# **FINAL**

# PRODUCED WATER SPILL SITE ASSESSMENT REPORT

### WEST LOVINGTON UNIT #099 PRODUCED WATER SPILL SITE LEA COUNTY, NEW MEXICO

Prepared for Chevron Mid-Continent Business Unit (MCBU)

Project No: 60591818 January 31, 2019



AECOM Technical Services, Inc. 9400 Amberglen Blvd. Austin, Texas 78729 Tel: (512) 454-4797 Fax: (512) 454-8807

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- Appendix B Water Column/Average Depth to Water Report
- Appendix C Laboratory Analysis Report
- Appendix D Soil Boring Logs and Field Notes
- Appendix E Photo Log

### 1.0 INTRODUCTION

On behalf of Chevron Mid-Continent Business Unit (MCBU), AECOM Technical Services, Inc. (AECOM) has prepared this Site Assessment Report to describe the assessment activities conducted to characterize potential impacts to environmental media (soil and groundwater) resulting from a produced water spill that occurred at the West Lovington Unit #099 injection well site (the Site) on August 24, 2018. The primary objectives of the site assessment were to delineate the vertical and horizontal extent of chloride-impacted soil resulting from the produced water spill and to evaluate the potential for chloride impact to groundwater.

### 2.0 BACKGROUND

The Site is located at Latitude 32.8548012, Longitude -103.3835907, approximately 2 miles west of the intersection of New Mexico Highway 483 and West Stiles Road, and approximately 6.5 miles southwest of Lovington, New Mexico (Figure 1). The Site ground surface elevation is approximately 3,900 feet (ft) above mean sea level and local topography slopes slightly to the south (Figure 2).

On August 24, 2018, a minor release of approximately 19.5 barrels (bbls) of produced water, with a dissolved chloride concentration greater than 10,000 milligrams per liter (mg/L), occurred at the Site as the result of internal corrosion of an injection line. As required by the New Mexico Oil Conservation Division (NMOCD) under 19.15.29 New Mexico Administrative Code (NMAC), Chevron's initial response to the release included:

- Stopping the release at the source;
- Securing the impacted soil area to protect human health and the environment;
- Containing the released produced water; and
- Recovering 12 bbls of produced water.

A Release Notification, Form C-141 dated September 6, 2018 was submitted to the NMOCD. The Form C-141 documents the responsible party, location of the release source, nature, and volume of the release, and initial response to the release. The Form C-141 for the West Lovington Unit #099 Site is provided as Appendix A.

### 3.0 INITIAL SITE ASSESSMENT/CHARACTERIZATION

The findings from an initial assessment/characterization of the Site are summarized below.

- Based on a Water Column/Average Depth to Water Report from the New Mexico Water Rights Reporting System (NMWRRS) for wells located within 1,500 meters (4,921 feet [ft]) of the Site, the shallowest potential depth to groundwater beneath the Site is 86 feet below ground surface (ft bgs) and the average depth to groundwater is 111 ft bgs. A copy of the Water Column/Average Depth to Water Report is attached as Appendix B.
- Approximately 19.5 bbls of produced water were released and 12 bbls were recovered. The underlying soils at the facility are composed of limestone and

clay and it seems unlikely that the remaining 7.5 bbls of released fluid would have resulted in chloride impact to groundwater.

- There are no continuously flowing watercourses or other significant watercourses within 300 ft of the Site.
- The Site is not located within 200 ft of any lakebed, sinkhole, or playa lake.
- The nearest occupied permanent residence, school, hospital, institution, or church is approximately five miles from the Site.
- There are no springs or wells used for domestic or stock watering purposes within 500 ft of the Site.
- There are no reported fresh water wells or springs within the 1,000 ft of the Site.
- No incorporated municipal boundaries or defined municipal fresh water well fields are located within five miles of the Site.
- No wetlands are present within 300 ft of the Site.
- No subsurface mines are located beneath the Site.
- No karst geology features or other unstable areas are known to be located near the Site.
- A 100-year floodplain was not identified near the Site.
- All operations near the Site are for oil and gas exploration, development, production, or storage only, and no impact to areas that are not on an exploration, development, production, or storage site are expected.
- Figure 1 shows the location of the Site and surrounding area on an aerial photograph. Based on information obtained during the initial desktop assessment/characterization, and the volume of produced water released and recovered, no impact to groundwater, surface water, springs, or other sources of fresh water is currently suspected. However, sampling is required to characterize the extent of potential chloride impacts to soil at the Site.

### 4.0 SOIL ASSESSMENT

On December 14, 2018, AECOM and drilling subcontractor Harrison & Cooper Incorporated (HCI) drilled five soil borings to a depth of 30 feet below ground surface (ft bgs) using an air rotary rig. The first soil boring (Boring #1)was drilled near the suspected center of the release area, approximately 10 ft west of the WLU #099 injection well. The four additional borings were drilled 30 to 35 ft in each cardinal direction from the first boring. Due to the hard rock subsurface at the Site, soil samples could not be collected using split-spoon sampling equipment. During the drilling activities, soil cuttings were retrieved at 5-ft to 10-ft depth intervals for lithological logging and field screening purposes. An electrical conductivity (EC) meter was used to field screen the soil cuttings to help determine sample depths for laboratory

analysis. Four soil samples from each boring were selected for laboratory analysis. In addition to a surface sample and total depth sample, two other depth intervals from each boring were selected for laboratory analysis based on the EC field screening results. The soil samples were submitted to Xenco Laboratories in Midland, Texas for chloride analysis by Method U.S. Environmental Protection Agency (EPA) 300.0. The EC field screening data and chloride soil sample results are presented in Table 1. Soil boring locations and laboratory analytical results are shown on Figure 3. The laboratory analytical report is included as Appendix C. Soil boring logs are provided as Appendix D and a photo log from site activities is provided as Appendix E.

# 5.0 SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

None of the soil samples exhibited chloride concentrations greater than the 10,000 mg/kg limit specified in NMAC 19.15.29.12 Table 1 for groundwater at depths between 51 and 100 ft. The highest reported chloride concentration was 898 milligrams per kilogram (mg/kg) for the 10 ft bgs sample collected at boring #3, located approximately 38 ft south of the WLU #99 injection well (Figure 3). Deeper vertical delineation soil samples from boring #3 exhibited chloride concentrations of 105 mg/kg and 93.4 mg/kg at depths of 15 and 30 ft bgs, respectively. Chloride was not reported at concentrations greater than 600 mg/kg in borings #1, #2, #4, and #5. Based on the analytical results for samples collected from boring #3, the vertical extent of chloride impact to soil has been delineated to below 600 mg/kg as required by the NMOCD under 19.15.29.11 NMAC.

The soil assessment results indicate that current Site conditions do not pose a significant threat for potential impact to groundwater underlying the Site. Therefore, no further action is recommended for the Site based on the following:

- The vertical and horizontal extent of chloride-impacted soil has been delineated as required by the NMOCD under 19.15.29 NMAC.
- Reported chloride concentrations do not exceed 600 mg/kg below a depth of 10 ft bgs, which provides a separation distance of 76 ft between the elevated soil chloride concentrations and anticipated minimum depth to groundwater beneath the Site.

### 6.0 **REFERENCES CITED**

AECOM Technical Services (AECOM), November 2018. Chevron Draft Site Sampling Plan, West Lovington Unit (WLU) #099. November 21.

New Mexico Water Rights Reporting System (NMWRRS), September 2018. New Mexico Office of the State Engineer Water Column/Average Depth to Water Report. September 21.

New Mexico Administrative Code (NMAC). Title 19 Natural Resources and Wildlife Chapter 15 Part 29 Table 1.

U.S. Geological Survey (USGS), 1985. Lovington SW Quadrangle, New Mexico-Lea County. 7.5 Minute Series (Topographic).

