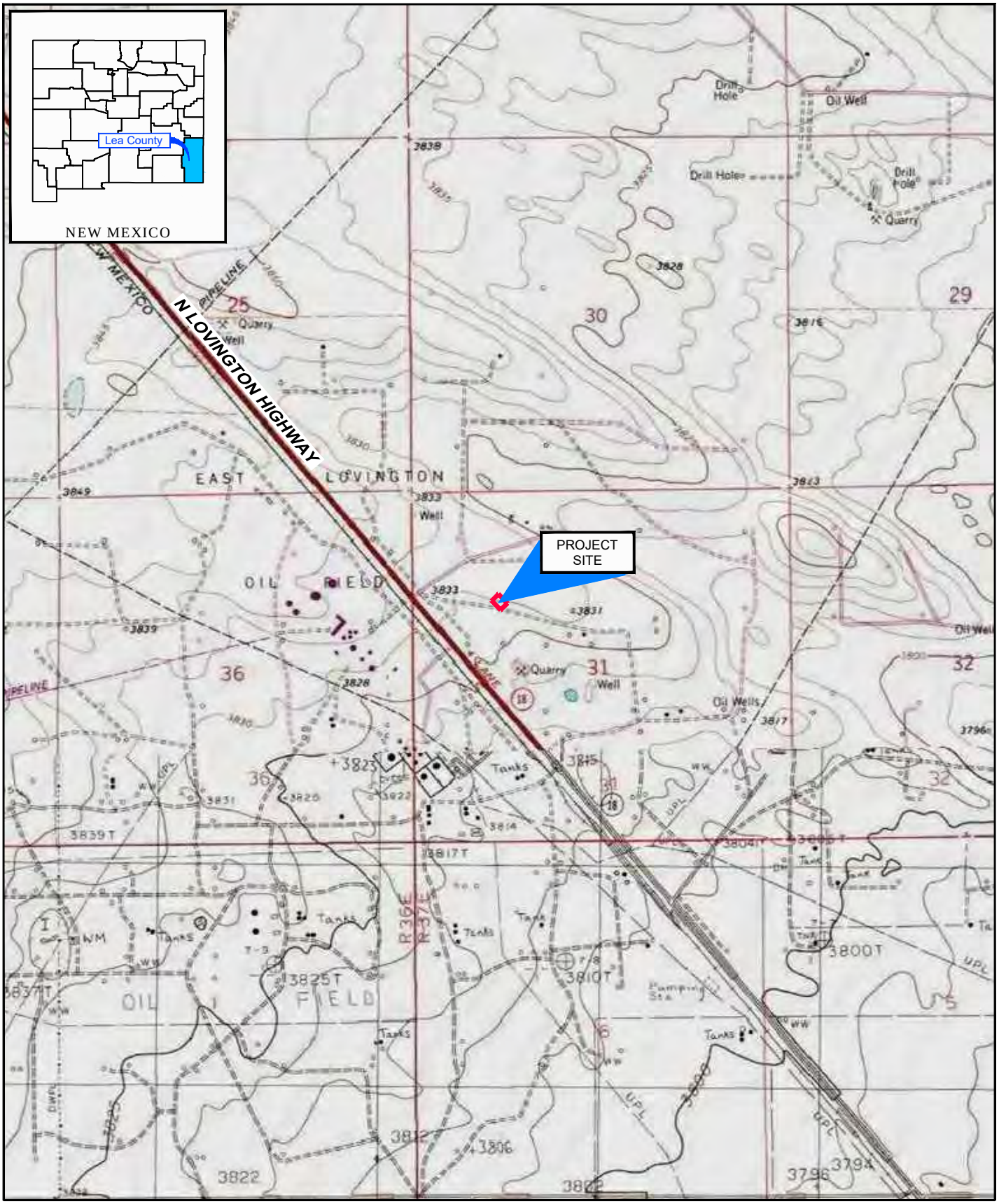


Scott Foord, P.G.
Project Manager



Raaj U. Patel, P.G.
Program Manager

Figures



Source: USGS 7.5 Minute Quad "Lovington and Lovington SE, Texas"

Lat/Long: 32.881111° North, 103.29512° West

0 1000 2000ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #89

074287-00

Feb 5, 2018

SITE LOCATION MAP

FIGURE 1

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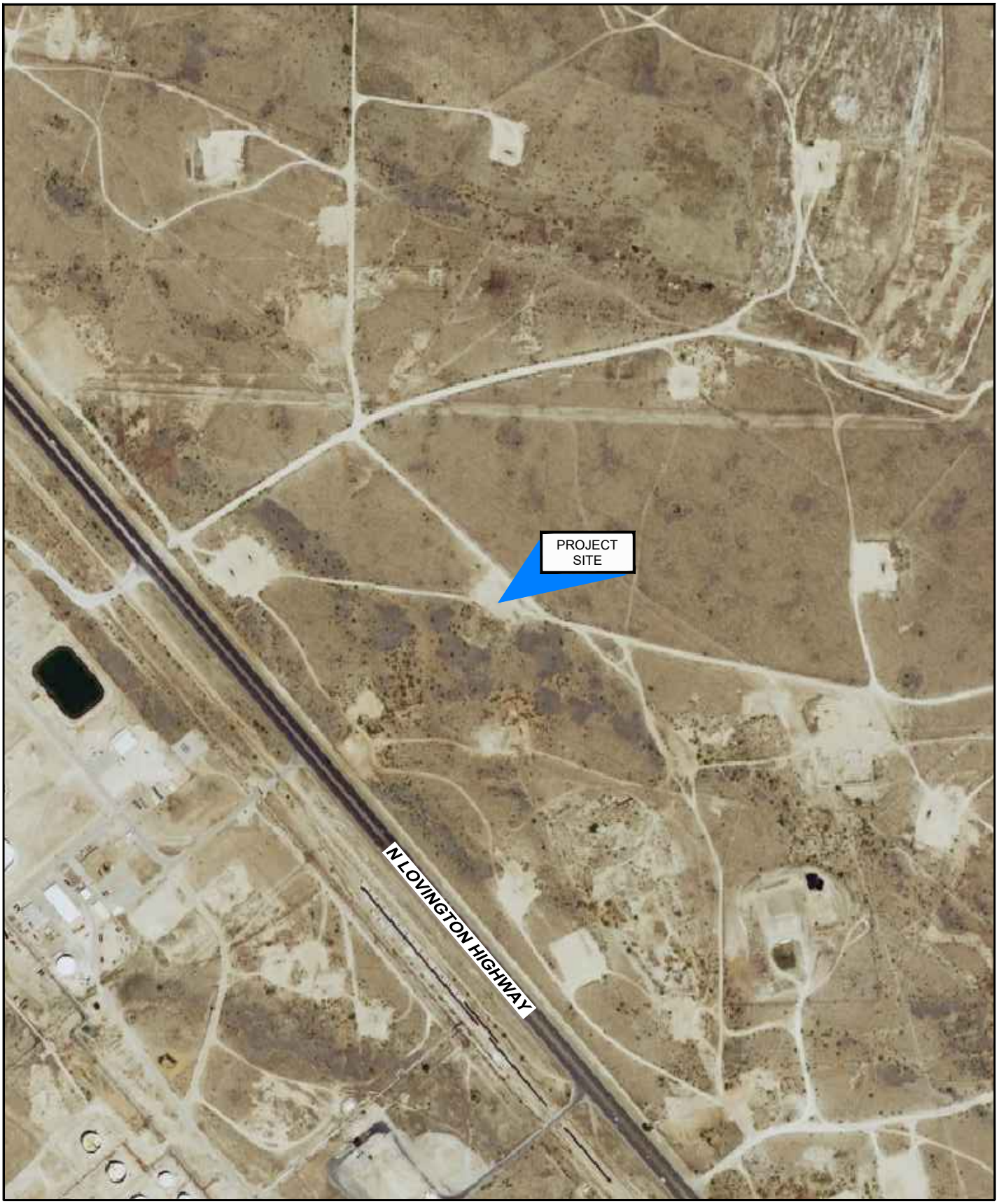

Source: USDA FSA Imagery, May 10, 2014

Lat/Long: 32.881111° North, 103.29512° West

0 250 500ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

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LOVINGTON PADDOCK UNIT #89

074287-00

Feb 5, 2018

SITE AERIAL MAP

FIGURE 2

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Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.881111° North, 103.29512° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

