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March 16, 2020

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

Re: Lovington Paddock Unit No. 59 Well Site
Case No. 1RP-915
2018 Site Assessment Report and Work Plan
Lea County, New Mexico

Dear whom it concerns,

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

- Lovington Paddock Unit No. 59 Well Site 1RP-915 2018 Site Assessment Report

The submittal was prepared by GHD Services, Inc. (GHD) on behalf of Chevron Environmental Management Company (CEMC).

Please do not hesitate to call Scott Foord with Arcadis U.S., Inc., the current consultant, at 713-953-4853 or myself at 832-854-5601, should you have any questions.

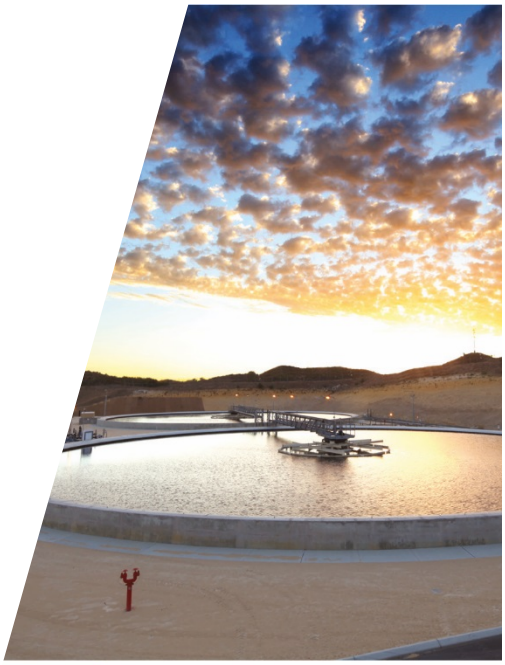
Sincerely,

Jason Michelson

Jason Michelson

Encl. Lovington Paddock Unit No. 59 Well Site 1RP-915 2018 Site Assessment Report

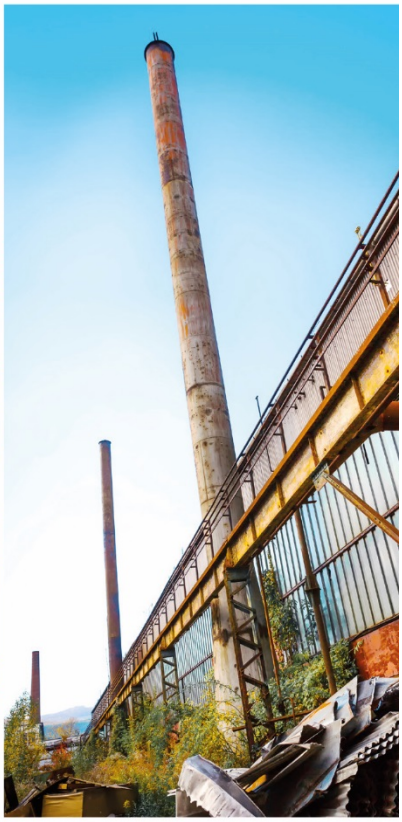
C.C. Amy Barnhill, Chevron/MCBU



Site Assessment Report

Lovington Paddock Unit 59
1RP-915
Produced Water Release
Lea County, New Mexico

Chevron Environmental Management Company



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1. Introduction

GHD is pleased to present this Site Assessment Report to Chevron Environmental Management Company (CEMC) for the Lovington Paddock Unit (LPU) 59 site release location (hereafter referred to as the "Site"). The Site is located in Unit G, Section 1, Township 17 South, Range 36 East, approximately 5 miles southeast of the City of Lovington (COL) in Lea County, New Mexico. The land surface is owned by the COL and the minerals are managed by the State of New Mexico. The location of the Site is identified on the vicinity map of Figure 1 and the aerial map of Figure 2.

2. Regulatory Criteria

2.1 Soil

Historical subsurface investigation activities were completed in accordance with the Guidelines for Remediation of Leaks, Spills, and Releases Rule 19.15.29 New Mexico Administrative Code (NMAC) from the New Mexico Oil Conservation Division (NMOCD) dated August 13, 1993. The former site-specific Recommended Remediation Action Levels (RRALs) previously applied to this location by the NMOCD were 10 milligrams per kilogram (mg/kg) for benzene, 50 mg/kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX), 100 mg/kg for total petroleum hydrocarbons (TPH), and 600 mg/kg for chloride.

Rule 19.15.29 was revised and reissued on August 14, 2018. The following criteria from Table 1 (below) within NMAC 19.15.29.12 was utilized to determine site-specific screening limits.

Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Limit*
>100 feet	Chloride**	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

* Numerical limits or natural background level, whichever is greater.

** This applies to release of produced water or other fluids which may contain chloride.

Localized depth to groundwater was confirmed to be approximately 107 feet below ground surface (bgs) in 2018 based on the information from monitoring wells MW-1 and MW-2 (located approximately 120-feet to the southeast of the original spill). See Figure 3 for monitoring well and soil boring locations. Additionally, information available from various sources including the New Mexico Office of the State Engineer (NMOSE) Point of Diversion (POD) Mapping Portal, Petroleum Recovery Research Center (PRRC) Mapping Portal, currently managed groundwater site(s) data by GHD, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:

a) the depth to groundwater at the Site is greater than 100-feet bgs;

b) the site is not within 300 feet of any continuously flowing watercourse;

c) the site is not within 200 feet of any lakebed, sinkhole or playa lake;

d) the site is not within 300 feet of an occupied permanent residence, school, etc.;

e) the site is not within 500 feet of a spring or private, domestic fresh water well;

f) the site is not within 1,000 feet of any fresh water well or spring;

g) the site is not within incorporated municipal boundaries or within a defined municipal fresh water well field;

h) the site is not within 300 feet of a wetland;

i) the site is not within an area overlying a subsurface mine;

j) the site is not within an unstable area; and

k) the site is not within a 100-year floodplain.

Consequently, the anticipated site-specific screening limits to be applied to this location by the NMOCD based on the revised Rule are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 2,500 mg/kg for total TPH, and 20,000 mg/kg for chloride.

2.2 Groundwater

The guidance also requires remediation of groundwater to human health standards of the New Mexico Water Quality Control Commission (NMWQCC) established in New Mexico Administrative Code Section 20.6.2.3103. Standards for chloride and total dissolved solids (TDS) are listed below.

Analyte	NMWQCC Standard for Groundwater (mg/L)
Chloride	250
TDS	1,000

3. Project Information and Background

According to historical records provided to GHD, an estimated 40 barrels (10 barrels recovered) of produced water were released from a pipe in a valve box at this location on June 4, 2006. The approximate affected area was estimated at 200 feet x 200 feet.

Shallow soil samples were collected from the impacted area in July 2010 from six hand augered sample locations (AH-1 through AH-6) at sampling intervals of 0 to 0.5 feet below ground surface (bgs), and in August 2010 from six locations in a sample trench (T-1 through T-6) at sample intervals of 0 to 1 feet bgs. Sample analyses included TPH; BTEX; and chloride from the July 2010 sampling event, and chloride only during the August 2010 sampling event. TPH and BTEX concentrations were below laboratory detection limits in the upper sample intervals from the hand augered locations (0 to 0.5 feet), and therefore these analyses were not performed for the deeper intervals collected

from the trench samples. Chloride results from both intervals collected at locations AH-2, AH-4, T-2, T-3, T-4, T-5, and T-6 exceeded the historical RRAL of 250 mg/kg for chloride.

In May 2011, GHD subcontractor Harrison Cooper, Inc. (HCI) advanced five soil borings (SB-1 through SB-5) utilizing an air-rotary drilling rig to depths ranging from 20 to 40 feet bgs, and soil samples were collected at five-foot intervals within each of the five soil borings. Samples were submitted to ALS Environmental laboratory in Houston, Texas for analysis of chlorides by EPA Method 300.

Laboratory analytical results indicated that the vertical extent of chloride impact was not yet defined in borings SB-2 and SB-3. On June 27, 2012, GHD and CEMC met at the NMOCD District 1 Hobbs office to discuss the path forward for the Site. The NMOCD requested that additional assessment be completed to further evaluate the vertical extent of chloride impacts.

In December 2012, under the supervision of GHD, HCI advanced two additional borings (SB-2b and SB-3b) utilizing an air-rotary drilling rig to depths of 70 feet bgs. Soil samples were collected from 40 to 70 feet bgs at 10-foot intervals in an effort to delineate the vertical extent of chloride impacts to soil. Samples were placed in laboratory-supplied sample containers on ice, labeled, and submitted to Lancaster Labs in Lancaster, Pennsylvania for analysis of chloride by EPA Method 300. Groundwater was not encountered in either boring. Following completion of activities, the borings were backfilled with hydrated bentonite pellets to the ground surface.

Monitoring well MW-1 was installed in October 2016 to assess potential groundwater impact in follow-up to soil analytical results collected and reported during previous assessments conducted in 2010 through 2012. The initial assessments indicated chloride concentrations extending vertically to a depth of at least 70 feet bgs. MW-1 was installed utilizing mud rotary drilling methods therefore no soil samples were collected during MW-1 installation activities. The depth to groundwater was confirmed at the Site at 101 feet bgs. BTEX and TPH constituents were non-detect in the groundwater sample, and chloride concentrations reported for the groundwater sample collected from MW-1 in October 2016 were below the NMWQCC standard of 250 milligrams per liter (mg/L).

Analytical results associated with assessment activities conducted from 2010 through 2016 indicated that the horizontal and vertical extent of chloride impact in soil had not been fully delineated. Groundwater from MW-1 was re-sampled in May 2017, and six additional soil borings (SB-6 through SB-11) were advanced and analytical analyses performed in October 2017 in an attempt to fully delineate the horizontal and vertical extents of chloride impact to soil.

The Site is delineated based on the revised NMOCD regulatory requirements for chloride in soil. Groundwater sample results from MW-1 were below NMWQCC standards for chloride and TDS. However, NMOCD requested a down gradient well be installed to confirm no impact to groundwater down gradient of the release area. As such, MW-2 was installed approximately 130-feet in the general down gradient direction (southeast of the spill location). Details of the drilling and sampling activities for MW-2 are in the following sections.

4. 2018 Drilling and Sampling

One monitoring well (MW-2) was advanced at the Site to further assess and impact to water southeast of the release area. Prior to mobilizing drilling equipment to the Site, the soil boring locations were pre marked and a New Mexico 811 One-Call utility locate was completed at least 48 hours prior to start of work. A secondary utility check was completed that included Ground Penetrating Radar (GPR) services by High Mesa of Albuquerque, New Mexico.

