



October 18, 2022

New Mexico Oil Conservation Division
Attn: Mr. Bradford Billings
5200 Oakland Avenue, N.E., Suite 100
Albuquerque, New Mexico 87113

RE: Incident Closure Request
NTO1423256491-VACUUM GLORIETTA WEST UNIT 85
IRP-3266- Lea County, New Mexico
NTO1423256491 @ 30-025-320236

Dear Mr. Billings:

This letter is to request closure of the Vacuum Glorietta West Unit 85 Incident NTO1423256491. The discovery of the flow line failure was initially reported on 8/29/12. A site assessment and remediation plan were received 11/4/2015 NMOCD representative Kellie Jones and included commentary for three items addressed by the previous operator in the attached documentation. Additional, records were not discovered on the NMOCD portal.

Upon completion of all remediation activities including additional 2016 soil investigations and 2017 geophysical survey information, in a site closure request was prepared in April of 2019 by the former operator's consulting group. The report along with the associated final C-141 records were supplied to MorningStar at the time of acquisition. However, these records were not available on the NMOCD portal "Incident Files" and it is unclear if this submission had been received or reviewed. As such, the closure request with all supporting data and records are being submitted at this time for NMOCD confirmation that this facility has been granted closure status as requested, with the understanding that this facility requires not further assessments or additional clean up actions.

If you have any questions regarding this request, please contact Alan Kane with Kane Environmental Engineering Inc. at (281) 370-6580 or email: alanjkane@comcast.net or Russell Hamm at (918) 693-4833 or email: rhammenviro@gmail.com.

Respectfully,



Dan Guillotte

Manager Environmental Health and Safety

CC: File, Kane Environmental Engineering Inc.
Attachments: Chevron/Arcadis Closure Request Report



Jason Michelson
Project Manager

**Chevron Environmental
Management Company**
1500 Louisiana Street, #38116
Houston, Texas 77002
Work: 832-854-5601
Cell: 281-660-8564
jmichelson@chevron.com

April 8, 2019

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

**Re: Vacuum Glorieta West Unit 85
Site Closure Report
NMOCDC Case No. 1RP-3265 and 1RP-3266
Lea County, New Mexico**

Dear whom it concerns,

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

- Vacuum Glorieta West Unit 85 - Site Closure Report

The submittal was prepared by Arcadis U.S., Inc. (Arcadis) on behalf of Chevron Environmental Management Company (CEMC).

Please do not hesitate to call Brett Krehbiel with Arcadis at 916-786-5382 or myself at 832-854-5601, should you have any questions.

Sincerely,

Jason Michelson

Encl. Vacuum Glorieta West Unit 85 - Site Closure Report

C.C. Amy Barnhill, Chevron/MCBU

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nTO1423256144
District RP	1RP-3265
Facility ID	30-025-31129
Application ID	pTO1423256238

Release Notification

Responsible Party

Responsible Party: Chevron USA Inc.	OGRID
Contact Name: Jason Michelson	Contact Telephone
Contact email: jmichelson@chevron.com	Incident # (assigned by OCD)
Contact mailing address:	

Location of Release Source

Latitude 32.782150 Longitude -103.496157
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Vacuum Glorietta West Unit #85	Site Type: Production Well
Date Release Discovered: 6/10/2012	API# (if applicable): 30-025-31129

Unit Letter	Section	Township	Range	County
B	6	18S	35E	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)

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls): 0.037	Volume Recovered (bbls): 0
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls): 17.7	Volume Recovered (bbls): 3
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Flowline leak due to integrity of line.

State of New Mexico
Oil Conservation Division

Incident ID	nTO1423256144
District RP	1RP-3265
Facility ID	30-025-31129
Application ID	pTO1423256238

Was this a major release as defined by 19.15.29.7(A) NMAC? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? – Less than 25 barrels were released.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? – See Initial C-141 Form submitted on 6/20/2012.	

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?	<u>120</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.

Incident ID	nTO1423256144
District RP	1RP-3265
Facility ID	30-025-31129
Application ID	pTO1423256238

Closure

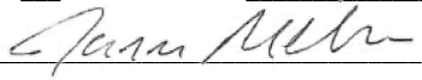
The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled 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) - **Photographic documentation is not available.**
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ Description of remediation activities – **Analytical soil sample data and an electromagnetic conductivity survey confirm that produced water impacts do not extend to deeper soil; therefore, there is currently no risk to groundwater at the Site.**

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: Jason Michelson Title: Project Manager

Signature:  Date: _____

email: jnichelson@chevron.com Telephone: 832.854.5601

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: _____

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	nTO1423256291
District RP	1RP-3266
Facility ID	30-025-20236
Application ID	pTO1423256636

Release Notification

Responsible Party

Responsible Party: Chevron USA Inc.	OGRID
Contact Name: Jason Michelson	Contact Telephone
Contact email: jmichelson@chevron.com	Incident # (assigned by OCD)
Contact mailing address:	

Location of Release Source

Latitude 32.787698 Longitude -103.514739
(NAD 83 in decimal degrees to 5 decimal places)

Site Name: Vacuum Glorietta West Unit #85	Site Type: Production Well
Date Release Discovered: 8/29/2012	API# (if applicable): 30-025-20236

Unit Letter	Section	Township	Range	County
B	6	18S	35E	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)

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls): 0.12	Volume Recovered (bbls): 0
<input checked="" type="checkbox"/> Produced Water	Volume Released (bbls): 123.6	Volume Recovered (bbls): 60
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release: Flowline leak occurred while rig was flowing back well throughout the night into the header to relieve pressure. VGSAU 85 is a submersible production well that is currently down and has been down since early June. There is a rig currently rigged up on the well and when the well pressures up at night they release the pressure down the line to relieve pressure on the well. Our belief is that the release was due to either carbonic acid eating through the line or CO2 breakthrough on the line causing the internal corrosion.

State of New Mexico
Oil Conservation Division

Incident ID	nTO1423256291
District RP	1RP-3266
Facility ID	30-025-20236
Application ID	pTO1423256636

Was this a major release as defined by 19.15.29.7(A) NMAC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? – Greater than 25 barrels were released.
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? – See Initial C-141 Form submitted on 9/04/2012.	

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?	<u>120</u> (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
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Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.

Page 3

State of New Mexico
Oil Conservation Division

Incident ID	nTO1423256291
District RP	1RP-3266
Facility ID	30-025-20236
Application ID	pTO1423256636

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 ½-mile of the lateral extents of the release
- ☒ Boring or excavation logs
- ☐ Photographs including date and GIS information – **Photographic documentation is not available.**
- ☒ 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.

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: Jason Michelson Title: Project Manager

Signature: C. J. Miller Date: _____

email: jmichelson@chevron.com Telephone: 832.854.5601

OCD Only

Received by: _____ Date: _____

Incident ID	nTO1423256291
District RP	1RP-3266
Facility ID	30-025-20236
Application ID	pTO1423256636

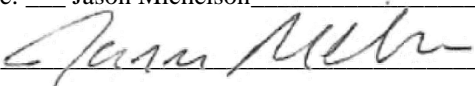
Closure

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.

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- ☒ Description of remediation activities – **Analytical soil sample data and an electromagnetic conductivity survey confirm that produced water impacts do not extend to deeper soil; therefore, there is currently no risk to groundwater at the Site.**

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Printed Name: Jason Michelson Title: Project Manager
Signature:  Date: _____
email: jnichelson@chevron.com Telephone: 832.854.5601

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: _____



New Mexico Oil Conservation Division – District I
Environmental Specialist
1625 N French Drive
Hobbs, New Mexico 88240

Arcadis U.S., Inc.
101 Creekside Ridge Court
Suite 200
Roseville
California 95678
Tel 916 786 0320
Fax 916 786 0366
www.arcadis.com

Subject:

Site Closure Report
2018 HES Transfer Site
Vacuum Glorieta West Unit 85
NMOCD Case No. 1RP-3265 and 1RP-3266
Lea County, New Mexico

ENVIRONMENT

Date:
April 8, 2019

Contact:
Brett Krehbiel

Phone:
916.786.5382

Email:
Brett.Krehbiel@arcadis.com

Our ref:
B0048616.0085

ARCADIS U.S., Inc.
TX Engineering License # F-533
Geoscientist License # 50158

Dear whom it concerns:

On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) prepared this Site Closure Report (Report) to document geophysical assessment activities performed at the Vacuum Glorieta West Unit (VGWU) 85, located in Lea County, New Mexico (Site). The purpose of the Report is summarize field activities completed and the results of samples collected during soil investigation activities conducted on site in 2013, 2016 and 2017, present final soil boring locations, results of the samples collected, and the evaluation performed as part of the investigations after the June 10, 2012 release of 17.7 barrels (bbls [42 gallons per bbl]) of produced water and 0.037 bbls of oil and the August 29, 2012 release of 123.6 bbls of produced water and 0.12 bbls of oil.

SITE DESCRIPTION AND BACKGROUND

The following site description and background section provides an overview of the site location and description, as well as the regional setting including geology, hydrogeology, nearby drinking water wells, surface water and climate.

Site Location and Description

The site is located within the Vacuum Glorieta West Unit (VGWU) approximately 14.5 miles southwest of Lovington, New Mexico. New Mexico Highway 238 is located approximately 0.54 mile east of the site. The closest agricultural area is 9 miles east of the site.

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April 8, 2019

The site is located in the western edge of the Permian Basin, a 75,000-square-mile area in west Texas and New Mexico that is populated by numerous oil and gas production wells. In New Mexico, the Permian Basin extends to Roosevelt County to the north and Chaves County to the west.

Climate

Average monthly temperatures near the site vary from a minimum of 27.9 degrees Fahrenheit (°F) in January to a maximum of 93.9°F in July (Western Regional Climate Center [WRCC] Hobbs, New Mexico [294026] weather station). Average annual precipitation recorded for the area of the site from the available WRCC period of record between 1912 and 2013 was approximately 15.75 inches per year (WRCC 2014a).

Due to the arid climate, the site experiences low precipitation and high evapotranspiration rates. The average annual evaporation from the available WRCC period of record between 1914 and 2005 was approximately 87.68 inches per year (WRCC 2014b).

Regional Geology and Hydrogeology

The site elevation is approximately 4,000 feet (ft) above mean sea level (amsl) and is located on the Llano Estacado of the Western High Plains, an ecoregion of the Great Plains of North America. The site is positioned immediately east of the Mescalero Ridge, which demarcates the western boundary of the (Miocene to Pliocene) High Plains Ogallala Formation (Reeves 1972). A rapid drop in elevation of 200 to 250 ft occurs west of the northwest-trending Mescalero Ridge. The Ogallala formation is unconfined and is predominantly composed of unconsolidated alluvial fan deposits of sand and gravel near the base, overlain by interbedded sand and clay in the upper portion of the formation (Seni 1980). Repeated depositional events on the High Plains surface beginning approximately 7 million years ago, followed by aerial exposure, generated a thick sequence of caliche horizons that are competent enough to act as a cliff for the expression of Mescalero Ridge. These hard caliche deposits form the upper portion of the stratigraphic sequence. In the site area, the Ogallala Formation is underlain by red beds of the Upper Triassic-age Dockum Group consisting of claystones, sandstones, and siltstones. Aquifers within the Dockum Group are not considered a major fresh groundwater resource in the area due to poor water production rates and elevated natural dissolved solids.

The main source of fresh groundwater in the area comes from the Ogallala aquifer. The Ogallala aquifer has a thickness of approximately 100 ft in the vicinity of the site and is considered the primary source of fresh water in the area. Depth to the groundwater regionally ranges from approximately 120 ft to 135 ft below ground surface (bgs).

Water-supply wells located within the region are completed in the Ogallala aquifer, also known as the High Plains Aquifer (HPA). The HPA consists primarily of the High Plains Ogallala Formation, and in localized areas, alluvial sediment of Quaternary age.

Based on satellite imagery, no surface-water bodies were identified within a radius of approximately 1-mile of the site (GoogleEarth 2018). During October 2018, Arcadis reviewed information obtained from the New Mexico Office of the State Engineer (NMOSE) online database (NMOSE 2018). Results of the database inquiry indicated that there were no water-supply wells located within a radius of 1,000 feet of

New Mexico Oil Conservation Division – District I
April 8, 2019

the site. In addition, results of the database review indicate average depth to groundwater is 128 ft bgs. Results of the database review are included in **Attachment 1**.

INITIAL RELEASE RESPONSE ACTIVITIES

According to the submitted New Mexico Oil Conservation Division (NMOCD) Notification of Release and Correction Actions (C-141 Form), a flowline leak resulted in a release of 17.7 bbls of produced water and 0.037 bbls of oil in June 10, 2012. The failure in the integrity of a line caused an additional release in August 29, 2012 of 123.6 bbls of produced water and 0.12 bbls of oil. Chevron personnel the Mid-Continent Business Unit (MCBU) stopped the release and conducted the initial response activities. On January 22, 2013, Chevron MCBU personnel excavated visually affected soil and collected four discrete confirmation soil samples from the base of the excavation, assumed to be 2 ft bgs. Information regarding the disposal of the excavated soil was not available to Arcadis. After collecting the soil samples, the excavated area was reportedly backfilled with imported soil.

Pursuant to NMOCD requirements (NMOCD 1993), a C-141 Form (**Attachment 2**) detailing the location, volume of release, and initial and planned cleanup efforts taken was submitted for the site by Nick Moschetti (Chevron MCBU).

2013 SOIL INVESTIGATIONS

Chevron MCBU personnel collected four soil samples (VGWU #85 Sample #1 through VGWU #85 Sample #4) on January 22, 2013 to initially assess the impacted area at VGWU-85 (**Figure 1**). Soil samples were collected in laboratory provided bottles and submitted to Cardinal Laboratories, a Texas-certified laboratory, for the following compounds:

- Benzene, toluene, ethylene, and xylenes (collectively referred to as BTEX) in accordance with United States Environmental Protection Agency (USEPA) Method 8021B
- Chloride in accordance with Standard Method 4500Cl-B
- Total petroleum hydrocarbons (TPH) Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) in accordance with USEPA Method 8015M

In November 2013, Arcadis conducted site assessment activities to characterize the lateral and vertical extents of potentially affected soil at the site. Soil boring locations were selected based on the results of confirmation soil sampling completed at the site in January 2013, locations of pipelines and other equipment at the site, and the extent of the release as documented by Chevron MCBU personnel during the initial response activities. Six soil samples from four soil borings (VGWU85-01 through VGWU85-04) were collected from each boring location (for a total of 24 soil samples) beginning at a depth of 2 ft bgs and continuing at 5-foot intervals from 5 to 25 ft bgs. Soil samples were placed in laboratory-supplied containers and submitted under appropriate chain of custody protocols to Xenco Laboratories (Xenco) for the following analyses:

- Chloride by USEPA Method 9056
- Percent moisture by ASTM International Method D2216

Following sampling, the boreholes were filled with soil cuttings and grouted to ground surface. The ground surface was restored to match the surrounding conditions. Boring locations are shown on **Figure**

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April 8, 2019

1 and analytical results from the soil samples are summarized in **Table 1**. Boring logs are presented in **Attachment 3**.

BTEX and TPH compounds were not detected in the four soil samples collected during the initially site assessment during January 2013. Chloride was detected in all four samples at concentrations ranging from 1,340 milligrams per kilogram (mg/kg; VGWU85-03) to 9,760 mg/kg [(VGWU85-01; Arcadis 2014a)]. Chloride was also detected in each of the 24 soil samples collected during the November 2013 sampling event, at concentrations ranging from 30 mg/kg (VGWU85-01 at 25 ft bgs) to 3,700 mg/kg (VGWU85-03 at 10 ft bgs) (Arcadis 2014b). The site assessment activities during 2013 and corresponding results are discussed in the *Site Assessment Report: Vacuum Glorieta West Unit #85*, dated December 2, 2014.

2016 SOIL INVESTIGATIONS

Arcadis conducted additional soil assessment activities in June and September 2016. Twenty-one soil samples were collected from nine (VGWU85-05 through VGWU85-11) soil borings at the site. Soil borings VGWU85-03 and VGWU85-04 originally installed in 2013 were reinstalled in the original locations in order to collect additional samples from deeper depths (**Figure 1**).

Soil samples were placed in laboratory-supplied containers and submitted under appropriate chain of custody protocols to Xenco Laboratories (Xenco) for the following analysis of chloride by USEPA Method 300/300.1.

Pursuant to the C141 directive published by the NMOCD, chloride results from the 2016 soil assessment were initially compared to the soil remediation action level of 600 (mg/kg required for vertical delineation, and 250 mg/kg required for lateral delineation. Title 19, Chapter 15, Part 29 (19.15.29) of the New Mexico Administrative Code (NMAC) concerning natural resources and wildlife, oil and gas, and releases which became effective on August 14, 2018. Closure criteria (CC) for chloride concentrations in the soil remains 600 mg/kg.

The cumulative analytical results from the 2016 soil assessment are provided in **Table 1**. Chloride was detected in each sample collected with concentrations ranging from 14 mg/kg (VGWU-85-11 at 2 ft bgs) to 6,120 mg/kg (VGWU-85-06 at 2 ft bgs). Chloride concentrations exceed the NMAC 2018 CC of 600 mg/kg in soil samples collected from 3 (VGWU85-05, VGWU85-06, and VGWU85-07) of the 7 borings advanced. Depths of samples collected with chloride concentrations that exceed CC range from 2 to 10 ft bgs. In addition, chloride concentrations from the soil samples collected from the readvancement of VGWU-03 and VGWU-04 were 57.5 mg/kg (30 ft bgs) and 66.7 mg/kg (30 ft bgs), respectively, which is below the CC.

Laboratory analytical results with chain of custody documentation are provided in **Attachment 4**.

2017 GEOPHYSICAL SURVEY

On June 29, 2017, Arcadis performed an electromagnetic conductivity survey over accessible areas of the site covering approximately 3 acres (**Figures 2 through 5**). The objective of the survey was to determine background electrical conductivity (EC) response and identify EC anomalies within the surveyed area to assess the lateral extent of possible produced water-related soil and impacts.

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The particularly high electrical conductivity of oil field production water makes the detection of produced water-related soil impacts by geophysical methods sensitive to the electrical conductivity of soil and groundwater a reliable approach. There are several methods that can be used for quantifying the EC of soil and groundwater, but a class of instruments which utilize the concept of electromagnetic induction to measure EC are very effective in many situations. Electromagnetic (EM) instruments that operate in what is known as the frequency domain are well suited for shallow investigations. EM conductivity instruments consist of co-planar transmitter and receiver coils, and a power source that can be handled by one or two persons. During the operation of the instrument, the transmitter coil is energized by an alternating current and radiates an electromagnetic field into the earth. This transmitted primary field induces electrical currents in the earth below the instrument. The magnitude of the induced current is proportional to the EC of the earth materials beneath the instrument. The induced current flow generates a secondary electromagnetic field, phase-lagged behind the primary field, that is detected by the receiver coil on the instrument. The receiver coil also detects the primary field and uses the ratio of the secondary to primary field to calculate the EC of the earth. This reading represents a bulk EC measurement, known as the apparent EC, within a volume of ground directly beneath the instrument down to its effective depth of penetration. The penetration depth is determined by the transmitter frequency, coil separation, height of instrument off the ground surface, and orientation of the coils.

For this site, Arcadis performed shallow-imaging EM surveys with two hand-held instruments: 1) a Model EM31-MK2 EM conductivity meter manufactured by Geonics Limited, and 2) a GEM-2 broadband electromagnetic sensor manufactured by Geophex Ltd. The EM31-MK2 is designed to map the apparent EC in the upper 18 ft of the subsurface. The EM-31MK2 operating frequency is 9.8 kilohertz (kHz) and the co-planar coils are separated by 12 ft. For the survey, the EM-31MK2 was operated in the vertical magnetic dipole mode (VMD) with approximate 9 to 18-foot effective sensing depth.