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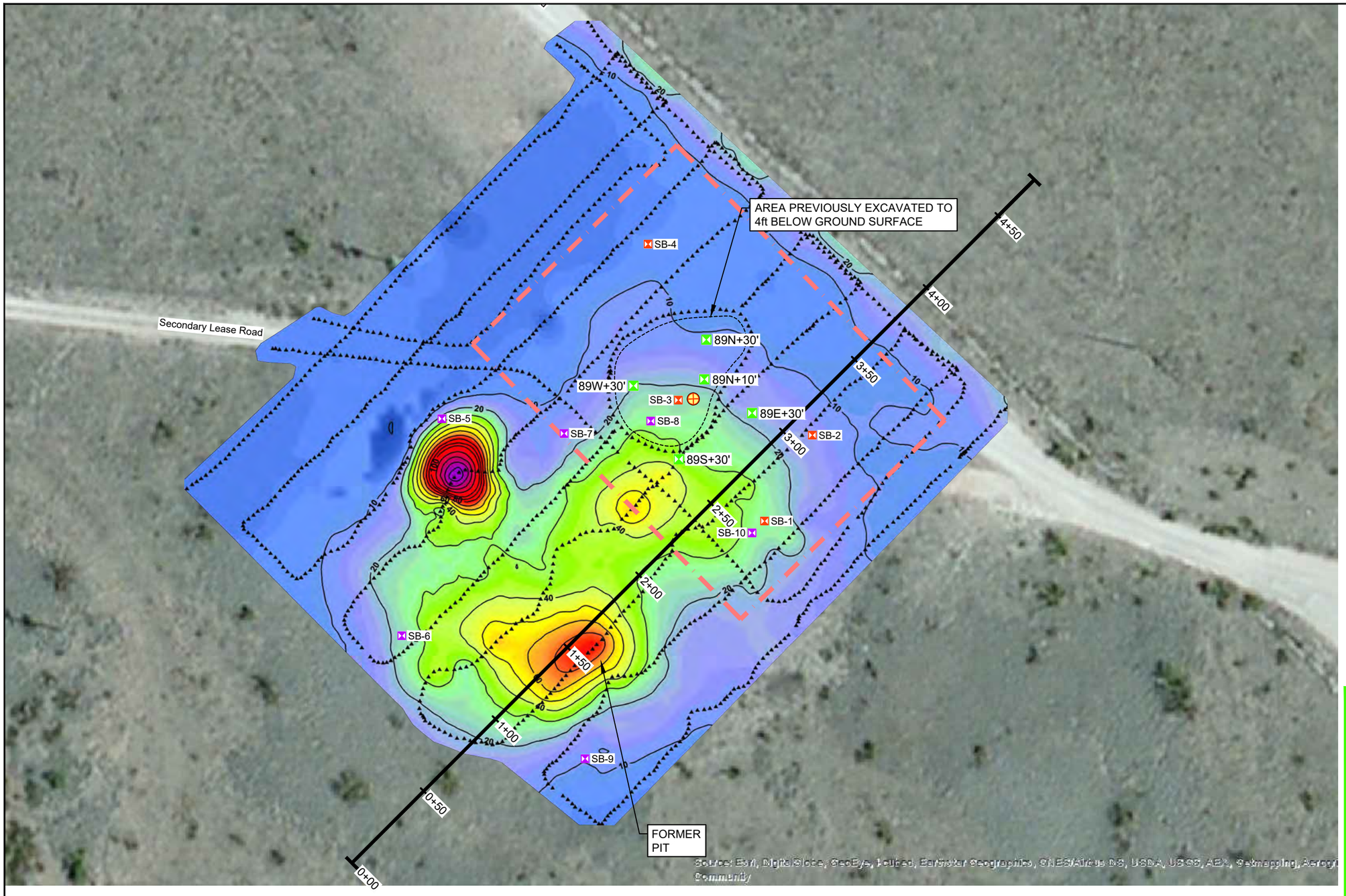
074287-00

May 10, 2018

SOIL BORING LOCATION MAP

FIGURE 3

CAD File: I:\CAD\Files\07----\074---\074287-CEMC-LPU # 89\074287-00\074287-00(004)\074287-00(004)GN-DL002.dwg



EM31 CONDUCTIVITY
RESPONSE (mS/m)

200
175
150
125
100
75
50
25
0

LEGEND

- Soil Boring Location - 2011
- Soil Boring Location - 2015
- Soil Boring Location - 2017
- LPU #89 Well Marker
- EM31 Survey Coverage
- Electrical Resistivity Survey Line
- 0+50 Fifty Foot Intervals
- Area Previously Excavated to 4FT BGS

Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.881111° North, 103.29512° West

0 20 50ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico East (US Feet)

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LOVINGTON PADDOCK UNIT #89

EM31 GEOPHYSICAL SURVEY MAP

74287-2017
May 2, 2018

FIGURE 4

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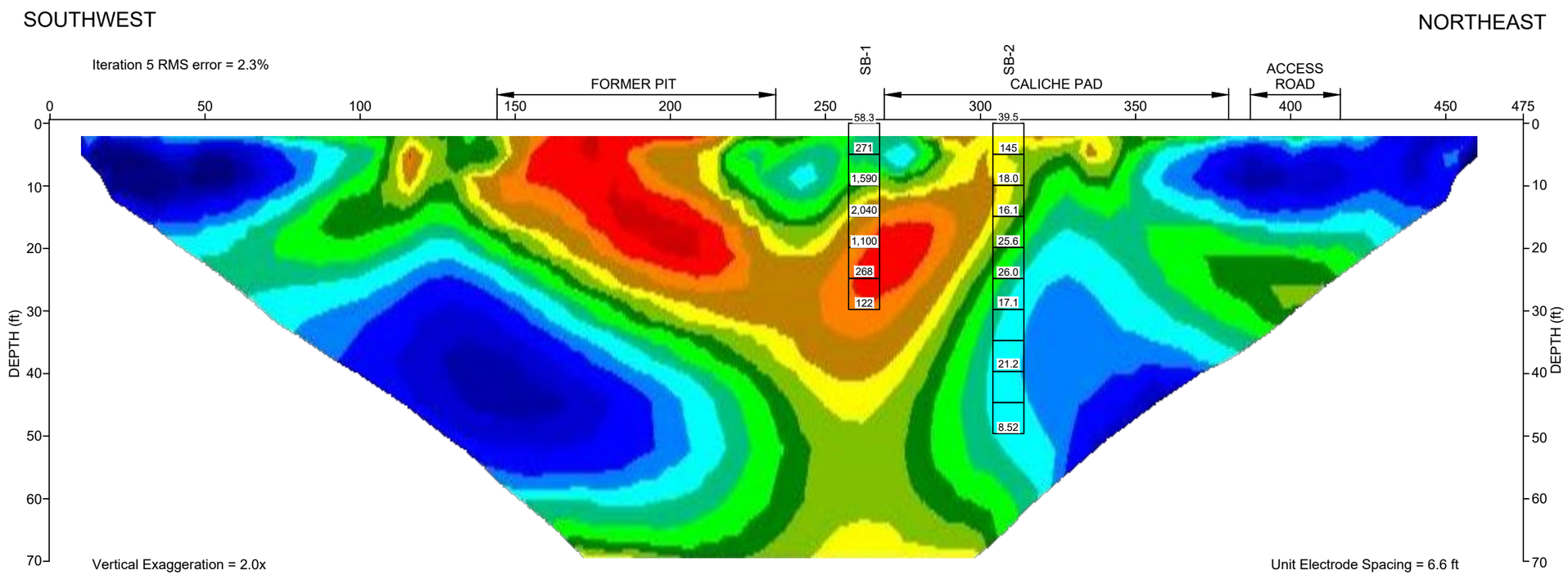
LPU 89 - LINE 1
INVERSE MODEL RESISTIVITY SECTION

DISTANCE (ft)



NOTE:

271
1,590 – CHLORIDE CONCENTRATION (mg/Kg)
2,040
1,100
200

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #89

ELECTRICAL RESISTIVITY SURVEY RESULTS
AND HISTORICAL SOIL ANALYTICAL DATA

74287-2017
May 2, 2018

FIGURE 5

CAD File: P:\drawings\74000s\74287\74287-REPORTS\74287-2017(006)\74287-2017(006)GN\74287-2017(006)GN-WA002.dwg

NOTES:

1. All analytical results reported in mg/kg.
2. Yellow shaded cells indicate exceedance of 250 mg/kg for chloride.
3. "<" indicates below laboratory detection limit.

