# Basin Environmental Service Technologies, LLC

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# **REMEDIATION SUMMARY &**

# SITE CLOSURE REQUEST

# ECHO PRODUCTION EAST LIVINGSTON RIDGE DELAWARE – AREA 1 Lea County, New Mexico Unit Letter "M" (SW/SW), Section 31, Township 22 South, Range 32 East Latitude 32.343580 North, Longitude -103.718976 West NMOCD Reference #: 1RP-4250

Prepared For:

Echo Production P.O. Box 1210 Graham, Texas 76450

Prepared By:

Basin Environmental Service Technologies, LLC 3100 Plains Highway Lovington, New Mexico 88260

February 2018

M

Robbie Runnels Project Manager

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### **1.0 INTRODUCTION & BACKGROUND INFORMATION**

Basin Environmental Service Technologies, LLC (Basin Environmental), on behalf of Echo Production (Echo), has prepared this *Remediation Summary & Site Closure Request* for the release site known as East Livingston Ridge Delaware – Area 1 (Area – 1). The legal description of the release site is Unit Letter "M" (SW/SW), Section 31, Township 22 South, Range 32 East, in Lea County, New Mexico. The geographic coordinates of the release site are 32.343580° North latitude and -103.718976° West longitude. The property affected by the release is owned by United States Department of the Interior - Bureau of Land Management (BLM). A "Site Location Map" is provided as Figure 1.

On February 19, 2016, during a relinquishment inspection, Randal Pair of the BLM discovered three (3) separate release areas along the pipeline right-of-way (ROW) being relinquished. During the week of March 14, 2016, Jamie Keyes of the New Mexico Oil Conservation Division (OCD) discovered an additional release area along the pipeline ROW to be relinquished. The release known as Area 1 was attributed to a failure in the pipe integrity at some time during operation. An unknown amount of crude oil and produced water impacted approximately two-thousand, four-hundred seventeen square feet  $(2,417 \text{ ft}^2)$  of pasture. The release areas were reported to the OCD on April 18, 2016 and approved the same day. The "Release Notification and Corrective Action" (Form C-141) is provided as Appendix A.

On April 19, 2016, Basin Environmental commenced delineation activities at the release site of Area 1. Three soil samples along the pathway of the release were retrieved from the surface (SP 1, SP 2, SP 5) and a hand-augered soil borings were advanced at the point of where the surface samples were retrieved in order to investigate the vertical extent of impacted soil. Each soil sample point was advanced in one-foot (1') intervals to approximately four feet (4') below ground surface (bgs). Representative surface soil samples and the soil samples retrieved at approximately 4' bgs were submitted to Cardinal Laboratories in Hobbs, New Mexico, for Total Petroleum Hyrdrocarbon (TPH) concentration analysis using Environmental Protection Agency (EPA) Method SW 846-8015M. The representative soil samples were also analyzed for chloride concentrations using Standard Method 4500-CL- B.

Laboratory analytical results indicated TPH concentrations at 4' ranged from 3,529 mg/kg in soil sample SP 2 @ 4' to 5,824 mg/kg in soil sample SP 1 @ 4'. Chloride concentrations ranged from 1,600 mg/kg in soil sample SP 5 @ 4' to 3,040 mg/kg in soil sample SP 2 @ 4'.

Review of laboratory analytical documentation indicated additional vertical delineation of the release was required.

General photographs of the release site and remediation activities are provided as Appendix B. Locations of the soil sampling are depicted in Figure 2, "Site & Sample Location Map". Laboratory analytical results are summarized in Table 1, "Concentrations of Benzene, BTEX, TPH & Chloride in Soil". Laboratory analytical reports are provided in Appendix C.

On May 18, 2016, a Corrective Action Plan (Work Plan) was submitted to the BLM and NMOCD outlining a strategy to advance the site to an approved closure. The Work Plan was approved upon submittal by a representative of the BLM, with the additional requirements that an Archeological survey take place.

The Work Plan was approved by an NMOCD representative on an "at-risk" basis. This entails that additional remediation may be required at a later date in that delineation had not been completed.

# 2.0 NMOCD SITE CLASSIFICATION

A search of the New Mexico Water Rights Reporting System (NMWRRS) database maintained by the New Mexico Office of the State Engineer (NMOSE) indicated information was unavailable for Section 31, Township 22 South, Range 32 East. A depth-to-groundwater (DGW) reference map utilized by the NMOCD indicates groundwater could be encountered approximately at a depth greater than four hundred feet (400') bgs. Utilizing gradient patterns and the Water Incident Database (WAID), DGW coincides with the groundwater reference map. Based on the NMOCD ranking system, zero (0) points were assigned to the site as a result of this criterion. A DGW map is provided as Figure 2.