TABLES

 Table 1

 Soil Analytical Results and Electrical Conductivity Field Measurements

### Table 1. Soil Analytical Results and Electrical Conductivity Field Measurements

Sample Leastion	Depth	Chloride	EC
Sample Location	(ft bgs)	(mg/kg)	(mS/cm)
	Surface	<4.95 U	124.5
	5	NS	35.2
Soil Boring #1	10	21.5	38.4
	15	<4.95 U	31.2
	30	24.2	30.2
	Surface	31.3	89.2
	5	NS	84.9
Soil Boring #2	10	103	36.8
	15	298	172.0
	30	63.2	40.4
	Surface	<5.00 U	51.2
	5	NS	21.3
Soil Boring #3	10	898	432.0
	15	105	211.0
	30	93.4	131.8
	Surface	344	1065.0
	5	NS	36.7
Soil Boring #4	10	24.8	61.8
	15	27.6	33.6
	30	24.4	57.3
	Surface	56.2	198.8
	5	NS	40.1
Soil Boring #5	10	32	33.5
	15	39.7	45.6
	30	26.5	31.4

Notes:

bgs = Below ground surface

cm = Centimeter

EC = Electrical Conductivity

ft = Feet

mg = Milligram

kg = Kilogram

mS = Millisiemen

## FIGURES

Figure 1 Site Location Map



: L'AGEIGISIAUS GISIGIS Projects\Chevron\MXD\Fig 1 Site Loc Map 099.mxd Date: 11/13/201.

Figure 2 Topographic Map from 7.5 Minute Series (Topographic) Lovington SW Quadrangle



ath: L:\AGE\G\S\AUS G\S\G\S\_Projects\Chevron\MXD\Fig 3 Topographic Map\_U099v1.mxd Date: 1/16/2019

Figure 3 Soil Boring Locations and Chloride Concentrations



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### APPENDICES

Appendix A Form C-141, West Lovington Unit #099 District I 1625 N. French Dr., Hobbs, NM 88240 District II 811 S. First St., Artesia, NM 88210 District III 1000 Rio Brazos Road, Aztec, NM 87410 District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico Energy Minerals and Natural Resources Department

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505

)

Incident ID	
District RP	
Facility ID	
Application ID	

# **Release Notification**

### **Responsible Party**

Responsible Party: Chevron USA Inc.	OGRID
Contact Name: Josepha DeLeon	Contact Telephone: 575-263-0424
Contact email: jdxd@chevron.com	Incident # (assigned by OCD)
Contact mailing address: 1616 Bender Blyd., Hobbs, NM, 88240	

### **Location of Release Source**

Latitude 32.8548012

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: West Lovington Unit #099	Site Type: Injection
Date Release Discovered: 08/24/2018	API# (if applicable): 30-025-31521

Unit Letter	Section	Township	Range	County
D	08	17S	36E	Lea

Surface Owner: State Federal Tribal Private (Name:

### Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
Produced Water	Volume Released (bbls): 19.50	Volume Recovered (bbls): 12
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	Yes No
Condensate	Volume Released (bbls)	Volume Recovered (bbls)
Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)
Cause of Release		
Internal corrosion on ir	ajection line.	

Page 2

#### State of New Mexico **Oil Conservation Division**

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC?	If YES, for what reason(s) does the responsible party consider this a major release? N/A		
🗌 Yes 🖾 No			
If YES, was immediate no N/A	otice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?		
Initial Response			
The responsible	The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury		

 $\boxtimes$  The source of the release has been stopped.

The impacted area has been secured to protect human health and the environment.

Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why: N/A

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Josepha DeLeon\_\_\_\_\_ Title: Environmental Compliance Specialist\_\_\_\_\_

Juleten

Signature:

Date: September 6, 2018

email: jdxd@chevron.com

Telephone: 575-263-0424

#### **OCD Only**

Received by:

Date:

State of New Mexico Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

# Site Assessment/Characterization

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

What is the shallowest depth to groundwater beneath the area affected by the release?	86_ (ft bgs)
Did this release impact groundwater or surface water?	Yes X No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	🗌 Yes 🗶 No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	🗌 Yes 🗶 No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	🗌 Yes 🗶 No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	🗌 Yes 🗶 No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	Yes X No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	🗌 Yes 🗶 No
Are the lateral extents of the release within 300 feet of a wetland?	Yes X No
Are the lateral extents of the release overlying a subsurface mine?	Yes X No
Are the lateral extents of the release overlying an unstable area such as karst geology?	Yes X No
Are the lateral extents of the release within a 100-year floodplain?	Yes X No
Did the release impact areas <b>not</b> on an exploration, development, production, or storage site?	Yes X No

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

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

	Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
	Field data
	Data table of soil contaminant concentration data
	Depth to water determination
	Determination of water sources and significant watercourses within 1/2-mile of the lateral extents of the release
	Boring or excavation logs
$\square$	Photographs including date and GIS information

- Topographic/Aerial maps
- Laboratory data including chain of custody

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

Form C-141 Page 5	State of New Mexico Oil Conservation Divisior	1	Incident ID District RP Facility ID Application ID	
I hereby certify that the infor regulations all operators are public health or the environm failed to adequately investiga addition, OCD acceptance of and/or regulations. Printed Name: Signature: email:	rmation given above is true and complete to the required to report and/or file certain release no nent. The acceptance of a C-141 report by the ate and remediate contamination that pose a the f a C-141 report does not relieve the operator of Barchill Marchill Marchill Marchill Me Chevron.com	e best of my knowledge a otifications and perform c OCD does not relieve the reat to groundwater, surfa of responsibility for comp Title: <u>UAST</u> Date: <u>2-5-</u> Telephone: <u>43</u>	and understand that pursu orrective actions for relea e operator of liability sho ace water, human health of liance with any other fed <b>C+ Water</b> , 19 - 687 - 7108	tant to OCD rules and ases which may endanger build their operations have or the environment. In eral, state, or local laws Specialist
OCD Only Received by:		Date:		

Form C-141 Page 6 State of New Mexico Oil Conservation Division

**<u>Remediation Plan Checklist</u>**: Each of the following items must be included in the plan.

Incident ID	
District RP	
Facility ID	
Application ID	

# **Remediation Plan**

<ul> <li>Detailed description of proposed remediation technique</li> <li>Scaled sitemap with GPS coordinates showing delineation points</li> <li>Estimated volume of material to be remediated</li> <li>Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC</li> <li>Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)</li> </ul>										
Deferral Requests Only: Each of the following items must be confirmed as part of any request for deferral of remediation.										
Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.										
Extents of contamination must be fully delineated.										
Contamination does not cause an imminent risk to human healt	h, the environment, or groundwater.									
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.  Printed Name: Title: Date: Date: Date:										
OCD Only										
Received by:	Date:									
Approved Approved with Attached Conditions of	Approval Denied Deferral Approved									
Signature:	Date:									

Form C-141 Page 7

State of New Mexico Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

# Closure

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

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

A scaled site and sampling diagram as described in 19.15.29.11 NMAC

Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Arry BArnhill	Title: WASte & Water Specialist									
Signature: <u>UBhi</u>	Date: $2-5-19$									
email: ABArnhill & Chevron.com	Telephone: 432-687-7108									
OCD Only										
Received by:	Date:									
Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.										
Closure Approved by:	Date:									
Printed Name:	Title:									

Appendix B Water Column/Average Depth to Water Report



# New Mexico Office of the State Engineer Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)	(R=POD has been replaced O=orphaned, C=the file is closed)	J,	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in mete							eters)	s) (In feet)				
POD Number	POD Sub- Code basin (	Count	C ty 64	Q 4 1 (	Q 64	Sec	Tws	Rng	х	Y	Distance	Depth Well	Depth Water	Water Column	
L 00381	L	LE	1	4	1	08	17S	36E	651586	3636052* 🌍	445	110			
L 01723 S	L	LE	4	2	3	05	17S	36E	651767	3637060* 🌍	877	162	86	76	
L 01723	L	LE	1	1	3	05	17S	36E	651164	3637252* 🌍	908	162	120	42	
L 01723 S2	L	LE	1	2	3	05	17S	36E	651567	3637260* 🌍	964	140	120	20	
L 01723 S3	L	LE	2	1	4	05	17S	36E	652170	3637268* 🌍	1298	140	118	22	
										Avera	age Depth to	Water:	111	feet	
											Minimum	Depth:	86	feet	
											Maximum	Depth:	120	feet	
Record Count: 5															

UTMNAD83 Radius Search (in meters):

Easting (X): 651253.36

Northing (Y): 3636348

Radius: 1500

\*UTM location was derived from PLSS - see Help

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

Appendix C Laboratory Report



**Contact:** 

**Project Location:** 

Kevin Pasternak

Certificate of Analysis Summary 609121

AECOM, Austin, TX Project Name: WLU 99



Date Received in Lab:Tue Dec-18-18 03:50 pmReport Date:27-DEC-18Project Manager:Kelsey Brooks