The GEM-2 is a digital, multi-frequency sensor capable of transmitting and receiving a digitally-synthesized arbitrary waveform containing multiple frequencies. The approximate depth of exploration for a given earth medium is determined by the operating frequency of the sensor. By utilizing multiple frequencies to measure the earth response from several depths, a concept of the approximate three-dimensional distribution of subsurface materials can be created. The quad-phase and in-phase instrument response values are stored in a handheld computer for subsequent processing. Data were collected in vertical dipole mode using five discrete frequencies (63 kHz, 18.3 kHz, 5.3 kHz, 1.5 kHz and 0.45 kHz). The higher instrument frequencies are sensitive to shallow variations in the subsurface, while the lower instrument frequencies are more sensitive to deeper variations in the subsurface.

Data from both instruments were collected along lines spaced approximately 10 ft apart with nearly continuous data coverage along these lines. Positioning information was provided by a Hemisphere A100 global positioning system (GPS) receiver with dynamic, real time correction (submeter accuracy). GPS and instrument response data were simultaneously recorded in a handheld field computer. All GPS and geophysical data collected during the survey were merged into a single data file for subsequent data processing.

Once the two EM data sets were collected, they were transferred to a laptop computer while on site. The data sets were preprocessed (*Trackmaker31* program from Geonics Limited (EM-31) and *WinGEM* from Geophex Ltd. (GEM-2)) and imported into *Surfer Version 15* to create relative conductivity maps. A raw plot of the GPS positions was created to verify the sufficiency of data coverage, which was verified

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affirmatively. Preliminary contour plots of the raw apparent conductivity data were also created while on site to verify that the data were within acceptable bounds and that project objectives were being met.

To further assess EC variations in the subsurface, a GEM-2 2D profile AA-AA' was inverse-modeled using the software IX1Dv3 by Interpex to produce an electrical resistivity cross-section of the subsurface depicted in **Figure 5**. Modeled GEM-2 2D data at depths near the limit of the penetration of the GEM-2 instrument are less constrained with results typically displaying distortions near the base of the model.

Interpretation of Geophysical Results

Figures 2 through **5** presents color-filled contour maps for the 63kHz GEM2 data (4 to 8-foot sensing depth), the 18.3kHz GEM2 data (6 to 10-foot sensing depth), and the EM-31MK2 data (9 to 18-foot sensing depth), respectively. **Figure 5** presents GEM-2 2D modelling results along the AA-AA' profile. Interpreted locations of metallic pipelines (based on field observations, aerial photographs, and the EM results) are denoted in the figures. The locations of 2013 and 2016 discrete soil samples are depicted in **Figures 2** through **5**. Chloride results in mg/kg from the 2013 and 2016 soil samples are displayed in the lower panel of **Figure 5**.

The color scale used in **Figures 2** through **5** is designed to visually portray the deviation from the background EC conditions, which are in the gray to blue green range. In contrast, anomalous areas of high EC are shown in upper portion of the color scale, from green to yellow to red, progressively indicating higher EC, which is generally assumed to reflect proportionately higher total dissolved solids (TDS) pore fluids (produced water influence) or conductive metallic features (site structure or subsurface utilities). Anomaly intensity and physical dimensions typically reveal whether the anomalies are due to pore fluid chemistry or metallic objects. Note that the data output for the GEM-2 model profile presented in **Figure 5** is in units of electrical resistivity (ohm-meters) which is the inverse quantity of electrical conductivity (milliSiemens/meter [mS/m]). A corresponding color scale is used in **Figure 5** to depict areas of areas of low electrical resistivity in the AA-AA' profile with warm colors (yellow to red) that correlate to areas of high EC in the contour maps.

In general, an elevated EC response is observed throughout the southern portion of the area surveyed with EC values >200 mS/m (red colors) as shown in **Figures 2** through **5**. The lateral footprint of the high EC response appears to decrease with depth, based on the comparison of the extent of elevated EC depicted in the shallow sensing 63-kHz GEM-2 map (**Figure 2**) to the deeper sensing EM-31MK2 map (**Figure 4**). The GEM-2 AA-AA' profile shown in **Figure 5** displays a similar lateral extent of high EC response, with elevated conductivity present throughout the right half of the AA-AA' profile. As denoted in **Figure 5**, the model resolves a confined “perched” low conductivity zone that extends from approximately 4 to 12 ft bgs, providing some vertical delineation of the elevated EC response and suggesting that produced water impacts may not extend to deeper soils in these areas.

CONCLUSIONS

Based on chloride concentrations results obtained during the 2013 and 2016 soil assessment (**Table 1**), delineation of chloride impacts has been achieved at the site. Chloride was detected in each sample collected from the 11 soil borings Arcadis advanced in 2013 and 2016. Concentrations ranged from 14 mg/kg (VGWU85-11 at 2 ft bgs) to 6,120 mg/kg (VGWU85-06 at 2 ft bgs). Chloride concentrations do not exceed the NMAC 2018 CC of 600 mg/kg from any samples collected deeper than 25 ft bgs. Based on

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data collected from the NMOSE online database, the average depth to groundwater near the site is 128 ft (**Attachment 1**).

In addition, EC data indicate that the extent of the spill is confined to a “perched” low conductivity zone that extends from approximately 4 to 12 ft bgs, providing some vertical delineation of the elevated EC response. This further suggests that produced water impacts may not extend to deeper soils in these areas and pose little to no risk to groundwater at the site.

CLOSING

Based on the data presented in this Report and concurrence from the NMOCD, no further assessments or additional cleanup actions are required at the site

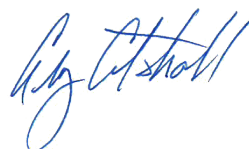
If you have any questions or comments regarding the information presented in this report, please contact Brett Krehbiel at 916.786.5382 or at Brett.Krehbiel@arcadis.com.

Sincerely,

Arcadis U.S., Inc.



Brett Krehbiel
Project Manager



Greg Cutshall
Program Manager

Copies:
File

Enclosures:

Tables

- 1 Soil Sampling Analytical Results

Figures

- 1 Soil Analytical Results
- 2 GEM-2 Conductivity Map – 63kHz
- 3 GEM-2 Conductivity Map – 18.3kHz
- 4 EM-31 Conductivity Map
- 5 Modelled GEM-2 Profile – Section AA-AA'

Attachments

- 1 NMOSE Water Column/Average Depth to Water
- 2 Form C141
- 3 Soil Boring Logs
- 4 Laboratory Analytical Results and Chain of Custody

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References

- Arcadis U.S., Inc. 2014a. Site Assessment Report, Vacuum Glorieta West Unit #85, Lea County New Mexico. December 2.
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- NMOSE. 2018a. Water Information, Maps and Data, Geospatial Data, OSE Well Data, http://www.ose.state.nm.us/water_info_data.html, October.
- NMOSE. 2018b. New Mexico Water Rights Reporting System, <http://nmwrrs.ose.state.nm.us/nmwrrs/waterColumn.html>, October.
- Reeves, C. C. 1972. Tertiary-Quaternary Stratigraphy and Geomorphology of West Texas and Southeastern New Mexico, New Mexico Geological Society, Guidebook 23 pp. 108-117.
- Seni, S. J. 1980. Sand-Body Geometry and Depositional Systems, Ogallala Formation, Texas, University of Texas, Bureau of Economic Geology, Report of Investigations No. 105, pp. 36.

TABLES

Table 1
Soil Analytical Results
Vacuum Glorieta West Unit #85
Lea County, New Mexico

Boring Location ID	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH-GRO (mg/kg)	TPH-DRO (mg/kg)	Chloride (mg/kg)	% Moisture
NMAC Closure Criteria ^(a)			10	---	---	---	50	100		600	---
VGWU #85 Sample #1	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	9,760	--
VGWU #85 Sample #2	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	7,840	--
VGWU #85 Sample #3	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	1,340	--
VGWU #85 Sample #4	1/22/2013	2	<0.050	<0.050	<0.050	<0.150	--	<10.0	<10.0	9,040	--
VGWU85-01	11/6/2013	2	--	--	--	--	--	--	--	2,700	5
	11/6/2013	5	--	--	--	--	--	--	--	2,700	6
	11/6/2013	10	--	--	--	--	--	--	--	640	6
	11/6/2013	15	--	--	--	--	--	--	--	320	8
	11/6/2013	20	--	--	--	--	--	--	--	59	20
	11/6/2013	25	--	--	--	--	--	--	--	30	5
VGWU85-02	11/6/2013	2	--	--	--	--	--	--	--	3,400	5
	11/6/2013	5	--	--	--	--	--	--	--	620	4
	11/6/2013	10	--	--	--	--	--	--	--	690	2
	11/6/2013	15	--	--	--	--	--	--	--	39	8
	11/6/2013	20	--	--	--	--	--	--	--	50	7
	11/6/2013	25	--	--	--	--	--	--	--	35	5
VGWU85-03	11/6/2013	2	--	--	--	--	--	--	--	2,000	10
	11/6/2013	5	--	--	--	--	--	--	--	2,000	17
	11/6/2013	10	--	--	--	--	--	--	--	3,700	15
	11/6/2013	15	--	--	--	--	--	--	--	590	19
	11/6/2013	20	--	--	--	--	--	--	--	450	4
	11/6/2013	25	--	--	--	--	--	--	--	2,100	8
VGWU85-04	6/21/2016	30	--	--	--	--	--	--	--	57.5	--
	11/6/2013	2	--	--	--	--	--	--	--	2,500	6
	11/6/2013	5	--	--	--	--	--	--	--	1,700	5
	11/6/2013	10	--	--	--	--	--	--	--	260	13
	11/6/2013	15	--	--	--	--	--	--	--	800	9
	11/6/2013	20	--	--	--	--	--	--	--	720	7
VGWU85-05	11/6/2013	25	--	--	--	--	--	--	--	740	7
	6/21/2016	30	--	--	--	--	--	--	--	66.7	--
	6/21/2016	2	--	--	--	--	--	--	--	4,220	--
	6/21/2016	4	--	--	--	--	--	--	--	1,840	--
	9/13/2016	2	--	--	--	--	--	--	--	6,120	--
	9/13/2016	4	--	--	--	--	--	--	--	2,540	--
VGWU85-06	9/13/2016	10	--	--	--	--	--	--	--	3,760	--
	9/13/2016	50	--	--	--	--	--	--	--	37.8	--
	6/21/2016	2	--	--	--	--	--	--	--	533	--
	6/21/2016	4	--	--	--	--	--	--	--	879	--
	6/21/2016	2	--	--	--	--	--	--	--	100	--
	6/21/2016	4	--	--	--	--	--	--	--	53	--
VGWU85-07	6/21/2016	2	--	--	--	--	--	--	--	279	--
	6/21/2016	4	--	--	--	--	--	--	--	523	--
VGWU85-08	6/21/2016	2	--	--	--	--	--	--	--	85	--
	6/21/2016	4	--	--	--	--	--	--	--	495	--
VGWU85-09	9/13/2016	2	--	--	--	--	--	--	--	14	--
	9/13/2016	4	--	--	--	--	--	--	--	31.1	--

Legend:

VALUE	Analytical value is greater than or equal to NMAC closure criteria
%	Percent
mg/kg	Miligram(s) per kilogram
<	Analyte was not detected above the specified method reporting limit
--	Not Analyzed/Not Listed
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
NMAC	New Mexico Administrative Code
TPH-GRO	Total Petroleum Hydrocarbons as Gasoline Range Organics
TPH-DRO	Total Petroleum Hydrocarbons as Diesel Range Organics

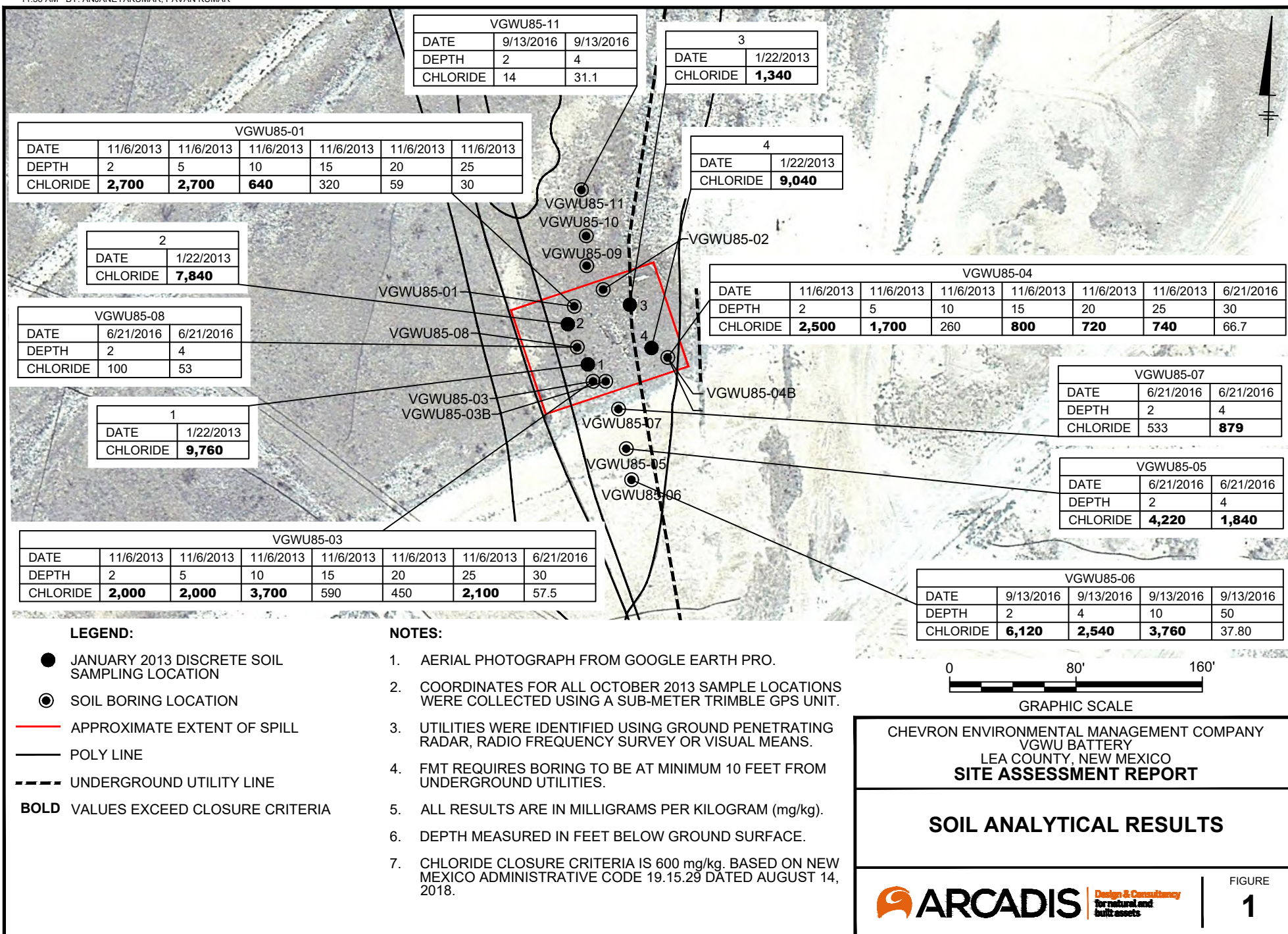
(a) Title 19, Chapter 15 of the NMAC for Natural Resources and Wildlife, Oil and Gas, and Releases, 19.15.29 NMAC. August.

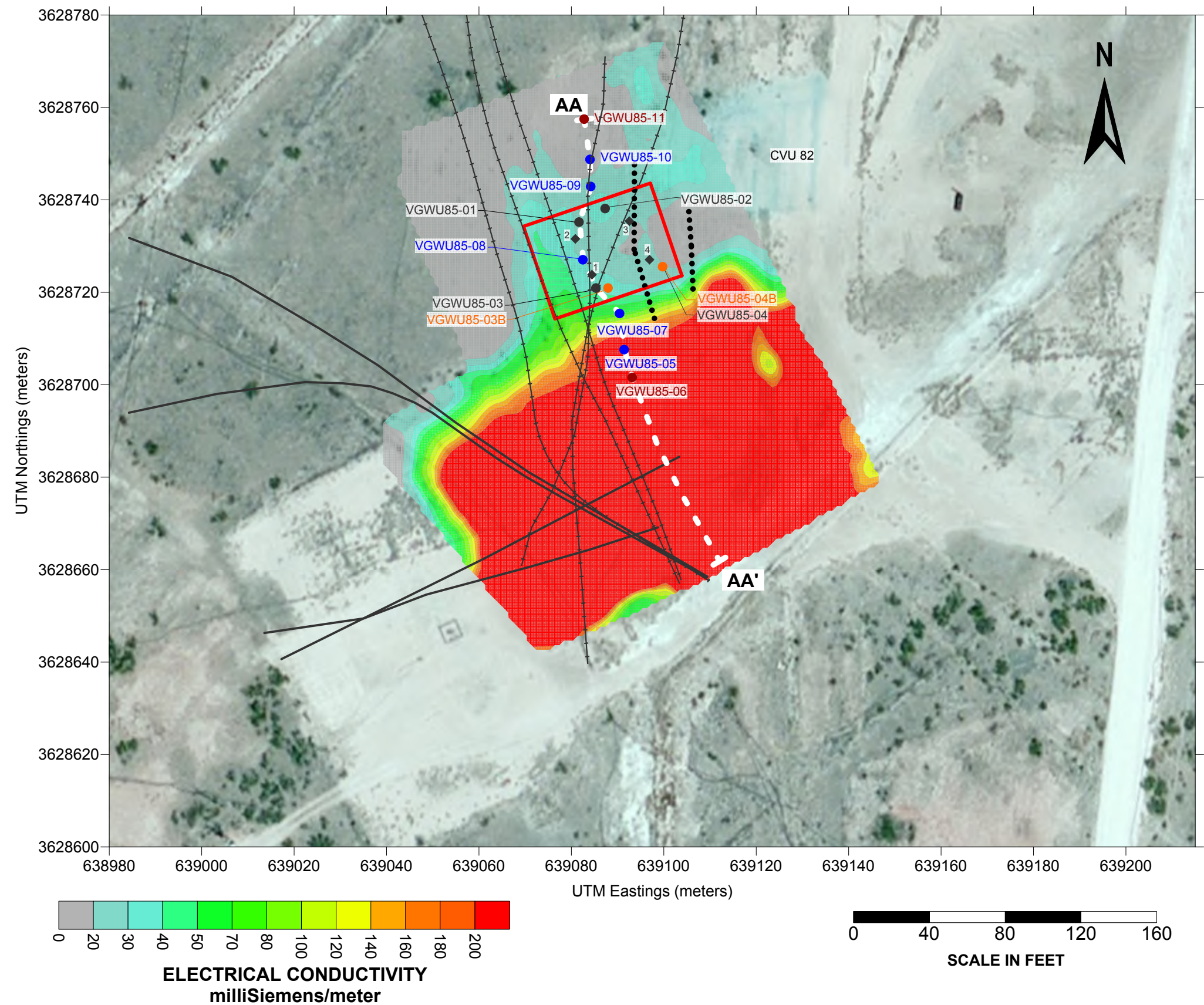
FIGURES



CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM

C:\Users\PAI01041\OneDrive - ARCADIS\BIM 360 Docs\CHEVRON CORPORATION\VGWU 85\2019\B0048616.0085\01-DWG\B00486111601-VGWU85.dwg LAYOUT: 1 SAVED: 1/25/2019 11:34 AM ACADVER: 21.05 (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 1/25/2019 11:56 AM BY: ANJANEYAKUMAR, PAVAN KUMAR





LEGEND

- OCTOBER 2013 DISCRETE SOIL SAMPLING LOCATION
- ◆ JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- AUGUST 2016 SHALLOW BORING LOCATION
- JUNE 2016 SHALLOW SOIL SAMPLE LOCATION
- JUNE 2016 DEEP SOIL SAMPLE LOCATION

— APPROXIMATE EXTENT OF SPILL

..... UNDER GROUND UTILITY LINE

— ABOVE GROUND METAL PIPELINE

—+—+— ABOVE GROUND POLY LINE

— — — MODELLED GEM-2 PROFILE

NOTES:

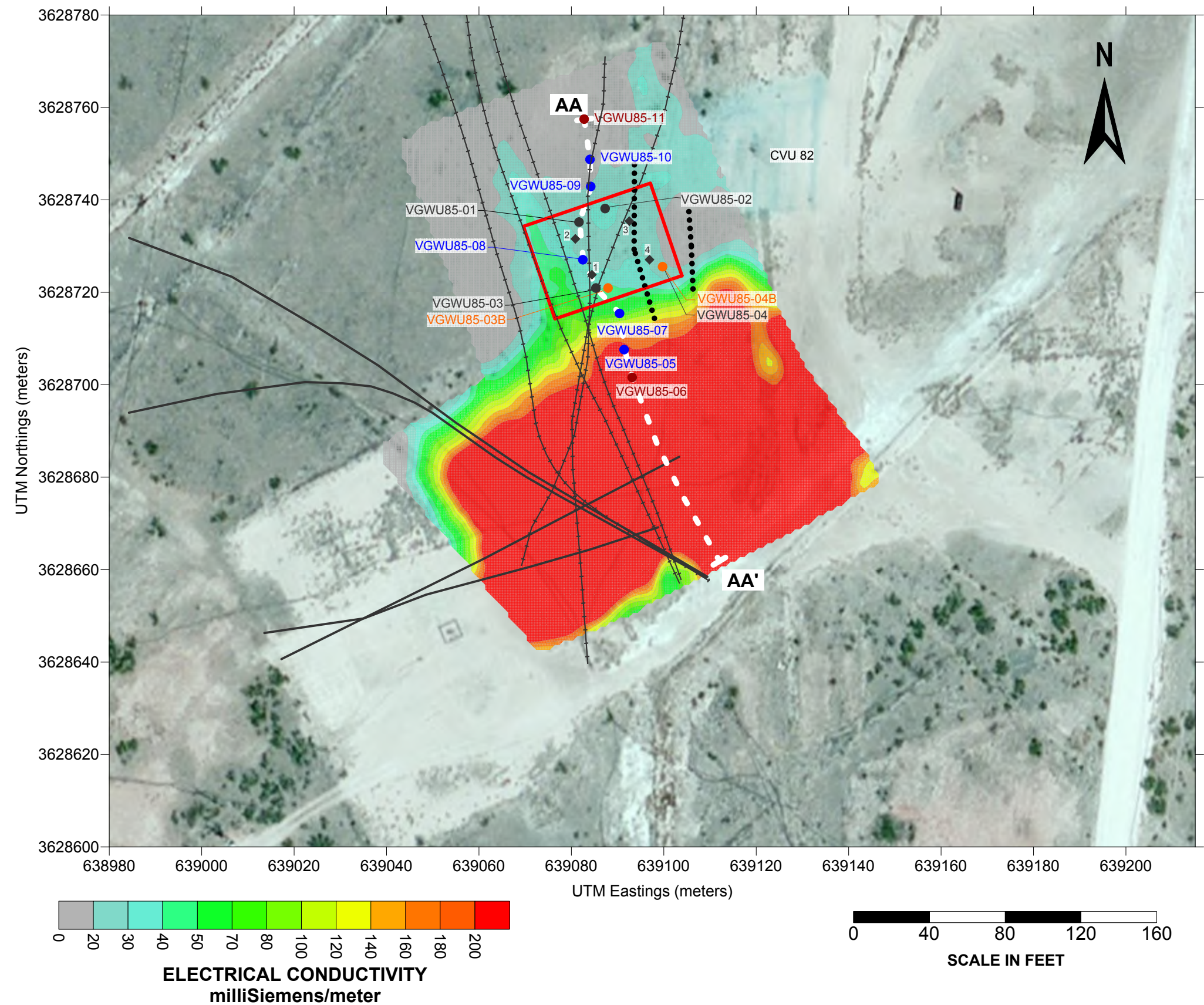
1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
2. COORDINATES FOR ALL OCTOBER 2013 SAMPLE LOCATIONS WERE COLLECTED USING A SUB-METER TRIMBLE GPS UNIT.
3. UTILITIES WERE IDENTIFIED USING GROUND PENETRATING RADAR, RADIO FREQUENCY SURVEY OR VISUAL MEANS.
4. FMT REQUIRES BORING TO BE A MINIMUM OF 10 FEET FROM UNDERGROUND UTILITIES.



GEM-2 Electrical Conductivity Map - 63 kHz Frequency
Approximate Penetration Depth of 4 to 8 feet bgs

VGWU 85
Chevron Environmental Management Company
VGWU Battery
Lea County, New Mexico

FIGURE 2



LEGEND

- OCTOBER 2013 DISCRETE SOIL SAMPLING LOCATION
- ◆ JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- AUGUST 2016 SHALLOW BORING LOCATION
- JUNE 2016 SHALLOW SOIL SAMPLE LOCATION
- JUNE 2016 DEEP SOIL SAMPLE LOCATION
- APPROXIMATE EXTENT OF SPILL
- UNDER GROUND UTILITY LINE
- ABOVE GROUND METAL PIPELINE
- ABOVE GROUND POLY LINE
- MODELLED GEM-2 PROFILE

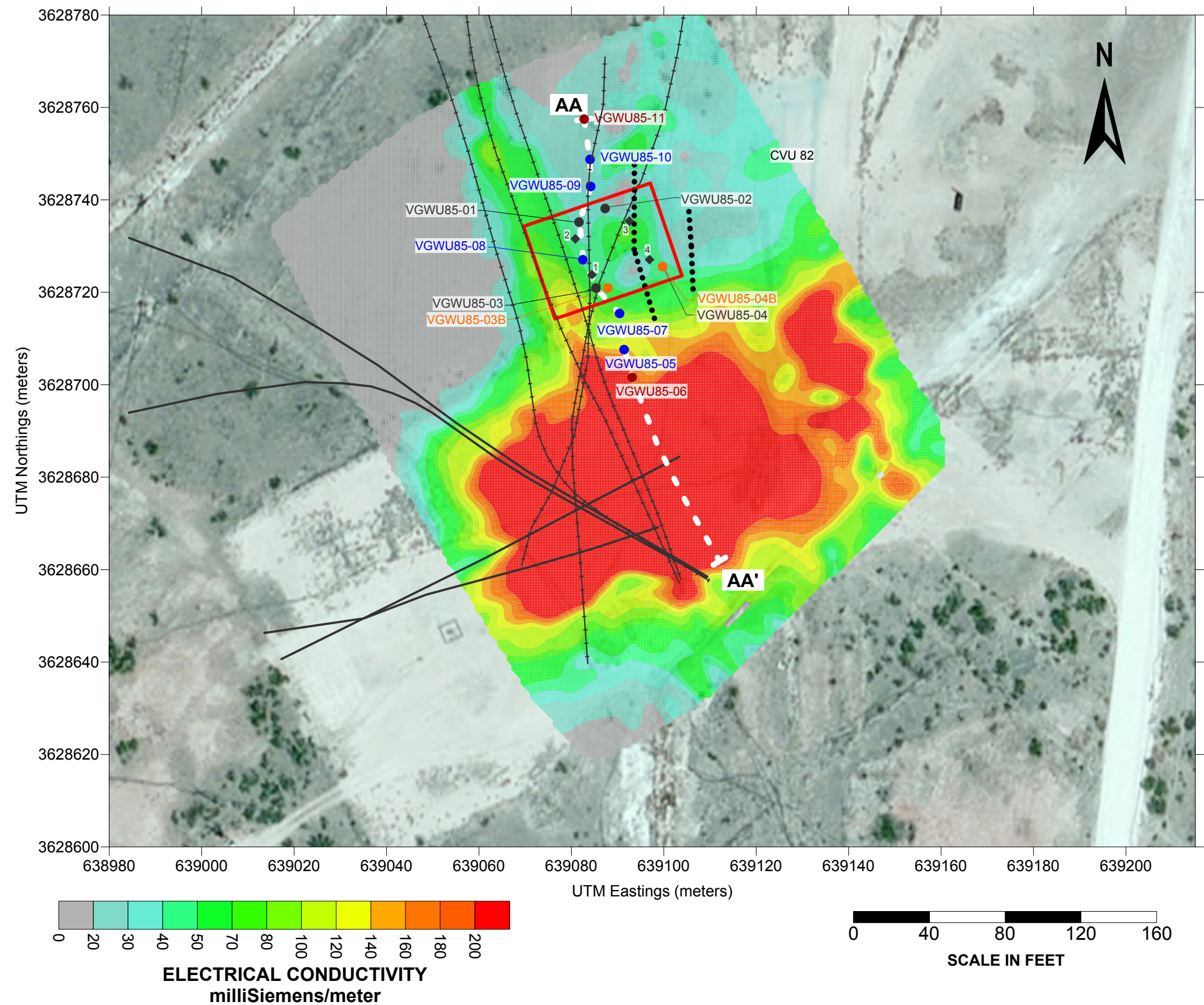
- NOTES:
1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
 2. COORDINATES FOR ALL OCTOBER 2013 SAMPLE LOCATIONS WERE COLLECTED USING A SUB-METER TRIMBLE GPS UNIT.
 3. UTILITIES WERE IDENTIFIED USING GROUND PENETRATING RADAR, RADIO FREQUENCY SURVEY OR VISUAL MEANS.
 4. FMT REQUIRES BORING TO BE A MINIMUM OF 10 FEET FROM UNDERGROUND UTILITIES.

GEM-2 Electrical Conductivity Depth Map - 18.3 kHz Frequency
Approximate Penetration Depth of 6 to 10 feet bgs



VGWU 85
Chevron Environmental Management Company
VGWU Battery
Lea County, New Mexico

FIGURE 3



LEGEND

- OCTOBER 2013 DISCRETE SOIL SAMPLING LOCATION
- ◆ JANUARY 2013 DISCRETE SOIL SAMPLING LOCATION
- AUGUST 2016 SHALLOW BORING LOCATION
- JUNE 2016 SHALLOW SOIL SAMPLE LOCATION
- JUNE 2016 DEEP SOIL SAMPLE LOCATION

— APPROXIMATE EXTENT OF SPILL

..... UNDER GROUND UTILITY LINE

— ABOVE GROUND METAL PIPELINE

—+—+— ABOVE GROUND POLY LINE

— - — MODELLED GEM-2 PROFILE

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH PRO.
2. COORDINATES FOR ALL OCTOBER 2013 SAMPLE LOCATIONS WERE COLLECTED USING A SUB-METER TRIMBLE GPS UNIT.
3. UTILITIES WERE IDENTIFIED USING GROUND PENETRATING RADAR, RADIO FREQUENCY SURVEY OR VISUAL MEANS.
4. FMT REQUIRES BORING TO BE A MINIMUM OF 10 FEET FROM UNDERGROUND UTILITIES.



EM-31 Electrical Conductivity Depth Map
Approximate Penetration Depth of 9 to 18 feet bgs

VGWU 85
Chevron Environmental Management Company
VGWU Battery
Lea County, New Mexico

FIGURE 4



FIGURE 5

ATTACHMENT 1

NMOSE Water Column/Average Depth to Water





New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 05843	L	LE		3	36	17S	34E			638753	3628731*	341		240	
L 13820 POD1	L	LE		3	1	3	01	18S	34E	639472	3628296	573	150	131	19
L 13820 POD2	L	LE		3	1	3	01	18S	34E	639472	3628296	573	150	131	19
L 06030	L	LE		3	3	36	17S	34E		638552	3628530*	577	230	102	128
L 10467	L	LE		1	2	01	18S	34E		639365	3628137*	651	231	115	116
L 05288	L	LE		4	4	36	17S	34E		639760	3628552*	689	231	90	141
L 05288	R	L	LE	4	4	36	17S	34E		639760	3628552*	689	231	90	141
L 02724 S4	L	LE		3	3	3	36	17S	34E	638451	3628429*	709	230	140	90
L 02722 S4	L	LE		1	2	2	01	18S	34E	639666	3628246*	748	234		
L 06115	L	LE		1	1	1	01	18S	34E	638460	3628217*	814	230	110	120
L 05003	L	LE			1	36	17S	34E		638742	3629538*	882	135	105	30
L 02722 S5	L	LE		2	2	2	01	18S	34E	639866	3628246*	910	232		
L 04247 POD5	L	LE		3	1	3	31	17S	35E	640040	3628781	947	235	95	140
L 02722	L	LE		3	1	1	01	18S	34E	638460	3628017*	953	229	105	124
L 04247 POD7	L	LE		1	3	3	31	17S	35E	640054	3628747	960		240	
L 06029	L	LE		4	4	35	17S	34E		638150	3628523*	966	230	102	128

Average Depth to Water: **128 feet**

Minimum Depth: **90 feet**

Maximum Depth: **240 feet**

Record Count: 16

Basin/County Search:

County: Lea

UTMNAD83 Radius Search (in meters):

Easting (X): 639094

Northing (Y): 3628729

Radius: 1000 meters

*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.

11/15/17 3:11 PM

Page 1 of 1

WATER COLUMN/ AVERAGE
DEPTH TO WATER

ATTACHMENT 2

Form C141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Form C-141
Revised August 8, 2011
Submit 1 Copy to appropriate District Office in
accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company CHEVRON U.S.A Inc.	Contact: Josie DeLeon
Address 56 Texas Camp Road, Lovington, NM 88260	Telephone No. Office: 575-396-4414 ext 222 Cellular: 432-425-1528
Facility Name Vacuum Glorietta West Unit #85	Facility Type Production Well
Surface Owner State of New Mexico	Mineral Owner State of New Mexico
API No. 3002520236	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	6	18.0S	35.0E					Lea

Latitude 32.787698° Longitude -103.514739°

NATURE OF RELEASE

Type of Release Produced Water Spill; oil	Volume of Release 0.12 BO and 123.6 BW	Volume Recovered 60 BW
Source of Release Flowline leak due to integrity of line	Date and Hour of Occurrence 08/29/12 03:00	Date and Hour of Discovery 08/29/12 9:30
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mr. Leking via voicemail	
By Whom? Nick Moschetti	Date and Hour 08/29/12 10:45	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*
NA

Describe Cause of Problem and Remedial Action Taken.*

Flowline leak occurred while rig was flowing back well throughout the night into the header to relieve pressure. VGSAU 85 is a submersible production well that is currently down and has been down since early June. There is a rig currently rigged up on the well and when the well pressures up at night they release the pressure down the line to relieve pressure on the well. Our belief is that the release was due to either carbonic acid eating thru the line or CO2 breakthrough on the line causing the internal corrosion.

Describe Area Affected and Cleanup Action Taken.*

On discovery vacuum truck contacted and vacuumed up the standing fluids which were sent to disposal. 60bbls of produced water was recovered. Next steps are for the visually contaminated soil to be excavated up to 2 feet and sent off for disposal.

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

Signature:		OIL CONSERVATION DIVISION	
Printed Name: David Pagano		Approved by Environmental Specialist:	
Title: Health & Environmental Specialist	Approval Date:	Expiration Date:	
E-mail Address: dpgn@chevron.com	Conditions of Approval:		Attached <input type="checkbox"/>
Date: 09/04/12	Phone: 505-787-9816		

* Attach Additional Sheets If Necessary

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

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

Form C-141
Revised August 8, 2011

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

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report

Name of Company CHEVRON U.S.A Inc.	Contact: Josie DeLeon
Address 56 Texas Camp Road, Lovington, NM 88260	Telephone No. Office: 575-396-4414 ext 222 Cellular: 432-425-1528
Facility Name Vacuum Glorietta West Unit #85	Facility Type Production Well
Surface Owner State of New Mexico	Mineral Owner State of New Mexico
API No. 3002531129	

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
B	6	18.0S	35.0E					Lea

Latitude 32.782150°

Longitude -103.496157°

NATURE OF RELEASE

Type of Release Produced Water Spill: oil	Volume of Release 17.7 BW and .037 BO	Volume Recovered 3 BW
Source of Release Flowline leak due to integrity of line	Date and Hour of Occurrence 06/10/12 10:45	Date and Hour of Discovery 06/10/12 10:45
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mr. Leking via voicemail	
By Whom? Nick Moschetti	Date and Hour 06/10/12 10:45	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	
If a Watercourse was Impacted, Describe Fully.* NA		
Describe Cause of Problem and Remedial Action Taken.* Flowline Leak due to integrity of line		
Describe Area Affected and Cleanup Action Taken.* On discovery vacuum truck contacted and vacuumed up the standing fluids which were sent to disposal. Next steps are for the visually contaminated soil to be excavated up to 2 feet and sent off for disposal		
I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOC 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 NMOC marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOC acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.		
Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Josie DeLeon	Approved by Environmental Specialist:	
Title: Safety Specialist	Approval Date:	Expiration Date:
E-mail Address: jdx@chevron.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 06/20/12 Phone: 432-425-1528		

* Attach Additional Sheets If Necessary

ATTACHMENT 3

Soil Boring Logs



Drilling Company: Harrison and Cooper Inc/K Cooper

Drilling Method: Air Rotary

Sampling Method: Shovel

Borehole Depth: 25' bgs

Descriptions By: M Phan

Client: Chevron EMC

Location: Vacuum Glorietta West Unit 85 Flow
Line Leak

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------

0	0							Air Knife only to 2"
		1	AR	5	1.4	✕		BIRDSEYE (CAPROCK) CALICHE, Brown (7.5YR5/2), Light Gray (7.5YR7/1), to Pink (7.5YR7/3), hard, dry, fractured, subangular to angular, 4 mm to 6 mm, organic material.
			AR					CALICHE, Gray (7.5YR5/1), Light Brown (7.5YR6/3), to Pinkish White (7.5YR8/2), hard, dry, fractured, subangular, 1 mm to 7 mm.
5	-5				2.4	✕		CALICHE, Pinkish Gray (7.5YR7/2), nodular, homogenous in color, chalky.
		2	AR	5				
10	-10				3.2	✕		CALICHE, Pinkish White (7.5YR8/2), homogenous in color, trace, subrounded to rounded nodules, hard to soft, chalky.
		3	AR	5				
15	-15				4.0	✕		SANDY CALICHE, Pink (7.5YR7/3) to White (7.5YR8/1), fine to medium grained, dry to moist.
		4	AR	5				
20	-20				1.2	✕		SANDSTONE, Light Brown (7.5YR6/3), fine grained, moist.
		5	AR	5				
25	-25				2.6	✕		



Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; cm = centimeter;

Drilling Company: Harrison and Cooper Inc/K Cooper

Drilling Method: Air Rotary

Sampling Method: Shovel

Borehole Depth: 25' bgs

Descriptions By: M Phan

Client: Chevron EMC

Location: Vacuum Glorietta West Unit 85 Flow
Line Leak

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------

0	0							Air Knife only to 2"
		1	AR	5	6.1	✕		BIRDSEYE (CAPROCK) CALICHE, Gray (7.5YR6/1), Brown (7.5YR4/2), to Pinkish White (7.5YR8/2), hard, dry, fractured, subangular to angular, 4 mm to 9 mm, organic material.
			AR					CALICHE, Gray (7.5YR6/1), Pink (7.5YR7/3), to White (7.5YR8/1), nodular, hard, dry, little rounded to subrounded nodules, well graded, 2 mm to 5 mm.
5	-5				6.0	✕		Same as above, subrounded, 3 mm to 11 mm, Pinkish White (7.5YR8/2) to White (7.5YR8/1).
		2	AR	5				
10	-10				11.9	✕		Same as above, trace subrounded nodules, 2 mm to 5 mm, moist, Pink (7.5YR7/3 to 7.5YR8/3).
		3	AR	5				
15	-15				8.7	✕		SANDY CALICHE, Pink (7.5YR7/3), homogenous in color, fine to medium grained sand, trace subrounded nodules, 3 mm to 6 mm, poorly graded, moist, soft.
		4	AR	5				
20	-20				3.8	✕		SANDSTONE, Light Brown (7.5YR6/4), homogenous in color, fine grained, moist, soft.
		5	AR	5				
25	-25				5.2	✕		



Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; cm = centimeter;



Drilling Company: Harrison and Cooper Inc/K Cooper

Drilling Method: Air Rotary

Client: Chevron EMC

Sampling Method: Shovel

Location: Vacuum Glorietta West Unit 85 Flow
Line Leak

Borehole Depth: 25' bgs

Descriptions By: M Phan

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------

0	0							Air Knife only to 2"
		1	AR	2	2.1	✕		BIRDSEYE (CAPROCK) CALICHE, Dark Gray (7.5YR4/1), Gray (7.5YR5/1), Light Gray (7.5YR7/1), to Black (7.5YR2.5/1), hard, dry, fractured, subangular to angular, well graded, 1 mm to 11 mm, organic material.
			AR	3				CALICHE, Pinkish Gray (7.5YR6/2), to Light Gray (7.5YR7/1), some subangular, well graded, 3 mm to 9 mm, dry, hard.
5	-5				3.0	✕		CALICHE, Pink (7.5YR7/3), to Pinkish White (7.5YR8/2), nodular, medium to hard, poorly graded, 3 mm to 5 mm, moist, subrounded to rounded, chalky.
		2	AR	5				
10	-10				3.4	✕		Same as above, Pinkish Gray (7.5YR7/2), Pinkish White (7.5YR8/2).
		3	AR	5				
15	-15				3.4	✕		
		4	AR	5				
20	-20				2.0	✕		SANDY CALICHE, Pink (7.5YR7/3), fine grained, trace rounded nodules, poorly graded, 2 mm to 3 mm, moist, soft.
		5	AR	5				
25	-25				2.2	✕		



Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; cm = centimeter;

Drilling Company: Harrison and Cooper Inc/K Cooper

Drilling Method: Air Rotary

Client: Chevron EMC

Sampling Method: Shovel

Location: Vacuum Glorietta West Unit 85 Flow
Line Leak

Borehole Depth: 25' bgs

Descriptions By: M Phan

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------

0	0							Air Knife only to 2"
		1	AR	2	0.7	✕		BIRDSEYE (CAPROCK) CALICHE, Dark Gray (7.5YR4/1), Brown (7.5YR4/2), to Pinkish White (7.5YR8/2), hard, dry, fractured, subangular to angular, well graded, 1 mm to 14 mm, organic material.
			AR	3				CALICHE, Gray (7.5YR5/1, 7.5YR6/1), Pinkish White (7.5YR8/2), to White (7.5YR8/1), some subangular, well graded, 2 mm to 7 mm, dry, hard.
5	-5				1.6	✕		CALICHE, Pinkish White (7.5YR8/2), trace nodules, rounded, poorly graded, 3 mm to 5 mm, hard to soft, chalky.
		2	AR	5				
10	-10				3.2	✕		CALICHE, White (7.5YR8/1), to Pinkish White (7.5YR8/2), soft, chalky.
		3	AR	5				
15	-15				3.5	✕		SANDY CALICHE, Light Brown (7.5YR6/4, 7.5YR6/3), fine grained, trace, subrounded nodules, poorly graded, 3 mm to 5 mm, moist, soft.
		4	AR	5				
20	-20				2.0	✕		Same as above, Pink (7.5YR7/4), to Pink (7.5YR8/3).
		5	AR	5				
25	-25				2.6	✕		



Remarks: ags = above ground surface; AK = air knife; amsl = above mean sea level; AR = air rotary; bgs = below ground surface; ppm = parts per million; cm = centimeter;



Boring No.: VGWU85-5

Soil Boring Log

Sheet: 1 of 1

Project Name: Chevron EMC

Date Started: 06/21/2016

Logger: Ken Wicks

Project Number: B0048616.0085

Date Completed: 06/21/2016

Editor: NA

Project Location: HES Transfer Sites

Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						SAND, few silt; trace gravel; well graded; tan.		
2			SB-5(2')			SAND, few silt; trace gravel; well graded; tan.	Borehole backfilled with Native material	
3								
4			SB-5(4')					
5						End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling

Sampling Method: Shovel

Driller: Kenny Cooper

Sampling Interval: NA

Drilling Method: Air Rotary

Water Level Start (ft. bgs.): NA

Drilling Fluid: None

Water Level Finish (ft. btoc.): NA

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface;

Converted to Well: ☐ Yes ☒ No

ppm = parts per million; NA = not available or not applicable.

Surface Elev.: NA

North Coord.: NA

East Coord.: NA



Boring No.: VGWU85-7

Soil Boring Log

Sheet: 1 of 1

Project Name: Chevron EMC

Date Started: 06/21/2016

Logger: Ken Wicks

Project Number: B0048616.0085

Date Completed: 06/21/2016

Editor: NA

Project Location: HES Transfer Sites

Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						SAND, few silt; well graded; dry; tan.		
2			SB-7(2')			SAND, few silt; well graded; dry; tan.	Borehole backfilled with Native material	
3								
4			SB-7(4')					
5						End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling

Sampling Method: Shovel

Driller: Kenny Cooper

Sampling Interval: NA

Drilling Method: Air Rotary

Water Level Start (ft. bgs.): NA

Drilling Fluid: None

Water Level Finish (ft. btoc.): NA

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface;

Converted to Well: ☐ Yes ☒ No

ppm = parts per million; NA = not available or not applicable.

Surface Elev.: NA

North Coord.: NA

East Coord.: NA

CHEVRON HES DIA-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEO BANGALORE\TEMPLATE\GINT TEMPLATE (EXISTING)\HES.GPJ ARCADIS.GDT 25/1/19



Boring No.: VGWU85-8

Soil Boring Log

Sheet: 1 of 1

Project Name: Chevron EMC

Date Started: 06/21/2016

Logger: Ken Wicks

Project Number: B0048616.0085

Date Completed: 06/21/2016

Editor: NA

Project Location: HES Transfer Sites

Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						SAND, with some gravel, trace fines; well graded; dry; tan.		
2			SB-8(2')			SAND, with little silt; trace gravel; well graded; dry.	Borehole backfilled with Native material	
3								
4			SB-8(4')					
5						End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling

Sampling Method: Shovel

Driller: Kenny Cooper

Sampling Interval: NA

Drilling Method: Air Rotary

Water Level Start (ft. bgs.): NA

Drilling Fluid: None

Water Level Finish (ft. btoc.): NA

Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface;

Converted to Well: ☐ Yes ☒ No

ppm = parts per million; NA = not available or not applicable.

Surface Elev.: NA

North Coord.: NA

East Coord.: NA



Boring No.: VGWU85-9

Soil Boring Log

Sheet: 1 of 1

Project Name: Chevron EMC
 Project Number: B0048616.0085
 Project Location: HES Transfer Sites

Date Started: 06/21/2016 Logger: Ken Wicks
 Date Completed: 06/21/2016 Editor: NA
 Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						GRAVEL to coarse SAND; trace fines; well graded; dry; gray.		
2			SB-9(2')			SAND, coarse; some silt; well graded; dry.	Borehole backfilled with Native material	
3								
4			SB-9(4')					
5						End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling
 Driller: Kenny Cooper
 Drilling Method: Air Rotary
 Drilling Fluid: None
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface;
ppm = parts per million; NA = not available or not applicable.

Sampling Method: Shovel
 Sampling Interval: NA
 Water Level Start (ft. bgs.): NA
 Water Level Finish (ft. btoc.): NA
 Converted to Well: ☐ Yes ☒ No
 Surface Elev.: NA
 North Coord.: NA
 East Coord.: NA

CHEVRON HES DIA-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEO BANGALORE\TEMPLATE\TEMPLATE EXISTING\HES.GPJ ARCADIS.GDT 25/1/19



Boring No.: VGWU85-10

Soil Boring Log

Sheet: 1 of 1

Project Name: Chevron EMC
 Project Number: B0048616.0085
 Project Location: HES Transfer Sites

Date Started: 06/21/2016 Logger: Ken Wicks
 Date Completed: 06/21/2016 Editor: NA
 Weather Conditions: NA

Depth (feet)	Sample Interval	Recovery (in.)	Sample ID	PID (ppm)	USCS Class	Description	Construction Details	Well
1						SAND, coarse; some silt; trace gravel; well graded; dry.		
2			SB-10(2')			SAND, coarse; some silt; trace gravel; well graded; dry.	Borehole backfilled with Native material	
3								
4			SB-10(4')					
5						End of boring at 4.0 ft bgs.		

Drilling Co.: HCI Drilling
 Driller: Kenny Cooper
 Drilling Method: Air Rotary
 Drilling Fluid: None
 Remarks: ' / ft = feet; " / in = inch; bgs = below ground surface;
ppm = parts per million; NA = not available or not applicable.

Sampling Method: Shovel
 Sampling Interval: NA
 Water Level Start (ft. bgs.): NA
 Water Level Finish (ft. btoc.): NA
 Converted to Well: ☐ Yes ☒ No
 Surface Elev.: NA
 North Coord.: NA
 East Coord.: NA

CHEVRON HES DIA-PROJECT FILES\BORELOGS\HES-BORING LOGS\GEO BANGALORE\TEMPLATE\GINT TEMPLATE EXISTING\HES.GPJ / ARCADIS.GDT 25/1/19

ATTACHMENT 4

Laboratory Analytical Results and Chain of Custody



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

January 29, 2013

DAVID PAGANO

Chevron - Lovington

HCR 60 Box 423

Lovington, NM 88260

RE: SOIL SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 01/22/13 16:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Coley D. Keene". The signature is written in a cursive style with a large, stylized 'C' and 'K'.

Celey D. Keene

Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
 DAVID PAGANO
 HCR 60 Box 423
 Lovington NM, 88260
 Fax To: None

Received: 01/22/2013
 Reported: 01/29/2013
 Project Name: SOIL SAMPLES
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 01/22/2013
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: VGWU #85 SAMPLE #1 (H300179-01)

BTX 8021B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/26/2013	ND	1.81	90.3	2.00	13.2	
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2	
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4	
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5	
Total BTX	<0.300	0.300	01/26/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	9760	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/24/2013	ND	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/24/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane 75.7 % 65.2-140

Surrogate: 1-Chlorooctadecane 88.7 % 63.6-154

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
 DAVID PAGANO
 HCR 60 Box 423
 Lovington NM, 88260
 Fax To: None

Received: 01/22/2013
 Reported: 01/29/2013
 Project Name: SOIL SAMPLES
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 01/22/2013
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: VGWU #85 SAMPLE #2 (H300179-02)

BTEx 8021B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/26/2013	ND	1.81	90.3	2.00	13.2		
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2		
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4		
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5		
Total BTEx	<0.300	0.300	01/26/2013	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7840	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/26/2013	ND	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane 98.1 % 65.2-140

Surrogate: 1-Chlorooctadecane 107 % 63.6-154

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
 DAVID PAGANO
 HCR 60 Box 423
 Lovington NM, 88260
 Fax To: None

Received: 01/22/2013
 Reported: 01/29/2013
 Project Name: SOIL SAMPLES
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 01/22/2013
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: VGWU #85 SAMPLE #3 (H300179-03)

BTEx 8021B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/26/2013	ND	1.81	90.3	2.00	13.2		
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2		
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4		
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5		
Total BTEx	<0.300	0.300	01/26/2013	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1340	16.0	01/25/2013	ND	400	100	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/26/2013	ND	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/26/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane 93.9 % 65.2-140

Surrogate: 1-Chlorooctadecane 102 % 63.6-154

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

Chevron - Lovington
 DAVID PAGANO
 HCR 60 Box 423
 Lovington NM, 88260
 Fax To: None

Received: 01/22/2013
 Reported: 01/29/2013
 Project Name: SOIL SAMPLES
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

Sampling Date: 01/22/2013
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: VGWU #85 SAMPLE #4 (H300179-04)

BTEx 8021B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/26/2013	ND	1.81	90.3	2.00	13.2		
Toluene*	<0.050	0.050	01/26/2013	ND	1.92	96.0	2.00	13.2		
Ethylbenzene*	<0.050	0.050	01/26/2013	ND	1.99	99.7	2.00	13.4		
Total Xylenes*	<0.150	0.150	01/26/2013	ND	6.04	101	6.00	13.5		
Total BTEx	<0.300	0.300	01/26/2013	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	9040	16.0	01/25/2013	ND	400	100	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/24/2013	ND	205	103	200	19.4	
DRO >C10-C28	<10.0	10.0	01/24/2013	ND	198	99.0	200	15.1	

Surrogate: 1-Chlorooctane 81.4 % 65.2-140

Surrogate: 1-Chlorooctadecane 92.1 % 63.6-154

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*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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A handwritten signature in black ink that reads "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

† *Cardinalis* (proper) were also on study between 1990 and 1992 (see Appendix 1 for details).



ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-82341-1

Client Project/Site: HES Transfer Sites, Lea County NM

For:

ARCADIS U.S., Inc.
2929 Briarpark Drive
Suite 300
Houston, Texas 77042

Attn: Mr. Jonathan Olsen

Authorized for release by:
11/21/2013 5:46:22 PM

Sachin Kudchadkar, Senior Project Manager
(713)690-4444
sachin.kudchadkar@testamericainc.com

LINKS

Review your project
results through
TotalAccess

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www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

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Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

Job ID: 600-82341-1**Laboratory: TestAmerica Houston****Narrative****Job Narrative
600-82341-1****Comments**

No additional comments.

Receipt

The samples were received on 11/8/2013 7:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 7 coolers at receipt time were 1.2° C, 1.4° C, 1.5° C, 1.5° C, 1.7° C, 1.8° C and 2.6° C.

General Chemistry

Method(s) 9056: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 120998 were outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 9056: The matrix spike duplicate (MSD) recovery for batch 120998 was outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

Method(s) 9056: Thematrix spike duplicate (MSD) recovery for batch 120998 was outside control limits for Chloride. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

Industrial Hygiene

No analytical or quality issues were noted.

Method Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Method	Method Description	Protocol	Laboratory
9056	Anions, Ion Chromatography	SW846	TAL HOU
Moisture	Percent Moisture	EPA	TAL HOU

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

TestAmerica Houston

Sample Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-82341-1	VGWU85-01-02	Solid	11/06/13 14:20	11/08/13 07:00
600-82341-2	VGWU85-01-05	Solid	11/06/13 14:22	11/08/13 07:00
600-82341-3	VGWU85-01-10	Solid	11/06/13 14:24	11/08/13 07:00
600-82341-4	VGWU85-01-15	Solid	11/06/13 14:26	11/08/13 07:00
600-82341-5	VGWU85-01-20	Solid	11/06/13 14:28	11/08/13 07:00
600-82341-6	VGWU85-01-25	Solid	11/06/13 14:30	11/08/13 07:00
600-82341-7	VGWU85-02-02	Solid	11/06/13 14:35	11/08/13 07:00
600-82341-8	VGWU85-02-05	Solid	11/06/13 14:37	11/08/13 07:00
600-82341-9	VGWU85-02-10	Solid	11/06/13 14:39	11/08/13 07:00
600-82341-10	VGWU85-02-15	Solid	11/06/13 14:41	11/08/13 07:00
600-82341-11	VGWU85-02-20	Solid	11/06/13 14:43	11/08/13 07:00
600-82341-12	VGWU85-02-25	Solid	11/06/13 14:45	11/08/13 07:00
600-82341-13	VGWU85-03-02	Solid	11/06/13 13:35	11/08/13 07:00
600-82341-14	VGWU85-03-05	Solid	11/06/13 13:37	11/08/13 07:00
600-82341-15	VGWU85-03-10	Solid	11/06/13 13:39	11/08/13 07:00
600-82341-16	VGWU85-03-15	Solid	11/06/13 13:41	11/08/13 07:00
600-82341-17	VGWU85-03-20	Solid	11/06/13 13:43	11/08/13 07:00
600-82341-18	VGWU85-03-25	Solid	11/06/13 13:45	11/08/13 07:00
600-82341-19	VGWU85-04-02	Solid	11/06/13 14:00	11/08/13 07:00
600-82341-20	VGWU85-04-05	Solid	11/06/13 14:02	11/08/13 07:00
600-82341-21	VGWU85-04-10	Solid	11/06/13 14:04	11/08/13 07:00
600-82341-22	VGWU85-04-15	Solid	11/06/13 14:06	11/08/13 07:00
600-82341-23	VGWU85-04-20	Solid	11/06/13 14:08	11/08/13 07:00
600-82341-24	VGWU85-04-25	Solid	11/06/13 14:10	11/08/13 07:00

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

Client Sample ID: VGWU85-01-02

Lab Sample ID: 600-82341-1

Date Collected: 11/06/13 14:20

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.0		1.0		%			11/10/13 12:08	1
Percent Solids	95		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2700		210		mg/Kg	☼		11/21/13 04:06	50

Client Sample ID: VGWU85-01-05

Lab Sample ID: 600-82341-2

Date Collected: 11/06/13 14:22

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.3		1.0		%			11/10/13 12:08	1
Percent Solids	94		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2700		110		mg/Kg	☼		11/21/13 04:22	25

Client Sample ID: VGWU85-01-10

Lab Sample ID: 600-82341-3

Date Collected: 11/06/13 14:24

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.7		1.0		%			11/10/13 12:08	1
Percent Solids	94		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	640		8.5		mg/Kg	☼		11/21/13 04:37	2

Client Sample ID: VGWU85-01-15

Lab Sample ID: 600-82341-4

Date Collected: 11/06/13 14:26

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.7		1.0		%			11/10/13 12:08	1
Percent Solids	92		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	320		4.3		mg/Kg	☼		11/21/13 04:53	1

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

Client Sample ID: VGWU85-01-20

Lab Sample ID: 600-82341-5

Date Collected: 11/06/13 14:28

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	20		1.0		%			11/10/13 12:08	1
Percent Solids	80		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	59		5.0		mg/Kg	☼		11/21/13 05:08	1

Client Sample ID: VGWU85-01-25

Lab Sample ID: 600-82341-6

Date Collected: 11/06/13 14:30

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.9		1.0		%			11/10/13 12:08	1
Percent Solids	95		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30		4.2		mg/Kg	☼		11/19/13 12:18	1

Client Sample ID: VGWU85-02-02

Lab Sample ID: 600-82341-7

Date Collected: 11/06/13 14:35

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.6		1.0		%			11/10/13 12:08	1
Percent Solids	95		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3400		420		mg/Kg	☼		11/19/13 13:04	100

Client Sample ID: VGWU85-02-05

Lab Sample ID: 600-82341-8

Date Collected: 11/06/13 14:37

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.1		1.0		%			11/10/13 12:08	1
Percent Solids	96		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	620		8.3		mg/Kg	☼		11/19/13 13:20	2

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-02-10

Lab Sample ID: 600-82341-9

Date Collected: 11/06/13 14:39

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	2.4		1.0		%			11/10/13 12:08	1
Percent Solids	98		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	690		8.2		mg/Kg	☼		11/19/13 13:35	2

Client Sample ID: VGWU85-02-15

Lab Sample ID: 600-82341-10

Date Collected: 11/06/13 14:41

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.4		1.0		%			11/10/13 12:08	1
Percent Solids	92		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	39		4.4		mg/Kg	☼		11/19/13 13:51	1

Client Sample ID: VGWU85-02-20

Lab Sample ID: 600-82341-11

Date Collected: 11/06/13 14:43

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.7		1.0		%			11/10/13 12:08	1
Percent Solids	93		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	50		4.3		mg/Kg	☼		11/19/13 14:06	1

Client Sample ID: VGWU85-02-25

Lab Sample ID: 600-82341-12

Date Collected: 11/06/13 14:45

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.5		1.0		%			11/10/13 12:08	1
Percent Solids	95		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	35		4.2		mg/Kg	☼		11/19/13 14:53	1

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

Client Sample ID: VGWU85-03-02

Lab Sample ID: 600-82341-13

Date Collected: 11/06/13 13:35

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10		1.0		%			11/10/13 12:08	1
Percent Solids	90		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2000		45		mg/Kg	☼		11/19/13 15:39	10