Main Lease Road

Secondary Lease Road

SB-4 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	11.0	29.1	14.1	8.22	7.75	7.55	2.65

89N+10' 06/10/11	
Depth	2'
TPH (GRO + DRO)	26
Chloride	2790

89W+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	3970

89N+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	27
Chloride	1570

89E+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	2480

SB-7 10/25/17						
Depth	0.5-1'	4-5'	9-10'	19-20'	39-40'	49-50'
Chloride	23.9	1630	413	564	378	371

SB-5 10/24/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	29.3	23.2	23.1	25.1

SB-3 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	4450	405	511	399	479	540	561

SB-8 10/25/17					
Depth	0.5-1'	4-5'	9-10'	19-20'	39-40'
Chloride	32.2	143	347	132	19.4

89S+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	391

SB-6 10/24/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	32.1	45.1	34.3	37.8

SB-9 10/24/17								
Depth	0.5-1'	4-5'	9-10'	19-20'	19-20'*	29-30'	39-40'	49-50'
Chloride	24.4	365	680	678	669*	183	102	45.6

SB-2 09/18/15									
Depth	0'	5'	10'	15'	20'	25'	30'	40'	50'
Chloride	39.6	145	18.0	16.1	25.6	26.0	17.1	21.2	8.52

SB-1 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	58.3	271	1590	2040	1100	268	122

SB-10 10/24/17								
Depth	0.5-1'	4-5'	9-10'	19-20'	29-30'	39-40'	49-50'	59-60'
Chloride	418	733	1420	897	1010	1050	621	297

SB-4, SB-3, SB-8, SB-7, SB-5, SB-2, SB-10, SB-1, SB-6, SB-9

89W+30', 89N+10', 89N+30', 89E+30', 89S+30'

LEGEND

	Soil Boring Location - 2011
	Soil Boring Location - 2015
	Soil Boring Location - 2017
	LPU #89 Well Marker
Depth	Depth of Sample (ft)
TPH	Total Petroleum Hydrocarbons Concentration (mg/kg)
DRO	TPH as Diesel Range Organics
GRO	TPH as Gasoline Range Organics
*	Indicates Duplicate Sample

Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.881111° North, 103.29512° West

0 20 50ft

Coordinate System: NAD 1983 StatePlane- New Mexico East (US Feet)

Sample ID — SB-3 09/18/15 — Sample Date
Depth 0' — Sample Depth (ft)
Chloride 4450 — Sample Result (mg/kg)

GHD

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LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #89

074287-00

May 2, 2018

CHLORIDE ANALYTICAL RESULTS MAP

FIGURE 6

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Tables

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LOVINGTON PADDOCK UNIT 89
LEA COUNTY, NEW MEXICO

Sample ID	Depth (feet)	Date	Chlorides mg/kg
NMOCD Recommended Remediation Action Levels			**250**
SB-1	0	9/18/15	58.3
	5	9/18/15	**271**
	10	9/18/15	**1590**
	15	9/18/15	**2040**
	20	9/18/15	**1100**
	25	9/18/15	**268**
	30	9/18/15	122
SB-2	0	9/18/15	39.6
	5	9/18/15	145
	10	9/18/15	18.0
	15	9/18/15	16.1
	20	9/18/15	25.6
	25	9/18/15	26.0
	30	9/18/15	17.1
	40	9/18/15	21.2
	50	9/18/15	8.52
SB-3	0	9/18/15	**4450**
	5	9/18/15	**405**
	10	9/18/15	**511**
	15	9/18/15	**399**
	20	9/18/15	**479**
	25	9/18/15	**540**
	30	9/18/15	**561**
SB-4	0	9/18/15	11.0
	5	9/18/15	29.1
	10	9/18/15	14.1
	15	9/18/15	8.22
	20	9/18/15	7.75
	25	9/18/15	7.55
	30	9/18/15	2.65
SB-5	0.5-1	10/24/17	29.3
	4-5	10/24/17	23.2
	9-10	10/24/17	23.1
	19-20	10/24/17	25.1
SB-6	0.5-1	10/24/17	32.1
	4-5	10/24/17	45.1
	9-10	10/24/17	34.3
	19-20	10/24/17	37.8

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
LOVINGTON PADDOCK UNIT 89
LEA COUNTY, NEW MEXICO

Sample ID	Depth (feet)	Date	Chlorides mg/kg
NMOCD Recommended Remediation Action Levels			**250**
SB-7	0.5-1	10/25/17	23.9
	4-5	10/25/17	**1630**
	9-10	10/25/17	**413**
	19-20	10/25/17	**564**
	39-40	10/25/17	**378**
	49-50	10/25/17	**371**
SB-8	0.5-1	10/25/17	32.2
	4-5	10/25/17	143
	9-10	10/25/17	**347**
	19-20	10/25/17	132
	39-40	10/25/17	19.4
SB-9	0.5-1	10/24/17	24.4
	4-5	10/24/17	**365**
	9-10	10/24/17	**680**
	19-20	10/24/17	**678**
Dup.	19-20	10/24/17	**669**
	29-30	10/24/17	183
	39-40	10/24/17	102
	49-50	10/24/17	45.6
SB-10	0.5-1	10/24/17	**418**
	4-5	10/24/17	**733**
	9-10	10/24/17	**1420**
	19-20	10/24/17	**897**
	29-30	10/24/17	**1010**
	39-40	10/24/17	**1050**
	49-50	10/24/17	**621**
	59-60	10/24/17	**297**

Notes:
1. All analytical results reported in (mg/kg) milligrams per kilogram
2. Chloride analyses by Method EPA 300
3. TPH analysis by Method SW 8015B Modified
4. bgs - below ground surface
5. < indicates below laboratory Reporting Limit (RL)
6. (SB) indicates Soil Borings
7. Highlighted cells indicate and exceedance of NMOCD Site RRALs

Appendices

Appendix A
SB-5 though SB-10 Boring Logs

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-5
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	Top Soil						
	CALICHE; light brown	1.00					
4			4-5		1.0		<28
	SILTY SAND (SM); light brown, contains caliche	5.00					
10			9-10		1.0		<28
20			19-20		1.0		<28
30			29-30		1.0		<28
	SILTY SAND (SM); reddish brown	30.00					

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-5
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE				
			DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	CHLORIDE (mg/kg)
36							
38							
40			39-40		1.0		<28
42							
44							
46							
48							
50	SILTY SAND (SM); light brown	49.00	49-50		1.0		<28
52	END OF BOREHOLE @ 50.0ft BGS	50.00					
54							
56							
58							
60							
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-6
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	Top Soil						
	CALICHE; light brown	1.00					
4			4-5		1.0		<28
8	SILTY SAND (SM); light brown, contains caliche	7.50					
10			9-10		1.0		<28
20			19-20		1.0		<28
	SILTY SAND (SM); reddish brown	25.00					
30			29-30		1.0		<28

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-6
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
36							
38							
40			39-40		1.0		<28
42							
44							
	SILTY SAND (SM); light brown	45.00					
46							
48							
50			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					
52							
54							
56							
58							
60							
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-7
DATE COMPLETED: 25 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	Top Soil		0.5-1		1.0		263
	SILTY CLAY (CL-ML); dark brown	1.00					
			4-5		1.0		82
	SILTY SAND (SM); light brown, contains caliche	7.50					
			9-10		1.0		130
			19-20		1.0		74
	SILTY SAND (SM); reddish brown	25.00					
			29-30		1.0		90

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-7
DATE COMPLETED: 25 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE				
			DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	CHLORIDE (mg/kg)
36	SILTY SAND (SM); light brown	35.00					
38							
40			39-40		1.0		74
42							
44							
46							
48							
50			49-50		1.0		90
	END OF BOREHOLE @ 50.0ft BGS	50.00					
52							
54							
56							
58							
60							
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-8
DATE COMPLETED: 25 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	Top Soil	1.00					
	CALICHE; light brown		4-5		1.0		28
	SILTY SAND (SM); light brown, contains caliche	7.50	9-10		1.0		82
			19-20		1.0		40
	SILTY SAND (SM); reddish brown	25.00	29-30		1.0		<28

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-8
DATE COMPLETED: 25 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
36							
38							
40			39-40		1.0		<28
42							
44							
	SILTY SAND (SM); light brown	45.00					
46							
48							
50			49-50		1.0		<28
	END OF BOREHOLE @ 50.0ft BGS	50.00					
52							
54							
56							
58							
60							
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-9
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
0	Top Soil	1.00					
2	CALICHE; light brown						
4			4-5		1.0		130
6							
8	SILTY SAND (SM); light brown, contains caliche	7.50					
10			9-10		1.0		210
12							
14							
16							
18							
20			19-20		1.0		244
22							
24							
26	SILTY SAND (SM); reddish brown	25.00					
28							
30			29-30		1.0		74
32							
34							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-9
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary FIELD
PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE				
			DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	CHLORIDE (mg/kg)
36							
38							
40			39-40		1.0		46
42							
44							
	SILTY SAND (SM); light brown	45.00					
46							
48							
50			49-50		1.0		28
	END OF BOREHOLE @ 50.0ft BGS	50.00					
52							
54							
56							
58							
60							
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-10
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
	Top Soil						
	SILTY SAND (SM); reddish brown, some caliche present	1.00					
4			4-5		1.0		90
10	- Light brown at 10.0ft BGS		9-10		1.0		354
20			19-20		1.0		263
30	- Reddish brown, no caliche present. at 30.0ft BGS		29-30		1.0		244