	Lab Id:	609121-0	609121-001		609121-002		609121-003		609121-004		609121-005		006	
Analysis Paguastad	Field Id:	Hole1-Surf	Hole1-Surface		Hole1-10		Hole1-15		Hole1-30		Hole2-Surface		0	
Analysis Requested	Depth:	0-		10-	10-		15-		30-		0-			
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		
	Sampled:	Dec-14-18 0	Dec-14-18 09:32		Dec-14-18 09:35		Dec-14-18 09:37		Dec-14-18 09:40		Dec-14-18 09:52		Dec-14-18 09:53	
Chloride by EPA 300	Extracted:	ed: Dec-20-18 12:45												
	Analyzed:	Dec-20-18 2	Dec-20-18 21:46		Dec-20-18 21:53		21:59	Dec-20-18 22:05		Dec-20-18 22:27		Dec-20-18 22:33		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	
Chloride		<4.95	4.95	21.5	4.99	<4.95	4.95	24.2	4.95	31.3	4.99	103	5.00	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

fession kenner

Jessica Kramer Project Assistant



**Contact:** 

**Project Location:** 

Kevin Pasternak

Certificate of Analysis Summary 609121

AECOM, Austin, TX Project Name: WLU 99



Date Received in Lab:Tue Dec-18-18 03:50 pmReport Date:27-DEC-18Project Manager:Kelsey Brooks

P													
	Lab Id:	609121-0	609121-007		609121-008		609121-009		609121-010		609121-011		)12
Analysis Requested	Field Id:	Hole2-1	Hole2-15		Hole2-30		Hole3-Surface		Hole3-10		Hole3-15		30
Analysis Kequestea	Depth:	15-	15-		30-		0-		10-		15-		
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Dec-14-18 (	Dec-14-18 09:55		Dec-14-18 09:57		Dec-14-18 10:08		10:10	Dec-14-18 10:11		Dec-14-18 10:12	
Chloride by EPA 300	Extracted:	ed: Dec-20-18 12:45		Dec-20-18 12:45		Dec-20-18 12:45		Dec-20-18 12:45		Dec-20-18 12:45		Dec-20-18 12:45	
	Analyzed:	Dec-20-18	Dec-20-18 22:54		Dec-20-18 23:00		3:07	Dec-20-18 23:13		Dec-20-18 23:19		Dec-20-18 23:25	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		298	4.95	63.2	5.00	<5.00 5.00 898 5.00		105	5.00	93.4	5.00		

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

fession kenner

Jessica Kramer Project Assistant



Project Id: 60591818 Contact: Kevin Pasternak

**Project Location:** 

Certificate of Analysis Summary 609121

AECOM, Austin, TX Project Name: WLU 99



Date Received in Lab:Tue Dec-18-18 03:50 pmReport Date:27-DEC-18Project Manager:Kelsey Brooks

	Lab Id:	609121-0	13	609121-0	609121-014		609121-015		016	609121-017		609121-018		
Analysis Reauested	Field Id:	Hole4-Sur	Hole4-Surface		Hole4-10		Hole4-15		Hole4-30		Hole5-Surface		0	
Analysis Requested	Depth:	0-		10-		15-		30-		0-		10-		
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		
	Sampled:	Dec-14-18	Dec-14-18 10:27		Dec-14-18 10:30		Dec-14-18 10:32		Dec-14-18 10:33		Dec-14-18 10:40		Dec-14-18 10:43	
Chloride by EPA 300	Extracted:	Dec-20-18	Dec-20-18 12:45		Dec-20-18 13:30		Dec-20-18 13:30		Dec-20-18 13:30		Dec-20-18 13:30		Dec-20-18 13:30	
	Analyzed:	Dec-20-18 2	Dec-20-18 23:31		Dec-20-18 21:09		Dec-20-18 21:40		21:50	Dec-20-18 22:21		Dec-20-18 22:32		
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	
Chloride		344	4.95	24.8	5.00	27.6	5.00	24.4	4.95	56.2	4.95	32.0	4.95	

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

fession kenner

Jessica Kramer Project Assistant



**Contact:** 

**Project Location:** 

Kevin Pasternak

Certificate of Analysis Summary 609121

AECOM, Austin, TX Project Name: WLU 99



Date Received in Lab:Tue Dec-18-18 03:50 pmReport Date:27-DEC-18Project Manager:Kelsey Brooks

							1	1
	Lab Id:	609121-0	19	609121-0	20			
Analysis Requested	Field Id:	Hole5-1	Hole5-15		0			
	Depth:	15-	15-					
	Matrix:	SOIL		SOIL				
	Sampled:	Dec-14-18 1	Dec-14-18 10:45		0:47			
Chloride by EPA 300	Extracted:	Dec-20-18 1	Dec-20-18 13:30		3:30			
	Analyzed:	Dec-20-18 2	Dec-20-18 22:42		2:52			
	Units/RL:	mg/kg	RL	mg/kg	RL			
Chloride		39.7	4.95	26.5	5.00			

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

fession kenner

Jessica Kramer Project Assistant

# Analytical Report 609121

for AECOM

**Project Manager: Kevin Pasternak** 

WLU 99

60591818

27-DEC-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)







Project Manager: **Kevin Pasternak AECOM** 9400 Amberglen Blvd. Austin, TX 78729

Reference: XENCO Report No(s): 609121 WLU 99 Project Address:

#### Kevin Pasternak:

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) 609121. 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. 609121 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,

Jession KRAMER

Jessica Kramer Project Assistant

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 609121



### AECOM, Austin, TX

WLU 99

Sample Id	Matrix	<b>Date Collected</b>	Sample Depth	Lab Sample Id
Hole1-Surface	S	12-14-18 09:32	0	609121-001
Hole1-10	S	12-14-18 09:35	10	609121-002
Hole1-15	S	12-14-18 09:37	15	609121-003
Hole1-30	S	12-14-18 09:40	30	609121-004
Hole2-Surface	S	12-14-18 09:52	0	609121-005
Hole2-10	S	12-14-18 09:53	10	609121-006
Hole2-15	S	12-14-18 09:55	15	609121-007
Hole2-30	S	12-14-18 09:57	30	609121-008
Hole3-Surface	S	12-14-18 10:08	0	609121-009
Hole3-10	S	12-14-18 10:10	10	609121-010
Hole3-15	S	12-14-18 10:11	15	609121-011
Hole3-30	S	12-14-18 10:12	30	609121-012
Hole4-Surface	S	12-14-18 10:27	0	609121-013
Hole4-10	S	12-14-18 10:30	10	609121-014
Hole4-15	S	12-14-18 10:32	15	609121-015
Hole4-30	S	12-14-18 10:33	30	609121-016
Hole5-Surface	S	12-14-18 10:40	0	609121-017
Hole5-10	S	12-14-18 10:43	10	609121-018
Hole5-15	S	12-14-18 10:45	15	609121-019
Hole5-30	S	12-14-18 10:47	30	609121-020



CASE NARRATIVE

#### Client Name: AECOM Project Name: WLU 99

 Project ID:
 60591818

 Work Order Number(s):
 609121

Report Date: 27-DEC-18 Date Received: 12/18/2018

#### Sample receipt non conformances and comments:

None

Sample receipt non conformances and comments per sample:

None

#### Analytical non conformances and comments:

Batch: LBA-3074055 Chloride by EPA 300

Lab Sample ID 609123-004 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 609121-014, -015, -016, -017, -018, -019, -020.

The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.