On September 6, 2018, GHD and GHD subcontractor HCI, mobilized to the Site to begin monitoring well installation activities for MW-2. The well was pre-cleared with a hydro-excavator to a depth of 5 feet bgs or until refusal. The well was then drilled to 90 feet bgs via air rotary and then to 130 feet bgs with mud rotary due to borehole collapse. The total drilling depth was approximately 25-feet below the water table. During drilling, a GHD geologist observed, visually inspected, and logged soil cuttings at 10-foot intervals and recorded subsurface lithology in accordance with the Unified Soil Classification System in field books. The boring log prepared from the field information can be found in Appendix A.

The soil types observed in soil samples collected during the drilling program consisted of fine grained sand with caliche followed by fine grained sand with pebbles and then poorly graded sand with caliche. Chloride screening was accomplished in the field by mixing soil samples with distilled water, then testing the rinsate using Hach chloride test strips.

Soils samples were collected for laboratory analysis from MW-2 at 4, 10, 20, 30, 40, 50, 60, 70, 80, and 90 feet bgs. Soil samples were packed into laboratory prepared jars and stored in a cooler with ice. The soil samples were sent to Xenco Laboratories (Xenco) in Midland, Texas for chloride analysis by EPA Method 300.

4.1 Soil Sampling Analytical Results

A soil analytical summary of results from 2010 through 2018 is presented in Table 1. A Chloride Analytical Results Map for Soils (2010 – 2018) is presented as Figure 4.

- Chloride concentrations above the revised Rule 19.15.29 screening limit of 20,000 mg/kg were not reported in any of the soil samples collected from MW-2.

The 2018 soil laboratory analytical report is included in Appendix B.

5. Groundwater Assessment

Groundwater sample results from existing monitoring well MW-1 have been collected at a minimum of annually since October 2016 with reported chloride concentrations below the NMWQCC standard of 250 mg/L. All groundwater samples have also been below the TDS standard of 1,000 mg/L. MW-2 was installed in September 2018 and MW-1 was re-sampled in October 2018 along with newly installed well MW-2.

5.1 Monitoring Well Installation

MW-2 was completed with four-inch diameter, schedule 40 polyvinyl chloride (PVC) casing, 30 feet of 0.010-inch PVC slotted screen, a 20/40 sand filter pack overlain by a bentonite seal extending up to 10 feet bgs, and riser casing extending above the ground surface. The well was completed at the surface with a stick-up protective casing set in an approximate 2 feet by 2 feet concrete pad.

Preliminary gauging data indicated that groundwater was present at approximately 105 feet below the top of casing. The well was developed by removal of sufficient volumes of water to clear the well casing and annulus of sediment. Turbid water was removed with a 3-inch diameter bailer. Following bailing, well development was completed by pumping with a submersible pump. The boring log, well construction diagram, and the State Well Report are provided in Appendix A.

Soil cuttings, drilling fluids and well development water were contained in a lined mudbox. The drill cuttings/fluids and development water were transported as exploration and production (E&P) exempt waste to Sundance Services, Inc. near Eunice, New Mexico.

5.2 Groundwater Sampling

Groundwater gauging was conducted and the vertical conductivity profiled throughout the entire water column of each of the monitoring wells (MW-1 and MW-2) prior to groundwater sampling activities. Depth to groundwater was measured in MW-1 and MW-2 to the nearest hundredth of a foot (106.42 and 107.30 feet bgs respectively) from the top of casing using an electronic water level meter on October 31, 2018. The conductivity profile of the water column was determined by recording conductivity at five-foot intervals from the top of the water column to the total depth of the well (230 feet bgs for MW-1 and 130 feet bgs for MW-2). The results of the conductivity profile are summarized on Table 3.

Low-flow purging techniques were used prior to sampling. During purging, the flow rate was adjusted to approximately 100 milliliters per minute in order to achieve minimal drawdown from the static water level. Temperature, oxidation reduction potential (ORP), pH, conductivity, and dissolved oxygen (DO) were monitored during purging. Purging continued until at least three of these parameters remained stabilized within a 10 percent range during three consecutive measurements. A groundwater sample was then collected in laboratory-supplied containers, labeled, and chilled on ice in an insulated cooler to maintain a temperature of 40°F (4°C) or lower. Field equipment was decontaminated with a Liquinox™ wash and distilled water rinse before beginning field activities and between wells.

Groundwater samples were submitted to Xenco Laboratories in Midland, Texas for analysis of chloride by EPA Method 300 and TDS by Method SM2540C. Chain of custody documentation was maintained throughout the sample collection and delivery process. Analyses were completed within required holding times.

5.3 Groundwater Analytical Results

Chloride was detected at a concentration of 159 mg/L from MW-1 and 137 mg/L from MW-2, which are both below the 250 mg/L standard. TDS was reported at a concentration of 727 mg/L from the

sample collected from MW-1 and 753 mg/L from the sample collected from MW-2, which are below the 1,000 mg/L standard.

Groundwater analytical results for chloride and TDS are summarized in Table 2 in reference to NMWQCC standards. The laboratory analytical report is provided in Appendix B.

6. Summary of Findings

Evaluation of the analytical data obtained from soil assessment and delineation activities performed from 2010 through 2018 indicate horizontal and vertical delineation of chloride impacts to soil has been achieved at the Site.

6.1 2019 Remediation Activities

Lateral and horizontal delineation of soil has been completed at the Site. Groundwater samples collected from MW-1 and MW-2 have confirmed no impact to groundwater at the Site. As such, soil remediation activities (excavation) per NMAC 19.15.29.13 will be conducted at the Site following NMOCD approval of the 2019 Remediation Work Plan attached as Appendix C of this report. GHD would also like to request permission to plug and abandon monitoring wells MW-1 and MW-2.

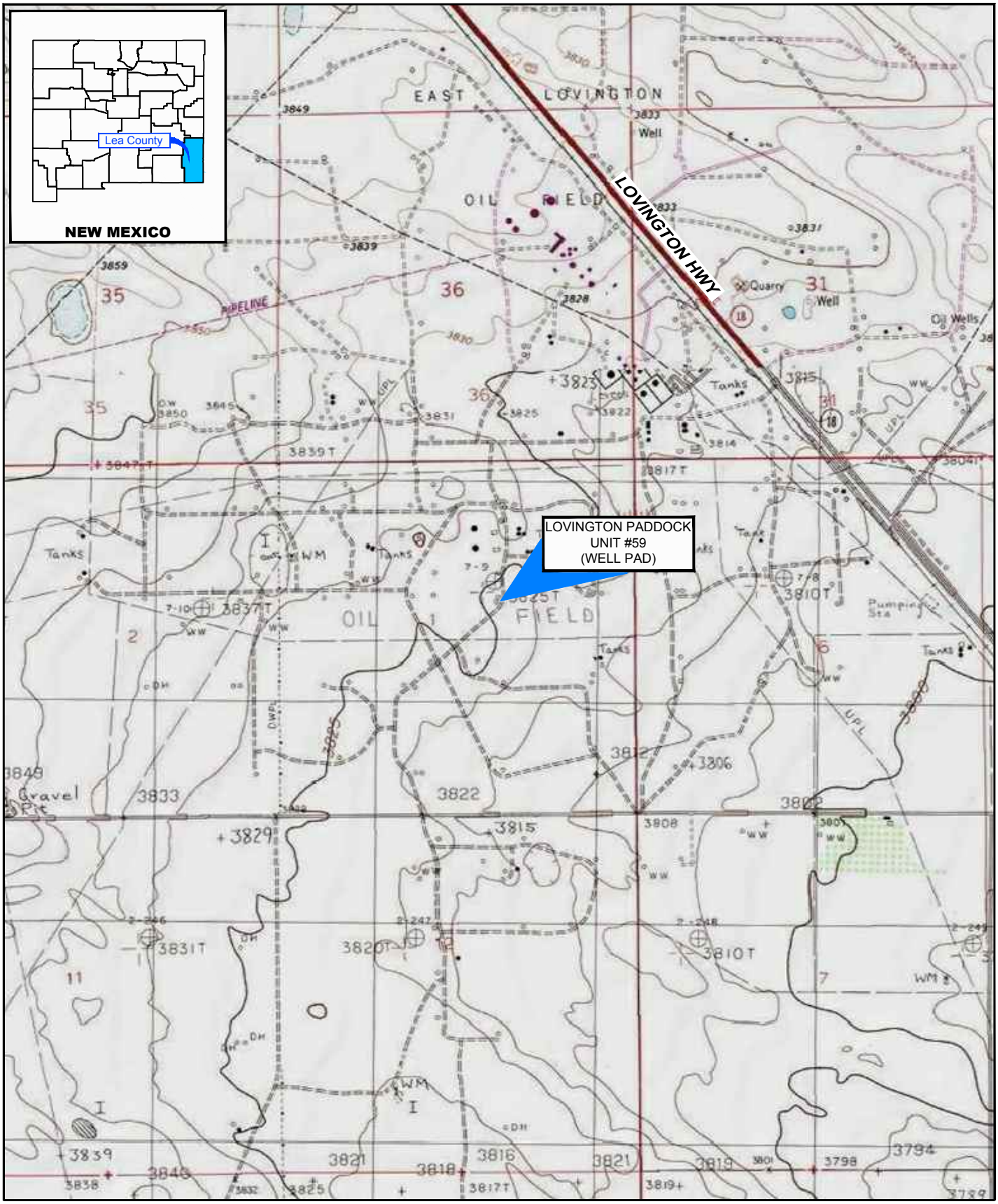
All of Which is Respectfully Submitted,

GHD

Paige Hall
Project Manager

Raaj U. Patel, P.G.,
Senior Project Manager

Figures



Source: USGS 7.5 Minute Quad "Lovington SE and Lovington, New Mexico"