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: LPU -89
PROJECT NUMBER: 74287
CLIENT: Chevron
LOCATION: Lovington

HOLE DESIGNATION: SB-10
DATE COMPLETED: 24 October 2017
DRILLING METHOD: Air Rotary
FIELD PERSONNEL: Rebecca Jones

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	SAMPLE DEPTH (ft)	SAMPLE INTERVAL	SAMPLE REC (ft)	SAMPLE PP (tsf)	SAMPLE CHLORIDE (mg/kg)
36	- Light brown at 35.0ft BGS						
38							
40			39-40		1.0		244
42							
44							
46							
48							
50			49-50		1.0		130
52							
54							
56							
58							
60	END OF BOREHOLE @ 60.0ft BGS	60.00	59-60		1.0		90
62							
64							
66							
68							

NOTES:

LABORATORY ANALYSIS ( )

OVERBURDEN LOG 074287 CVX LPU 89.GPJ CRA_CORP.GDT 15/2/18

Appendix B
Certified Analytical Report

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566621-001		566621-002		566621-003		566621-004		566621-005		566621-006	
	Field Id:	SB-10-S-0.5-1-171024		SB-10-S-4-5-171024		SB-10-S-9-10-171024		SB-10-S-19-20-171024		SB-10-S-29-30-171024		SB-10-S-39-40-171024	
	Depth:	0.5-1		4-5		9-10		19-20		29-30		39-40	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-24-17 11:50		Oct-24-17 11:53		Oct-24-17 11:56		Oct-24-17 11:59		Oct-24-17 12:02		Oct-24-17 12:08	
Chloride by EPA 300	***Extracted:***	Nov-06-17 10:00		Nov-06-17 10:00		Nov-06-17 10:00		Nov-06-17 10:00		Nov-06-17 10:00		Nov-06-17 12:15	
	Analyzed:	Nov-06-17 19:15		Nov-06-17 19:22		Nov-06-17 19:28		Nov-06-17 19:34		Nov-06-17 19:41		Nov-06-17 14:58	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		418	4.99	733	4.98	1420	4.98	897	5.00	1010	4.97	1050	4.97
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.79	1.00	11.1	1.00	6.32	1.00	6.84	1.00	5.60	1.00	6.41	1.00

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566621-007		566621-008		566621-009		566621-010		566621-011		566621-012	
	Field Id:	SB-10-S-49-50-171024		SB-10-S-59-60-171024		SB-5-S-0.5-1-171024		SB-5-S-4-5-171024		SB-5-S-9-10-171024		SB-5-S-19-20-171024	
	Depth:	49-50		59-60		0.5-1		4-5		9-10		19-20	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-24-17 12:11		Oct-24-17 13:35		Oct-24-17 13:35		Oct-24-17 13:38		Oct-24-17 13:41		Oct-24-17 13:44	
Chloride by EPA 300	***Extracted:***	Nov-06-17 12:15		Nov-09-17 10:00		Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15	
	Analyzed:	Nov-06-17 15:25		Nov-09-17 12:08		Nov-06-17 15:34		Nov-06-17 15:43		Nov-06-17 15:51		Nov-06-17 16:18	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		621	4.90	297	4.94	29.3	4.99	23.2	4.96	23.1	4.94	25.1	4.96
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-30-17 11:00		Nov-10-17 17:04		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.48	1.00	5.59	1.00	4.74	1.00	7.05	1.00	6.34	1.00	8.23	1.00

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566621-016		566621-017		566621-018		566621-019		566621-023		566621-024	
	Field Id:	SB-6-S-0.5-1-171024		SB-6-S-4-5-171024		SB-6-S-9-10-171024		SB-6-S-19-20-171024		SB-9-S-0.5-1-171024		SB-9-S-4-5-171024	
	Depth:	0.5-1		4-5		9-10		19-20		0.5-1		4-5	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-24-17 15:15		Oct-24-17 15:18		Oct-24-17 15:21		Oct-24-17 15:24		Oct-24-17 15:55		Oct-24-17 15:58	
Chloride by EPA 300	***Extracted:***	Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15	
	Analyzed:	Nov-06-17 16:27		Nov-06-17 16:36		Nov-06-17 16:45		Nov-06-17 16:53		Nov-06-17 17:02		Nov-06-17 17:29	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		32.1	4.98	45.1	4.97	34.3	4.97	37.8	4.93	24.4	4.92	365	4.99
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.33	1.00	32.2	1.00	23.5	1.00	6.96	1.00	9.66	1.00	3.60	1.00

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566621-025		566621-026		566621-027		566621-028		566621-029		566621-030	
	Field Id:	SB-9-S-9-10-171024		SB-9-S-19-20-171024		SB-9-S-29-30-171024		SB-9-S-39-40-171024		SB-9-S-49-50-171024		SB-7-S-0.5-1-171025	
	Depth:	9-10		19-20		29-30		39-40		49-50		0.5-1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-24-17 16:01		Oct-24-17 16:04		Oct-24-17 16:07		Oct-24-17 16:10		Oct-24-17 16:13		Oct-25-17 07:45	
Chloride by EPA 300	***Extracted:***	Nov-06-17 12:15		Nov-06-17 12:15		Nov-09-17 10:00		Nov-09-17 10:00		Nov-09-17 10:00		Nov-06-17 12:15	
	Analyzed:	Nov-06-17 17:38		Nov-06-17 18:04		Nov-09-17 12:27		Nov-09-17 12:33		Nov-09-17 12:39		Nov-06-17 18:13	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		680	4.90	678	4.93	183	4.92	102	4.95	45.6	4.98	23.9	4.98
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-30-17 11:00		Oct-30-17 11:00		Nov-10-17 17:04		Nov-10-17 17:04		Nov-10-17 17:04		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		3.80	1.00	7.84	1.00	5.32	1.00	5.74	1.00	6.19	1.00	14.3	1.00

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	566621-031		566621-032		566621-033		566621-035		566621-036		566621-037	
	Field Id:	SB-7-S-4-5-171025		SB-7-S-9-10-171025		SB-7-S-19-20-171025		SB-7-S-39-40-171025		SB-7-S-49-50-171025		SB-8-S-0.5-1-171025	
	Depth:	4-5		9-10		19-20		39-40		49-50		0.5-1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-25-17 07:48		Oct-25-17 07:51		Oct-25-17 07:54		Oct-25-17 08:00		Oct-25-17 08:03		Oct-25-17 08:40	
Chloride by EPA 300	***Extracted:***	Nov-06-17 12:15		Nov-06-17 12:15		Nov-06-17 12:15		Nov-09-17 10:00		Nov-09-17 10:00		Nov-06-17 12:15	
	Analyzed:	Nov-06-17 18:22		Nov-06-17 18:31		Nov-06-17 18:40		Nov-09-17 12:46		Nov-09-17 13:05		Nov-06-17 18:48	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		1630	49.3	413	24.7	564	4.98	378	5.00	371	4.94	32.2	4.98
Percent Moisture	***Extracted:***												
	Analyzed:	Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Nov-10-17 17:04		Nov-10-17 17:04		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		26.8	1.00	8.52	1.00	9.58	1.00	5.56	1.00	6.09	1.00	3.07	1.00

Mike Kimmel
Client Services Manager

Certificate of Analysis Summary 566621

GHD Services, INC- Midland, Midland, TX

Project Name: LPU# 89

Project Id: 074287
Contact: Scott Foord
Project Location: Lea County,NM

Date Received in Lab: Thu Oct-26-17 02:10 pm
Report Date: 13-NOV-17
Project Manager: Kelsey Brooks

Analysis Requested											
	Lab Id:	566621-038		566621-039		566621-040		566621-042		566621-044	
	Field Id:	SB-8-S-4-5-171025		SB-8-S-9-10-171025		SB-8-S-19-20-171025		SB-8-S-39-40-171025		DUP-1 171024	
	Depth:	4-5		9-10		19-20		39-40			
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Oct-25-17 08:43		Oct-25-17 08:46		Oct-25-17 08:49		Oct-25-17 08:55		Oct-24-17 00:00	
Chloride by EPA 300	***Extracted:***	Nov-06-17 12:15		Nov-06-17 16:00		Nov-06-17 16:00		Nov-09-17 10:00		Nov-06-17 16:00	
	Analyzed:	Nov-06-17 18:57		Nov-07-17 20:20		Nov-06-17 20:26		Nov-09-17 13:11		Nov-06-17 20:35	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		143	4.98	347	4.98	132	4.98	19.4	4.96	669	4.92
Percent Moisture	***Extracted:***										
	Analyzed:	Oct-30-17 11:00		Oct-30-17 11:00		Oct-30-17 11:00		Nov-10-17 17:04		Oct-30-17 11:00	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		5.94	1.00	5.40	1.00	7.92	1.00	5.45	1.00	7.86	1.00