# **Certificate of Analytical Results 609121**



1

# AECOM, Austin, TX

WLU 99

Sample Id:	Hole1-Surface		Matrix:	Soil		Date Received	1:12.18.1	8 15.50	
Lab Sample Id	: 609121-001		Date Collected: 12.14.18 09.32			Sample Depth: 0			
Analytical Met	thod: Chloride by EPA 30	00				Prep Method:	E300P		
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet W	eight	
Seq Number:	3073880								
Parameter		Cas Number	Result I	RL	Units	Analysis D	ate F	lag	Dil

<4.95

16887-00-6

4.95

mg/kg 12.20.18

12.20.18 21.46 U



# **Certificate of Analytical Results 609121**



# AECOM, Austin, TX

### WLU 99

Sample Id:	Hole1-10		Matrix:	Soil		Date Received	1:12.18.1	18 15.50	
Lab Sample Id	: 609121-002		Date Collected: 12.14.18 09.35			Sample Depth: 10			
Analytical Me	thod: Chloride by EPA 30	)0				Prep Method:	E300P		
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet W	eight	
Seq Number:	3073880								
Parameter		Cas Number	Result R	L	Units	Analysis Da	ate I	Flag	Dil

16887-00-6 21.5

4.99

12.20.18 21.53

mg/kg

1




1

### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole1-15		Matrix:	Soil	Date Receive	d:12.18.18 15.50	
Lab Sample Id	: 609121-003		Date Collected: 12.14.18 09.37		Sample Depth: 15		
Analytical Me	thod: Chloride by EPA 30	00			Prep Method	: E300P	
Tech:	CHE				% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45	Basis:	Wet Weight	
Seq Number:	3073880						
Parameter		Cas Number	Result R	L U	nits Analysis I	Date Flag Dil	

<4.95

16887-00-6

4.95

mg/kg

12.20.18 21.59 U





#### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole1-30		Matrix:	Soil		Date Received	1:12.18.18 15	.50
Lab Sample Id: 609121-004			Date Collected: 12.14.18 09.40		Sample Depth: 30			
Analytical Met	hod: Chloride by EPA 30	00				Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weight	
Seq Number:	3073880							
Parameter		Cas Number	Result F	L	Units	Analysis Da	ate Flag	Dil

Chloride

24.2

16887-00-6

4.95

12.20.18 22.05

mg/kg





# AECOM, Austin, TX

WLU 99

Sample Id:	Hole2-Surface		Matrix:	Soil	]	Date Received	:12.18.18	15.50
Lab Sample Id	Lab Sample Id: 609121-005		Date Collec	Date Collected: 12.14.18 09.52		Sample Depth: 0		
Analytical Me	ethod: Chloride by EPA	300			l	Prep Method:	E300P	
Tech:	CHE				Q	% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45	]	Basis:	Wet Weig	ght
Seq Number:	3073880							
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate Flag	g Dil
Chloride		16887-00-6	31.3	4.99	mg/kg	12.20.18 22.	27	1

4.99

mg/kg





## AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole2-10		Matrix:	Soil		Date Received	1:12.18.18 1:	5.50
Lab Sample Id: 609121-006			Date Collected: 12.14.18 09.53		Sample Depth: 10			
Analytical Met	hod: Chloride by EPA 30	00				Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weigh	t
Seq Number:	3073880							
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate Flag	Dil

Chloride

103

16887-00-6

5.00

12.20.18 22.33

mg/kg





#### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole2-15		Matrix:	Soil		Date Received	1:12.18.18 15.50	)
Lab Sample Id	: 609121-007		Date Collect	ed: 12.14.18 09.55		Sample Depth	:15	
Analytical Met	hod: Chloride by EPA 30	00				Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weight	
Seq Number:	3073880							
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate Flag	Dil

16887-00-6 298

4.95

12.20.18 22.54

mg/kg





### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole2-30		Matrix:	Soil		Date Received	1:12.18.1	8 15.50	
Lab Sample Id	: 609121-008		Date Collecte	ed: 12.14.18 09.57		Sample Depth	:30		
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E300P		
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet We	eight	
Seq Number:	3073880								
Parameter		Cas Number	Result I	RL	Units	Analysis D	ate F	lag	Dil

63.2

16887-00-6

5.00

12.20.18 23.00

mg/kg





U

1

# AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole3-Surface		Matrix:	Soil		Date Received	1:12.18.18 15.	.50
Lab Sample Id: 609121-009			Date Collected: 12.14.18 10.08		Sample Depth: 0			
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E300P	
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weight	
Seq Number:	3073880							
Parameter		Cas Number	Result R	L	Units	Analysis Da	ate Flag	Dil

16887-00-6

<5.00 5.00

mg/kg 12.20.18 23.07





1

### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole3-10		Matrix:	Soil		Date Received	1:12.18.18 15.5	0
Lab Sample Id: 609121-010			Date Collected: 12.14.18 10.10		Sample Depth: 10			
Analytical Met	thod: Chloride by EPA 30	00				Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weight	
Seq Number:	3073880							
Parameter		Cas Number	Result I	RL	Units	Analysis Da	ate Flag	Dil

Chloride

16887-00-6 **898** 

5.00

12.20.18 23.13

mg/kg

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## AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole3-15		Matrix:	Soil		Date Received	:12.18.18 15.5	0
Lab Sample Id: 609121-011			Date Collected: 12.14.18 10.11		Sample Depth: 15			
Analytical Met	thod: Chloride by EPA 30	00				Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet Weight	
Seq Number:	3073880							
Parameter		Cas Number	Result I	RL	Units	Analysis Da	ate Flag	Dil

16887-00-6 105

5.00

12.20.18 23.19

mg/kg





## AECOM, Austin, TX

WLU 99

Sample Id:	Hole3-30		Matrix:	Soil		Date Received	1:12.18	8.18 15.50	
Lab Sample Id	: 609121-012		Date Collect	ed: 12.14.18 10.12		Sample Depth	:30		
Analytical Met	thod: Chloride by EPA 30	00				Prep Method:	E300	P	
Analyst:	CHE		Date Prep:	12.20.18 12.45		Basis:	Wet V	Weight	
Seq Number:	3073880								
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate	Flag	Dil

16887-00-6 **93.4** 

5.00

12.20.18 23.25

mg/kg





# AECOM, Austin, TX

WLU 99

Sample Id:	Hole4-Surface		Matrix:	Soil	]	Date Received	:12.18.18	15.50
Lab Sample Id	Lab Sample Id: 609121-013		Date Collec	Date Collected: 12.14.18 10.27		Sample Depth: 0		
Analytical Me	ethod: Chloride by EPA	300			]	Prep Method:	E300P	
Tech:	CHE					% Moisture:		
Analyst:	CHE		Date Prep:	12.20.18 12.45	]	Basis:	Wet Weig	ght
Seq Number:	3073880							
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate Fla	g Dil
Chloride		16887-00-6	344	4.95	mg/kg	12.20.18 23.	31	1

344

4.95

mg/kg

1

Page 21 of 35





## AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole4-10		Matrix:	Soil		Date Received	1:12.18	.18 15.50	
Lab Sample Id	: 609121-014		Date Collect	ed: 12.14.18 10.30		Sample Depth	:10		
Analytical Met	thod: Chloride by EPA 30	00				Prep Method:	E300	Р	
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 13.30		Basis:	Wet W	Veight	
Seq Number:	3074055								
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate	Flag	Dil

16887-00-6 **24.8** 

5.00

12.20.18 21.09

mg/kg





1

## AECOM, Austin, TX

WLU 99

Sample Id:	Hole4-15		Matrix:	Soil		Date Received	:12.18.18 15	.50	
Lab Sample Id	: 609121-015		Date Collect	ed: 12.14.18 10.32	Sample Depth: 15				
Analytical Met	hod: Chloride by EPA 30	00				Prep Method:	E300P		
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 13.30		Basis:	Wet Weight		
Seq Number:	3074055								
Parameter		Cas Number	Result	RL	Units	Analysis Da	ate Flag	Dil	

16887-00-6 27.6

5.00

mg/kg 12.20.18 21.40





## AECOM, Austin, TX

WLU 99

Sample Id:	Hole4-30		Matrix:	Soil		Date Received	:12.18.18 15.5	0
Lab Sample Id:	609121-016		Date Collect	ed: 12.14.18 10.33		Sample Depth	:30	
Analytical Met	hod: Chloride by EPA 30	00				Prep Method:	E300P	
Analyst:	CHE		Date Prep:	12.20.18 13.30		% Moisture: Basis:	Wet Weight	
Seq Number:	3074055		-					
Parameter		Cas Number	Result	RL	Units	Analysis Da	nte Flag	Dil

16887-00-6 24.4

4.95

12.20.18 21.50

mg/kg





### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole5-Surface		Matrix:	Soil		Date Received	1:12.18.	18 15.50	
Lab Sample Id	: 609121-017		Date Collect	ed: 12.14.18 10.40		Sample Depth	:0		
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E300P	•	
Tech:	CHE			12 20 19 12 20		% Moisture:	Wet W	laight	
Seq Number:	3074055		Date Prep:	12.20.18 15.50		Dasis:	weiw	eight	
Parameter		Cas Number	Result	RL	Units	Analysis D	ate 1	Flag	Dil