Lat/Long: 32.8657° North, 103.3060° West

0 1000 2000ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00

Feb 6, 2018

SITE VICINITY MAP

FIGURE 1

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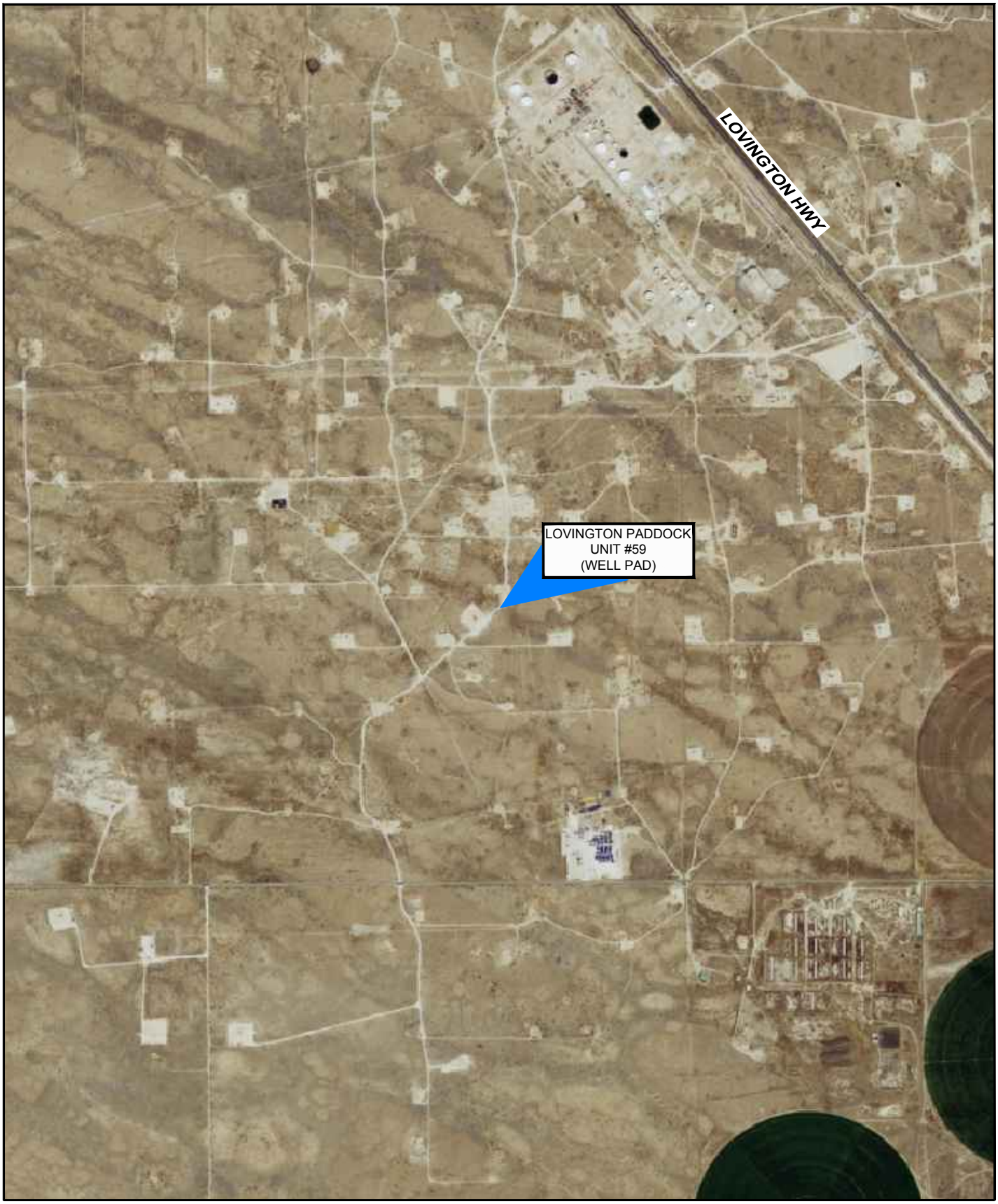

Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.8657° North, 103.3060° West

0 500 1500ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00

Feb 6, 2018

SITE LOCATION MAP

FIGURE 2

CAD File: I:\CAD\Files\07-----\073---\073819-CEMC LPU #59\073819-00\073819-00(006)\073819-00(006)GN-DL001.dwg

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Lat/Long: 32.8657° North, 103.3060° West

0 10 30ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

GHD

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00

Nov 14, 2018

SOIL BORING AND MONITOR WELL LOCATION MAP

FIGURE 3

CAD File: I:\CAD\Files\07----\073---\073819-CEMC-LPU #59\073819-00\073819-00(006)\073819-00(006)GN-DL001.dwg

SB-10 10/19/17								
Depth	0.5-1'	4-5'	9-10'	19-20'	29-30'	39-40'	49-50'	59-60'
Chloride	<4.93	191	645	1,400	564	423	64.7	28.9

SB-10

AH-1 7/16/10	
Depth	0-0.5'
Chloride	<200
T-1 8/18/10	
Depth	0.5-1'
Chloride	448

AH-1 T-1

SB-5 5/27/11				
Depth	4-5'	9-10'	14-15'	15-20'
Chloride	4.96	75.2	22.4	49.2

SB-6 10/19/17						
Depth	0.5-1'	4-5'	9-10'	19-20'	29-30'	29-30"*
Chloride	5.19	6.24	11.8	19.7	225	222*

SB-6

SB-7 10/19/17							
Depth	0.5-1'	4-5'	9-10'	19-20'	69-70'	79-80'	89-90'
Chloride	7.71	<4.95	17.50	286	52.0	53.4	78.1

AH-2 7/16/10	
Depth	0-0.5'
Chloride	2,910
T-2 8/18/10	
Depth	0.5-1'
Chloride	1,620

AH-2 T-2

LPU #59 SB-5

AH-6 7/16/10	
Depth	0-0.5'
Chloride	<200
T-6 8/18/10	
Depth	0.5-1'
Chloride	534

AH-6 T-6

AH-5 T-5

SB-2 5/27/11								
Depth	4-5'	9-10'	14-15'	19-20'	24-25'	29-30'	34-35'	39-40'
Chloride	102	312	706	1,260	1,174	1,180	1,140	622

LPU #59 SB-2

SB-3 5/27/11				
Depth	4-5'	9-10'	14-15'	19-20'
Chloride	148	436	390	338

LPU #59 SB-3

LPU #59 SB-3b

SB-7

MW-1

AH-5 7/16/10	
Depth	0-0.5'
Chloride	<400
T-5 8/18/10	
Depth	0.5-1'
Chloride	515

SB-2b 12/18/12			
Depth	49-50'	59-60'	69-70'
Chloride	606	618	176

LPU #59 SB-2b

SB-11

AH-3 T-3

SB-4 5/27/11				
Depth	4-5'	9-10'	14-15'	15-20'
Chloride	70.6	12	12	12

LPU #59 SB-4

SB-11 10/19/17							
Depth	0.5-1'	4-5'	9-10'	19-20'	69-70'	79-80'	89-90'
Chloride	<24.6	9.97	<4.94	<4.95	12.3	9.8	13.8

AH-3 7/16/10	
Depth	0-0.5'
Chloride	<400
T-3 8/18/10	
Depth	0.5-1'
Chloride	7,140

AH-4 T-4

SB-3b 12/18/12			
Depth	49-50'	59-60'	69-70'
Chloride	2,210	1,750	1,690

AH-4 7/16/10	
Depth	0-0.5'
Chloride	2,720
T-4 8/18/10	
Depth	0.5-1'
Chloride	1,650

SB-8

LPU # 59 SB-1

LOVINGTON PADDOCK UNIT #59 Well

SB-1 5/27/11				
Depth	4-5'	9-10'	14-15'	15-20'
Chloride	4.75	54.1	104	111

SB-8 10/19/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	<4.94	6.74	<4.92	84.4

MW-2

SB-9

SB-9 10/19/17				
Depth	0.5-1'	4-5'	9-10'	19-20'
Chloride	11.2	17.7	5.31	58.2

MW-2 9/6/18										
Depth	4'	10'	20'	30'	40'	50'	60'	70'	80'	90'
Chloride	34.3	20.2	33.9	13.1	15.6	28.8	12.4	19.3	<5.44	<5.31

LEGEND

- MONITORING WELL
- SOIL BORING LOCATION (OCTOBER 2017)
- BORING LOCATION (MAY 2011 / DECEMBER 2012)
- AUGER HOLE SAMPLE LOCATION (JULY 2010)
- SAMPLE TRENCH (AUGUST 2010)

NOTES:

1. All analytical results reported in mg/kg.
2. Highlighted cells indicate concentrations exceeding guidance RRALs of 20,000 mg/kg for chloride.
3. Depth of samples reported in feet.

Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.8657° North, 103.3060° West

0 10 30ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

Sample ID — SB-2b 12/18/12 — Sample Date
Depth 4-5' — Sample Depth (ft)
Chloride 606 — Sample Result (mg/kg)

GHD

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00

Jan 5, 2019

CHLORIDE ANALYTICAL RESULTS MAP - SOILS

FIGURE 4

CAD File: I:\CAD\Files\07----\073---\073819-CEMC-LPU #59\073819-00\073819-00(006)\073819-00(006)GN-DL001.dwg

Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.8657° North, 103.3060° West

0 10 30ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

Sample ID — MW-2 10/31/18 — Sample Date
Chloride 137 — Sample Result (mg/L)
TDS 753

GHD

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00
Jan 2, 2019

CHLORIDE ANALYTICAL RESULTS MAP - GROUND WATER

FIGURE 5

CAD File: I:\CAD\Files\07----\073---\073819-CEMC-LPU #59\073819-00\073819-00(006)\073819-00(006)GN-DL001.dwg

Tables

Summary of Soil Analytical Results
Chevron Environmental Management Company
Lovington Paddock Unit 59
Lea County, New Mexico

Sample ID	Depth (feet)	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	TPH			Chlorides
								DRO	GRO	GRO/DRO	
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NMOCD Screening Standards											
			10	**---**	**---**	**---**	**50**	**---**	**---**	**1,000**	**20,000**
Restoration Requirements within the Top 4 feet bgs											**600***
AH-1	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<200
T-1	0.5-1	8/18/10	--	--	--	--	--	--	--	--	448.00
AH-2	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	**2910.00**
T-2	0.5-1	8/18/10	--	--	--	--	--	--	--	--	**1620.00**
AH-3	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<400
T-3	0.5-1	8/18/10	--	--	--	--	--	--	--	--	**7140.00**
AH-4	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	**2720.00**
T-4	0.5-1	8/18/10	--	--	--	--	--	--	--	--	**1650.00**
AH-5	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<400
T-5	0.5-1	8/18/10	--	--	--	--	--	--	--	--	515.00
AH-6	0-0.5	7/6/10	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<50.0	<2.00	<50.0	<200
T-6	0.5-1	8/18/10	--	--	--	--	--	--	--	--	534.00
SB-1	4-5	5/26/11	--	--	--	--	--	--	--	--	4.75
	9-10	5/26/11	--	--	--	--	--	--	--	--	54.10
	14-15	5/26/11	--	--	--	--	--	--	--	--	104.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	111.00
SB-2	4-5	5/26/11	--	--	--	--	--	--	--	--	102.00
	9-10	5/26/11	--	--	--	--	--	--	--	--	312.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	706.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	1260.00
	24-25	5/26/11	--	--	--	--	--	--	--	--	1174.00
	29-30	5/26/11	--	--	--	--	--	--	--	--	1180.00
	34-35	5/26/11	--	--	--	--	--	--	--	--	1140.00
	39-40	5/26/11	--	--	--	--	--	--	--	--	622.00
SB-2B	49-50	12/18/12	--	--	--	--	--	--	--	--	606.00
	59-60	12/18/12	--	--	--	--	--	--	--	--	618.00
	69-70	12/18/12	--	--	--	--	--	--	--	--	176.00
SB-3	4-5	5/26/11	--	--	--	--	--	--	--	--	148.00
	9-10	5/26/11	--	--	--	--	--	--	--	--	436.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	390.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	338.00
SB-3b	49-50	12/18/12	--	--	--	--	--	--	--	--	2210.00
	59-60	12/18/12	--	--	--	--	--	--	--	--	1750.00
	69-70	12/18/12	--	--	--	--	--	--	--	--	1690.00
SB-4	4-5	5/26/11	--	--	--	--	--	--	--	--	70.60
	9-10	5/26/11	--	--	--	--	--	--	--	--	12.00
	14-15	5/26/11	--	--	--	--	--	--	--	--	12.00
	19-20	5/26/11	--	--	--	--	--	--	--	--	12.00
SB-5	4-5	5/26/11	--	--	--	--	--	--	--	--	4.96
	9-10	5/26/11	--	--	--	--	--	--	--	--	75.20
	14-15	5/26/11	--	--	--	--	--	--	--	--	22.40
	19-20	5/26/11	--	--	--	--	--	--	--	--	49.20
SB-6	0.5-1	10/19/17	--	--	--	--	--	--	--	--	5.19
	4-5	10/19/17	--	--	--	--	--	--	--	--	6.24
	9-10	10/19/17	--	--	--	--	--	--	--	--	11.80
	19-20	10/19/17	--	--	--	--	--	--	--	--	19.70
	29-30	10/19/17	--	--	--	--	--	--	--	--	225.00
Dup.	29-30	10/19/17	--	--	--	--	--	--	--	--	222.00
SB-7	0.5-1	10/19/17	--	--	--	--	--	--	--	--	7.71
	4-5	10/19/17	--	--	--	--	--	--	--	--	<4.95
	9-10	10/19/17	--	--	--	--	--	--	--	--	17.50