Client Sample ID: VGWU85-03-05

Lab Sample ID: 600-82341-14

Date Collected: 11/06/13 13:37

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	17		1.0		%			11/10/13 12:08	1
Percent Solids	83		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2000		24		mg/Kg	☼		11/19/13 15:55	5

Client Sample ID: VGWU85-03-10

Lab Sample ID: 600-82341-15

Date Collected: 11/06/13 13:39

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	15		1.0		%			11/10/13 12:08	1
Percent Solids	85		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3700		230		mg/Kg	☼		11/19/13 16:10	50

Client Sample ID: VGWU85-03-15

Lab Sample ID: 600-82341-16

Date Collected: 11/06/13 13:41

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19		1.0		%			11/10/13 12:08	1
Percent Solids	81		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	590		9.9		mg/Kg	☼		11/19/13 16:26	2

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-03-20

Lab Sample ID: 600-82341-17

Date Collected: 11/06/13 13:43

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.1		1.0		%			11/10/13 12:08	1
Percent Solids	96		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	450		8.3		mg/Kg	☼		11/19/13 16:41	2

Client Sample ID: VGWU85-03-25

Lab Sample ID: 600-82341-18

Date Collected: 11/06/13 13:45

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.0		1.0		%			11/10/13 12:08	1
Percent Solids	92		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2100		43		mg/Kg	☼		11/19/13 16:57	10

Client Sample ID: VGWU85-04-02

Lab Sample ID: 600-82341-19

Date Collected: 11/06/13 14:00

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	6.3		1.0		%			11/10/13 12:08	1
Percent Solids	94		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2500		210		mg/Kg	☼		11/19/13 17:12	50

Client Sample ID: VGWU85-04-05

Lab Sample ID: 600-82341-20

Date Collected: 11/06/13 14:02

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.9		1.0		%			11/10/13 12:08	1
Percent Solids	95		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1700		21		mg/Kg	☼		11/19/13 18:30	5

TestAmerica Houston

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

Client Sample ID: VGWU85-04-10

Lab Sample ID: 600-82341-21

Date Collected: 11/06/13 14:04

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13		1.0		%			11/10/13 12:08	1
Percent Solids	87		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	260		4.6		mg/Kg	☼		11/19/13 19:16	1

Client Sample ID: VGWU85-04-15

Lab Sample ID: 600-82341-22

Date Collected: 11/06/13 14:06

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.6		1.0		%			11/10/13 12:08	1
Percent Solids	91		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	800		8.8		mg/Kg	☼		11/19/13 19:32	2

Client Sample ID: VGWU85-04-20

Lab Sample ID: 600-82341-23

Date Collected: 11/06/13 14:08

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.2		1.0		%			11/10/13 12:08	1
Percent Solids	93		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	720		8.6		mg/Kg	☼		11/19/13 19:47	2

Client Sample ID: VGWU85-04-25

Lab Sample ID: 600-82341-24

Date Collected: 11/06/13 14:10

Matrix: Solid

Date Received: 11/08/13 07:00

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.2		1.0		%			11/10/13 12:08	1
Percent Solids	93		1.0		%			11/10/13 12:08	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	740		8.6		mg/Kg	☼		11/19/13 20:03	2

TestAmerica Houston

Definitions/Glossary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F	MS/MSD Recovery and/or RPD exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Sample Results

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: MB 600-120665/1-A

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: Method Blank

Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			11/19/13 10:18	1

Lab Sample ID: MB 600-120665/21-A

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: Method Blank

Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		4.0		mg/Kg			11/19/13 17:59	1

Lab Sample ID: LCS 600-120665/22-A

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: Lab Control Sample

Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	193		mg/Kg		96	90 - 110

Lab Sample ID: LCS 600-120665/2-A

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: Lab Control Sample

Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	200	188		mg/Kg		94	90 - 110

Lab Sample ID: 600-82341-6 MS

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-01-25

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	30		105	111	F	mg/Kg	☼	76	80 - 120

Lab Sample ID: 600-82341-6 MSD

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-01-25

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	30		105	113	F	mg/Kg	☼	78	80 - 120	2	20

Lab Sample ID: 600-82341-12 MS

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-02-25

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	35		106	122		mg/Kg	☼	82	80 - 120

Lab Sample ID: 600-82341-12 MSD

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-02-25

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	35		106	117	F	mg/Kg	☼	77	80 - 120	4	20

TestAmerica Houston

QC Sample Results

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Lab Sample ID: 600-82341-20 MS

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-04-05

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1700		526	2110		mg/Kg	☼	85	80 - 120

Lab Sample ID: 600-82341-20 MSD

Matrix: Solid

Analysis Batch: 120998

Client Sample ID: VGWU85-04-05

Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1700		526	2070	F	mg/Kg	☼	76	80 - 120	2	20

Method: Moisture - Percent Moisture

Lab Sample ID: 600-82341-1 DU

Matrix: Solid

Analysis Batch: 120079

Client Sample ID: VGWU85-01-02

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	5.0		5.4		%		8	20
Percent Solids	95		95		%		0.5	20

Lab Sample ID: 600-82341-11 DU

Matrix: Solid

Analysis Batch: 120079

Client Sample ID: VGWU85-02-20

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	6.7		6.3		%		6	20
Percent Solids	93		94		%		0.4	20

Lab Sample ID: 600-82341-21 DU

Matrix: Solid

Analysis Batch: 120079

Client Sample ID: VGWU85-04-10

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	13		13		%		3	20
Percent Solids	87		87		%		0.4	20

TestAmerica Houston

QC Association Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

General Chemistry

Analysis Batch: 120079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-1	VGWU85-01-02	Total/NA	Solid	Moisture	
600-82341-1 DU	VGWU85-01-02	Total/NA	Solid	Moisture	
600-82341-2	VGWU85-01-05	Total/NA	Solid	Moisture	
600-82341-3	VGWU85-01-10	Total/NA	Solid	Moisture	
600-82341-4	VGWU85-01-15	Total/NA	Solid	Moisture	
600-82341-5	VGWU85-01-20	Total/NA	Solid	Moisture	
600-82341-6	VGWU85-01-25	Total/NA	Solid	Moisture	
600-82341-7	VGWU85-02-02	Total/NA	Solid	Moisture	
600-82341-8	VGWU85-02-05	Total/NA	Solid	Moisture	
600-82341-9	VGWU85-02-10	Total/NA	Solid	Moisture	
600-82341-10	VGWU85-02-15	Total/NA	Solid	Moisture	
600-82341-11	VGWU85-02-20	Total/NA	Solid	Moisture	
600-82341-11 DU	VGWU85-02-20	Total/NA	Solid	Moisture	
600-82341-12	VGWU85-02-25	Total/NA	Solid	Moisture	
600-82341-13	VGWU85-03-02	Total/NA	Solid	Moisture	
600-82341-14	VGWU85-03-05	Total/NA	Solid	Moisture	
600-82341-15	VGWU85-03-10	Total/NA	Solid	Moisture	
600-82341-16	VGWU85-03-15	Total/NA	Solid	Moisture	
600-82341-17	VGWU85-03-20	Total/NA	Solid	Moisture	
600-82341-18	VGWU85-03-25	Total/NA	Solid	Moisture	
600-82341-19	VGWU85-04-02	Total/NA	Solid	Moisture	
600-82341-20	VGWU85-04-05	Total/NA	Solid	Moisture	
600-82341-21	VGWU85-04-10	Total/NA	Solid	Moisture	
600-82341-21 DU	VGWU85-04-10	Total/NA	Solid	Moisture	
600-82341-22	VGWU85-04-15	Total/NA	Solid	Moisture	
600-82341-23	VGWU85-04-20	Total/NA	Solid	Moisture	
600-82341-24	VGWU85-04-25	Total/NA	Solid	Moisture	

Leach Batch: 120664

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-1	VGWU85-01-02	Soluble	Solid	DI Leach	
600-82341-2	VGWU85-01-05	Soluble	Solid	DI Leach	
600-82341-3	VGWU85-01-10	Soluble	Solid	DI Leach	
600-82341-4	VGWU85-01-15	Soluble	Solid	DI Leach	
600-82341-5	VGWU85-01-20	Soluble	Solid	DI Leach	

Leach Batch: 120665

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-6	VGWU85-01-25	Soluble	Solid	DI Leach	
600-82341-6 MS	VGWU85-01-25	Soluble	Solid	DI Leach	
600-82341-6 MSD	VGWU85-01-25	Soluble	Solid	DI Leach	
600-82341-7	VGWU85-02-02	Soluble	Solid	DI Leach	
600-82341-8	VGWU85-02-05	Soluble	Solid	DI Leach	
600-82341-9	VGWU85-02-10	Soluble	Solid	DI Leach	
600-82341-10	VGWU85-02-15	Soluble	Solid	DI Leach	
600-82341-11	VGWU85-02-20	Soluble	Solid	DI Leach	
600-82341-12	VGWU85-02-25	Soluble	Solid	DI Leach	
600-82341-12 MS	VGWU85-02-25	Soluble	Solid	DI Leach	
600-82341-12 MSD	VGWU85-02-25	Soluble	Solid	DI Leach	
600-82341-13	VGWU85-03-02	Soluble	Solid	DI Leach	
600-82341-14	VGWU85-03-05	Soluble	Solid	DI Leach	

TestAmerica Houston

QC Association Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

General Chemistry (Continued)

Leach Batch: 120665 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-15	VGWU85-03-10	Soluble	Solid	DI Leach	
600-82341-16	VGWU85-03-15	Soluble	Solid	DI Leach	
600-82341-17	VGWU85-03-20	Soluble	Solid	DI Leach	
600-82341-18	VGWU85-03-25	Soluble	Solid	DI Leach	
600-82341-19	VGWU85-04-02	Soluble	Solid	DI Leach	
600-82341-20	VGWU85-04-05	Soluble	Solid	DI Leach	
600-82341-20 MS	VGWU85-04-05	Soluble	Solid	DI Leach	
600-82341-20 MSD	VGWU85-04-05	Soluble	Solid	DI Leach	
600-82341-21	VGWU85-04-10	Soluble	Solid	DI Leach	
600-82341-22	VGWU85-04-15	Soluble	Solid	DI Leach	
600-82341-23	VGWU85-04-20	Soluble	Solid	DI Leach	
600-82341-24	VGWU85-04-25	Soluble	Solid	DI Leach	
LCS 600-120665/22-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCS 600-120665/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
MB 600-120665/1-A	Method Blank	Soluble	Solid	DI Leach	
MB 600-120665/21-A	Method Blank	Soluble	Solid	DI Leach	

Analysis Batch: 120998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-6	VGWU85-01-25	Soluble	Solid	9056	120665
600-82341-6 MS	VGWU85-01-25	Soluble	Solid	9056	120665
600-82341-6 MSD	VGWU85-01-25	Soluble	Solid	9056	120665
600-82341-7	VGWU85-02-02	Soluble	Solid	9056	120665
600-82341-8	VGWU85-02-05	Soluble	Solid	9056	120665
600-82341-9	VGWU85-02-10	Soluble	Solid	9056	120665
600-82341-10	VGWU85-02-15	Soluble	Solid	9056	120665
600-82341-11	VGWU85-02-20	Soluble	Solid	9056	120665
600-82341-12	VGWU85-02-25	Soluble	Solid	9056	120665
600-82341-12 MS	VGWU85-02-25	Soluble	Solid	9056	120665
600-82341-12 MSD	VGWU85-02-25	Soluble	Solid	9056	120665
600-82341-13	VGWU85-03-02	Soluble	Solid	9056	120665
600-82341-14	VGWU85-03-05	Soluble	Solid	9056	120665
600-82341-15	VGWU85-03-10	Soluble	Solid	9056	120665
600-82341-16	VGWU85-03-15	Soluble	Solid	9056	120665
600-82341-17	VGWU85-03-20	Soluble	Solid	9056	120665
600-82341-18	VGWU85-03-25	Soluble	Solid	9056	120665
600-82341-19	VGWU85-04-02	Soluble	Solid	9056	120665
600-82341-20	VGWU85-04-05	Soluble	Solid	9056	120665
600-82341-20 MS	VGWU85-04-05	Soluble	Solid	9056	120665
600-82341-20 MSD	VGWU85-04-05	Soluble	Solid	9056	120665
600-82341-21	VGWU85-04-10	Soluble	Solid	9056	120665
600-82341-22	VGWU85-04-15	Soluble	Solid	9056	120665
600-82341-23	VGWU85-04-20	Soluble	Solid	9056	120665
600-82341-24	VGWU85-04-25	Soluble	Solid	9056	120665
LCS 600-120665/22-A	Lab Control Sample	Soluble	Solid	9056	120665
LCS 600-120665/2-A	Lab Control Sample	Soluble	Solid	9056	120665
MB 600-120665/1-A	Method Blank	Soluble	Solid	9056	120665
MB 600-120665/21-A	Method Blank	Soluble	Solid	9056	120665

TestAmerica Houston

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: HES Transfer Sites, Lea County NM

TestAmerica Job ID: 600-82341-1

General Chemistry (Continued)

Analysis Batch: 121126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-82341-1	VGWU85-01-02	Soluble	Solid	9056	120664
600-82341-2	VGWU85-01-05	Soluble	Solid	9056	120664
600-82341-3	VGWU85-01-10	Soluble	Solid	9056	120664
600-82341-4	VGWU85-01-15	Soluble	Solid	9056	120664
600-82341-5	VGWU85-01-20	Soluble	Solid	9056	120664

Lab Chronicle

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-01-02

Lab Sample ID: 600-82341-1

Date Collected: 11/06/13 14:20

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120664	11/15/13 10:30	KRD	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	121126	11/21/13 04:06	DAW	TAL HOU

Client Sample ID: VGWU85-01-05

Lab Sample ID: 600-82341-2

Date Collected: 11/06/13 14:22

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120664	11/15/13 10:30	KRD	TAL HOU
Soluble	Analysis	9056		25	5 mL	5 mL	121126	11/21/13 04:22	DAW	TAL HOU

Client Sample ID: VGWU85-01-10

Lab Sample ID: 600-82341-3

Date Collected: 11/06/13 14:24

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120664	11/15/13 10:30	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	121126	11/21/13 04:37	DAW	TAL HOU

Client Sample ID: VGWU85-01-15

Lab Sample ID: 600-82341-4

Date Collected: 11/06/13 14:26

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120664	11/15/13 10:30	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	121126	11/21/13 04:53	DAW	TAL HOU

Client Sample ID: VGWU85-01-20

Lab Sample ID: 600-82341-5

Date Collected: 11/06/13 14:28

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120664	11/15/13 10:30	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	121126	11/21/13 05:08	DAW	TAL HOU

TestAmerica Houston

Lab Chronicle

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-01-25

Lab Sample ID: 600-82341-6

Date Collected: 11/06/13 14:30

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	120998	11/19/13 12:18	DAW	TAL HOU

Client Sample ID: VGWU85-02-02

Lab Sample ID: 600-82341-7

Date Collected: 11/06/13 14:35

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		100	5 mL	5 mL	120998	11/19/13 13:04	DAW	TAL HOU

Client Sample ID: VGWU85-02-05

Lab Sample ID: 600-82341-8

Date Collected: 11/06/13 14:37

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 13:20	DAW	TAL HOU

Client Sample ID: VGWU85-02-10

Lab Sample ID: 600-82341-9

Date Collected: 11/06/13 14:39

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 13:35	DAW	TAL HOU

Client Sample ID: VGWU85-02-15

Lab Sample ID: 600-82341-10

Date Collected: 11/06/13 14:41

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	120998	11/19/13 13:51	DAW	TAL HOU

TestAmerica Houston

Lab Chronicle

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-02-20

Lab Sample ID: 600-82341-11

Date Collected: 11/06/13 14:43

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	120998	11/19/13 14:06	DAW	TAL HOU

Client Sample ID: VGWU85-02-25

Lab Sample ID: 600-82341-12

Date Collected: 11/06/13 14:45

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	120998	11/19/13 14:53	DAW	TAL HOU

Client Sample ID: VGWU85-03-02

Lab Sample ID: 600-82341-13

Date Collected: 11/06/13 13:35

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	120998	11/19/13 15:39	DAW	TAL HOU

Client Sample ID: VGWU85-03-05

Lab Sample ID: 600-82341-14

Date Collected: 11/06/13 13:37

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	120998	11/19/13 15:55	DAW	TAL HOU

Client Sample ID: VGWU85-03-10

Lab Sample ID: 600-82341-15

Date Collected: 11/06/13 13:39

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	120998	11/19/13 16:10	DAW	TAL HOU

TestAmerica Houston

Lab Chronicle

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-03-15

Lab Sample ID: 600-82341-16

Date Collected: 11/06/13 13:41

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 16:26	DAW	TAL HOU

Client Sample ID: VGWU85-03-20

Lab Sample ID: 600-82341-17

Date Collected: 11/06/13 13:43

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 16:41	DAW	TAL HOU

Client Sample ID: VGWU85-03-25

Lab Sample ID: 600-82341-18

Date Collected: 11/06/13 13:45

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		10	5 mL	5 mL	120998	11/19/13 16:57	DAW	TAL HOU

Client Sample ID: VGWU85-04-02

Lab Sample ID: 600-82341-19

Date Collected: 11/06/13 14:00

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		50	5 mL	5 mL	120998	11/19/13 17:12	DAW	TAL HOU

Client Sample ID: VGWU85-04-05

Lab Sample ID: 600-82341-20

Date Collected: 11/06/13 14:02

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		5	5 mL	5 mL	120998	11/19/13 18:30	DAW	TAL HOU

TestAmerica Houston

Lab Chronicle

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Client Sample ID: VGWU85-04-10

Lab Sample ID: 600-82341-21

Date Collected: 11/06/13 14:04

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		1	5 mL	5 mL	120998	11/19/13 19:16	DAW	TAL HOU

Client Sample ID: VGWU85-04-15

Lab Sample ID: 600-82341-22

Date Collected: 11/06/13 14:06

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 19:32	DAW	TAL HOU

Client Sample ID: VGWU85-04-20

Lab Sample ID: 600-82341-23

Date Collected: 11/06/13 14:08

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 19:47	DAW	TAL HOU

Client Sample ID: VGWU85-04-25

Lab Sample ID: 600-82341-24

Date Collected: 11/06/13 14:10

Matrix: Solid

Date Received: 11/08/13 07:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			120079	11/10/13 12:08	MJB	TAL HOU
Soluble	Leach	DI Leach			5 g	50 mL	120665	11/15/13 10:45	KRD	TAL HOU
Soluble	Analysis	9056		2	5 mL	5 mL	120998	11/19/13 20:03	DAW	TAL HOU

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

TestAmerica Houston

Certification Summary

Client: ARCADIS U.S., Inc.

TestAmerica Job ID: 600-82341-1

Project/Site: HES Transfer Sites, Lea County NM

Laboratory: TestAmerica Houston

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Arkansas DEQ	State Program	6	88-0759	08-04-14
Louisiana	NELAP	6	30643	06-30-14
Oklahoma	State Program	6	9503	08-31-13 *
Texas	NELAP	6	T104704223	10-31-14
USDA	Federal		P330-08-00217	04-01-14
Utah	NELAP	8	TX00083	10-31-13 *

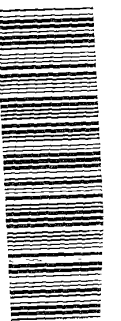
* Expired certification is currently pending renewal and is considered valid.