Mike Kimmel
Client Services Manager

Analytical Report 566621

for

GHD Services, INC- Midland

Project Manager: Scott Foord

LPU# 89

074287

13-NOV-17

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-17-23), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab code: TX01468):
Texas (T104704295-17-15), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-17-13)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)

13-NOV-17

Project Manager: **Scott Foord**
GHD Services, INC- Midland
2135 S Loop 250 W
Midland, TX 79703

Reference: XENCO Report No(s): **566621**
LPU# 89
Project Address: Lea County,NM

Scott Foord:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 566621. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 566621 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Mike Kimmel
Client Services Manager

Sample Cross Reference 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB-10-S-0.5-1-171024	S	10-24-17 11:50	0.5 - 1	566621-001
SB-10-S-4-5-171024	S	10-24-17 11:53	4 - 5	566621-002
SB-10-S-9-10-171024	S	10-24-17 11:56	9 - 10	566621-003
SB-10-S-19-20-171024	S	10-24-17 11:59	19 - 20	566621-004
SB-10-S-29-30-171024	S	10-24-17 12:02	29 - 30	566621-005
SB-10-S-39-40-171024	S	10-24-17 12:08	39 - 40	566621-006
SB-10-S-49-50-171024	S	10-24-17 12:11	49 - 50	566621-007
SB-10-S-59-60-171024	S	10-24-17 13:35	59 - 60	566621-008
SB-5-S-0.5-1-171024	S	10-24-17 13:35	0.5 - 1	566621-009
SB-5-S-4-5-171024	S	10-24-17 13:38	4 - 5	566621-010
SB-5-S-9-10-171024	S	10-24-17 13:41	9 - 10	566621-011
SB-5-S-19-20-171024	S	10-24-17 13:44	19 - 20	566621-012
SB-6-S-0.5-1-171024	S	10-24-17 15:15	0.5 - 1	566621-016
SB-6-S-4-5-171024	S	10-24-17 15:18	4 - 5	566621-017
SB-6-S-9-10-171024	S	10-24-17 15:21	9 - 10	566621-018
SB-6-S-19-20-171024	S	10-24-17 15:24	19 - 20	566621-019
SB-9-S-0.5-1-171024	S	10-24-17 15:55	0.5 - 1	566621-023
SB-9-S-4-5-171024	S	10-24-17 15:58	4 - 5	566621-024
SB-9-S-9-10-171024	S	10-24-17 16:01	9 - 10	566621-025
SB-9-S-19-20-171024	S	10-24-17 16:04	19 - 20	566621-026
SB-9-S-29-30-171024	S	10-24-17 16:07	29 - 30	566621-027
SB-9-S-39-40-171024	S	10-24-17 16:10	39 - 40	566621-028
SB-9-S-49-50-171024	S	10-24-17 16:13	49 - 50	566621-029
SB-7-S-0.5-1-171025	S	10-25-17 07:45	0.5 - 1	566621-030
SB-7-S-4-5-171025	S	10-25-17 07:48	4 - 5	566621-031
SB-7-S-9-10-171025	S	10-25-17 07:51	9 - 10	566621-032
SB-7-S-19-20-171025	S	10-25-17 07:54	19 - 20	566621-033
SB-7-S-39-40-171025	S	10-25-17 08:00	39 - 40	566621-035
SB-7-S-49-50-171025	S	10-25-17 08:03	49 - 50	566621-036
SB-8-S-0.5-1-171025	S	10-25-17 08:40	0.5 - 1	566621-037
SB-8-S-4-5-171025	S	10-25-17 08:43	4 - 5	566621-038
SB-8-S-9-10-171025	S	10-25-17 08:46	9 - 10	566621-039
SB-8-S-19-20-171025	S	10-25-17 08:49	19 - 20	566621-040
SB-8-S-39-40-171025	S	10-25-17 08:55	39 - 40	566621-042
DUP-1 171024	S	10-24-17 00:00		566621-044
SB-5-S-29-30-171024	S	10-24-17 13:47	29 - 30	Not Analyzed
SB-5-S-39-40-171024	S	10-24-17 13:50	39 - 40	Not Analyzed
SB-5-S-49-50-171024	S	10-24-17 13:53	49 - 50	Not Analyzed
SB-6-S-29-30-171024	S	10-24-17 15:27	29 - 30	Not Analyzed
SB-6-S-39-40-171024	S	10-24-17 15:30	39 - 40	Not Analyzed
SB-6-S-49-50-171024	S	10-24-17 15:33	49 - 50	Not Analyzed
SB-7-S-29-30-171025	S	10-25-17 07:57	29 - 30	Not Analyzed
SB-8-S-29-30-171025	S	10-25-17 08:52	29 - 30	Not Analyzed

SB-8-S-49-50-171025	S	10-25-17 08:58	49 - 50	Not Analyzed

Sample receipt non conformances and comments:

Per Scott Ford, add Chloride to samples: 008,027,028,029,035,036,042.
Revised report on 11/13/17 for Chloride samples taken off of hold to analyze.

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3032574 Chloride by EPA 300
Lab Sample ID 566621-023 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike and Matrix Spike Duplicate. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 566621-006, -007, -009, -010, -011, -012, -016, -017, -018, -019, -023, -024, -025, -026, -030, -031, -032, -033, -037, -038.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-0.5-1-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-001	Date Collected:	10.24.17 11.50	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 10.00	Basis:	Wet Weight
Seq Number:	3032548				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**418**	4.99	mg/kg	11.06.17 19.15		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-4-5-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-002	Date Collected:	10.24.17 11.53	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 10.00	Basis:	Wet Weight
Seq Number:	3032548				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**733**	4.98	mg/kg	11.06.17 19.22		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-9-10-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-003	Date Collected:	10.24.17 11.56	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 10.00	Basis:	Wet Weight
Seq Number:	3032548				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1420**	4.98	mg/kg	11.06.17 19.28		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-19-20-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-004	Date Collected:	10.24.17 11.59	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 10.00	Basis:	Wet Weight
Seq Number:	3032548				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**897**	5.00	mg/kg	11.06.17 19.34		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-29-30-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-005	Date Collected:	10.24.17 12.02	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 10.00	Basis:	Wet Weight
Seq Number:	3032548				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1010**	4.97	mg/kg	11.06.17 19.41		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-39-40-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-006	Date Collected:	10.24.17 12.08	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1050**	4.97	mg/kg	11.06.17 14.58		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-49-50-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-007	Date Collected:	10.24.17 12.11	Sample Depth:	49 - 50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**621**	4.90	mg/kg	11.06.17 15.25		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-10-S-59-60-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-008	Date Collected:	10.24.17 13.35	Sample Depth:	59 - 60
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**297**	4.94	mg/kg	11.09.17 12.08		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-5-S-0.5-1-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-009	Date Collected:	10.24.17 13.35	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**29.3**	4.99	mg/kg	11.06.17 15.34		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-5-S-4-5-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-010	Date Collected:	10.24.17 13.38	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**23.2**	4.96	mg/kg	11.06.17 15.43		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-5-S-9-10-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-011	Date Collected:	10.24.17 13.41	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**23.1**	4.94	mg/kg	11.06.17 15.51		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-5-S-19-20-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-012	Date Collected:	10.24.17 13.44	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**25.1**	4.96	mg/kg	11.06.17 16.18		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-6-S-0.5-1-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-016	Date Collected:	10.24.17 15.15	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**32.1**	4.98	mg/kg	11.06.17 16.27		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-6-S-4-5-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-017	Date Collected:	10.24.17 15.18	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**45.1**	4.97	mg/kg	11.06.17 16.36		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-6-S-9-10-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-018	Date Collected:	10.24.17 15.21	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**34.3**	4.97	mg/kg	11.06.17 16.45		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-6-S-19-20-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-019	Date Collected:	10.24.17 15.24	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**37.8**	4.93	mg/kg	11.06.17 16.53		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-0.5-1-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-023	Date Collected:	10.24.17 15.55	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**24.4**	4.92	mg/kg	11.06.17 17.02		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-4-5-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-024	Date Collected:	10.24.17 15.58	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**365**	4.99	mg/kg	11.06.17 17.29		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-9-10-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-025	Date Collected:	10.24.17 16.01	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**680**	4.90	mg/kg	11.06.17 17.38		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-19-20-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-026	Date Collected:	10.24.17 16.04	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**678**	4.93	mg/kg	11.06.17 18.04		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-29-30-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-027	Date Collected:	10.24.17 16.07	Sample Depth:	29 - 30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**183**	4.92	mg/kg	11.09.17 12.27		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-39-40-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-028	Date Collected:	10.24.17 16.10	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**102**	4.95	mg/kg	11.09.17 12.33		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-9-S-49-50-171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-029	Date Collected:	10.24.17 16.13	Sample Depth:	49 - 50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**45.6**	4.98	mg/kg	11.09.17 12.39		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-0.5-1-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-030	Date Collected:	10.25.17 07.45	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**23.9**	4.98	mg/kg	11.06.17 18.13		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-4-5-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-031	Date Collected:	10.25.17 07.48	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1630**	49.3	mg/kg	11.06.17 18.22		10