Chloride

16887-00-6 **56.2** 

4.95

12.20.18 22.21

mg/kg





### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole5-10		Matrix:	Soil		Date Received	1:12.18	.18 15.50	
Lab Sample Id	: 609121-018		Date Collecte	d: 12.14.18 10.43		Sample Depth	:10		
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E3001	P	
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 13.30		Basis:	Wet W	Veight	
Seq Number:	3074055								
Parameter		Cas Number	Result I	RL	Units	Analysis D	ate	Flag	Dil

32.0

16887-00-6

4.95

12.20.18 22.32

mg/kg





#### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole5-15		Matrix:	Soil		Date Received	1:12.18	.18 15.50	
Lab Sample Id	: 609121-019		Date Collecte	d: 12.14.18 10.45		Sample Depth	:15		
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E300I	Р	
Tech:	CHE					% Moisture:			
Analyst:	CHE		Date Prep:	12.20.18 13.30		Basis:	Wet V	Veight	
Seq Number:	3074055								
Parameter		Cas Number	Result I	RL	Units	Analysis D	ate	Flag	Dil

16887-00-6 **39.7** 

4.95

12.20.18 22.42

mg/kg





### AECOM, Austin, TX

#### WLU 99

Sample Id:	Hole5-30		Matrix:	Soil		Date Received	1:12.18.1	8 15.50	
Lab Sample Id	: 609121-020		Date Collected: 12.14.18 10.47			Sample Depth	:30		
Analytical Me	thod: Chloride by EPA 30	00				Prep Method:	E300P		
Analyst:	CHE		Date Prep:	12.20.18 13.30		Basis:	Wet We	eight	
Seq Number:	3074055								
Parameter		Cas Number	Result ]	RL	Units	Analysis Da	ate F	lag	Dil

16887-00-6 26.5

5.00

12.20.18 22.52

mg/kg



### **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 LimitSDLSample Detection LimitLOD Limit of Detection
- PQL Practical Quantitation Limit MQL Method Quantitation Limit LOQ Limit of Quantitation
- DL Method Detection Limit
- NC Non-Calculable

SMP Clier	nt Sample	BLK	Method Blank	
BKS/LCS	Blank Spike/Laboratory Control Sample	BKSD/LCSD	Blank Spike Duplicate/Labor	atory 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 609121

#### AECOM

#### WLU 99

Analytical Method:	Chloride by EPA 30	0						Pr	ep Method	l: E30	0P	
Seq Number:	3073880			Matrix:	Solid				Date Prep	p: 12.2	0.18	
MB Sample Id:	7668457-1-BLK		LCS Sar	nple Id:	7668457-1	I-BKS		LCSI	D Sample l	ld: 7668	3457-1-BSD	
Parameter	MB	Spike	LCS	LCS	LCSD	LCSD	Limits	%RPD	RPD Limit	Units	Analysis	Flog
	Result	Amount	Result	%Rec	Result	%Rec					Date	Flag

Analytical Method:	Chloride by EPA 30	)0						Pı	ep Metho	od: E30	0P	
Seq Number:	3074055			Matrix:	Solid				Date Pr	ep: 12.2	20.18	
MB Sample Id:	7668540-1-BLK		LCS San	nple Id:	7668540-1	I-BKS		LCS	D Sample	e Id: 766	8540-1-BSD	
Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Lim	it Units	Analysis Date	Flag
Chloride	< 5.00	250	236	94	236	94	90-110	0	20	mg/kg	12.20.18 20:48	

Analytical Method:	Chloride by EPA 30	0						Pı	ep Meth	od: E3	00P	
Seq Number:	3073880			Matrix:	Soil				Date Pr	ep: 12.	20.18	
Parent Sample Id:	608987-025		MS San	nple Id:	608987-02	25 S		MS	D Sample	e Id: 60	3987-025 SD	
Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Lim	it Units	Analysis Date	Flag
Chloride	1.59	250	260	103	271	108	90-110	4	20	mg/kg	12.20.18 20:39	

Analytical Method:	Chloride by EPA 30	0						Р	rep Metho	od: E30	00P	
Seq Number:	3073880			Matrix:	Soil				Date Pr	ep: 12.2	20.18	
Parent Sample Id:	609121-004		MS Sar	nple Id:	609121-00	04 S		MS	D Sample	e Id: 609	121-004 SD	
Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Lim	it Units	Analysis Date	Flag
Chloride	24.2	248	272	100	281	104	90-110	3	20	mg/kg	12.20.18 22:11	

Analytical Method:	Chloride by EPA 30	0						P	rep Metho	od: E30	)0P	
Seq Number:	3074055			Matrix:	Soil				Date Pr	ep: 12.	20.18	
Parent Sample Id:	609121-014		MS San	nple Id:	609121-01	14 S		MS	D Sample	e Id: 609	121-014 SD	
Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Lim	it Units	Analysis Date	Flag
Chloride	24.8	250	240	86	251	90	90-110	4	20	mg/kg	12.20.18 21:19	Х

MS/MSD Percent Recovery Relative Percent Difference LCS/LCSD Recovery Log Difference [D] = 100\*(C-A) / B RPD = 200\* | (C-E) / (C+E) | [D] = 100 \* (C) / [B] Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample A = Parent Result C = MS/LCS Result E = MSD/LCSD Result MS = Matrix Spike B = Spike Added D = MSD/LCSD % Rec



QC Summary 609121

#### AECOM

WLU 99

Analytical Method:	Chloride by EPA 30	0						Pı	rep Meth	od: E30	00P	
Seq Number:	3074055			Matrix:	Soil				Date Pr	ep: 12.2	20.18	
Parent Sample Id:	609123-004		MS San	nple Id:	609123-00	04 S		MS	D Sample	e Id: 609	123-004 SD	
Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Lim	it Units	Analysis Date	Flag
Chloride	32.0	250	244	85	243	84	90-110	0	20	mg/kg	12.20.18 23:44	Х

MS/MSD Percent Recovery Relative Percent Difference LCS/LCSD Recovery Log Difference [D] = 100\*(C-A) / B RPD = 200\* | (C-E) / (C+E) | [D] = 100 \* (C) / [B] Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample A = Parent Result C = MS/LCS Result E = MSD/LCSD Result MS = Matrix Spike B = Spike Added D = MSD/LCSD % Rec

Parties Saf N CONTRACTOR Station. ABORATORIES

-Trip

# Chain of Custody

Housien, TX (281) 240-4200 Dalias, TX (214) 502-0300 San Antonio, TX (216) 503-0004

Work Order No:

	ORI	E S Hobbs I	Midland,	TX (432-704-54	140) EL	Paso,	TX (915	5)585-3	443 Lu	ibbock,	TX (806	6)794-12	96								
Project Manager: Kevin Pr	nsterna	K	101 (07 0-382-7	Bill to: (if differ	AZ (480	-355-0	900) A	tlanta,C	SA (770	-449-88	800) Ta	impa,FL	(813-6	20-2000	)	www	xenco	o.com	Page		of
Company Name: AECOM	_		······································	Company Na	ame'							- <u></u>	-   -			W	ork O	rder C	<u>comment</u>	<u>Ş</u>	
Address: 9400 An	nbrerg	len Blud		Address:									-    <sup>e</sup>	rogran' State	1: UST/I	oct: 45		Brow	nfieldsF	RC Su	perfund
City, State ZIP: Austin, 7	<u>x</u>			City, State Z	IP:									2enortin	n'i evel	ιΠια			глот Пт		
Phone: (512) 4	19'- S	293	Email:	Kevin . T	Dacter	nov 6	2000	~ 0	0	······				Deliveral	oles: E	מכ ה ה			г П и		
Project Name: WLW 99				I'n Around		i ene e	<u>e vier</u>					10.00		Kine R							
Project Number: 6059 (9	318		Routi	ine 🕡			T	Ī	<u>i i i i i i i i i i i i i i i i i i i </u>		ALYS	IS RE		i sere				estalijsky T	WO	rk Order	Notes
P.O. Number:			Rush																		
Sampler's Name: San Wh	nipkey	/	Due I	Date:																	
SAMPLE RECEIPT	np Blank:	Yes No	Wet Ice:	Kes No																	
Temperature (°C):	1.3		Th <u>er</u> mometer	1D	ers.											Ì					
Received Intact (Yes	No		R8	ne i fan jin fin de staaten e	ntain																
Sample Custody Seals: Yes No	O (N/A	Corre	ction Factor:	-0.1	S						*			1					TAT		
Countrie Costory Seals, A Tes In		/ lota	l Containers:		ero		les												lab, i	s the day re f received b	cevied by the y 4:30pm
Sample Identification	Matrix	Date Sampled	Time Sampled	Depth	dmb	H	hloric							ŀ					San	anlo Con	
Hole 1-Surface	S	12/14/18	9 <b>3</b> 2			F	0									· .	_			ipie con	
1401e1-10	5	12/14/18	935	lo	<u>  '</u>			<u> </u>									-		<u> </u>		
[tole 1 - 15	S	12/14/18	955977	15	1	V V	t.Z		+								·				
[Hole1 - 30	S	12/14/18	940	30		1	Ž					· · · · ·				_					
Holez-Surface	S	12/14/18	952	~		V	V		1					·				+			
1401e2 - 10	<u>S</u>	12/14/18	953	10		V	$\checkmark$										-	+	1		
Hole C - 15	5	12/14/18	955	15		$\checkmark$	$\checkmark$									-	- <b> </b>	+	1		
Hole 3 - Sul		12/14/18	951	30	ļ	$\vee$	$\bigvee$										1	1			
Hole 3 10	5	12/14/18	160%	10	ļ																
		10/19/19	1040				$ $ $\vee$												ļ		
Circle Method(s) and Metal(s)	to be an	8RC alvzed	RA 13PPN	M Texas 11	ALS	Sb As	s Ba	Be B	Cd	Ca Cr	Со	Cu Fe	Pb I	Mg Mr	Mol	NiKS	Se Ag	SiO2	Na Sr	TI Sn U	V Zn
Notice: Signature of this document and reling	uishment	f samples com-				Sb /	As Ba	Be	Cd C	r Co	Cu P	b Mn	Mo N	Ni Se	Ag Ti	U	<del>Tri unada</del> tidi	16	31 / 245.	/ 7470 /	7471 : Hg
of service. Xenco will be liable only for the co of Xenco. A minimum charge of \$75.00 will be	st of sample	les and shall no	ot assume any n	urchase order fi esponsibility for	rom clier ' any los	nt comp ses or (	expense	Xenco, es incur	its affili red by t	ates and he clien	subcor t if such	Iosses :	. It assi are due	igns stan	dard ter	ns and c	ondition	IS rol			
Relinquished by (Signature)	appried (0	Doocha	to a charge of \$	55 for each samp	ole subn	nitted to	Xenco	but no	t analyz	ed. The	se terms	s will be	enforce	d unless	previous	ly negoti	ated.				
1 20 Line by (orginature)	11	Received	by: (Signatu	ne)		Date	/Time		Re	linquis	shed b	y: (Sig	natur	e)	Re	ceived	by: (S	Signati	ure)	Dat	e/Time
3 Jun Way	Kl	mp	UL II	HAIBIS	N/2/16	18	4 <b>8</b> 0		2												
5					<u> </u>				4												
	L				<u> </u>	,			6		·······										

7845 0143 3277



# Chain of Custody

Work Order No: \_\_\_\_\_\_

Houston, TX (281) 240-4200 Datias, TX (214) 502-0300 San Antonio, TX (210) 503-0004

Midland,TX (432-704-5440) EL Paso,TX (915)585-3443 Lubbock,TX (806)794-1296

Project Manager Kevin Pack	enak	s,INNI (575-392-7	550) Phoenix,	AZ (480	-355-0	900) A	tlanta,G	A (770-	449-88	00) Tamp	a,FL (81:	3-620-20	00)	ww	w.xenco	o.com	Page	20	f_ <u>Z</u>
Company Name: AFCOM		·· <u>·····</u> ·····························	Composition	ent)	<u> </u>				·					V	Vork O	rder C	omment	s	
Address: 9400 Amb	eddlen BI.VN		Addro	ame:	1	,			n			Progr	am: US	r/PST	PRP	Brown	nfields [][		erfund
City State ZIP: Austin TV			Address:	likolia Ny State		·		•••••••••				Sta	te of P	oject:					
Phone: (5)2) (1)4-	- <del> </del> <ም§>		City, State Z	<u>IP; (*</u>	1		· · · · · · · · · · · · · · · · · · ·			······	]	Repor	ting:Lev		evel III	DPST	VUST 🗌 T	RRP 🗌 Lev	vel IV 🗌
		⊨mail:	Kevin. Po	asteri	NKE	Vaec	om.co	m				Delive	rables:			ADaP1		Other:	
Project Name: WCU 99	a and a state that we have a state of the st	<b>T</b> ŭ	rn Around						AN	ALYSIS	REQU	EST					Wo	rk Order N	lotes
Project Number: 603 416 10		Routi	ne 🗹												T		<u></u>	Construction of the state	idali (dila da di di
P.O. Number:		Rush																	
Sampler's Name: Jan Wi	phey.	Due [	Date:																
SAMPLE RECEIPT Ter	np Blank: Yes No	Wet Ice:	(Yes) No																
Temperature (°C):	1.3	Thermometer	ID	9LS															
Received Intact: Yes	2No	R8	and the second second second	Itain															
Cooler Custody Seals: Yes No	o SNA Con	rection Factor:	-0.	_ S															
Sample Custody Seals: Yes No	o (N/A) Tot	al Containers:		ar of		sa											TAT start lab, i	s the day rece f received by	evied by the
Sample Identification	Matrix Date	Time	Depth	] agu	- -	orid													
Holazais		Sampled		<u>P</u>	Ē	ਤ											San	nple Comr	nents
Halozeza	$\int \frac{1}{2} \frac{1}{4} \frac{1}{4}$	5 1011	()	1		$ \vee $	· ·										and an an article of	A COMPACT AND A COMPACT OF A	CONCERNES.
Holey Surfam	$\frac{2}{5}$ 12/14/18	1010	30		Ľ	$\leq$													
Holey-10	$S$ $v_1 v_1 v_2$	1001	1.6		$\lor$							_							
Hole4-15	S 12/14/18	1030	10	<u>+</u> }_	$\sim$	ert						_	· · · · ·						i mini ingu
Hole 4- 30	5 12/14/18	1633	<u> </u>	1	$\vdash$							_							
Holes - Surface	S 12/14/18	1640	<u> </u>		NV N	$\downarrow$	$\left\{ \right\}$				_				· ·				
Holes- 10	5 12/14/18	1043	16	1.		1.7	$\left  - \right $					· · · ·				ļ			
Hole 5- 15	5 12/14/18	1045	15	$\frac{1}{1}$			╀╌╴┨										<u> </u>		
1-101e5- 30	5 12/14/18	1047	30	1		5										· ·			
Total 200.7 / 6010 200.8 / 6	020· 8P		A 7. 44		<u> </u>												<u> </u>		
Circle Method(s) and Metal(s)	to be analyzed	TCLP / SPI	P 6010 8		Sb As	s Ba	Be B	Cd C	a Cr	Co Cu	Fe Pt	o Mg I	Vn Mo	NiK	Se Ag	SiO2	Na Sr	TI Sn U V	Zn
Notice: Signature of this document and reling	uishment of samples con	stitutes a valid p			30 /	AS Ba	a Be (	Cd Cr		Cu Pb I	Vin Mo	Ni S	e Ag 1	10		16	<u>31 / 245.</u>	1/7470 /7	<b>′471</b> : Hg
of service. Xenco will be liable only for the co	st of samples and shall r	not assume any re	esponsibility for	rom clie r any los	nt comp ses or	pany to expense	Xenco, il es incurr	ts affiliat red by th	es and e client	subcontrac	tors. It a	issigns s	tandard 1	erms and	condition	S			
Polinguished by (City)	applied to each project	and a charge of \$	5 for each samp	ole subn	nitted to	Xenco	, but not	analyze	d. Thes	e terms wil	be enfor	rced unle	ss previo	usly negot	the contr iated.	rol			
	Received	i by: (Signatu	re)		Date	/Time		Reli	nquis	hed by:	Signat	ure)	F	eceived	by; (S	ignatu	ire)	Date	/Time
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																		JAT	T





# **XENCO Laboratories**



Prelogin/Nonconformance Report- Sample Log-In

Client: AECOM	Acceptable Temperature Range: 0 - 6	deaC
Date/ Time Received: 12/18/2018 03:50:00 PM	Air and Metal samples Acceptable Rai	nge: Ambient
Work Order #: 609121	Temperature Measuring device used :	R8
Sample I	Receipt Checklist Comment	:S
#1 *Temperature of cooler(s)?	1.3	
#2 *Shipping container in good condition?	Yes	
#3 *Samples received on ice?	Yes	
#4 *Custody Seals intact on shipping container/ cooler	? <b>N/A</b>	
#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?	Yes	
#9 Chain of Custody signed when relinquished/ received	ed? 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	

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

Analyst:

PH Device/Lot#:

#18 Water VOC samples have zero headspace?