TestAmerica Houston

TestAmerica Houston

6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record



600-82341 Chain of Custody

Client Information		Sampler	MENSA DHAN		Lab P/N:	Kudchadkar, Sachin G
Client Contact Mr. Jonathan Olsen		Phone	713 953 4800		E-Mail:	sachin.kudchadkar@testamericainc.com
Company: ARCADIS U.S., Inc.		Analysis Requested				
Address: 2929 Briarpark Drive Suite 300		Due Date Requested:				
City: Houston		TAI Requested (days):				
State, Zip: TX 77042		STANDARD				
Phone: 713 953 4800		PO #:				
Email: jonathan.olsen@arcadis-us.com		Purchase Order Requested				
Project Name: HES Transfer Sites, Lea County NM		Project #:	60004633			
Site: VGWU 85		SSOW#:				
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Mineral, Organic, Inorganic, Other)	Field Filtered Sample (Yes or No)
VGWU85-01-02	11/6/13	1420	G	Solid		Perform MS/MSD (Yes or No)
VGWU85-01-05	"	1422		Solid		9015B_DRO
VGWU85-01-10	"	1424		Solid		9056_28D - Chloride
VGWU85-01-15	"	1426		Solid		9015B_GRO
VGWU85-01-20	"	1426		Solid		9021B-BTEX
VGWU85-01-25	"	1430		Solid		
VGWU85-02-02	"	1435		Solid		
VGWU85-02-05	"	1437		Solid		
VGWU85-02-10	"	1439		Solid		
VGWU85-02-15	"	1441		Solid		
VGWU85-02-20	"	1443		Solid		
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (Specify)		Special Instructions/QC Requirements:				
Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:		
Relinquished by: <i>[Signature]</i>		Date/Time: 11/7/13 800		Received by: <i>[Signature]</i>	Date/Time: 11/8/13 700	Company: <i>[Signature]</i>
Relinquished by:		Date/Time:		Received by:	Date/Time:	Company:
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Special Instructions/Note:

Preservation Codes:

A - HCl
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4.5
Z - other (Specify)

TestAmerica Houston

6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information		Sampler:	Lab PM:	COC No:	
Client Contact: Mr. Jonathan Olsen		Phone: 713 953 4800	Kudchadkar, Sachin G	600-23395-8666.1	
Company: ARCADIS U.S., Inc.		E-Mail: sachin.kudchadkar@testamericainc.com	Page: 24		
Address: 2929 Briarpark Drive Suite 300		Date Date Requested:		Job #:	
City: Houston		TAT Requested (days):		Preservation Codes:	
State, Zip: TX, 77042		STANDARD		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Anchor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsMAO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
Phone: 713 953 4800		PO #:		Other:	
Email: jonathan.olsen@arcadis-us.com		Purchase Order Requested			
Project Name: HES Transfer Sites, Lea County NM		Project #:			
Site: VGWU 85		SSOW#:			
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (Monomer, Smell, Overstabil, BTEX, Arocl, Arocl)
VGWU 85-02-25	11/6/13	1445	G		Solid
VGWU 85-03-02	11	1335			Solid
VGWU 85-03-05	11	1337			Solid
VGWU 85-03-10	11	1337			Solid
VGWU 85-03-15	11	1341			Solid
VGWU 85-03-20	11	1343			Solid
VGWU 85-03-25	11	1345			Solid
VGWU 85-04-02	11	1400			Solid
VGWU 85-04-05	11	1402			Solid
VGWU 85-04-10	11	1404			Solid
VGWU 85-04-15	11	1406			Solid
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/Note:			
Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:	
Relinquished by:		Date/Time: 11/7/13 800		Received by: [Signature]	
Relinquished by:		Date/Time:		Received by: [Signature]	
Relinquished by:		Date/Time:		Received by: [Signature]	
Custody Seal Intact: A Yes A No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	

TestAmerica Houston

6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information		Sampler: MEUSA PHAL		Lab PM: Kudchadkar, Sachin G		Carrier Tracking No(s):		COC No: 600-23595-8666.1	
Client Contact: Mr. Jonathan Olsen		Phone: 713 953 4800		E-Mail: sachin.kudchadkar@testamericainc.com				Page: 34	
Company: ARCADIS U.S., Inc.		Due Date Requested:		Analysis Requested				Job #:	
Address: 2929 Briarpark Drive Suite 300		TAT Requested (days):						Preservation Codes:	
City: Houston		State, Zip: TX, 77042		PO #:				A - HCL	
Phone: 713 953 4800		Purchase Order Requested		W/O #:				B - NaOH	
Email: Jonathan.olsen@arcadis-us.com								C - Zn Acetate	
Project Name: HES Transfer Sites, Lea County NM		Project #:						D - Nitric Acid	
HES Transfer Sites, Lea County NM		SSOV#:						E - NaHSO4	
Site: VGWU 85								F - MeOH	
								G - Anchor	
								H - Ascorbic Acid	
								I - Ice	
								J - DI Water	
								K - EDTA	
								L - EDA	
								Other:	
								M - Hexane	
								N - None	
								O - AsNaO2	
								P - Na2O4S	
								Q - Na2SO3	
								R - Na2CSO3	
								S - H2SO4	
								T - TSP Dodecylhydrate	
								U - Acetone	
								V - MCAA	
								W - pH 4.5	
								Z - other (specify)	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=Water, S=Soil, O=Other, B=Breathable Acid)	
VGWU85-04-20		11/6/13		1406		G		Solid	
VGWU85-04-25		11		1410		G		Solid	
VGWU85-05-02		11		1315		G		Solid	
VGWU85-05-05		11		1311		G		Solid	
VGWU85-05-10		11		1319		G		Solid	
VGWU85-05-15		11		1321		G		Solid	
VGWU85-05-20		11		1323		G		Solid	
VGWU85-05-25		11		1325		G		Solid	
VGWU85-06-02		11		1457		G		Solid	
VGWU85-06-05		11		1459		G		Solid	
VGWU85-06-10		11		1501		G		Solid	
Possible Hazard Identification									
<input checked="" type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable		<input type="checkbox"/> Skin Irritant		<input type="checkbox"/> Poison B		<input type="checkbox"/> Unknown	
<input type="checkbox"/> Radiological									
Deliverable Requested: I, II, III, IV, Other (specify)									
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: <i>[Signature]</i>		11/13/13		800		Received by: <i>[Signature]</i>		Date/Time: 11/13/13	
Relinquished by: <i>[Signature]</i>		Date/Time:		Company:		Received by: <i>[Signature]</i>		Date/Time: 11/13/13	
Relinquished by: <i>[Signature]</i>		Date/Time:		Company:		Received by: <i>[Signature]</i>		Date/Time: 11/13/13	
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:			

TestAmerica Houston

6310 Rothway Street
Houston, TX 77040
Phone (713) 690-4444 Fax (713) 690-5646

Chain of Custody Record

Client Information		Sample #		Lab P/N		Carrier Tracking No(s)		COC No:	
Client Contact: Mr. Jonathan Olsen		Phone: 713 953 4800		E-Mail: sachin.kudachadka@testamericainc.com				600-23595-8666.1	
Company: ARCADIS U.S., Inc.		Due Date Requested:		Analysis Requested				Page: 4 of 4	
Address: 2929 Briarpark Drive Suite 300		City: Houston		State: TX, ZIP: 77042					
Phone: 713 953 4800		PO #:		Purchase Order Requested					
Email: jonathan.olsen@arcadis-us.com		W/O #:							
Project Name: HES Transfer Sites, Lea County NM		Project #:							
Site: NGWU 85		SSOW#:							
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=organic, B=bitumen, A=air)	
NGWU85-06-15		11/16/13		1503		G		Solid	
NGWU85-06-20		11		1505				Solid	
NGWU85-06-25		11		1507				Solid	
NGWU85-07-02		11		1517				Solid	
NGWU85-07-05		11		1519				Solid	
NGWU85-07-10		11		1521				Solid	
NGWU85-07-15		11		1523				Solid	
NGWU85-07-20		11		1525				Solid	
NGWU85-07-25		11		1527				Solid	
Possible Hazard Identification		Flammable		Skin Irritant		Poison B		Unknown	
Deliverable Requested: I, II, III, IV, Other (specify)		Biological							
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: [Signature]		Date/Time: 11/13/13 800		Company:		Received by: [Signature]		Date/Time: 11/13/13 100	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: A Yes A No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:					
Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		8015B_DRO		8056_28D - Chloride		8015B_GRO	
				8021B - BTEX					
Total Number of containers		Special Instructions/Note:		Hold					
Preservation Codes:		A - HCl		B - NaOH		C - Zn Acetate		D - Nitric Acid	
		E - NaHSO4		F - MeOH		G - Anchor		H - Ascorbic Acid	
		I - Ice		J - DI Water		K - EDTA		L - EDA	
		M - Hexane		N - None		O - Ash/CO2		P - Na2CO3	
		Q - Na2SO3		R - Na2S2O3		S - H2SO4		T - TSP Dodecylsulfate	
		U - Acetone		V - MCAA		W - pH 4.5		Z - other (specify)	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		Return To Client		Disposal By Lab		Archive For		Months	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 600-82341-1

Login Number: 82341

List Source: TestAmerica Houston

List Number: 1

Creator: Capps, Dana R

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2/1.4/1.8/1.5/1.7/2.6/1.5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Analytical Report 532328

for
ARCADIS

Project Manager: Arti Patel

Chevron Sites

713.953.4841

20-JUL-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



20-JUL-16

Project Manager: **Arti Patel**

ARCADIS

1004 N. Big Spring St.

Midland, TX 79701

Reference: XENCO Report No(s): **532328**

Chevron Sites

Project Address: Hobbs, NM

Arti Patel:

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) 532328. 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. 532328 will be filed for 60 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,

A handwritten signature in black ink, appearing to read 'Kelsey Brooks', is written over a horizontal line.

Kelsey Brooks

Project Manager

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Sample Cross Reference 532328

ARCADIS, Midland, TX

Chevron Sites

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWU61-08B 80'	S	06-22-16 00:00	- 80 ft	532328-001
VGWU61-09B 80'	S	06-22-16 00:00	- 80 ft	532328-008
VGWU118-17 2'	S	06-23-16 00:00	- 2 ft	532328-009
VGWU118-17 4'	S	06-23-16 00:00	- 4 ft	532328-010
VGWU118-13 2'	S	06-23-16 00:00	- 2 ft	532328-013
VGWU118-13 4'	S	06-23-16 00:00	- 4 ft	532328-014
VGWU118-14 2'	S	06-23-16 00:00	- 2 ft	532328-015
VGWU118-14 4'	S	06-23-16 00:00	- 4 ft	532328-016
VGWU118-11 2'	S	06-23-16 00:00	- 2 ft	532328-017
VGWU118-11 4'	S	06-23-16 00:00	- 4 ft	532328-018
VGWU118-12 2'	S	06-23-16 00:00	- 2 ft	532328-019
VGWU118-12 4'	S	06-23-16 00:00	- 4 ft	532328-020
VGWU118-09 2'	S	06-23-16 00:00	- 2 ft	532328-021
VGWU118-09 4'	S	06-23-16 00:00	- 4 ft	532328-022
VGWU85-8 2'	S	06-21-16 00:00	- 2 ft	532328-023
VGWU85-8 4'	S	06-21-16 00:00	- 4 ft	532328-024
VGWU85-7 2'	S	06-21-16 00:00	- 2 ft	532328-025
VGWU85-7 4'	S	06-21-16 00:00	- 4 ft	532328-026
VGWU85-5 2'	S	06-21-16 00:00	- 2 ft	532328-027
VGWU85-5 4'	S	06-21-16 00:00	- 4 ft	532328-028
VGWU85-4B 30'	S	06-21-16 00:00	- 30 ft	532328-029
VGWU85-3B 30'	S	06-21-16 00:00	- 30 ft	532328-031
VGWU85-9 2'	S	06-21-16 00:00	- 2 ft	532328-033
VGWU85-9 4'	S	06-21-16 00:00	- 4 ft	532328-034
VGWU85-10 2'	S	06-21-16 00:00	- 2 ft	532328-035
VGWU85-10 4'	S	06-21-16 00:00	- 4 ft	532328-036
VGWU61-4B 30'	S	06-22-16 00:00	- 30 ft	532328-042
VGWU118-08 2'	S	06-23-16 00:00	- 2 ft	532328-056
VGWU118-08 4'	S	06-23-16 00:00	- 4 ft	532328-058
VGWU040-02B 80'	S	06-23-16 00:00	- 80 ft	532328-062
VGWU61-09B 30'	S	06-22-16 00:00	- 30 ft	Not Analyzed
VGWU61-09B 35'	S	06-22-16 00:00	- 35 ft	Not Analyzed
VGWU61-09B 40'	S	06-22-16 00:00	- 40 ft	Not Analyzed
VGWU61-09B 45'	S	06-22-16 00:00	- 45 ft	Not Analyzed
VGWU61-09B 55'	S	06-22-16 00:00	- 55 ft	Not Analyzed
VGWU61-09B 65'	S	06-22-16 00:00	- 65 ft	Not Analyzed
VGWU118-16 2'	S	06-23-16 00:00	- 2 ft	Not Analyzed
VGWU118-16 4'	S	06-23-16 00:00	- 4 ft	Not Analyzed
VGWU85-4B 35'	S	06-21-16 00:00	- 35 ft	Not Analyzed
VGWU85-3B 35'	S	06-21-16 00:00	- 35 ft	Not Analyzed
VGWU85-3B 40'	S	06-21-16 00:00	- 40 ft	Not Analyzed
VGWU85-3B 45'	S	06-21-16 00:00	- 45 ft	Not Analyzed
VGWU85-4B 40'	S	06-21-16 00:00	- 40 ft	Not Analyzed



Sample Cross Reference 532328

ARCADIS, Midland, TX

Chevron Sites

VGWU85-4B 45'	S	06-21-16 00:00	- 45 ft	Not Analyzed
Blank	S	06-22-16 00:00		Not Analyzed
VGWU61-4B 35'	S	06-22-16 00:00	- 35 ft	Not Analyzed
VGWU61-4B 40'	S	06-22-16 00:00	- 40 ft	Not Analyzed
VGWU61-4B 45'	S	06-22-16 00:00	- 45 ft	Not Analyzed
VGWU61-8B 30'	S	06-22-16 00:00	- 30 ft	Not Analyzed
VGWU61-8B 35'	S	06-22-16 00:00	- 35 ft	Not Analyzed
VGWU61-8B 40'	S	06-22-16 00:00	- 40 ft	Not Analyzed
VGWU61-8B 45'	S	06-22-16 00:00	- 45 ft	Not Analyzed
VGWU61-8B 50'	S	06-22-16 00:00	- 50 ft	Not Analyzed
VGWU61-8B 55'	S	06-22-16 00:00	- 55 ft	Not Analyzed
VGWU61-8B 60'	S	06-22-16 00:00	- 60 ft	Not Analyzed
VGWU61-8B 65'	S	06-22-16 00:00	- 65 ft	Not Analyzed
VGWU61-8B 70'	S	06-22-16 00:00	- 70 ft	Not Analyzed
VGWU61-8B 75'	S	06-22-16 00:00	- 75 ft	Not Analyzed
VGWU118-10 2'	S	06-23-16 00:00	- 2 ft	Not Analyzed
VGWU118-10 4'	S	06-23-16 00:00	- 4 ft	Not Analyzed
VGWU040-02B 45'	S	06-23-16 00:00	- 45 ft	Not Analyzed
VGWU040-02B 55'	S	06-23-16 00:00	- 55 ft	Not Analyzed
VGWU040-02B 65'	S	06-23-16 00:00	- 65 ft	Not Analyzed
VGWU040-02B 75'	S	06-23-16 00:00	- 75 ft	Not Analyzed



CASE NARRATIVE

Client Name: *ARCADIS*

Project Name: *Chevron Sites*

Project ID: 713.953.4841
Work Order Number(s): 532328

Report Date: 20-JUL-16
Date Received: 06/24/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 532328

ARCADIS, Midland, TX

Project Name: Chevron Sites

Project Id: 713.953.4841

Contact: Arti Patel

Project Location: Hobbs, NM

Date Received in Lab: Fri Jun-24-16 10:05 am

Report Date: 20-JUL-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532328-001	532328-008	532328-009	532328-010	532328-013	532328-014
	<i>Field Id:</i>	VGWU61-08B 80'	VGWU61-09B 80'	VGWU118-17 2'	VGWU118-17 4'	VGWU118-13 2'	VGWU118-13 4'
	<i>Depth:</i>	80 ft	80 ft	2 ft	4 ft	2 ft	4 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jun-22-16 00:00	Jun-22-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jun-30-16 17:00	Jul-06-16 10:00	Jun-28-16 19:58	Jun-28-16 20:05	Jun-28-16 20:13	Jun-28-16 20:21
	<i>Analyzed:</i>	Jun-30-16 21:26	Jul-06-16 16:07	Jun-28-16 19:58	Jun-28-16 20:05	Jun-28-16 20:13	Jun-28-16 20:21
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		374 10.0	1440 100	248 10.0	115 10.0	13.2 10.0	125 10.0

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.

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 532328

ARCADIS, Midland, TX

Project Name: Chevron Sites

Project Id: 713.953.4841

Contact: Arti Patel

Project Location: Hobbs, NM

Date Received in Lab: Fri Jun-24-16 10:05 am

Report Date: 20-JUL-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532328-015	532328-016	532328-017	532328-018	532328-019	532328-020
	<i>Field Id:</i>	VGWU118-14 2'	VGWU118-14 4'	VGWU118-11 2'	VGWU118-11 4'	VGWU118-12 2'	VGWU118-12 4'
	<i>Depth:</i>	2 ft	4 ft	2 ft	4 ft	2 ft	4 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jun-28-16 20:44	Jun-28-16 20:52	Jul-18-16 14:00	Jul-18-16 14:00	Jun-28-16 21:00	Jun-28-16 21:08
	<i>Analyzed:</i>	Jun-28-16 20:44	Jun-28-16 20:52	Jul-18-16 20:50	Jul-18-16 21:13	Jun-28-16 21:00	Jun-28-16 21:08
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		298 10.0	325 50.0	28.7 10.0	300 50.0	374 50.0	246 50.0

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Project Manager



Certificate of Analysis Summary 532328

ARCADIS, Midland, TX

Project Name: Chevron Sites

Project Id: 713.953.4841

Contact: Arti Patel

Project Location: Hobbs, NM

Date Received in Lab: Fri Jun-24-16 10:05 am

Report Date: 20-JUL-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532328-021	532328-022	532328-023	532328-024	532328-025	532328-026
	<i>Field Id:</i>	VGWU118-09 2'	VGWU118-09 4'	VGWU85-8 2'	VGWU85-8 4'	VGWU85-7 2'	VGWU85-7 4'
	<i>Depth:</i>	2 ft	4 ft	2 ft	4 ft	2 ft	4 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jun-23-16 00:00	Jun-23-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jun-28-16 21:16	Jun-28-16 21:23	Jun-28-16 21:47	Jun-28-16 21:55	Jun-28-16 22:18	Jun-28-16 22:26
	<i>Analyzed:</i>	Jun-28-16 21:16	Jun-28-16 21:23	Jun-28-16 21:47	Jun-28-16 21:55	Jun-28-16 22:18	Jun-28-16 22:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		42.2 10.0	50.9 10.0	100 10.0	53.0 10.0	533 50.0	879 50.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 532328

ARCADIS, Midland, TX

Project Name: Chevron Sites

Project Id: 713.953.4841

Contact: Arti Patel

Project Location: Hobbs, NM

Date Received in Lab: Fri Jun-24-16 10:05 am

Report Date: 20-JUL-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532328-027	532328-028	532328-029	532328-031	532328-033	532328-034
	<i>Field Id:</i>	VGWU85-5 2'	VGWU85-5 4'	VGWU85-4B 30'	VGWU85-3B 30'	VGWU85-9 2'	VGWU85-9 4'
	<i>Depth:</i>	2 ft	4 ft	30 ft	30 ft	2 ft	4 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00	Jun-21-16 00:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jul-18-16 14:00	Jul-18-16 14:00	Jun-28-16 22:34	Jun-28-16 22:41	Jun-28-16 22:49	Jun-29-16 11:00
	<i>Analyzed:</i>	Jul-18-16 21:21	Jul-18-16 21:44	Jun-28-16 22:34	Jun-28-16 22:41	Jun-28-16 22:49	Jun-29-16 14:08
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		4220 500	1840 100	66.7 10.0	57.5 10.0	279 50.0	523 50.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 532328