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-9-10-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-032	Date Collected:	10.25.17 07.51	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**413**	24.7	mg/kg	11.06.17 18.31		5

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-19-20-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-033	Date Collected:	10.25.17 07.54	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**564**	4.98	mg/kg	11.06.17 18.40		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-39-40-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-035	Date Collected:	10.25.17 08.00	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**378**	5.00	mg/kg	11.09.17 12.46		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-7-S-49-50-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-036	Date Collected:	10.25.17 08.03	Sample Depth:	49 - 50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**371**	4.94	mg/kg	11.09.17 13.05		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-8-S-0.5-1-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-037	Date Collected:	10.25.17 08.40	Sample Depth:	0.5 - 1
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**32.2**	4.98	mg/kg	11.06.17 18.48		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-8-S-4-5-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-038	Date Collected:	10.25.17 08.43	Sample Depth:	4 - 5
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 12.15	Basis:	Wet Weight
Seq Number:	3032574				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**143**	4.98	mg/kg	11.06.17 18.57		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-8-S-9-10-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-039	Date Collected:	10.25.17 08.46	Sample Depth:	9 - 10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 16.00	Basis:	Wet Weight
Seq Number:	3032576				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**347**	4.98	mg/kg	11.07.17 20.20		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-8-S-19-20-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-040	Date Collected:	10.25.17 08.49	Sample Depth:	19 - 20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 16.00	Basis:	Wet Weight
Seq Number:	3032576				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**132**	4.98	mg/kg	11.06.17 20.26		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**SB-8-S-39-40-171025**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-042	Date Collected:	10.25.17 08.55	Sample Depth:	39 - 40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.09.17 10.00	Basis:	Wet Weight
Seq Number:	3032929				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**19.4**	4.96	mg/kg	11.09.17 13.11		1

Certificate of Analytical Results 566621

GHD Services, INC- Midland, Midland, TX

LPU# 89

Sample Id:	**DUP-1 171024**	Matrix:	Soil	Date Received:	10.26.17 14.10
Lab Sample Id:	566621-044	Date Collected:	10.24.17 00.00		
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	MNV			% Moisture:	
Analyst:	MNV	Date Prep:	11.06.17 16.00	Basis:	Wet Weight
Seq Number:	3032576				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**669**	4.92	mg/kg	11.06.17 20.35		1

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

***** (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

QC Summary 566621

GHD Services, INC- Midland

LPU# 89

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032548 Matrix: Solid Date Prep: 11.06.17
MB Sample Id: 7633896-1-BLK LCS Sample Id: 7633896-1-BKS LCSD Sample Id: 7633896-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	261	104	263	105	90-110	1	20	mg/kg	11.06.17 16:36	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032574 Matrix: Solid Date Prep: 11.06.17
MB Sample Id: 7633897-1-BLK LCS Sample Id: 7633897-1-BKS LCSD Sample Id: 7633897-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	242	97	245	98	90-110	1	20	mg/kg	11.06.17 14:41	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032576 Matrix: Solid Date Prep: 11.06.17
MB Sample Id: 7633898-1-BLK LCS Sample Id: 7633898-1-BKS LCSD Sample Id: 7633898-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	234	94	235	94	90-110	0	20	mg/kg	11.06.17 19:33	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032929 Matrix: Solid Date Prep: 11.09.17
MB Sample Id: 7634115-1-BLK LCS Sample Id: 7634115-1-BKS LCSD Sample Id: 7634115-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<5.00	250	255	102	256	102	90-110	0	20	mg/kg	11.09.17 11:55	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032548 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566877-023 MS Sample Id: 566877-023 S MSD Sample Id: 566877-023 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	762	246	969	84	976	87	90-110	1	20	mg/kg	11.06.17 16:55	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032548 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566877-033 MS Sample Id: 566877-033 S MSD Sample Id: 566877-033 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	10.2	248	264	102	266	103	90-110	1	20	mg/kg	11.06.17 18:24	

QC Summary 566621

GHD Services, INC- Midland

LPU# 89

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032574 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566621-006 MS Sample Id: 566621-006 S MSD Sample Id: 566621-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	1050	249	1260	84	1270	88	90-110	1	20	mg/kg	11.06.17 15:07	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032574 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566621-023 MS Sample Id: 566621-023 S MSD Sample Id: 566621-023 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	24.4	246	239	87	239	87	90-110	0	20	mg/kg	11.06.17 17:11	X

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032576 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566621-039 MS Sample Id: 566621-039 S MSD Sample Id: 566621-039 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	347	249	599	101	600	102	90-110	0	20	mg/kg	11.07.17 20:29	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032576 Matrix: Soil Date Prep: 11.06.17
Parent Sample Id: 566853-002 MS Sample Id: 566853-002 S MSD Sample Id: 566853-002 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	25.5	246	248	90	248	90	90-110	0	20	mg/kg	11.07.17 21:13	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032929 Matrix: Soil Date Prep: 11.09.17
Parent Sample Id: 566621-008 MS Sample Id: 566621-008 S MSD Sample Id: 566621-008 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	297	247	538	98	536	97	90-110	0	20	mg/kg	11.09.17 12:14	

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3032929 Matrix: Soil Date Prep: 11.09.17
Parent Sample Id: 566990-004 MS Sample Id: 566990-004 S MSD Sample Id: 566990-004 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	759	249	966	83	965	83	90-110	0	20	mg/kg	11.09.17 13:43	X

GHD Services, INC- Midland

LPU# 89

Analytical Method: **Percent Moisture**
Seq Number: 3031777 Matrix: Solid
MB Sample Id: 3031777-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	10.30.17 11:00	

Analytical Method: **Percent Moisture**
Seq Number: 3031778 Matrix: Solid
MB Sample Id: 3031778-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	10.30.17 11:00	

Analytical Method: **Percent Moisture**
Seq Number: 3033007 Matrix: Solid
MB Sample Id: 3033007-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<1.00	%	11.10.17 17:04	

Analytical Method: **Percent Moisture**
Seq Number: 3031777 Matrix: Soil
Parent Sample Id: 566619-024 MD Sample Id: 566619-024 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	12.6	10.8	15	20	%	10.30.17 11:00	

Analytical Method: **Percent Moisture**
Seq Number: 3031777 Matrix: Soil
Parent Sample Id: 566621-016 MD Sample Id: 566621-016 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	5.33	5.22	2	20	%	10.30.17 11:00	

Analytical Method: **Percent Moisture**
Seq Number: 3031778 Matrix: Soil
Parent Sample Id: 566621-017 MD Sample Id: 566621-017 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	32.2	30.2	6	20	%	10.30.17 11:00	

QC Summary 566621

GHD Services, INC- Midland

LPU# 89

Analytical Method: **Percent Moisture**
Seq Number: 3031778 Matrix: Soil
Parent Sample Id: 566771-002 MD Sample Id: 566771-002 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	8.71	9.49	9	20	%	10.30.17 11:00	

Analytical Method: **Percent Moisture**
Seq Number: 3033007 Matrix: Soil
Parent Sample Id: 566503-053 MD Sample Id: 566503-053 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	6.07	5.97	2	20	%	11.10.17 17:04	

Analytical Method: **Percent Moisture**
Seq Number: 3033007 Matrix: Soil
Parent Sample Id: 566621-008 MD Sample Id: 566621-008 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	5.59	5.43	3	20	%	11.10.17 17:04	

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Client / Reporting Information