Summary of Soil Analytical Results
Chevron Environmental Management Company
Lovington Paddock Unit 59
Lea County, New Mexico

Sample ID	Depth (feet)	Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total BTEX	TPH			Chlorides
								DRO	GRO	GRO/DRO	
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NMOCD Screening Standards											
			10	**---**	**---**	**---**	**50**	**---**	**---**	**1,000**	**20,000**
Restoration Requirements within the Top 4 feet bgs											**600***
SB-7	19-20	10/19/17	--	--	--	--	--	--	--	--	286.00
	29-30	10/19/17	--	--	--	--	--	--	--	--	--
	39-40	10/19/17	--	--	--	--	--	--	--	--	--
	49-50	10/19/17	--	--	--	--	--	--	--	--	--
	59-60	10/19/17	--	--	--	--	--	--	--	--	--
	69-70	10/19/17	--	--	--	--	--	--	--	--	52.00
	79-80	10/19/17	--	--	--	--	--	--	--	--	53.40
	89-90	10/19/17	--	--	--	--	--	--	--	--	78.10
SB-8	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<4.94
	4-5	10/19/17	--	--	--	--	--	--	--	--	6.74
	9-10	10/19/17	--	--	--	--	--	--	--	--	<4.92
	19-20	10/19/17	--	--	--	--	--	--	--	--	84.40
SB-9	0.5-1	10/19/17	--	--	--	--	--	--	--	--	11.20
	4-5	10/19/17	--	--	--	--	--	--	--	--	17.70
	9-10	10/19/17	--	--	--	--	--	--	--	--	5.31
	19-20	10/19/17	--	--	--	--	--	--	--	--	58.20
SB-10	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<4.93
	4-5	10/19/17	--	--	--	--	--	--	--	--	191.00
	9-10	10/19/17	--	--	--	--	--	--	--	--	645.00
	19-20	10/19/17	--	--	--	--	--	--	--	--	1400.00
	29-30	10/19/17	--	--	--	--	--	--	--	--	564.00
	39-40	10/19/17	--	--	--	--	--	--	--	--	423.00
	49-50	10/19/17	--	--	--	--	--	--	--	--	64.70
	59-60	10/19/17	--	--	--	--	--	--	--	--	28.90
SB-11	0.5-1	10/19/17	--	--	--	--	--	--	--	--	<24.6
	4-5	10/19/17	--	--	--	--	--	--	--	--	9.97
	9-10	10/19/17	--	--	--	--	--	--	--	--	<4.94
	19-20	10/19/17	--	--	--	--	--	--	--	--	<4.95
	29-30	10/19/17	--	--	--	--	--	--	--	--	--
	39-40	10/19/17	--	--	--	--	--	--	--	--	--
	49-50	10/19/17	--	--	--	--	--	--	--	--	--
	59-60	10/19/17	--	--	--	--	--	--	--	--	--
	69-70	10/19/17	--	--	--	--	--	--	--	--	12.30
	79-80	10/19/17	--	--	--	--	--	--	--	--	9.83
	89-90	10/19/17	--	--	--	--	--	--	--	--	13.80
MW-02	4	9/6/18	--	--	--	--	--	--	--	--	34.30
	10	9/6/18	--	--	--	--	--	--	--	--	20.20
	20	9/6/18	--	--	--	--	--	--	--	--	33.90
	30	9/6/18	--	--	--	--	--	--	--	--	13.10
	40	9/6/18	--	--	--	--	--	--	--	--	15.60
	50	9/6/18	--	--	--	--	--	--	--	--	28.80
	60	9/6/18	--	--	--	--	--	--	--	--	12.40
	70	9/6/18	--	--	--	--	--	--	--	--	19.30
	80	9/6/18	--	--	--	--	--	--	--	--	<5.44
	90	9/6/18	--	--	--	--	--	--	--	--	<5.31

Notes:
- Bold concentrations are above lab reporting limits.
- Highlighted cells indicated concentrations exceeding screening standards
- "--" indicates not analyzed or not applicable
- BTEX analyses by EPA Method 8021B.
- TPH analyzed by EPA Method SW8015B Mod.
- Chloride analyzed by EPA Method 300.

Table 2

Summary of Groundwater Analytical Results
Chevron Environmental Management Company

Lea County, New Mexico

Well ID	Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH GRO	TPH DRO	Chloride	Total Dissolved Solids
NMWQCC Standards		0.01	0.75	0.75	0.62	--	--	250	1000
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-1	10/19/16	<0.002	<0.002	<0.002	<0.002	<1.50	<1.50	117	--
	5/26/17	--	--	--	--	--	--	144	530
	10/19/17	<0.002	<0.002	<0.002	<0.002	<1.50	<1.50	117	--
	10/31/18	--	--	--	--	--	--	159	727
MW-2	10/31/18	--	--	--	--	--	--	137	753
Dup-1	10/31/18	--	--	--	--	--	--	141	689

NOTES:

NMWQCC - New Mexico Water Quality Control Commission

'mg/L' indicates milligrams per liter

-- indicates analyte not analyzed

- BTEX analysis by EPA Method 8021B.

- TPH analysis by Method SW8015B.

- Chloride analyzed by EPA Method 300.1

Summary of MW-1 and MW-2 Electrical Conductivity Profile
Chevron Environmental Management Company
Lovington Paddock Unit 59
Lea County, New Mexico

Well: MW-1
Date: 10/31/2018

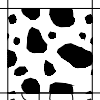
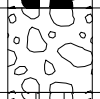
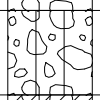
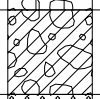
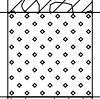
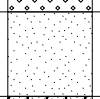
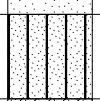
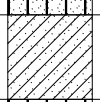
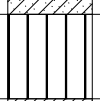
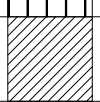
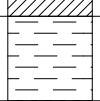
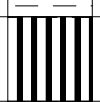
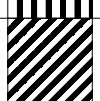
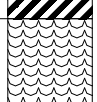
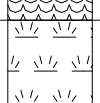
Depth	Conductivity	Temperature
106.42		
110	880	20.0
115	882	20.0
120	887	20.0
125	871	20.0
130	822	20.0
135	805	20.0
140	766	20.0
145	763	20.1
150	766	20.1
155	768	20.1
160	772	20.1
165	771	20.1
170	782	20.1
175	783	20.2
180	785	20.2
185	787	20.2
190	787	20.2
195	787	20.2
200	789	20.2
205	787	20.2
210	790	20.2
215	790	20.2
220	790	20.2
225	791	20.2
230	793	20.2
231.76		

NOTES:

Depth - feet below top of casing
Conductivity - microseimens per centimeter
Temperature - degrees Celsius

Appendices

Appendix A
Monitoring Well Log and State Well Report (MW-2)

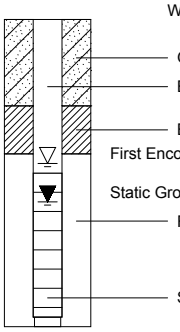
MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LESS THAN 15% FINES	GW		WELL-GRADED GRAVELS WITH OR WITHOUT SAND
			GP		POORLY-GRADED GRAVELS WITH OR WITHOUT SAND
		GRAVELS WITH 15% OR MORE FINES	GM		SILTY GRAVELS WITH OR WITHOUT SAND
			GC		CLAYEY GRAVELS WITH OR WITHOUT SAND
	SANDS MORE THAN HALF COARSE FRACTION IS FINER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 15% FINES	SW		WELL-GRADED SANDS WITH OR WITHOUT GRAVEL
			SP		POORLY-GRADED SANDS WITH OR WITHOUT GRAVEL
		SANDS WITH 15% OR MORE FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OL		ORGANIC SILTS OR CLAYS OF LOW TO MEDIUM PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			CH		INORGANIC CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
			OH		ORGANIC SILTS OR CLAYS OF HIGH PLASTICITY WITH OR WITHOUT SAND OR GRAVEL
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

SYMBOLS KEY

SAMPLE TYPES

- AK — Air Knife
- Auger Cuttings
- Composite
- Rock Core
- HV — Hydro-Vac
- HA — Hand Auger
- Large Bore
- P/S — Macro-Core
- Modified Split Spoon
- No Recovery
- Post Hole Digger
- Shelby Tube
- Sonic Core
- Split Spoon
- Undisturbed Core
- Vane Shear

WELL SYMBOLS



ABBREVIATION KEY

CA	-	CHEMICAL ANALYSIS (CORROSIVITY)	(200)	-	(WITH % PASSING NO. 200 SIEVE
CD	-	CONSOLIDATED DRAINED TRIAXIAL			
CN	-	CONSOLIDATION	SW	-	SWELL TEST
CU	-	CONSOLIDATED UNDRAINED TRIAXIAL	TC	-	CYCLIC TRIAXIAL
DS	-	DIRECT SHEAR	TV	-	TORVANE SHEAR
PP	-	POCKET PENETROMETER (TSF)	UC	-	UNCONFINED COMPRESSION
(3.0)	-	(WITH SHEAR STRENGTH IN KSF)	(1.5)	-	(WITH SHEAR STRENGTH IN KSF)
RV	-	R-VALUE			
SA	-	SIEVE ANALYSIS: % PASSING #200 SIEVE	UU	-	UNCONSOLIDATED UNDRAINED TRIAXIAL
			WA	-	WASH ANALYSIS
			(200%)		(WITH % PASSING NO. 200 SIEVE)