ARCADIS, Midland, TX

Project Name: Chevron Sites

Project Id: 713.953.4841

Contact: Arti Patel

Project Location: Hobbs, NM

Date Received in Lab: Fri Jun-24-16 10:05 am

Report Date: 20-JUL-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	532328-035	532328-036	532328-042	532328-056	532328-058	532328-062
	<i>Field Id:</i>	VGWU85-10 2'	VGWU85-10 4'	VGWU61-4B 30'	VGWU118-08 2'	VGWU118-08 4'	VGWU040-02B 80'
	<i>Depth:</i>	2 ft	4 ft	30 ft	2 ft	4 ft	80 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Jun-21-16 00:00	Jun-21-16 00:00	Jun-22-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00	Jun-23-16 00:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Jul-18-16 14:00	Jul-18-16 14:00	Jun-29-16 11:00	Jun-29-16 11:00	Jun-29-16 11:00	Jun-30-16 17:00
	<i>Analyzed:</i>	Jul-18-16 21:52	Jul-18-16 22:00	Jun-29-16 14:16	Jun-29-16 14:39	Jun-29-16 14:47	Jun-30-16 21:42
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		85.1 10.0	495 50.0	50.1 10.0	<10.0 10.0	<10.0 10.0	93.3 10.0

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Kelsey Brooks
Project Manager



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 **SQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(281) 240-4200	(281) 240-4280
(214) 902 0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



BS / BSD Recoveries

Project Name: Chevron Sites

Work Order #: 532328

Project ID: 713.953.4841

Analyst: MNR

Date Prepared: 06/28/2016

Date Analyzed: 06/28/2016

Lab Batch ID: 997156

Sample: 710442-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	226	90	250	230	92	2	90-110	20	

Analyst: MNR

Date Prepared: 06/29/2016

Date Analyzed: 06/29/2016

Lab Batch ID: 997207

Sample: 710482-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	242	97	250	248	99	2	90-110	20	

Analyst: MNR

Date Prepared: 06/30/2016

Date Analyzed: 06/30/2016

Lab Batch ID: 997412

Sample: 710538-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	262	105	250	262	105	0	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries

Project Name: Chevron Sites

Work Order #: 532328

Project ID: 713.953.4841

Analyst: MNR

Date Prepared: 07/06/2016

Date Analyzed: 07/06/2016

Lab Batch ID: 997589

Sample: 710653-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	236	94	250	232	93	2	90-110	20	

Analyst: MNR

Date Prepared: 07/18/2016

Date Analyzed: 07/18/2016

Lab Batch ID: 998310

Sample: 711075-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	246	98	250	250	100	2	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS Recoveries

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 997156

Date Analyzed: 06/28/2016

QC- Sample ID: 532328-022 S

Reporting Units: mg/kg

Date Prepared: 06/28/2016

Batch #: 1

Project ID: 713.953.4841

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	50.9	250	272	88	80-120	

Lab Batch #: 997156

Date Analyzed: 06/28/2016

QC- Sample ID: 532432-001 S

Reporting Units: mg/kg

Date Prepared: 06/28/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	5010	12500	16800	94	80-120	

Lab Batch #: 997207

Date Analyzed: 06/29/2016

QC- Sample ID: 532377-004 S

Reporting Units: mg/kg

Date Prepared: 06/29/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	<10.6	266	241	91	80-120	

Lab Batch #: 997207

Date Analyzed: 06/29/2016

QC- Sample ID: 532470-001 S

Reporting Units: mg/kg

Date Prepared: 06/29/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	108	250	339	92	80-120	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$
 Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$
 All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit



Form 3 - MS Recoveries

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 997412

Date Analyzed: 06/30/2016

QC- Sample ID: 532336-008 S

Reporting Units: mg/kg

Date Prepared: 06/30/2016

Batch #: 1

Project ID: 713.953.4841

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	1910	2500	4260	94	80-120	

Lab Batch #: 997412

Date Analyzed: 06/30/2016

QC- Sample ID: 532377-043 S

Reporting Units: mg/kg

Date Prepared: 06/30/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	44.4	305	326	92	80-120	

Lab Batch #: 997589

Date Analyzed: 07/06/2016

QC- Sample ID: 532769-001 S

Reporting Units: mg/kg

Date Prepared: 07/06/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	945	2500	3210	91	80-120	

Lab Batch #: 997589

Date Analyzed: 07/06/2016

QC- Sample ID: 532769-011 S

Reporting Units: mg/kg

Date Prepared: 07/06/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	1190	2500	3550	94	80-120	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$
 Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$
 All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit



Form 3 - MS Recoveries

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 998310

Date Analyzed: 07/18/2016

QC- Sample ID: 532328-017 S

Reporting Units: mg/kg

Date Prepared: 07/18/2016

Batch #: 1

Project ID: 713.953.4841

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	28.7	250	258	92	80-120	

Lab Batch #: 998310

Date Analyzed: 07/18/2016

QC- Sample ID: 533521-001 S

Reporting Units: mg/kg

Date Prepared: 07/18/2016

Batch #: 1

Analyst: MNR

Matrix: Soil

MATRIX / MATRIX SPIKE RECOVERY STUDY						
Inorganic Anions by EPA 300	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Analytes						
Chloride	<10.0	250	274	110	80-120	

Matrix Spike Percent Recovery [D] = $100 \times (C-A)/B$ Relative Percent Difference [E] = $200 \times (C-A)/(C+B)$

All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 997156

Project ID: 713.953.4841

Date Analyzed: 06/28/2016 21:31

Date Prepared: 06/28/2016

Analyst: MNR

QC- Sample ID: 532328-022 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	50.9	44.2	14	20	

Lab Batch #: 997156

Date Analyzed: 06/28/2016 19:42

Date Prepared: 06/28/2016

Analyst: MNR

QC- Sample ID: 532432-001 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	5010	4940	1	20	

Lab Batch #: 997207

Date Analyzed: 06/29/2016 15:26

Date Prepared: 06/29/2016

Analyst: MNR

QC- Sample ID: 532377-004 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	<10.6	<10.6	0	20	U

Lab Batch #: 997207

Date Analyzed: 06/29/2016 13:37

Date Prepared: 06/29/2016

Analyst: MNR

QC- Sample ID: 532470-001 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	108	108	0	20	

Spike Relative Difference $RPD = 200 * |(B-A)/(B+A)|$

All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 997412

Project ID: 713.953.4841

Date Analyzed: 06/30/2016 20:08

Date Prepared: 06/30/2016

Analyst: MNR

QC- Sample ID: 532336-008 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	1910	1910	0	20	

Lab Batch #: 997412

Date Analyzed: 06/30/2016 18:11

Date Prepared: 06/30/2016

Analyst: MNR

QC- Sample ID: 532377-043 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	44.4	37.4	17	20	

Lab Batch #: 997589

Date Analyzed: 07/06/2016 11:20

Date Prepared: 07/06/2016

Analyst: MNR

QC- Sample ID: 532769-001 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	945	943	0	20	

Lab Batch #: 997589

Date Analyzed: 07/06/2016 14:03

Date Prepared: 07/06/2016

Analyst: MNR

QC- Sample ID: 532769-011 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	1190	1240	4	20	

Spike Relative Difference RPD $200 * |(B-A)/(B+A)|$

All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit

Project Name: Chevron Sites

Work Order #: 532328

Lab Batch #: 998310

Project ID: 713.953.4841

Date Analyzed: 07/18/2016 20:57

Date Prepared: 07/18/2016

Analyst: MNR

QC- Sample ID: 532328-017 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	28.7	25.5	12	20	

Lab Batch #: 998310

Date Analyzed: 07/18/2016 19:08

Date Prepared: 07/18/2016

Analyst: MNR

QC- Sample ID: 533521-001 D

Batch #: 1

Matrix: Soil

Reporting Units: mg/kg

SAMPLE / SAMPLE DUPLICATE RECOVERY

Inorganic Anions by EPA 300/300.1	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Chloride	<10.0	<10.0	0	20	U

Spike Relative Difference RPD $200 * |(B-A)/(B+A)|$

All Results are based on MDL and validated for QC purposes.

BRL - Below Reporting Limit



XENCO Laboratories

Prelogin/Nonconformance Report- Sample Log-In

Client: ARCADIS

Date/ Time Received: 06/24/2016 10:05:00 AM

Work Order #: 532328

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.2
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	Yes
#5 *Custody Seals intact on shipping container/ cooler?	Yes
#6 Custody Seals intact on sample bottles?	Yes
#7 *Custody Seals Signed and dated?	Yes
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	Yes
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Mary Negron

Date: 06/24/2016

Checklist reviewed by:

Kelsey Brooks

Date: 06/24/2016

[illegible]



ID#

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

5323200

[illegible]



ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

532326

Send Results to:				PARAMETER ANALYSIS & METHOD				REMARKS											
Contact & Company Name:		Telephone:		Preservative		Container Information Key:		Matrix Key:		SE - Sediment		NL - NAP/LOI							
Address:		Fax:		Filtered (✓)		# of Containers		SO - Soil		SW - Sludge		SW - Sample Wipe							
City		State		Zip		Container Information		WV - Water		A - Air		Other:							
Project Name/Location (City, State)				Project #:				H. Other:				10. Other:							
Sampler's Printed Name:				Sampler's Signature:				G. Other:				Other:							
Sample ID				Collection Date		Type (✓)		Matrix											
85				SB-1B 30		6-21		✓		Soc									
SB-4B 35																			
SB-3B 30																			
SB-3B 35																			
SB-9 2																			
SB-9 4																			
SB-10 2																			
SB-10 4																			
SB-3B 40																			
SB-3B 45																			
SB-4B 40																			
SB-4B 45																			
Special Instructions/Comments:																			
Laboratory Information and Receipt				Cooler Custody Seal (✓)															
Lab Name:																			
Cooler packed with ice (✓)				Intact		Not Intact													
Specify Turnaround Requirements:																			
Shipping Tracking #:																			
Condition/Cooler Temp:				201															
Relinquished By				Printed Name:		Received By		Printed Name:											
Signature:				Date/Time:		Signature:		Date/Time:											
Firm:				Firm/Counter:		Firm/Counter:		Firm/Counter:											
Relinquished By				Printed Name:		Received By		Printed Name:											
Signature:				Date/Time:		Signature:		Date/Time:											
Firm:				Firm/Counter:		Firm/Counter:		Firm/Counter:											
Laboratory Received By				Printed Name:															
Signature:				Date/Time:															
Firm:				Date/Time:															

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

532328

Send Results to:	
Contact & Company Name: <u>ARCADIS</u>	Telephone: <u>713.353.4841</u>
Address: <u>15000 Westchase</u>	Fax: <u>713.353.4841</u>
City: _____ State: _____ Zip: _____	E-mail Address: _____

Project Name/Location (City, State):

Project #:

Sampler's Printed Name:

Sampler's Signature:

Sample ID

Collection Date Time

Type (✓)
Comp Grab

Matrix

Preservatives
Filtered (✓)
of Containers
Container Information

PARAMETER ANALYSIS & METHOD

Preservation Key:

Keys

Container Information Key:

1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz Glass
7. 4 oz Glass
8. 8 oz Glass
9. Other: _____
10. Other: _____

Matrix Key:

- SE - Sediment
- SW - Water
- SL - Sludge
- A - Air
- NL - NAPL/Oil
- SW - Sample Wipe
- Other: _____

REMARKS

testholdtest holdholdholdholdholdholdholdhold☐ Special QA/QC Instructions(✓):

Special Instructions/Comments:

Laboratory Information and Receipt

Lab Name:

Cooler Custody Seal (✓)

☐ Cooler packed with ice (✓)☒ Intact☐ Not Intact

Specify Turnaround Requirements:

Sample Receipt:

Shipping Tracking #:

Condition/Cooler Temp: 25.1

Relinquished By

Printed Name:

Signature:

Firm:

Received By

Printed Name:

Signature:

Firm:

Laboratory Received By

Printed Name:

Signature:

Firm:

Date/Time:

Distribution:

WHITE - Laboratory returns with results

YELLOW - Lab copy

PINK - Retained by Arcadis

7/30/2016 Cdc AR Form 08.27.2015



ID#

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

532326

[illegible]

ARCADIS

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 5

Lab Work Order #

532328

Send Results to:

City: State: Zip:

Project Name: Location (City, State):

Project #:

Contract Address:

Contractor Information:

Preservative:

Number of Containers:

Container Information:

Parameter Analysis & Method:

Keys:

Preservation Key:

Matrix Key:

Sample ID

Collection Date

Time

Type

Comp

Grab

Matrix

Remarks

Remarks

Remarks

Remarks

Remarks

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Remarks

Laboratory Information and Receipt

Cooler Custody Seal (✓)

Intact

Not Intact

Sample Receipt

Condition/Cooler Temp

Distribution:

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals

WHITE - Laboratory retains with residuals



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CHAIN OF CUSTODY & LABORATORY
ANALYSIS REQUEST FORM

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Lab Work Order #

552328

[illegible]



ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

532328

Contact & Company Name <i>Arti Park</i>		Telephone <i>713-953-4841</i>
City	State	Zip
E-mail Address		Project #
Project Name/Location (City, Street)		Sample's Signature

Preservative	Filtered (✓)	# of Containers	Container Information
--------------	--------------	-----------------	-----------------------

PARAMETER ANALYSIS & METHOD

Sample ID

Collection

Type (✓)

Matrix

REMARKS

Matrix Key:	SE - Sediment	NL - NAPL/Oil
SO - Soil	SW - Sludge	SW - Sample Wtgs
WV - Water	A - Air	Other:
T - Tissue		

Preservation Key:	Keys
1. 40 ml Vial	Container Information Key:
2. 1 L Amber	1. 40 ml Vial
3. 250 ml Plastic	2. 1 L Amber
4. 500 ml Plastic	3. 250 ml Plastic
5. Encore	4. 500 ml Plastic
6. 2 oz Glass	5. Encore
7. 4 oz Glass	6. 2 oz Glass
8. 8 oz Glass	7. 4 oz Glass
9. Other:	8. 8 oz Glass
10. Other:	9. Other:

Sample ID	Collection Date	Type (✓)	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	Matrix Key	SE	NL	SW	Other
85 SB-113 30	6-21	✓	Soil	✓	✓	✓	✓	hoid	TEST			
SB-413 35				✓	✓	✓	✓	hoid	TEST			
SB-313 30				✓	✓	✓	✓	hoid	TEST			
SB-313 35				✓	✓	✓	✓	hoid	TEST			
SB-9 2				✓	✓	✓	✓	hoid	TEST			
SB-9 4				✓	✓	✓	✓	hoid	TEST			
SB-10 2				✓	✓	✓	✓	hoid	TEST			
SB-10 4				✓	✓	✓	✓	hoid	TEST			
SB-313 40				✓	✓	✓	✓	hoid	TEST			
SB-313 45				✓	✓	✓	✓	hoid	TEST			
SB-413 40				✓	✓	✓	✓	hoid	TEST			
SB-413 45				✓	✓	✓	✓	hoid	TEST			

☐ Special QA/QC Instructions (✓)

Laboratory Information and Receipt

Cooler Custody Seal (✓)

☒ Intact ☐ Not Intact

Sample Receipt:

Condition/Cooler Temp: *25.1*

Distribution:

WHITE - Laboratory returns with results

YELLOW - Lab copy

PINK - Retained by Arcadis



ID#

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

[illegible]



ID#

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

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Lab Work Order #

532328

Send Results to:

City	State	Zip	E-mail Address

Project Name/Location (City, State)

Sampler's Printed Name

Project #

Sampler's Signature

Sample ID

Collection Date

Time

Type (✓)

Matrix

Preservative Filtered (✓)

of Containers

Container Information

PARAMETER ANALYSIS & METHOD

Matrix Key:

SE - Sediment

SL - Sludge

SW - Water

SV - Sample Vial

Other

REMARKS

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold

TEST

hold



Prelogin/Nonconformance Report- Sample Log-In

Client: ARCADIS

Date/ Time Received: 06/24/2016 10:05:00 AM

Work Order #: 532328

Acceptable Temperature Range: 0 - 6 degC

Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used :

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	3.2
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	Yes
#5 *Custody Seals intact on shipping container/ cooler?	Yes
#6 Custody Seals intact on sample bottles?	Yes
#7 *Custody Seals Signed and dated?	Yes
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	Yes
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Mary Negron

Date: 06/24/2016

Checklist reviewed by:

Kelsey Brooks

Date: 06/24/2016

Analytical Report 536864

for
Arcadis - Houston

Project Manager: Jonathan Olsen

HES Transfer

11-OCT-16

Collected By: Client



1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215), Arizona (AZ0765), Florida (E871002), Louisiana (03054)
Oklahoma (9218)

Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400)
Xenco-San Antonio: Texas (T104704534)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona(AZ0757)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)



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11-OCT-16

Project Manager: **Jonathan Olsen**

Arcadis - Houston

2929 Briarpark Dr., Ste 300

Houston, TX 77042

Reference: XENCO Report No(s): **536864**

HES Transfer

Project Address: Lovington NM

Jonathan Olsen:

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) 536864. 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. 536864 will be filed for 60 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,

A handwritten signature in black ink, appearing to read 'Kelsey Brooks', is written over a horizontal line.

Kelsey Brooks

Project Manager

Recipient of the Prestigious Small Business Administration Award of Excellence in 1994.