Company Name / Branch: GHD / Houston
Company Address: 6320 Rothway St. #100, Houston TX 77040
Email: Chris.Knight@ghd.com
Phone No: 512-506-8803
Project Contact: Scott.Foord@ghd.com
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: LPU #89 / 074287
Project Location: Lea County, NM
Invoice To:
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	Moisture	Field Comments
1	SB-10-S-0.5-1-171024	0.5-1	10/24	1150	S	1								1			
2	SB-10-S-4-5-171024	4-5		1153	S	1								1			
3	SB-10-S-9-10-171024	9-10		1156	S	1								1			
4	SB-10-S-19-20-171024	19-20		1159	S	1								1			
5	SB-10-S-29-30-171024	29-30		1202	S	1								1			
6	SB-10-S-39-40-171024	39-40		1205	S	1								1			
7	SB-10-S-49-50-171024	49-50		1208	S	1								1			
8	SB-10-S-59-60-171024	59-60		1211	S	1								1			Hold
9	SB-5-S-0.5-1-171024	0.5-1		1335	S	1								1			
10	SB-5-S-4-5-171024	4-5	↓	1338	S	1								1			

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Temp: 2.5 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.3

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/25-1410	1	2		2 Shaunee Smith
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 2.2 Thermo. Corr. Factor

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Phoenix, Arizona (480-355-0900)
www.xenco.com

Xenco Quote #
Xenco Job # 576021

Client / Reporting Information

Company Name / Branch: GHD / Houston
Company Address: 6320 Rothway St. #100, Houston TX 77040
Email: Chris.Knight@ghd.com
Phone No: 512-506-8803
Project Contact: Scott.Foord@ghd.com
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: LPU #89 / 074287
Project Location: Lea County, NM
Invoice To:
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Date	Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	Moisture	Field Comments
1	SB-5-S-9-10-171024	9-10	10/24	1341	S	1								1			
2	SB-5-S-19-20-171024	19-20		1344	S	1								1			
3	SB-5-S-29-30-171024	29-30		1347	S	1								1			Hold
4	SB-5-S-39-40-171024	39-40		1350	S	1								1			Hold
5	SB-5-S-49-50-171024	49-50		1353	S	1								1			Hold
6	SB-6-S-0.5-1-171024	0.5-1		1515	S	1								1			
7	SB-6-S-4-5-171024	4-5		1518	S	1								1			
8	SB-6-S-9-10-171024	9-10		1521	S	1								1			
9	SB-6-S-19-20-171024	19-20		1524	S	1								1			
10	SB-6-S-29-30-171024	29-30	↓	1527	S	1								1			Hold

Turnaround Time (Business days)

- ☐ Same Day TAT
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- ☐ Next Day EMERGENCY
- ☐ 7 Day TAT
- ☐ 2 Day EMERGENCY
- ☐ Contract TAT
- ☐ 3 Day EMERGENCY

TAT Starts Day received by Lab, if received by 5:00 pm

Data Deliverable Information

- ☐ Level II Std QC
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Temp: 2.5 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.3

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/25-1410	1	2		2 Shaunee Smith
3			3	4		4
5			5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor

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Xenco Quote # | Xenco Job # 510021

Client / Reporting Information

Company Name / Branch: GHD / Houston
Company Address: 6320 Rothway St. #100, Houston TX 77040
Email: Chris.Knight@ghd.com | Phone No: 512-506-8803
Project Contact: Scott.Foord@ghd.com
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: LPU #89 / 074287
Project Location: Lea County, NM
Invoice To:
PO Number:

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Analytical Information: Chloride	Moisture	Field Comments
1	SB-6-S-39-40-171024	39-40	10/24	1530	S	1								1			Hold
2	SB-6-S-49-50-171024	49-50		1533	S	1								1			Hold
3	SB-9-S-0.5-1-171024	0.5-1		1555	S	1								1			
4	SB-9-S-4-5-171024	4-5		1558	S	1								1			
5	SB-9-S-9-10-171024	9-10		1601	S	1								1			
6	SB-9-S-19-20-171024	19-20		1604	S	1								1			
7	SB-9-S-29-30-171024	29-30		1607	S	1								1			Hold
8	SB-9-S-39-40-171024	39-40		1610	S	1								1			Hold
9	SB-9-S-49-50-171024	49-50	↓	1613	S	1								1			Hold
10	SB-7-S-0.5-1-171025	0.5 1	10/25	0745	S	1								1			

Turnaround Time (Business days)

- ☐ Same Day TAT
- ☐ 5 Day TAT
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- ☐ 7 Day TAT
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Temp: 2.5 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.3

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	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10-25-1410	1	2		2 Shannel Smith
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 2.2 Thermo. Corr. Factor

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www.xenco.com

Xenco Quote # | Xenco Job # 576621

Client / Reporting Information

Company Name / Branch: GHD / Houston
Company Address: 6320 Rothway St. #100, Houston TX 77040
Email: Chris.Knight@ghd.com | Phone No: 512-506-8803
Project Contact: Scott.Foord@ghd.com
Samplers's Name Rebecca Jones

Project Information

Project Name/Number: LPU #89 / 074287
Project Location: Lea County, NM
Invoice To:
PO Number:

Analytical Information

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW =Ground Water
DW = Drinking Water
P = Product
SW = Surface water
SL = Sludge
OW =Ocean/Sea Water
WI = Wipe
O = Oil
WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	Moisture	Field Comments
1	SB-7-S-4-5-171025	4-5	10/25	0748	S	1								1			
2	SB-7-S-9-10-171025	9-10		0751	S	1								1			
3	SB-7-S-19-20-171025	19-20		0754	S	1								1			
4	SB-7-S-29-30-171025	29-30		0757	S	1								1			Hold
5	SB-7-S-39-40-171025	39-40		0800	S	1								1			Hold
6	SB-7-S-49-50-171025	49-50		0803	S	1								1			Hold
7	SB-8-S-0.5-1-171025	0.5-1		0840	S	1								1			
8	SB-8-S-4-5-171025	4-5		0843	S	1								1			
9	SB-8-S-9-10-171025	9-10		0846	S	1								1			
10	SB-8-S-19-20-171025	19-20	↓	0849	S	1								1			

Turnaround Time (Business days)

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- ☐ Level III Std QC+ Forms
- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

FI

Notes:

Temp: 2.5 IR ID:R-8
CF:(0-6: -0.2°C)
(6-23: +0.2°C)
Corrected Temp: 2.3

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	Rebecca Jones	10/25 - 1410	1	2		2 Maurice Smith
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
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CHAIN OF CUSTODY

Page 5 Of #5

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www.xenco.com

Xenco Quote #

Xenco Job # Stelde21

Client / Reporting Information

Company Name / Branch: GHD / Houston

Company Address: 6320 Rothway St. #100, Houston TX 77040

Email: Chris.Knight@ghd.com

Phone No: 512-506-8803

Project Contact: Scott.Foord@ghd.com

Samplers's Name Rebecca Jones

Project Information

Project Name/Number: LPU #89 / 074287

Project Location: Lea County, NM

Invoice To:

PO Number:

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GW =Ground Water
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SW = Surface water
SL = Sludge
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WI = Wipe
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WW= Waste Water
A = Air

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Chloride	Moisture	Field Comments
1	SB-8-S-29-30-171025	29-30	10/25	0852	S	1								1			Hold
2	SB-8-S-39-40-171025	39-40	"	0855	S	1								1			Hold
3	SB-8-S-49-50-171025	49-50	↓	0858	S	1								1			Hold
4	DUP-1-171024	—	10/24	—	S	1								1			
5					S	1								1			
6					S	1								1			
7					S	1								1			
8					S	1								1			
9					S	1								1			
10					S	1								1			

Turnaround Time (Business days)

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- ☐ TRRP Level IV
- ☐ Level 3 (CLP Forms)
- ☐ UST / RG -411
- ☐ TRRP Checklist

Temp: 2.5 IR ID:R-8

CF:(0-6: -0.2°C)

(6-23: +0.2°C)

Corrected Temp: 2.3

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1	Rebecca Jones	1025-1410	1	2		2 Shawnel Smith
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable ☐	On Ice ☒ Cooler Temp. 2.2 Thermo. Corr. Factor

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XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 10/26/2017 02:10:00 PM

Work Order #: 566621

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	2.3
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**No**
#18 Water VOC samples have zero headspace?	**N/A**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst:

PH Device/Lot#:

Checklist completed by: Shawnee Smith Date: 10/26/2017

Shawnee Smith

Checklist reviewed by: Kelsey Brooks Date: 10/26/2017

Kelsey Brooks

Appendix C
2018 Work Plan

July 13, 2018 Reference No. 074287

Ms. Olivia Yu
Environmental Specialist
New Mexico Oil Conservation Division – District 1
1625 N. French Drive
Hobbs, New Mexico 88240

Re: 2018 Work Plan – Additional Soil Assessment
LPU No. 89 (1RP-4017)
Lea County, New Mexico

Dear Ms. Yu,

1. Project Information

The Site is located in Unit E, Section 31, Township 16 South, Range 37 East, approximately 5.00-miles southeast of Lovington, in eastern Lea County, New Mexico. The LPU No. 89 well was plugged and abandoned in July 2010. A dry hole marker is present at the location and surface equipment has been removed from the Site.