Key to Boring Log

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LPU-59
PROJECT NUMBER: 073819
CLIENT: Chevron
LOCATION: Lovington
DRILLING COMPANY: HCI

HOLE DESIGNATION: MW-2
DATE COMPLETED: 6 September 2018
DRILLING METHOD: Hydro Excavation, Air Rotary, Mud Rotary
FIELD PERSONNEL: Sean Parry

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	Monitoring Well	SAMPLE DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	Chloride (mg/kg)
	fine sand with caliche, yellowish orange, dry			4		1.0		34.3
				10		1.0		20.2
				20		1.0		33.9
	fine sand, light brown, dry	30.00		30		1.0		13.1
				40		1.0		15.6
			Cement Bentonite Mix; 4-inch SCH 40 PVC riser	50		1.0		28.8
	fine sand with pebbles, light yellowish orange, dry	60.00		60		1.0		12.4
	fine sand with some pebbles, light reddish brown, dry	70.00		70		1.0		19.3

NOTES: Mud Rotary began at 90 FT BGS
WATER FOUND ▽ STATIC WATER LEVEL ▼
LABORATORY ANALYSIS ⬭

OVERBURDEN LOG 073819 - LPU 59.GPJ CRA_CORP.GDT 25/9/18

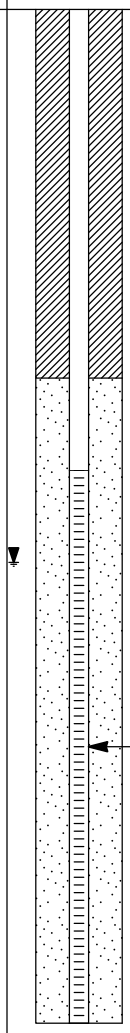
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LPU-59
PROJECT NUMBER: 073819
CLIENT: Chevron
LOCATION: Lovington
DRILLING COMPANY: HCI

HOLE DESIGNATION: MW-2
DATE COMPLETED: 6 September 2018
DRILLING METHOD: Hydro Excavation, Air Rotary, Mud Rotary
FIELD PERSONNEL: Sean Parry

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS
80	fine sand with some pebbles, light reddish brown, moist	80.00
100	poorly graded sand with caliche, very light brown	100.00
110	poorly graded sand with caliche, light brown	110.00
120	poorly graded sand, reddish brown	120.00
130	poorly graded sand, reddish brown	129.00
	END OF BOREHOLE @ 130.0ft BGS	130.00

Monitoring Well



WELL DETAILS
Screened interval:
100.00 to 130.00ft BGS
Length: 30ft
Slot Size: 0.01
Material: PVC
Seal:
0.00 to 95.00ft BGS
Material: Cement Bentonite Mix
Sand Pack:
95.00 to 130.00ft BGS
Material: 8/16 sieve sand

BOREHOLE DIAMETER 8

SAMPLE				
DEPTH (ft)	INTERVAL	REC (ft)	PP (tsf)	Chloride (mg/kg)
80		1.0		<5.44
90		1.0		<5.44

NOTES: Mud Rotary began at 90 FT BGS
WATER FOUND ▽ STATIC WATER LEVEL ▼
LABORATORY ANALYSIS ⬭

OVERBURDEN LOG 073819 - LPU 59.GPJ CRA_CORP.GDT 25/9/18

This log should not be used separately from the original report.

WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

1. GENERAL AND WELL LOCATION

OSE POD NO. (WELL NO.)	WELL TAG ID NO.	OSE FILE NO(S).
WELL OWNER NAME(S)		PHONE (OPTIONAL)
WELL OWNER MAILING ADDRESS		CITY STATE ZIP

WELL LOCATION (FROM GPS)	DEGREES	MINUTES	SECONDS	
	LATITUDE			N
	LONGITUDE			W

* ACCURACY REQUIRED: ONE TENTH OF A SECOND

* DATUM REQUIRED: WGS 84

DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS – PLSS (SECTION, TOWNSHJIP, RANGE) WHERE AVAILABLE

2. DRILLING & CASING INFORMATION

LICENSE NO.	NAME OF LICENSED DRILLER			NAME OF WELL DRILLING COMPANY
DRILLING STARTED	DRILLING ENDED	DEPTH OF COMPLETED WELL (FT)	BORE HOLE DEPTH (FT)	DEPTH WATER FIRST ENCOUNTERED (FT)
COMPLETED WELL IS:	ARTESIAN	DRY HOLE	SHALLOW (UNCONFINED)	STATIC WATER LEVEL IN COMPLETED WELL (FT)
DRILLING FLUID:	AIR	MUD	ADDITIVES – SPECIFY:	
DRILLING METHOD:	ROTARY	HAMMER	CABLE TOOL	OTHER – SPECIFY:

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE (add coupling diameter)	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)

3. ANNULAR MATERIAL

DEPTH (feet bgl) FROM	TO	BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT

FOR OSE INTERNAL USE

WR-20 WELL RECORD & LOG (Version 06/30/17)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 1 OF 2

4. HYDROGEOLOGIC LOG OF WELL

DEPTH (feet bgl) FROM	TO	THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES **(attach supplemental sheets to fully describe all units)**	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER-BEARING ZONES (gpm)
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
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				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	
				☐ Y ☐ N	

METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: PUMP AIR LIFT BAILER OTHER – SPECIFY:	TOTAL ESTIMATED WELL YIELD (gpm):

5. TEST; RIG SUPERVISION

WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.

MISCELLANEOUS INFORMATION:

PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE:

6. SIGNATURE

THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 30 DAYS AFTER COMPLETION OF WELL DRILLING:

SIGNATURE OF DRILLER / PRINT SIGNEE NAME   DATE

FOR OSE INTERNAL USE   WR-20 WELL RECORD & LOG (Version 06/30/2017)

FILE NO.	POD NO.	TRN NO.	
LOCATION		WELL TAG ID NO.	PAGE 2 OF 2

Appendix B
Laboratory Analytical Reports – 2018

Certificate of Analysis Summary 598441

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59

Project Id: 073819-2018-001
Contact: Scott Foord
Project Location:

Date Received in Lab: Sat Sep-08-18 08:00 am
Report Date: 21-SEP-18
Project Manager: Debbie Simmons

Analysis Requested													
	Lab Id:	598441-001		598441-002		598441-003		598441-004		598441-005		598441-006	
	Field Id:	MW2-4-060918		MW2-10-060918		MW2-20-060918		MW2-30-060918		MW2-40-060918		MW2-50-060918	
	Depth:	4-		10-		20-		30-		40-		50-	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Sep-06-18 11:30		Sep-06-18 11:35		Sep-06-18 11:40		Sep-06-18 11:45		Sep-06-18 11:50		Sep-06-18 11:55	
Chloride by EPA 300	***Extracted:***	Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 12:15	
	Analyzed:	Sep-11-18 15:10		Sep-11-18 15:16		Sep-11-18 15:41		Sep-11-18 15:47		Sep-11-18 15:53		Sep-11-18 15:59	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		34.3	5.52	20.2	5.36	33.9	5.38	13.1	5.41	15.6	5.56	28.8	5.37
Percent Moisture	***Extracted:***												
	Analyzed:	Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40	
	Units/RL:	%	RL	%	RL	%	RL	%	RL	%	RL	%	RL
Percent Moisture		9.99		6.94		7.24		7.56		10.1		6.30	

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Debbie Simmons
Project Manager

Final 1.000

Certificate of Analysis Summary 598441

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59

Project Id: 073819-2018-001
Contact: Scott Foord
Project Location:

Date Received in Lab: Sat Sep-08-18 08:00 am
Report Date: 21-SEP-18
Project Manager: Debbie Simmons

Analysis Requested													
	Lab Id:	598441-007		598441-008		598441-009		598441-010					
	Field Id:	MW2-60-060918		MW2-70-060918		MW2-80-060918		MW2-90-060918					
	Depth:	60-		70-		80-		90-					
	Matrix:	SOIL		SOIL		SOIL		SOIL					
	Sampled:	Sep-06-18 11:57		Sep-06-18 12:00		Sep-06-18 12:05		Sep-06-18 12:10					
Chloride by EPA 300	***Extracted:***	Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 12:15		Sep-11-18 14:00					
	Analyzed:	Sep-11-18 16:06		Sep-11-18 16:12		Sep-11-18 16:18		Sep-11-18 16:55					
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL				
Chloride		12.4	5.16	19.3	5.51	<5.44	5.44	<5.31	5.31				
Percent Moisture	***Extracted:***												
	Analyzed:	Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40		Sep-11-18 11:40					
	Units/RL:	%	RL	%	RL	%	RL	%	RL				
Percent Moisture		3.42		9.46		8.02		5.48					

Debbie Simmons
Project Manager

Analytical Report 598441

for

GHD Services, INC- Midland

Project Manager: Scott Foord

CEMC LPU-59

073819-2018-001

21-SEP-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-27), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-13)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-17)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-16)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

21-SEP-18

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

Reference: XENCO Report No(s): **598441**
CEMC LPU-59
Project Address:

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) 598441. 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. 598441 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,

Debbie Simmons

Debbie Simmons
Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America

Sample Cross Reference 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW2-4-060918	S	09-06-18 11:30	4	598441-001
MW2-10-060918	S	09-06-18 11:35	10	598441-002
MW2-20-060918	S	09-06-18 11:40	20	598441-003
MW2-30-060918	S	09-06-18 11:45	30	598441-004
MW2-40-060918	S	09-06-18 11:50	40	598441-005
MW2-50-060918	S	09-06-18 11:55	50	598441-006
MW2-60-060918	S	09-06-18 11:57	60	598441-007
MW2-70-060918	S	09-06-18 12:00	70	598441-008
MW2-80-060918	S	09-06-18 12:05	80	598441-009
MW2-90-060918	S	09-06-18 12:10	90	598441-010