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Sample Cross Reference 536864

Arcadis - Houston, Houston, TX

HES Transfer

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
VGWUO40-12 (2')	S	09-13-16 08:50		536864-001
VGWUO40-12 (4')	S	09-13-16 08:55		536864-002
VGWUO40-17 (2')	S	09-13-16 10:30		536864-003
VGWUO40-17 (4')	S	09-13-16 10:34		536864-004
VGWUO40-16 (2')	S	09-13-16 09:58		536864-005
VGWUO40-16 (4')	S	09-13-16 10:00		536864-006
VGWUO40-16 (50')	S	09-13-16 10:48		536864-007
VGWUO40-19 (2')	S	09-13-16 11:46		536864-008
VGWUO40-19 (4')	S	09-13-16 11:50		536864-009
VGWUO40-18 (2')	S	09-13-16 12:14		536864-010
VGWUO40-18 (4')	S	09-13-16 12:16		536864-011
VGWUO40-18 (70')	S	09-13-16 13:23		536864-012
VGWU85-06 (2')	S	09-13-16 14:41		536864-013
VGWU85-06 (4')	S	09-13-16 14:42		536864-014
VGWU85-06 (10')	S	09-13-16 14:44		536864-016
VGWU85-06 (50')	S	09-13-16 15:27		536864-017
VGWU85-11 (2')	S	09-13-16 16:00		536864-018
VGWU85-11 (4')	S	09-13-16 16:01		536864-019
VGWUSAT3-03 (4')	S	09-14-16 09:49		536864-023
VGWUSAT3-03 (40')	S	09-14-16 10:40		536864-024
VGWUSAT3-05 (4')	S	09-14-16 11:11		536864-025
VGWUSAT3-05 (40')	S	09-14-16 11:55		536864-026
VGWU118-15 (2')	S	09-14-16 14:00		536864-027
VGWU118-15 (4')	S	09-14-16 14:01		536864-028
VGWU118-18 (2')	S	09-14-16 14:30		536864-031
VGWU118-18 (4')	S	09-14-16 14:31		536864-032
VGWU118-18 (7')	S	09-14-16 14:32		536864-033
VGWU118-18 (10')	S	09-14-16 14:33		536864-034
VGWU85-06 (7')	S	09-13-16 14:43		Not Analyzed
VGWU85-11 (7')	S	09-13-16 16:02		Not Analyzed
VGWU85-11 (10')	S	09-13-16 16:05		Not Analyzed
VGWU85-11 (11')	S	09-13-16 16:21		Not Analyzed
VGWU118-15 (7')	S	09-14-16 14:02		Not Analyzed
VGWU118-15 (10')	S	09-14-16 14:03		Not Analyzed



CASE NARRATIVE

Client Name: *Arcadis - Houston*

Project Name: *HES Transfer*

Project ID:

Work Order Number(s): 536864

Report Date: 11-OCT-16

Date Received: 09/15/2016

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None



Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	536864-001	536864-002	536864-003	536864-004	536864-005	536864-006
	<i>Field Id:</i>	VGWUO40-12 (2')	VGWUO40-12 (4')	VGWUO40-17 (2')	VGWUO40-17 (4')	VGWUO40-16 (2')	VGWUO40-16 (4')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-13-16 08:50	Sep-13-16 08:55	Sep-13-16 10:30	Sep-13-16 10:34	Sep-13-16 09:58	Sep-13-16 10:00
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Sep-20-16 08:00	Sep-20-16 08:00	Sep-20-16 08:00	Sep-20-16 08:00	Sep-20-16 08:00	Sep-20-16 08:00
	<i>Analyzed:</i>	Sep-20-16 14:44	Sep-20-16 14:51	Sep-20-16 14:59	Sep-20-16 15:07	Sep-20-16 15:15	Sep-20-16 15:23
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		86.6 10.0	54.0 10.0	52.8 10.0	34.8 10.0	329 10.0	881 10.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	536864-007	536864-008	536864-009	536864-010	536864-011	536864-012
	<i>Field Id:</i>	VGWUO40-16 (50')	VGWUO40-19 (2')	VGWUO40-19 (4')	VGWUO40-18 (2')	VGWUO40-18 (4')	VGWUO40-18 (70')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-13-16 10:48	Sep-13-16 11:46	Sep-13-16 11:50	Sep-13-16 12:14	Sep-13-16 12:16	Sep-13-16 13:23
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Sep-30-16 09:00	Sep-21-16 10:00	Sep-21-16 10:00	Sep-21-16 10:00	Sep-21-16 10:00	Sep-30-16 09:00
	<i>Analyzed:</i>	Sep-30-16 13:18	Sep-21-16 12:10	Sep-21-16 12:33	Sep-21-16 12:41	Sep-21-16 12:49	Sep-30-16 13:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		16.4 5.00	54.2 10.0	59.6 10.0	65.3 10.0	318 10.0	142 5.00

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	536864-013	536864-014	536864-016	536864-017	536864-018	536864-019
	<i>Field Id:</i>	VGWU85-06 (2')	VGWU85-06 (4')	VGWU85-06 (10')	VGWU85-06 (50')	VGWU85-11 (2')	VGWU85-11 (4')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-13-16 14:41	Sep-13-16 14:42	Sep-13-16 14:44	Sep-13-16 15:27	Sep-13-16 16:00	Sep-13-16 16:01
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Sep-21-16 10:00	Sep-21-16 10:00	Sep-30-16 09:00	Oct-10-16 09:35	Sep-21-16 10:00	Sep-21-16 10:00
	<i>Analyzed:</i>	Sep-21-16 12:57	Sep-21-16 17:46	Sep-30-16 13:47	Oct-10-16 19:19	Sep-21-16 13:28	Sep-21-16 13:36
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		6120 100	2540 50.0	3760 50.0	37.8 5.00	14.0 10.0	31.1 10.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	536864-023	536864-024	536864-025	536864-026	536864-027	536864-028
	<i>Field Id:</i>	VGWUSAT3-03 (4')	VGWUSAT3-03 (40')	VGWUSAT3-05 (4')	VGWUSAT3-05 (40')	VGWU118-15 (2')	VGWU118-15 (4')
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Sep-14-16 09:49	Sep-14-16 10:40	Sep-14-16 11:11	Sep-14-16 11:55	Sep-14-16 14:00	Sep-14-16 14:01
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Sep-21-16 10:00	Sep-30-16 09:00	Sep-30-16 09:00	Oct-10-16 09:35	Sep-21-16 10:00	Sep-21-16 10:00
	<i>Analyzed:</i>	Sep-21-16 13:44	Sep-30-16 13:54	Sep-30-16 14:01	Oct-10-16 19:26	Sep-21-16 13:51	Sep-21-16 13:59
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		454 10.0	12.0 5.00	943 5.00	ND 5.00	18.5 10.0	ND 10.0

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Kelsey Brooks
Project Manager



Certificate of Analysis Summary 536864

Arcadis - Houston, Houston, TX

Project Name: HES Transfer

Project Id:

Contact: Jonathan Olsen

Project Location: Lovington NM

Date Received in Lab: Thu Sep-15-16 11:30 am

Report Date: 11-OCT-16

Project Manager: Kelsey Brooks

<i>Analysis Requested</i>	<i>Lab Id:</i>	536864-031	536864-032	536864-033	536864-034		
	<i>Field Id:</i>	VGWU118-18 (2')	VGWU118-18 (4')	VGWU118-18 (7')	VGWU118-18 (10')		
	<i>Depth:</i>						
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL		
	<i>Sampled:</i>	Sep-14-16 14:30	Sep-14-16 14:31	Sep-14-16 14:32	Sep-14-16 14:33		
Inorganic Anions by EPA 300/300.1	<i>Extracted:</i>	Sep-21-16 10:00	Sep-21-16 10:00	Sep-30-16 09:00	Oct-10-16 09:35		
	<i>Analyzed:</i>	Sep-21-16 14:23	Sep-21-16 14:46	Sep-30-16 14:08	Oct-10-16 19:33		
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		91.4 10.0	355 10.0	307 5.00	41.3 5.00		

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Kelsey Brooks
Project Manager



Flagging Criteria

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the quantitation limit and above the detection limit.
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.
- JN** A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

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

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

DL Method Detection Limit

NC Non-Calculable

+ NELAC certification not offered for this compound.

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

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(210) 509-3334	(210) 509-3335
(432) 563-1800	(432) 563-1713
(602) 437-0330	



BS / BSD Recoveries

Project Name: HES Transfer

Work Order #: 536864

Project ID:

Analyst: MNR

Date Prepared: 09/20/2016

Date Analyzed: 09/20/2016

Lab Batch ID: 3000344

Sample: 713949-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	250	100	250	257	103	3	90-110	20	

Analyst: MNR

Date Prepared: 09/21/2016

Date Analyzed: 09/21/2016

Lab Batch ID: 3000445

Sample: 713999-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<10.0	250	246	98	250	250	100	2	90-110	20	

Analyst: MNR

Date Prepared: 09/30/2016

Date Analyzed: 09/30/2016

Lab Batch ID: 3001120

Sample: 714399-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	233	93	250	234	94	0	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries

Project Name: HES Transfer

Work Order #: 536864

Project ID:

Analyst: MNR

Date Prepared: 10/10/2016

Date Analyzed: 10/10/2016

Lab Batch ID: 3001741

Sample: 714723-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	<5.00	250	250	100	250	262	105	5	90-110	20	

Relative Percent Difference RPD = $200 * |(C-F)/(C+F)|$ Blank Spike Recovery [D] = $100 * (C)/[B]$ Blank Spike Duplicate Recovery [G] = $100 * (F)/[E]$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order #: 536864

Project ID:

Lab Batch ID: 3000344

QC- Sample ID: 536602-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/20/2016

Date Prepared: 09/20/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	2780	1250	4000	98	1250	4030	100	1	90-110	20	

Lab Batch ID: 3000344

QC- Sample ID: 536660-002 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/20/2016

Date Prepared: 09/20/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1970	1250	3230	101	1250	3210	99	1	90-110	20	

Lab Batch ID: 3000445

QC- Sample ID: 536864-008 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/21/2016

Date Prepared: 09/21/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	54.2	250	298	98	250	294	96	1	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
 Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order #: 536864

Project ID:

Lab Batch ID: 3000445

QC- Sample ID: 536864-028 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/21/2016

Date Prepared: 09/21/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<10.0	250	250	100	250	244	98	2	90-110	20	

Lab Batch ID: 3001120

QC- Sample ID: 536657-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/30/2016

Date Prepared: 09/30/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	920	250	1160	96	250	1150	92	1	90-110	20	

Lab Batch ID: 3001120

QC- Sample ID: 537439-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 09/30/2016

Date Prepared: 09/30/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	4120	2500	6760	106	2500	6650	101	2	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
 Relative Percent Difference $RPD = 200 * |(C - F) / (C + F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.



Form 3 - MS / MSD Recoveries

Project Name: HES Transfer

Work Order #: 536864

Project ID:

Lab Batch ID: 3001741

QC- Sample ID: 538189-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/10/2016

Date Prepared: 10/10/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	1720	250	1980	104	250	1970	100	1	90-110	20	

Lab Batch ID: 3001741

QC- Sample ID: 538316-006 S

Batch #: 1 Matrix: Soil

Date Analyzed: 10/10/2016

Date Prepared: 10/10/2016

Analyst: MNR

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	258	250	501	97	250	493	94	2	90-110	20	

Matrix Spike Percent Recovery $[D] = 100 \times (C-A)/B$
 Relative Percent Difference $RPD = 200 \times |(C-F)/(C+F)|$

Matrix Spike Duplicate Percent Recovery $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable

N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

HES transfer sites
Chevron PM Rob Speer



CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

ID#:

Lab Work Order #

Page 1 of 3

53609604

Contact & Company Name: Jonathan Olsen Address: Suite 300 2929 Briar Park Dr City: Houston TX 77042 State: TX Zip: 77042 Project Name/Location (City/State): Houston, TX (HES) Sender's Printed Name: Jonathan Olsen Sender's Signature: <i>[Signature]</i>		Telephone: 713.953.4874 Fax: E-mail Address: Jonathan.Olsen@arcadis.com Project #:		Preservative: E Filtered (✓): NA # of Containers: 1 Container Information: 7		Keys: Preservation Key: A. H ₂ SO ₄ B. HCl C. HNO ₃ D. NaOH E. None F. Other: _____ G. Other: _____ H. Other: _____ Container Information Key: 1. 40 ml Vial 2. 1 L Amber 3. 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz Glass 7. 4 oz Glass 8. 8 oz Glass 9. Other: _____ 10. Other: _____ Matrix Key: SO - Soil SE - Sediment SL - Sludge NW - Water A - Air T - Tissue NL - NAPLCH SW - Sample Wipe Other: _____	
PARAMETER ANALYSIS & METHOD							
Chloride							
Sample ID	Collection Date	Time	Type (✓)	Comp	Grab	Matrix	REMARKS
VGWU040-12(2')	9/13/16	850	X			SO	
VGWU040-12(4')	9/13/16	855	X			SO	
VGWU040-17(2')	9/13/16	1030	X			SO	
VGWU040-17(4')	9/13/16	1034	X			SO	
VGWU040-16(2')	9/13/16	958	X			SO	
VGWU040-16(4')	9/13/16	1000	X			SO	
VGWU040-16(50')	9/13/16	1048	X			SO	
VGWU040-19(2')	9/13/16	1146	X			SO	HOLD
VGWU040-19(4')	9/13/16	1150	X			SO	
VGWU040-18(2')	9/13/16	1214	X			SO	
VGWU040-18(4')	9/13/16	1216	X			SO	
VGWU040-18(70')	9/13/16	1323	X			SO	HOLD
VGWU040-85(6')							
VGWU040-85(2')	9/13/16	1441	X			SO	
Special Instructions/Comments: Standard TBT							

Received By: Melissa Phan Printed Name: Melissa Phan Signature: <i>[Signature]</i> Date/Time: 9/14/16 1600		Relinquished By: Dexterae Costa Printed Name: Dexterae Costa Signature: <i>[Signature]</i> Date/Time: 9/14/16 4:00pm		Laboratory Received By: K. PLAMER Printed Name: K. PLAMER Signature: <i>[Signature]</i> Date/Time: 9.15.16 1130	
Lab Name: Arcadis Condition/Cooler Temp: 12 Shipping Tracking #:		Lab Name: Arcadis Condition/Cooler Temp: 12 Shipping Tracking #:		Lab Name: Arcadis Condition/Cooler Temp: 12 Shipping Tracking #:	

Chevron PM - Bay Speer
HES Transfer SitesCHAIN OF CUSTODY & LABORATORY
ANALYSIS REQUEST FORM

ID#:

Lab Work Order #

Page 2 of 3

536864

Contact & Company Name:		Telephone:	Preservative	Filtered (✓)	# of Containers	Container Information	PARAMETER ANALYSIS & METHOD				REMARKS	
Address:		Fax:										
Jonathan Olsen Arcadis 2929 Briarpark Dr Houston, TX 77042		713.953.4874	✓	NA	1	7						
City: Houston, TX 77042												
State: Louisiana, NM (HES)												
Sample's Pinch Name: Melissa Phan												
Sample's Signature: [Signature]												
Sample ID	Collection Date	Time	Type (✓)	Comp	Grab	Matrix						
VGWW85-06(4')	9/13/16	1442	X			SO	X					
VGWW85-06(7')	9/13/16	1443	X			SO	X					
VGWW85-06(10')	9/13/16	1444	X			SO	X					
VGWW85-06(50')	9/13/16	1527	X			SO	X					
VGWW85-11(2')	9/13/16	1600	X			SO	X					
VGWW85-11(4')	9/13/16	1601	X			SO	X					
VGWW85-11(7')	9/13/16	1602	X			SO	X					
VGWW85-11(18')	9/13/16	1605	X			SO	X					
VGWW85-11(40')	9/13/16	1621	X			SO	X					
VGWW85-11(40')	9/14/16	1449	X			SO	X					
VGWW85-11(40')	9/14/16	1040	X			SO	X					
VGWW85-11(40')	9/14/16	1111	X			SO	X					
VGWW85-11(40')	9/14/16	1155	X			SO	X					
VGWW85-11(40')	9/14/16	1300	X			SO	X					
Special Instructions/Comments: 1400												
Standard TAT												
Lab Name:			Received By:			Relinquished By:			Laboratory Received By:			
Cooler Custody Seal (✓)			Printed Name:			Printed Name:			Printed Name:			
X Intact			Signature:			Signature:			Signature:			
Sample Receipt:			Firm:			Firm:			Firm:			
Condition/Cooler Temp:			Date/Time:			Date/Time:			Date/Time:			
12°C			9/14/16 1600			9/14/16 4:00pm			9/15/16 1138			
Shipping Tracking #:			Date/Time:			Date/Time:			Date/Time:			
			9/14/16 1600			9/14/16 4:00pm			9/15/16 1138			
2073025 Co/C AR Form 08.27.2015			WHITE - Laboratory returns with results			YELLOW - Lab copy			PINK - Retained by Arcadis			

HES Transfer Sites
Chevron PM Rob SpeerCHAIN OF CUSTODY & LABORATORY
ANALYSIS REQUEST FORM

ID#:

Lab Work Order #

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5360864

Contact & Company Name:		Telephone:		Preservative		Filled (%)		E		NA	
Jonathan Olson		Arcadis		713-953-4874							
Address:		Fac:									
2929 Briarpark Dr		Suite 300									
City:		State:		Zip:							
Houston, TX		77042									
Project Name:		City, State:		Project #:							
HES Livingston, NM											
Sampler's Printed Name:		Sampler's Signature:		Collection		Type (%)		Matrix			
Melissa Phan				Date		Time		Comp		Grab	
Sample ID		Date		Time		Comp		Grab		Matrix	
VGWV118-15(4')		9/14/16		1401							
VGWV118-15(7')		9/14/16		1402							
VGWV118-15(10')		9/14/16		1403							
VGWV118-18(2')		9/14/16		1430							
VGWV118-18(4')		9/14/16		1431							
VGWV118-18(7')		9/14/16		1432							
VGWV118-18(10')		9/14/16		1433							

PARAMETER ANALYSIS & METHOD

Chloride

REMARKS

Hold

Hold

Hold

Hold

Special Instructions/Comments:

Standard TAT

Laboratory Information and Receipt		Relinquished By		Received By		Relinquished By		Laboratory Received By	
Lab Name:	Cooler Custody Seal (%)	Printed Name:	Signature:	Printed Name:	Signature:	Printed Name:	Signature:	Printed Name:	Signature:
ARCADIS	Intact <input checked="" type="checkbox"/> Not Intact <input type="checkbox"/>	Melissa Phan		Dessirae Goff		Dessirae Goff		Dessirae Goff	
Specify Turnaround Requirements:	Sample Receipt:	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:	Firm:
	Condition/Cooler Temp: 12°C	ARCADIS	MS.	MS.	MS.	MS.	MS.	MS.	MS.
Shipping Tracking #:		Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:	Date/Time:
		9/14/16 1600	9/14/16 4:00pm	9/14/16 4:00pm	9/14/16 4:00pm	9/14/16 4:00pm	9/14/16 4:00pm	9/14/16 4:00pm	9/14/16 4:00pm

20750828 CoC AR Form 08.27.2015

WHITE - Laboratory returns with results

YELLOW - Lab copy

PINK - Retained by Arcadis

ORIGIN ID: H08A (5/5) 392-7550

MAIL SERVICES ETC, LLC
4008 N GRIMES

HOBBS, NY 88240
UNITED STATES US

SHIP DATE: 14SEP16
ACTWGT: 27.0 LB NON
CAD: 0909328/CAFE2915
DIMS: 29x18x13 IN

BILL RECIPIENT

TO XENCO LABORATORIES
XENCO LABORATORIES
1211 W FLORIDA AVE

MIDLAND TX 79701

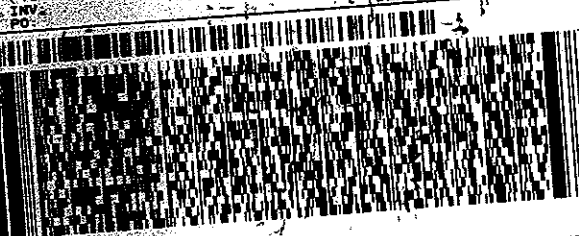
(432) 563-1800

REP:

DEPT:

INV:

PO:



FedEx
Express



11511508138110

TRK:
02001

6506 3912 4936

THU - 15 SEP 3:00P
STANDARD OVERNIGHT

41 MAFA

79701
TX-US LBB



Part # 156148-137-145 0-718



Prelogin/Nonconformance Report- Sample Log-In

Client: Arcadis - Houston

Date/ Time Received: 09/15/2016 11:30:00 AM

Work Order #: 536864

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)?	6.3
#2 *Shipping container in good condition?	Yes
#3 *Samples received on ice?	Yes
#4 *Custody Seal present on shipping container/ cooler?	Yes
#5 *Custody Seals intact on shipping container/ cooler?	Yes
#6 Custody Seals intact on sample bottles?	Yes
#7 *Custody Seals Signed and dated?	Yes
#8 *Chain of Custody present?	Yes
#9 Sample instructions complete on Chain of Custody?	Yes
#10 Any missing/extra samples?	No
#11 Chain of Custody signed when relinquished/ received?	Yes
#12 Chain of Custody agrees with sample label(s)?	Yes
#13 Container label(s) legible and intact?	Yes
#14 Sample matrix/ properties agree with Chain of Custody?	Yes
#15 Samples in proper container/ bottle?	Yes
#16 Samples properly preserved?	Yes
#17 Sample container(s) intact?	Yes
#18 Sufficient sample amount for indicated test(s)?	Yes
#19 All samples received within hold time?	Yes
#20 Subcontract of sample(s)?	N/A
#21 VOC samples have zero headspace (less than 1/4 inch bubble)?	N/A
#22 <2 for all samples preserved with HNO3,HCL, H2SO4? Except for samples for the analysis of HEM or HEM-SGT which are verified by the analysts.	N/A
#23 >10 for all samples preserved with NaAsO2+NaOH, ZnAc+NaOH?	N/A

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

Analyst:

PH Device/Lot#:

Checklist completed by:

Jessica Kramer

Date: 09/15/2016

Checklist reviewed by:

Kelsey Brooks

Date: 09/16/2016

District I

1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720

District II

811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
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 160596

CONDITIONS

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 160596
	Action Type: [IM-SD] Incident File Support Doc (ENV) (IM-BNF)

CONDITIONS

Created By	Condition	Condition Date
jnobui	Closure Report Uploaded 4/8/2019. Closure Denied at this time.	11/21/2022