Information available from various sources including the Petroleum Recovery Research Center (PRRC) Mapping Portal, current GHD managed groundwater site(s) data, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:

a) the depth to groundwater from the deepest impacted soil at the Site is less than 50-feet bgs;

b) the nearest private domestic water source is greater than 200-feet from the release site;

c) the nearest public/municipal water source is greater than 1,000-feet from the release site; and

d) the release site lies more than 1,000 horizontal feet from the nearest surface water body.

Localized depth to groundwater was confirmed to be approximately 97 feet below ground surface (bgs) in 2017 based on gauging information from monitoring wells MW-1 through MW-5 associated with the LPU-96 Site (RP-1665) located approximately 0.5 miles south/southwest of the Site.

Consequently, the NMOCD total ranking criteria score is twenty (20) for the Site as depth from chloride impacted soil to groundwater is estimated at less than 50 feet. The anticipated site-specific RRALs to be applied to this location by the NMOCD are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 100 mg/kg for total TPH, and 600 mg/kg for horizontal and 250 mg/kg for vertical delineation of chloride.

GHD
6320 Rothway Street Suite 100 Houston Texas 77040 USA
T 713 734 3090 **F** 713 734 3391 **W** http://www.ghd.com/

In an August 28, 2017 telephone conversation between Bernard Bockisch (GHD) and Jim Griswold (NMOCD Environmental Bureau Chief), GHD was informed that the NMOCD is accepting chloride concentrations of 600 mg/kg for the horizontal delineation assessment clean up levels.

In September 2015, GHD subcontractor Harrison Cooper, Inc. (HCI) advanced four soil borings (SB-1 through SB-4) utilizing an air-rotary drilling rig to depths of approximately 50 feet bgs. Following approval of a Work Plan submitted to NMOCD in August 2016, GHD and subcontractor Diamondback Services (Diamondback) initiated excavation activities at the Site in September 2016 to remove chloride impacted soils within the well pad to a depth of approximately 4 feet bgs. Soil samples were collected from the sidewalls of the excavation limits and field screened for chloride. During field screening activities, it was determined that horizontal delineation of the impacted soils had not been achieved. As such, additional site assessment/delineation activities were determined necessary and the excavation activities were suspended.

In 2017, a two-phase geophysical investigation was completed and six additional soil borings were subsequently advanced (SB-5 through SB-10) at the Site. Soil samples were collected from each boring for analytical analyses in an attempt to further delineate the horizontal and vertical extents of the chloride impact. Soil sample analytical results are depicted on Figure 1.

Analytical results associated with assessment activities conducted in 2017 indicate the horizontal extents of the chloride impact in soil have not been fully delineated. The vertical extent of chloride impact appears delineated to concentrations protective of groundwater, and confined to shallow soils less than 60 feet bgs.

2. 2018 Scope of Work

On February 13, 2018, GHD and Chevron representatives met with NMOCD and the New Mexico State Land Office (NMSLO) regarding further delineation activities and future remedial actions addressing the presence of chloride concentrations at the Site. Further delineation activities recommended include the advancement of two soil borings to 70 feet bgs (see Figure 1). The specific locations of the soil borings have been determined based on the geophysical survey and previous soil sample analytical results. The following sections outline the scope of work that will be completed by GHD.

2.1 Task I – Soil Boring Installation Activities

GHD is proposing the installation of two soil borings up to 70 feet bgs southeast of the impacted area to further screen soil for chloride impact. GHD will coordinate all subsurface utility clearance activities prior to initiating drilling activities. A New Mexico 811 utility locate will be completed at least 48 hours prior to mobilization. In addition to the utility locate, a geophysical survey will be completed for each of the proposed boring locations.

The soil boring program will consist of the following:

- An air rotary drilling rig will be used to advance two soil borings to an anticipated maximum depth of 70 feet bgs. The two soil boring locations will be located to the south and southeast of the release area (see Figure 1).
- Soil samples will be collected at 5, 10, 15 and 20 feet bgs, and every 10 feet thereafter. Soils will be field screened for chloride during drilling activities by mixing soil samples with de-ionized water. The rinsate will be analyzed using Hach chloride test strips.
- Soil cuttings and samples will be visually inspected and logged according to the Unified Soil Classification System.
- Borings will not be advanced into the groundwater table; therefore, a plugging plan will not be required by the New Mexico State Engineer's Office.
- Soil borings will be backfilled with the cuttings from the borings up to 10 feet bgs, and then with hydrated bentonite pellets from 10 feet bgs to the ground surface. Remaining soil cuttings will be thin spread on site, pending field screening results.
- Selected soil samples will be submitted to the analytical laboratory for analysis of chloride by EPA Method 300.

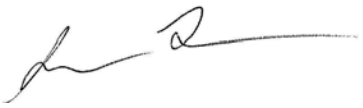
2.2 Task II - Reporting

A summary report will be prepared following completion of all field activities and receipt of the finalized analytical data. The report will summarize the results of the soil assessment and will include a sample location map, tabulation of the soil analytical results, photographic documentation, and boring logs. The report will also include conclusions and future recommendations, as appropriate. The report will be finalized and submitted to the NMCOD and the NMSLO.

If you have any questions, please contact me at 713-734-3090.

Sincerely,

GHD



Scott Foord, P.G.
Project Manager

SF/sh/1

Encl.

Attachment: Figure 1 – Proposed Soil Boring Location Map

NOTES:

1. All analytical results reported in mg/kg.
2. Yellow shaded cells indicate exceedance of the NMOCD RRAL of 250 mg/kg for chloride.
3. Depth of samples reported in feet.
4. "<" indicates below laboratory detection limit.

Main Lease Road

Secondary Lease Road

SB-4 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	11.0	29.1	14.1	8.22	7.75	7.55	2.65

89N+10' 06/10/11	
Depth	2'
TPH (GRO + DRO)	26
Chloride	2,790

89W+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	3,970

89N+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	27
Chloride	1,570

89E+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	2,480

SB-7 10/25/17						
Depth	0.5-1'	4-5'	9-10'	19-20'	39-40'	49-50'
Chloride	23.9	1,630	413	564	378	371

SB-5 10/24/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	29.3	23.2	23.1	25.1

SB-3 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	4,450	405	511	399	479	540	561

SB-8 10/25/17						
Depth	0.5-1'	4-5'	9-10'	19-20'	39-40'	
Chloride	32.2	143	347	132	19.4	

89S+30' 06/10/11	
Depth	2'
TPH (GRO + DRO)	<13.0
Chloride	391

SB-6 10/24/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	32.1	45.1	34.3	37.8

SB-9 10/24/17								
Depth	0.5-1'	4-5'	9-10'	19-20'	19-20'*	29-30'	39-40'	49-50'
Chloride	24.4	365	680	678	669*	183	102	45.6

SB-2 09/18/15									
Depth	0'	5'	10'	15'	20'	25'	30'	40'	50'
Chloride	39.6	145	18.0	16.1	25.6	26.0	17.1	21.2	8.52

SB-1 09/18/15							
Depth	0'	5'	10'	15'	20'	25'	30'
Chloride	58.3	271	1,590	2,040	1,100	268	122

SB-10 10/24/17								
Depth	0.5-1'	4-5'	9-10'	19-20'	29-30'	39-40'	49-50'	59-60'
Chloride	418	733	1,420	897	1,010	1,050	621	297

SB-4, 89N+10', 89N+30', 89W+30', SB-3, SB-8, SB-5, SB-7, 89S+30', SB-2, SB-10, SB-1, SB-6, SB-9

LEGEND

	Proposed Soil Boring Location
	Soil Boring Location - 2011
	Soil Boring Location - 2015
	Soil Boring Location - 2017
	LPU #89 Well Marker
Depth	Depth of Sample (ft)
TPH	Total Petroleum Hydrocarbons Concentration (mg/kg)
DRO	TPH as Diesel Range Organics
GRO	TPH as Gasoline Range Organics
*	Indicates Duplicate Sample

Source: UDSA FSA Imagery, May 10, 2014

Lat/Long: 32.881111° North, 103.29512° West

0 20 50ft

Coordinate System: NAD 1983 StatePlane- New Mexico East (US Feet)

Sample ID — SB-3 09/18/15 — Sample Date
Depth 0' — Sample Depth (ft)
Chloride 4450 — Sample Result (mg/kg)

GHD

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #89

074287-00

May 7, 2018

PROPOSED SOIL BORING LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\07----\074---\074287-CEMC-LPU # 89\Proposed\074287-00(Proposed-02)GN-DL001.dwg