CASE NARRATIVE

Client Name: GHD Services, INC- Midland

Project Name: CEMC LPU-59

Project ID: *073819-2018-001*
Work Order Number(s): *598441*

Report Date: *21-SEP-18*
Date Received: *09/08/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-4-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-001	Date Collected:	09.06.18 11.30	Sample Depth:	4
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	9.99
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**34.3**	5.52	mg/kg	09.11.18 15.10		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-10-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-002	Date Collected:	09.06.18 11.35	Sample Depth:	10
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	6.94
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**20.2**	5.36	mg/kg	09.11.18 15.16		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-20-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-003	Date Collected:	09.06.18 11.40	Sample Depth:	20
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	7.24
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**33.9**	5.38	mg/kg	09.11.18 15.41		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-30-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-004	Date Collected:	09.06.18 11.45	Sample Depth:	30
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	7.56
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**13.1**	5.41	mg/kg	09.11.18 15.47		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-40-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-005	Date Collected:	09.06.18 11.50	Sample Depth:	40
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	10.12
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**15.6**	5.56	mg/kg	09.11.18 15.53		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-50-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-006	Date Collected:	09.06.18 11.55	Sample Depth:	50
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	6.3
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**28.8**	5.37	mg/kg	09.11.18 15.59		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-60-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-007	Date Collected:	09.06.18 11.57	Sample Depth:	60
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	3.42
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**12.4**	5.16	mg/kg	09.11.18 16.06		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-70-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-008	Date Collected:	09.06.18 12.00	Sample Depth:	70
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	9.46
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**19.3**	5.51	mg/kg	09.11.18 16.12		1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-80-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-009	Date Collected:	09.06.18 12.05	Sample Depth:	80
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	OJS			% Moisture:	8.02
Analyst:	SCM	Date Prep:	09.11.18 12.15	Basis:	Dry Weight
Seq Number:	3062836				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.44	5.44	mg/kg	09.11.18 16.18	U	1

Certificate of Analytical Results 598441

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id:	**MW2-90-060918**	Matrix:	Soil	Date Received:	09.08.18 08.00
Lab Sample Id:	598441-010	Date Collected:	09.06.18 12.10	Sample Depth:	90
Analytical Method:	Chloride by EPA 300			Prep Method:	E300P
Tech:	SCM			% Moisture:	5.48
Analyst:	SCM	Date Prep:	09.11.18 14.00	Basis:	Dry Weight
Seq Number:	3062839				

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	<5.31	5.31	mg/kg	09.11.18 16.55	U	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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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

QC Summary 598441

GHD Services, INC- Midland

CEMC LPU-59

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3062836 — Matrix: Solid — Date Prep: 09.11.18
MB Sample Id: 7662038-1-BLK — LCS Sample Id: 7662038-1-BKS — LCSD Sample Id: 7662038-1-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	254	102	255	102	90-110	0	20	mg/kg	09.11.18 13:13	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3062839 — Matrix: Solid — Date Prep: 09.11.18
MB Sample Id: 7662040-1-BLK — LCS Sample Id: 7662040-1-BKS — LCSD Sample Id: 7662040-1-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	260	104	258	103	90-110	1	20	mg/kg	09.11.18 16:43	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3062836 — Matrix: Soil — Date Prep: 09.11.18
Parent Sample Id: 598340-001 — MS Sample Id: 598340-001 S — MSD Sample Id: 598340-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	322	250	558	94	556	94	90-110	0	20	mg/kg	09.11.18 14:58	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3062836 — Matrix: Soil — Date Prep: 09.11.18
Parent Sample Id: 598350-001 — MS Sample Id: 598350-001 S — MSD Sample Id: 598350-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	82.5	250	330	99	331	99	90-110	0	20	mg/kg	09.11.18 15:35	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3062839 — Matrix: Soil — Date Prep: 09.11.18
Parent Sample Id: 598439-006 — MS Sample Id: 598439-006 S — MSD Sample Id: 598439-006 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	4.28	294	303	102	302	101	90-110	0	20	mg/kg	09.11.18 18:28	

MS/MSD Percent Recovery — [D] = 100*(C-A) / B — LCS = Laboratory Control Sample — MS = Matrix Spike
Relative Percent Difference — RPD = 200* | (C-E) / (C+E) | — A = Parent Result — B = Spike Added
LCS/LCSD Recovery — [D] = 100 * (C) / [B] — C = MS/LCS Result — D = MSD/LCSD % Rec
Log Difference — Log Diff. = Log(Sample Duplicate) - Log(Original Sample) — E = MSD/LCSD Result

QC Summary 598441

GHD Services, INC- Midland

CEMC LPU-59

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3062839 Matrix: Soil Date Prep: 09.11.18
Parent Sample Id: 598441-010 MS Sample Id: 598441-010 S MSD Sample Id: 598441-010 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.912	266	262	98	262	98	90-110	0	20	mg/kg	09.11.18 17:01	

Analytical Method: **Percent Moisture**
Seq Number: 3062818 Matrix: Solid
MB Sample Id: 3062818-1-BLK

Parameter	MB Result	Units	Analysis Date	Flag
Percent Moisture	<	%	09.11.18 11:40	

Analytical Method: **Percent Moisture**
Seq Number: 3062818 Matrix: Soil
Parent Sample Id: 598439-063 MD Sample Id: 598439-063 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	6.64	6.17	7	20	%	09.11.18 11:40	

Analytical Method: **Percent Moisture**
Seq Number: 3062818 Matrix: Soil
Parent Sample Id: 598441-010 MD Sample Id: 598441-010 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Percent Moisture	5.48	5.48	0	20	%	09.11.18 11:40	

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

Chain of Custody

Work Order No: 598441

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296
Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000) www.xenco.com

Page 1 of 1

Project Manager:	Scott Foord	Bill to: (if different)	Cenergy Partners c/o Jason Michaelson
Company Name:	GHD	Company Name:	Chevron Enviromental Management Company
Address:	2135 S. Loop 250 West	Address:	1400 Smith Street, Office 07084
City, State ZIP:	Midland, TX. 79703	City, State ZIP:	Houston, TX. 77002
Phone:	713-734-3090 Email:	Christopher.Knight@ghd.com & William.Foord@ghd.com	

Work Order Comments

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐
State of Project:
Reporting:Level II ☐ Level III ☐ PST/UST ☐ RRP ☐ Level IV ☐
Deliverables: EDD ☐ ADaPT ☐ Other:

Project Name:	CEMC LPU-59	Turn Around	
Project Number:	073819-2018-001	Routine	☒
P.O. Number:		Rush:	
Sampler's Name:	Sean Parry	Due Date:	

SAMPLE RECEIPT				
Temp Blank:	(Yes) No	Wet Ice:	(Yes) No	
Temperature (°C):	0.3	Thermometer ID	108	
Received Intact:	(Yes) No			
Cooler Custody Seals:	Yes No (N/A)	Correction Factor:	0.0	
Sample Custody Seals:	Yes (No) N/A	Total Containers:		

ANALYSIS REQUEST

Work Order Notes

TAT starts the day recevied by the lab, if received by 4:30pm

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	Chloride	% Moisture	Sample Comments
MW2-4-060918	S	9/6/18	1130	4	1			
MW2-10-060918	S	9/6/18	1135	10	1			
MW2-20-060918	S	9/6/18	1140	20	1			
MW2-30-060918	S	9/6/18	1145	30	1			
MW2-40-060918	S	9/6/18	1150	40	1			
MW2-50-060918	S	9/6/18	1155	50	1			
MW2-60-060918	S	9/6/18	1157	60	1			
MW2-70-060918	S	9/6/18	1200	70	1			
MW2-80-060918	S	9/6/18	1205	80	1			
MW2-90-060918	S	9/6/18	1210	90	1			

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed **TCLP / SPLP 6010**: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U **1631 / 245.1 / 7470 / 7471** : Hg

	Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1		Esperanza Gonzalez	9/7/18 0855	2	Esperanza Gonzalez	0800 9/8/18
3				4		
5				6		

Revised Date 051418 Rev. 2018.1


ORIGIN ID:HOBA (575) 392-7550
** MAIL SERVICES ETC, LLC
4008 N GRIMES
HOBBS, NM 88240
UNITED STATES US
SHIP DATE: 07SEP18
ACTWGT: 62.00 LB MAN
CAD: 0909328/CAFE3210
DIMS: 25x15x14 IN
BILL RECIPIENT
TO XENCO LABORATORIES
FEDEX OFFICE PRINT & SHIP CENTER
FEDEX OFFICE PRINT & SHIP CENTER
200 W INTERSTATE 20
MIDLAND TX 79701
(432) 563-1800
REF:
DEPT:
INV:
PO:
551C1/F78C/184C
FedEx
Express
J181118042001uv
SATURDAY HOLD
PRIORITY OVERNIGHT
HLD
MAFKI
TX-US LBB
TRK# 0201 6606 3917 7594
41 MAFA
9/60 GI

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 09/08/2018 08:00:00 AM

Work Order #: 598441

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)?	.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: Brianna Teel Date: 09/10/2018
Brianna Teel

Checklist reviewed by: Debbie Simmons Date: 09/11/2018
Debbie Simmons

Certificate of Analysis Summary 604309

GHD Services, INC- Midland, Midland, TX

Project Name: CEMC LPU-59

Project Id: 073819-2018-001
Contact: Scott Foord
Project Location:

Date Received in Lab: Fri Nov-02-18 11:15 am
Report Date: 13-NOV-18
Project Manager: Debbie Simmons

Analysis Requested											
	Lab Id:	604309-001		604309-002		604309-003					
	Field Id:	MW-1-W-181031		MW-2-W-181031		DUP-1-W-181031					
	Depth:										
	Matrix:	GROUND WATER		GROUND WATER		GROUND WATER					
	Sampled:	Oct-31-18 12:30		Oct-31-18 11:10		Oct-31-18 00:00					
Chloride by EPA 300	***Extracted:***	Nov-07-18 10:00		Nov-07-18 11:00		Nov-07-18 11:00					
	Analyzed:	Nov-07-18 12:39		Nov-07-18 18:21		Nov-07-18 18:31					
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL				
Chloride		159	2.50	137	2.50	141	2.50				
TDS by SM2540C	***Extracted:***										
	Analyzed:	Nov-06-18 09:00		Nov-06-18 09:00		Nov-06-18 09:00					
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL				
Total Dissolved Solids		727	5.00	753	5.00	689	5.00				

Debbie Simmons
Project Manager

Analytical Report 604309

for

GHD Services, INC- Midland

Project Manager: Scott Foord

CEMC LPU-59

073819-2018-001

13-NOV-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-28), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-18-17), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-18-14)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-18-18)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-18-18)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-18-4)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

13-NOV-18

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

Reference: XENCO Report No(s): **604309**
CEMC LPU-59
Project Address:

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) 604309. 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. 604309 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,

Debbie Simmons

Debbie Simmons
Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.
Certified and approved by numerous States and Agencies.
A Small Business and Minority Status Company that delivers SERVICE and QUALITY

Houston - Dallas - Midland - San Antonio - Phoenix - Oklahoma - Latin America

Sample Cross Reference 604309

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1-W-181031	W	10-31-18 12:30		604309-001
MW-2-W-181031	W	10-31-18 11:10		604309-002
DUP-1-W-181031	W	10-31-18 00:00		604309-003

CASE NARRATIVE

Client Name: GHD Services, INC- Midland

Project Name: CEMC LPU-59

Project ID: *073819-2018-001*
Work Order Number(s): *604309*

Report Date: *13-NOV-18*
Date Received: *11/02/2018*

Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

Certificate of Analytical Results 604309

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id: **MW-1-W-181031** Matrix: Ground Water Date Received:11.02.18 11.15