Date: 12/18/2018

N/A

 Checklist completed by:
 July

 Katie Lowe

 Checklist reviewed by:
 Many Moah

 Kelsey Brooks

Date: 12/19/2018

Appendix D Soil Boring Logs and Field Notes

						Client: Ch	evron							-	
		$\mathbf{O}$	M			Project Name	: Chevron	Produced	Jate 5	ll'i ci <sup>n</sup>	Sit	es (	NLI	99	
						Project No.:	6059181	8							
9400 A	mber	glen E	BLVD	)		Project Locati	ion: Lea	Couty, NW	r, W	est La	oving	ton (	2nit	99	
Austin,	TX, 7	8729				Logged By:	Samue	el Whipkey	•						
Boreho	le ID:	Ilal	. 1			Drilling Comp	anv: HCI		Т	otal D	onth:	2	6 Ar		
Locatio	n:	1010	(C)			Driller Name	KParth (	Cappie	Comple	ted D	enth:	2	0 47 1 r		
Start Da	ate:	12 11	4/10	<u> </u>		Drilling Metho	d: Air Ro	tarv	Borehole	Diam	eter:	30	<i>F1</i>		
Comple	etion [	Date:	12/1	, 4/18		Sampling Dev	/ice: NIE		Static W	ater L	evel:	N	IA		
						· ·	Po/ ja								
Depth (ft)	Recovery (%)	Sample No. & Depth Interval (ft)	Blow Count	Classification USCS	(Inclu notatio	de lithology, grain on, mineralogy, be	Lithologic Desc size, sorting, ar dding, plasticity applicable	ription nularity, Munsell co , density, consister )	lor name & icy, etc., as	Screening VOCs	Lithology		Well Construction	Additional Remarks	
0		Holes-			Med	- Dark Brown	Calicle + To	op 50:1.						EC - 124	1.5
		Surtice	N/A				·								
5					Ton	fo white, C	inestar +	caliche, fina	graiwd					-5' EC-3	5,2
					dry	powder									
														16° FC- 31	B 4
10		Hole I-10													
		1101-15			T,	1 Sussioner	Din oraine	J, silty, Dr	s Dowdr.					15" EC = 3	hz
20					lun,	CIMUSIUM		, ,	- •						
												Page		f 1	

						Client: Chevron							
A		20				Project Name: C1 D. /. /	1210	1110	1				_
		U	NZ.			Project No: ( OF GIGE C	Water >	$p_{i} \parallel \sum$	ites.	INLI	299		
0400	mbor					Project No (6) \$ 9 7070							_
Augtin		20700		,		Project Location. Con County 10 M.	West	Court-	<u>nytan</u>	Drit	99		
Austin	, I <b>A</b> , I	10129		_	_	JLogged by. Samuel Whipkey			·				
		_											
Boreho	ole ID:					Drilling Company: HCI	Τ.	otal D	epth:	30	)		
Locatio	on: W	12099	C₩	<del>J #8</del> 4	-	Driller Name: Kenny Cooper	Comple	eted D	epth:	30	2		
Start D	)ate:	12/1	4/1	B		Drilling Method: Air Rotary	Borehole	Diam	eter:		-		
Compl	etion	Date:	(2)	14/10	,	Sampling Device:	Static W	ater L	evel:	/	-		
apth (ft)	acovery (%)	ample No. & Depth Interval )	ow Count	assification SCS	(Inclue	Lithologic Description Ide lithology, grain size, sorting, anularity, Munsell cc on, mineralogy, bedding, plasticity, density, consister	olor name & ncy, etc., as	reening DCs	hology	ell Construction		ditional Remarks	
	r Karley and Sharley and Sharl	v €	ā	ວິວ		applicable)		s S S	Ē		<u> </u>	P4	_
30		גישוטיין			Aed-	-Dark B. Tan to white, Cinestae.	, Dry					EC = 30.2	4
			N/A		Po	ow ober							
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50						\$4,1							
60													
							i			Page	<b>7</b> of	7	

					Client: Chevron						
Δ		0	M		Project Name: Cheuron Produced water	- 55111	site	s /	NLU	99	
					Project No .: Leh County, NM 1	Vest 10	New	ten	(m!	+ 99	
9400 A	\mber	glen E	BLVC	)	Project Location: 60591618		1	•••			
Austin,	<u>, TX, 7</u>	78729			Logged By: Samuel Whipkey	_					
Boroho		11.	1.2								
Locatio			ne <u>L</u>		Drillor Name: K	Complex		eptn:		<u>50</u>	
Start D	) oto: ///. [/	<u>, 100 (</u>	14		Drilling Mothod: Air Potony	Comple		eptn:		20	
Compl	etion I	<u>12//1</u>	1118		Drilling Method. All Rolary	Statio W/	Diam	eter:	/	_	
				// «//. 		Static VV		evei.			
Depth (ft)	Recovery (%)	Sample No. & Depth Interval (ft)	Blow Count	Classification USCS	Lithologic Description (Include lithology, grain size, sorting, anularity, Munsell color notation, mineralogy, bedding, plasticity, density, consistency applicable)	r name & y, etc., as	Screening VOCs	Lithology		Well Construction	Additional Remarks
0		Hole R Sur face	N/A		Mod to dr K brown Top soil, Chaliche,						EC= 89.2
5					Tanto White, Cimestenes Caliebe, Rine g dry powels.	g raind					5' EC 84,9
10		Holezy	D						1		10- EC 36.8
15		Die 3-10									15'EC = 172
20									Page		f -2

					Client: Chevron						
					Project Name: Classic D. / /	1.0	Ĩ (L vé	<b>S</b> ( ,			
A		J	Ń		Project Name. Chevron Produced V	vater S	PIIIS	514-5	$\omega_{L}$	- 699	r
0400	mahar	alan F			Project No.: 605971818		2				
9400 P		gien t	DLVL	,	Project Location: Cea Coarty, NM	West L	aring	ton	Unit	<u> </u>	
Austin,	17,	/8/29			Logged By: Samuel vvnipkey						
Boreho	ole ID:	: 14	sler		Drilling Company: HCI	T	otal De	epth:	30	5	
Locatio	on:	-1299	<u>î</u> C¥4	<b>J #8</b> 4	Driller Name: Kenny Cooper	Comple	eted De	epth:	30	7	
Start D	ate:	12	<u> 14 </u>	18	Drilling Method: Air Rotary	Borehole	e Diam	eter:	/	-	
Compl	etion	Date:	121	14/18	Sampling Device:	Static W	ater L	evel:	_		
			THE S								
		val									
		Iter	150								
		5	16353								
		epi	12.						E		irks
		 ∞	100	_	Lithologic Description				ctic		ma
	8	ġ	Ĭ	Itio	Enhologic Description				stru		Re
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b t	l S	Ē	M	Issi CS	notation, mineralogy, bedding, plasticity, density, consister	ncy, etc., as	S e	90	0		litic
<u> </u>	Re	₿ (£	B	СS СS	applicable)		N SCI		Ň		Add
30		Hole 7-3	1		Tan to white Line stare. Dry Doweler	fine					
			N/A			/ -					
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				_		Client: Chevron							
A		( <b>0</b> )				Project Name: Charson Poorly and	(Nat	er Sall	Site	- W	2099		
						Project No.: 605 91818		- /					
9400 A	mber	glen E	BLVE	)		Project Location: Cea County, NI	n, i	Vest (oul	ng tou	~120	14 9	<u>9</u>	
Austin,	17, 1	18729				Logged By: Samuel Whipk	ey						
Boreho	ole ID:	Ha	1.3			Drilling Company: HCI		Т	otal D	enth.		50	
Locatio	n: i	NLU	46			Driller Name: Konny Cooper		Comple	ted D	epth:		30	
Start D	ate:	1	2/11	1/18		Drilling Method: Air Rotary		Borehole	Diam	eter:			·····
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		Surface	N/A		Mech	Drown, Top soil & Caliche.							CC SIIC
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						Client: Chevron						
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Austin,	17, 1	0123				Logged by. Samuel whipkey						
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Borenc		1011	( y			Drilling Company: HCI		otal D	epth:	>0	5	
Locatio		CU94	GVI	J #84	}	Driller Name: Kenny Cooper	Comple	eted D	epth:	30	)	
Start D	ate:		$\mu p$			Drilling Method: Air Rotary	Borehole	Diam	eter:		$\rightarrow$	
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Austin,	TX, 7	78729				Logged By	/:	Samuel	Whipkey	1		- 9+				
Deset		11.													-	
Boreno	DIE ID:	140	<u>e4</u>			Drilling Co	mpany:	HCI			otal D	epth:		50		
Locatio	n: 6	260	99	<u>^</u>		Driller Nan	ne: Ka	enny C	ooper	Comple	eted D	epth:		30		
Start D	ate:	$\frac{211}{2}$	411	$\frac{9}{100}$			thod:	Air Rota	ry	Borehold	e Diam	eter:				. <u> </u>
Comple		Jale.		4/1%		[Sampling I	Device:			Static v	later L	evei:				
Depth (ft)	Recovery (%)	Sample No. & Depth Interval (ft)	Blow Count	Classification USCS	(Inclue notatic	de lithology, g on, mineralogy	Litholo rain size, s ⁄, bedding, a	gic Descrip orting, anul plasticity, c pplicable)	tion larity, Munsell lensity, consis	color name & tency, etc., as	Screening VOCs	Lithology		Well Construction		Additional Remarks
0		Hole 4 Surface	N/A		Moc	1 - Dorlo	brown	Top So	il d Claile	Le.					E	= 1065
5					Tan d	o White L	here so	tone t (	Calidu, D	ry powelle					5"	EC = 36:7
10															10-	EC = 61.9
15					Tar . Dry	to white, Powe	Lines ber.	tone, t	line gro	ined.					15-	EC = 33,6
20													Page		of	2