Lab Sample Id: 604309-001 Date Collected: 10.31.18 12.30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE % Moisture:

Analyst: CHE Date Prep: 11.07.18 10.00

Seq Number: 3069004

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**159**	2.50	mg/L	11.07.18 12.39		5

Analytical Method: TDS by SM2540C

Tech: OJS % Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**727**	5.00	mg/L	11.06.18 09.00		1

Certificate of Analytical Results 604309

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id: **MW-2-W-181031** Matrix: Ground Water Date Received:11.02.18 11.15

Lab Sample Id: 604309-002 Date Collected: 10.31.18 11.10

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE % Moisture:

Analyst: CHE Date Prep: 11.07.18 11.00

Seq Number: 3069122

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**137**	2.50	mg/L	11.07.18 18.21		5

Analytical Method: TDS by SM2540C

Tech: OJS % Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**753**	5.00	mg/L	11.06.18 09.00		1

Certificate of Analytical Results 604309

GHD Services, INC- Midland, Midland, TX

CEMC LPU-59

Sample Id: **DUP-1-W-181031** Matrix: Ground Water Date Received:11.02.18 11.15

Lab Sample Id: 604309-003 Date Collected: 10.31.18 00.00

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE % Moisture:

Analyst: CHE Date Prep: 11.07.18 11.00

Seq Number: 3069122

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**141**	2.50	mg/L	11.07.18 18.31		5

Analytical Method: TDS by SM2540C

Tech: OJS % Moisture:

Analyst: OJS

Seq Number: 3068878

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**689**	5.00	mg/L	11.06.18 09.00		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

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

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

QC Summary 604309

GHD Services, INC- Midland

CEMC LPU-59

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3069004 — Matrix: Water — Date Prep: 11.07.18
MB Sample Id: 7665626-1-BLK — LCS Sample Id: 7665626-1-BKS — LCSD Sample Id: 7665626-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	24.1	96	24.2	97	90-110	0	20	mg/L	11.07.18 11:17	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3069122 — Matrix: Water — Date Prep: 11.07.18
MB Sample Id: 7665651-1-BLK — LCS Sample Id: 7665651-1-BKS — LCSD Sample Id: 7665651-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	24.3	97	24.3	97	90-110	0	20	mg/L	11.07.18 17:29	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3069004 — Matrix: Drinking Water — Date Prep: 11.07.18
Parent Sample Id: 604625-001 — MS Sample Id: 604625-001 S — MSD Sample Id: 604625-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	8.25	25.0	34.6	105	34.7	106	90-110	0	20	mg/L	11.07.18 11:48	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3069004 — Matrix: Drinking Water — Date Prep: 11.07.18
Parent Sample Id: 604651-001 — MS Sample Id: 604651-001 S — MSD Sample Id: 604651-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	10.5	25.0	37.9	110	37.9	110	90-110	0	20	mg/L	11.07.18 14:13	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3069122 — Matrix: Drinking Water — Date Prep: 11.07.18
Parent Sample Id: 604626-001 — MS Sample Id: 604626-001 S — MSD Sample Id: 604626-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	12.8	25.0	38.5	103	38.5	103	90-110	0	20	mg/L	11.07.18 18:00	

MS/MSD Percent Recovery — [D] = 100*(C-A) / B — LCS = Laboratory Control Sample — MS = Matrix Spike
Relative Percent Difference — RPD = 200* | (C-E) / (C+E) | — A = Parent Result — B = Spike Added
LCS/LCSD Recovery — [D] = 100 * (C) / [B] — C = MS/LCS Result — D = MSD/LCSD % Rec
Log Difference — Log Diff. = Log(Sample Duplicate) - Log(Original Sample) — E = MSD/LCSD Result

QC Summary 604309

GHD Services, INC- Midland

CEMC LPU-59

Analytical Method: **Chloride by EPA 300** Prep Method: E300P
Seq Number: 3069122 Matrix: Drinking Water Date Prep: 11.08.18
Parent Sample Id: 604789-001 MS Sample Id: 604789-001 S MSD Sample Id: 604789-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	64.7	259	63.7	255	90-110	2	20	mg/L	11.08.18 11:58	X

Analytical Method: **TDS by SM2540C**
Seq Number: 3068878 Matrix: Water
MB Sample Id: 3068878-1-BLK LCS Sample Id: 3068878-1-BKS LCSD Sample Id: 3068878-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	<5.00	1000	963	96	959	96	80-120	0	10	mg/L	11.06.18 09:00	

Analytical Method: **TDS by SM2540C**
Seq Number: 3068878 Matrix: Ground Water
Parent Sample Id: 604307-001 MD Sample Id: 604307-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	1080	1190	10	10	mg/L	11.06.18 09:00	

Analytical Method: **TDS by SM2540C**
Seq Number: 3068878 Matrix: Ground Water
Parent Sample Id: 604310-003 MD Sample Id: 604310-003 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	449	448	0	10	mg/L	11.06.18 09:00	

MS/MSD Percent Recovery [D] = 100*(C-A) / B LCS = Laboratory Control Sample MS = Matrix Spike
Relative Percent Difference RPD = 200* | (C-E) / (C+E) | A = Parent Result B = Spike Added
LCS/LCSD Recovery [D] = 100 * (C) / [B] C = MS/LCS Result D = MSD/LCSD % Rec
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample) E = MSD/LCSD Result

XENCO LABORATORIES

Chain of Custody

Work Order No: 604369

Houston,TX (281) 240-4200 Dallas,TX (214) 902-0300 San Antonio,TX (210) 509-3334
Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296
Hobbs,NM (575-392-7550) Phoenix,AZ (480-355-0900) Atlanta,GA (770-449-8800) Tampa,FL (813-620-2000)

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Project Manager:	Scott Foord	Bill to: (if different)	Jason Michaelson
Company Name:	GHD	Company Name:	Chevron Enviromental Management Company
Address:	2135 S. Loop 250 West	Address:	1400 Smith Street, Office 07094
City, State ZIP:	Midland, TX. 79703	City, State ZIP:	Houston, TX. 77002
Phone:	713-734-3090 or 281-725-7477	Email:	William.Foord@ghd.com & Christopher.Knight@ghd.com & Megan.Willis@ghd.com

Work Order Comments

Program: UST/PST ☐ PRP ☐ Brownfields ☐ RRC ☐ Superfund ☐

State of Project:

Reporting: Level II ☑ Level III ☐ PST/UST ☐ TRRP ☐ Level IV ☐

Deliverables: EDD ☐ ADaPT ☐ Other:

		Turn Around	
Project Name:	CEMC LPU-59		
Project Number:	073819-2018-001	Routine	☑
P.O. Number:		Rush:	
Sampler's Name:	Justin Nixon	Due Date:	

SAMPLE RECEIPT	Temp Blank:	(Yes) No	Wet Ice:	(Yes) No
Temperature (°C):	0.5		Thermometer ID	80
Received Intact:	(Yes) No			
Cooler Custody Seals:	Yes (No) N/A		Correction Factor:	0.0
Sample Custody Seals:	Yes (No) N/A		Total Containers:	

ANALYSIS REQUEST

Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	Number of Containers	Chloride	TDS	Sample Comments
MW-1-W-181031	GW	10-31-18	1230		1	X	X	
MW-2-W-181031	↓	↓	1110		1	X	X	
Dup-W-181031	↓	↓	—		1	X	X	

Work Order Notes

TAT starts the day recevied by the lab, if received by 4:30pm

Total 200.7 / 6010 200.8 / 6020: 8RCRA 13PPM Texas 11 Al Sb As Ba Be B Cd Ca Cr Co Cu Fe Pb Mg Mn Mo Ni K Se Ag SiO2 Na Sr Tl Sn U V Zn

Circle Method(s) and Metal(s) to be analyzed **TCLP / SPLP 6010**: 8RCRA Sb As Ba Be Cd Cr Co Cu Pb Mn Mo Ni Se Ag Tl U **1631 / 245.1 / 7470 / 7471** : Hg

Relinquished by: (Signature)	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Received by: (Signature)	Date/Time
1 [signature]	[signature]	11-2-18 1115	2		
3			4		
5			6		

Final 1.000

Page 12 of 13

XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: GHD Services, INC- Midland

Date/ Time Received: 11/02/2018 11:15:00 AM

Work Order #: 604309

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)?	.5
#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)?	**N/A**
#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: BT

PH Device/Lot#: A032690

Checklist completed by: Katie Lowe Date: 11/02/2018

Checklist reviewed by: Debbie Simmons Date: 11/02/2018

Debbie Simmons

Appendix C
2019 Remediation Work Plan

March 21, 2019 Reference No. 073819

New Mexico Oil Conservation Division – District 1
1625 N. French Drive
Hobbs, New Mexico 88240

Dear NMOCD:

Re: 2019 Remediation Work Plan
Lovington Paddock Unit 59 – Produced Water Release (1RP-915)
Lea County, New Mexico

1. Project Information

The Site is located in Unit G, Section 1, Township 17 South, Range 36 East, approximately 5 miles southeast of the City of Lovington (COL) in Lea County, New Mexico. According to historical records provided to GHD, an estimated 40 barrels (10 barrels recovered) of produced water were released from a pipe in a valve box at this location on June 4, 2006. The approximate affected area was estimated at 200 feet x 200 feet.

2. NMOCD Closure Requirement Criteria for Soils

Subsurface investigation activities were completed in accordance with the Guidelines for Remediation of Leaks, Spills, and Releases Rule 19.15.29 New Mexico Administrative Code (NMAC) from the NMOCD dated August 13, 1993. The former the site-specific Recommended Remediation Action Levels (RRALs) previously applied to this location by the NMOCD were 10 milligrams per kilogram (mg/kg) for benzene, 50 mg/kg for total benzene, toluene, ethylbenzene, and xylenes (BTEX), 100 mg/kg for petroleum hydrocarbons (TPH), and 600 mg/kg for chloride.

Rule 19.15.29 was revised and reissued on August 14, 2018. The following criteria from Table 1 (below) within NMAC 19.15.29.12 was utilized to determine site-specific screening limits.

Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/l TDS	Constituent	Limit**
>100 feet	Chloride***	20,000 mg/kg
	TPH (GRO+DRO+MRO)	2,500 mg/kg
	GRO+DRO	1,000 mg/kg
	BTEX	50 mg/kg
	Benzene	10 mg/kg

** Numerical limits or natural background level, whichever is greater.

*** This applies to release of produced water or other fluids which may contain chloride.

Localized depth to groundwater was confirmed to be approximately 107 feet below ground surface (bgs) in 2018 based on the information from monitoring wells MW-1 (located approximately on top of the original spill) and MW-2 (located approximately 120-feet to the southeast of the original spill). Additionally, information available from various sources including the New Mexico Office of the State Engineer (NMOSE) Point of Diversion (POD) Mapping Portal, Petroleum Recovery Research Center (PRRC) Mapping Portal, currently managed groundwater site(s) data by GHD, and the United States Geological Survey (USGS) Current Water Database for the Nation, concludes:

a) the depth to groundwater at the Site is greater than 100-feet bgs;

b) the site is not within 300 feet of any continuously flowing watercourse;

c) the site is not within 200 feet of any lakebed, sinkhole or playa lake;

d) the site is not within 300 feet of an occupied permanent residence, school, etc.;

e) the site is not within 500 feet of a spring or private, domestic fresh water well;

f) the site is not within 1,000 feet of any fresh water well or spring;

g) the site is not within incorporated municipal boundaries or within a defined municipal fresh water well field;

h) the site is not within 300 feet of a wetland;

i) the site is not within an area overlying a subsurface mine;

j) the site is not within an unstable area; and

k) the site is not within a 100-year floodplain.

Consequently, the anticipated site-specific screening limits to be applied to this location by the NMOCD based on the revised Rule are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 2,500 mg/kg for total TPH, and 20,000 mg/kg for chloride.

Per 19.15.29.13, Restoration, Reclamation, and Re-vegetation, the impacted area must be remediated a minimum of 4-feet bgs with non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg. Soil cover must consist of topsoil at a thickness comparable to background topsoil thicknesses, or one foot of suitable earthen material capable of establishing and maintaining vegetation at the site. Reclamation is considered complete when all disturbed areas have established vegetative cover with a life-form ratio of plus or minus 50 percent of pre-remedial levels, and plant cover of a minimum of 70 percent of previous levels, excluding noxious weeds.

Evaluation of the analytical data obtained from soil assessment and delineation activities performed from 2010 through 2018 indicate horizontal and vertical delineation of chloride impacts to soil has been achieved at the Site to support remediation activities (excavation and lining of the area).

3. 2019 Scope of Work

The scope of work for this project in 2019 will involve soil remediation activities inclusive of excavation, sampling, lining the excavation, backfilling, and restoration (re-seeding of off-pad areas) of the impacted area (see Figure 1).

Chloride impacted caliche well pad material and soil will be excavated accompanied by confirmation soil sample analysis. Field screening of soils for chlorides will be performed in order to guide excavation activities. Subsequently, the excavation will be lined, backfilled with clean caliche material and soil, graded and contoured to ensure proper surface area drainage, and the soil (off-pad areas) fertilized and re-seeded. The following outlines basic project details that will be completed by GHD and GHD subcontractors.

Field Program

- Prior to mobilizing excavation equipment to the Site, a New Mexico 811 utility notification will be made at least 48-hours prior to mobilization.
- In addition to the utility locate, data from the geophysical survey conducted prior to 2018 drilling activities will be re-evaluated for the proposed excavation area.
- Following all utility clearance activities, a Chevron Dig Plan will be prepared and approved by Chevron prior to performing any excavation activities.
- Underground utilities in proximity to the proposed excavation area will be day-lighted via hydroexcavation prior to remedial excavation activities.
- GHD anticipates that pipeline operators will not allow excavation within 10 feet of any pipelines, therefore remediation within these areas will be deferred until operations of the pipelines cease.
- Approximately 560 cubic yards (cy) of shallow sub-surface area consisting of caliche well pad materials and off-pad soil areas will be excavated (Figure 1). Impacted soil in the affected area will be excavated until field screening indicates that the soil is below the limit for chloride (600 mg/kg) specified in NMMAC 19.15.29.13 D (1), or until a depth of 4 feet bgs is reached.
- Soils will be field screened for chloride during excavation activities utilizing Hach chloride test strips. Soils with field test results greater than 3,000 mg/kg chloride with be transported to an approved disposal facility. If field screening indicates that soils are below 3,000 mg/kg chloride, it will be segregated into 50-100 cy stockpiles and a 5-point composite sample will be collected and analyzed for chloride by EPA Method 300. Soils with analytical results above 600 mg/kg will be transported to the R360 facility located in Hobbs, New Mexico for disposal. Stockpiled soils with analytical results below 600 mg/kg will be further consolidated on-site for use as backfill.
- Five-point composite confirmation soil samples will be collected from the excavation floor and sidewalls at 200 square feet intervals for analysis of chloride by EPA Method 300. Lateral limits of the excavation will halt once confirmation sample analytical results are 600 mg/kg chloride or less.

- If impacts appear to extend past four feet bgs, the sides of the excavation will be sloped and a 20-mil polyethylene liner will be placed in the bottom of the excavation. Liner seams will be overlapped a minimum of 24 inches. Each liner will be placed without rips or tears.
- The excavation will be backfilled with caliche and soil from an off-site borrow pit (Pearce Ranch Trust) to grade.
- The disturbed off-pad area will be fertilized and re-seeded with a Bureau of Land Management-approved seed mix.

Quality Assurance/ Quality Control

Confirmation soil sampling will be completed in accordance with our standard Quality Assurance/ Quality Control procedures designed to minimize cross-contamination between samples and to provide reliable laboratory results.

Reporting

A report summarizing remediation activities will be submitted. The report will include a Site description, project history, description of field events, a discussion of results, and recommendations (if any).

The report will include:

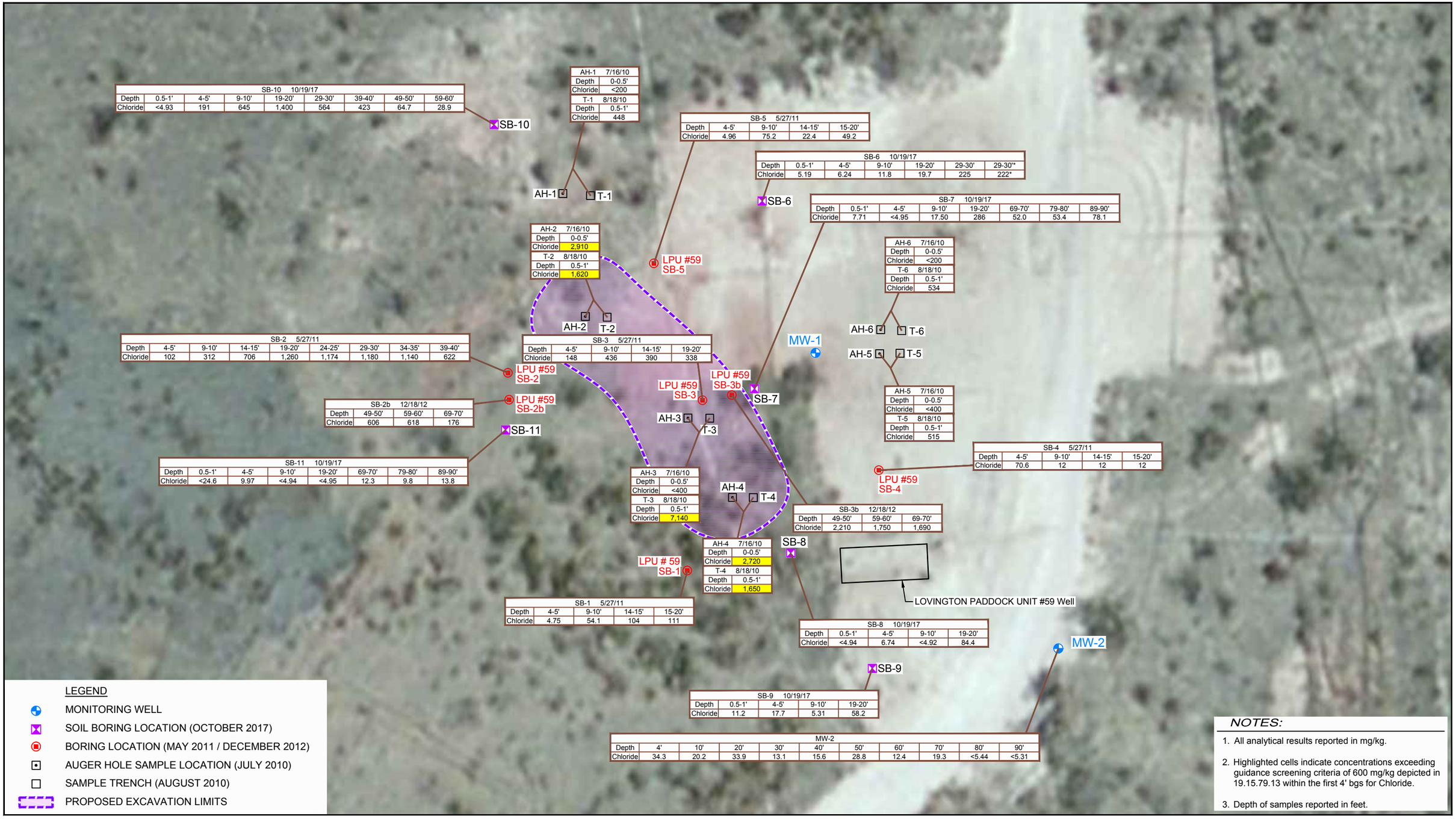
- A scaled Site plan showing the locations of the excavation and other Site features;
- Tabulation of field screening and laboratory analytical results; and
- Geotagged photographic documentation of field activities.

Vegetation Monitoring

Following completion of soil remediation activities at the Site, and as required by the New Mexico State Land Office (NMSLO), GHD will conduct vegetation monitoring visits to the Site. The status of vegetative growth within the remediated area will be documented with photographs and in field notes during each visit. A closure request report will be completed following one year of monitoring for submittal to NMSLO.

4. Work Plan Approval Request

GHD is prepared to initiate the scope of work following NMOCD approval of this work plan. If you have any questions or comments with regards to this work plan, please do not hesitate to contact our Houston office at (713) 734-3090. Your timely response to this correspondence is appreciated.



Source: Microsoft Product Screen shot(s) Reprinted with permission from Microsoft Corporation

Lat/Long: 32.8657° North, 103.3060° West

0 10 30ft

Coordinate System:
NAD 1983 (2011) StatePlane-
New Mexico East (US Feet)

Sample ID — SB-2b 12/18/12 — Sample Date
Depth 4-5' — Sample Depth (ft)
Chloride 606 — Sample Result (mg/kg)

GHD

CEMC
LEA COUNTY, NEW MEXICO
LOVINGTON PADDOCK UNIT #59

073819-00

Jan 12, 2019

PROPOSED EXCAVATION BOUNDARIES

FIGURE 1

CAD File: I:\CAD\Files\07----\073---\073819-CEMC-LPU #59\Proposed\073819-00(Proposed-03)GN-DL001.dwg

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 4535

CONDITIONS

Operator: Arcadis U.S., Inc 630 Plaza Drive Highlands Ranch, CO 80129	OGRID: 329073
	Action Number: 4535
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
bbillings	Proceed as per approved work plan and permission to P&A monitor wells as per OSE rules is granted. Please submit a report on these wells in Closure Report.	9/8/2021