A 9400 A Austin,	mber TX, 7	<b>3</b> glen E 78729		)		Client: Chevro Project Name: () Project No.: (o() Project Location: Logged By:	n Wyrin Produced 594818 White Conty Samuel Whipkey	, N	)ater Sp M (1	);115, 1es+	itrs Loui	WC	U 9'	7 + 99	
Boreho	le ID:	Hol	ell			Drilling Company:	HCI		T	otal D	epth:	30	5		
Locatio	n: W	174		<del>J #</del> 64		Driller Name:	Kenny Coopy		Comple	ted D	epth:	30	7		
Comple	etion	Date:	12	0	<i>q,</i>	Sampling Device:	All Rolary	$\rightarrow$	Static W	ater L	evel:				
Depth (ft)	Recovery (%)	Sample No. & Depth Interval (ft)	Blow Count	Classification USCS	(Incluc notatio	Litho de lithology, grain size, n, mineralogy, bedding	logic Description sorting, anularity, Munse g, plasticity, density, cons applicable)	II col	or name & cy, etc., as	Screening VOCs	Lithology	Well Construction			Additional Remarks
30		Wen-D	N/A		Tan to	White, L'unesta	re five grained i	clry	power					EC = 9	57,3
40							-50								
50															
60															
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AECOM Project Name: Chevron Produced Water Spill site WLV 99 Project No: ( a 5 G 1940															
9400 Amberglen BLVD Austin, TX, 78729 Dogged By: Samuel Whipkey											<del>ĵ</del>				
Borehole ID: 1401+3						Drilling Company: HCI To			otal Depth: 30						
Start Date: 714/16						Drilling Method: Air Potady Borebole				Diameter:					
Completion Date: 12/14/18						Sampling Device: Static Water Level:				-					
		th Interval				• • • • • • • • • • • • • • • • • • •									
Depth (ft)	Recovery (%)	Sample No. & Dep (ft)	Blow Count	Classification USCS	(Inclu notatio	Lithologic Description de lithology, grain size, sorting, anularity, Munsell color name & on, mineralogy, bedding, plasticity, density, consistency, etc., as applicable)		Screening VOCs	Lithology	Well Construction			Additional Remarks		
0		Holes- suifaire	N/A		Moc	l Brown Top soil & collicle.							U	C = 198,8	
5					Tan . fin	to white, Linestane, fine & c ed grained, powder.	ali	che.					7	EC = 9011	
10								4					10'	EC = 33.5	
15					Tan	, Cimestan, fined graind,	Ρø	welis.					15	" EC= 45.6	
20											Page	(	of	L	

					Client: Chevron								
					Project Name: (2) used Data 1 (4)	)		- (1 -	c )/ )	NOC.			
		U	Ň		Project No: (20) San Produced (A	Project No: 605 GIRIO							
	mher	alon F	ם או	•	Project location: Contraction	Project location: (a) (b) the life life life life life life life lif							
Austin TX 78720									ton D	nit	44		
Kusun,													
Derehe		111	5				-4-1 D	a va Ala v	70				
Borenc		Hol	<u>د ب</u>	1 #04	Drilling Company: HCI	0.000	otal D	eptn:	50				
Locatio	on: (J)	1099	CVI	1#04	Driller Name: Centry Cooper	Driller Name: Kenny Coomer Completed Depth: 30							
Start D	ate:	12	14/1	8	Drilling Method: Air Rotary	Drilling Method: Air Rotary Borehole Diameter:							
Comple	etion	Date:	12/11	<u>11 e</u>		Sampling Device: Static Water Level:					·····		
		_											
		2a	THE R										
		Inte	5 222										
		bth	19.75						_		S		
		De							tion		Jarl		
	(%	оð	-	5	Lithologic Description	Lithologic Description			LIC I		Zen		
E	ation No (, , , , , , , , , , , , , , , , , , ,								ng v				
÷	ove	ble	Ö	ili Si	(Include lithology, grain size, sorting, anularity, Munsell col	or name &	s	<u> </u>	ŏ		tior		
)ep	Sec	ft) Sarr	Slov	ISC las	applicable)	cy, elc., as	No se	it.	Vel		/ddi		
30	<u> </u>	Holes			Fail allette l'instrum Cline a calmet	Doude	0 >		Ť		F(- 31.4		
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14 Location Buckey Location, Num Date 12/13/18 Project / Client \_\_\_\_\_\_

Come hotel for Buddage alfice. 070 Arrive at the affire and besin 0800 Site Specific MCBU training. Submit Dis pla for approval to Austin Bats. 0850 0850 heavy affice for WLU 99. 0730 Asrive at WLU99, Met with HEI Winds NNW 30 uph w/ 40+ mph Busts Stop werk and go to hotel. Will resume to marrow marriy. Arrive at Motel. 1000

Location \_\_\_\_\_\_ Date /2/14/18 75 Project / Client Chevron

03 00 Loane hotel. Stop at Wal-mart Per Icre 2 Supplies 0835 Arrive ansite. Cardyet Review at HATP & JSet, Recived Extavation permit for 0910 Joe at Cherra 0920 Setting up to begin baring. 0930 Clear hole. 2 (32.854790, -103.583603 0432 Surface 124 5 EC 5-35 09 35 10 Sample 38.4.15 0937 15 Sample 31,205 0940 30 sample. 30, 2 ,5 09 50 Clear hole 2 (32.854766, -103.383696 **89.** 2 5 84.9 0952 Scrface 0953 36,8 10 Sample 1720 15 Sayke 09 55 30 - Saple 39 57 40.4 Clear hole 3 32.854699, 103.383609 10 05 1008 Surface 51.2 5' 1009 21.3 1010 10' 432 1011 211 S Rite in the Rain

76 Location	Wevg	9 6059	1818	Date _/	2/14/10
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1693	301	57,	3		
1040	Clew	hde 5	32,854	867, -10	3,363614)
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Appendix E Photo Log



Facility Name: West Lovington Unit #099 Site Location: Lea County, NM PHOTO LOG

**Project No.** 60591818





## Photo No.Date:212/14/18Direction PhotoTaken:

North

## Description:

Image of WLU #99 injection well. Boreholes locations are visible and drill cutting waste drums are located on the north side of the injection well.