A search of the NMWRRS database indicated there are no water wells within one thousand feet (1,000') of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

There are no surface water bodies within one thousand feet (1,000') of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

NMOCD guidelines indicate the Area -1 release site has an initial ranking score of zero (0) points. The soil remediation levels for a site with a ranking score of zero (0) points are as follows:

- Benzene 10 mg/kg (ppm)
- Benzene, ethylbenzene, toluene, and xylenes (BTEX) 50 mg/kg (ppm)
- Total petroleum hydrocarbons (TPH) 5,000 mg/kg (ppm)

The New Mexico Administrative Code (NMAC) does not currently specify a remediation level for chloride concentrations in soil. Chloride remediation levels are set by the NMOCD on a site-specific basis and have been presumed to be 1,000 mg/kg for a site with a ranking score of zero (0).

### 3.0 SUMMARY OF SOIL REMEDIATION ACTIVITIES

In January of 2017, Basin personnel were on the location to perform remediation activities. The entire release area was excavated to a depth of approximately five feet (5') bgs. Discrete soil samples were retrieved from the floor of the excavation (Floor 1, Floor 2, Floor 3, Floor 4) to be analyzed at a commercial laboratory for concentrations of TPH and chloride. All four (4) floor soil samples revealed a concentration of TPH to be well below the remediation recommended action levels (RRAL). Chloride concentration was found to be above the RRAL for soils samples Floor 1, Floor 2, and Floor 3.

In an attempt to complete delineation for chlorides, (presumed to be 250 mg/kg for this site), excavation was advanced in the areas where soil samples were taken for Floor 1, Floor 2, and Floor 3. The point where soil sample Floor 1 was retrieved was advanced to a depth of twenty-three feet (23') bgs. Delineation had still not occurred. Floor 2 and Floor 3 were advanced to nine feet (9') bgs without achieving delineation.

Basin applied a six-inch (6") cushion of sand in the floor of the excavation and then installed a 20mil liner in the necessary area of the excavation. Another 6" cushion of sand was applied on the liner to protect it from backfilling activities. The liner was to prevent the migration of contaminants from moving toward the groundwater and from percolating upwards to the vadose zone. Soilboring conduit was then placed and welded to the liner to facilitate backfilling.

The site known as Area 1 was then backfilled with clean, non-impacted, imported soils and contoured to the surrounding area.

On September 21, 2017, Basin personnel procured an environmental drilling rig in order to achieve delineation for three (3) sample points of Area 1. Soil Bore 1 (SB-1) was advanced vertically to a depth of ninety feet (90') bgs before ascertaining delineation. A discrete soil sample was retrieved at this depth and the drilling advanced to ninety-five (95) and one-hundred feet (100') respectively. Discrete soil samples were retrieved at these depths and delivered to a laboratory for confirmatory analysis.

Soil Bore 2 (SB-2) was advanced vertically to a depth of one-hundred ten feet (110') bgs before ascertaining delineation. The drilling was advanced to one-hundred fifteen (115) and one-hundred twenty feet (120') respectively. Discrete soil samples were retrieved at these depths and delivered to a laboratory for confirmatory analysis.

Soil Bore 3 (SB-3) was advanced vertically to a depth of one-hundred thirty feet (130') bgs before ascertaining delineation. The drilling advanced to one-hundred thirty-five (135) and one-hundred forty feet (140') respectively. Discrete soil samples were retrieved at these depths and delivered to a laboratory for confirmatory analysis.

All samples were confirmed to be below the RRAL for the site for concentrations of BTEX and chlorides.

The location will be seeded with a land-owner approved seed mix free of noxious or invasive species at a time conducive for germination.

# 4.0 QA/QC PROCEDURES

# 4.1 Soil Sampling

Soil Samples were delivered to Cardinal Laboratories, Inc., in Hobbs, New Mexico, for analysis of BTEX, TPH, and/or chloride concentrations using the methods described below. Soil samples were analyzed for BTEX, TPH, and/or chloride concentrations within fourteen (14) days following the collection date.

The soil samples were analyzed as follows:

- BTEX concentrations in accordance with EPA Method SW 846-8021b
- TPH concentrations in accordance with modified EPA Method SW 846-8015M
- Chloride concentrations in accordance with EPA Method 300.1

# 4.2 Decontamination of Equipment

Cleaning of the sampling equipment was the responsibility of the environmental technician. Prior to use, and between each sample, the sampling equipment was cleaned with Liqui-Nox® detergent and rinsed with distilled water.

## 4.3 Laboratory Protocol

The laboratory was responsible for proper QA/QC procedures after signing the chain-of-custody form(s). These procedures were either transmitted with the laboratory analytical reports or are on file at the laboratory.

### 5.0 SITE CLOSURE REQUEST

The East Livingston Ridge Delaware Area 1 release site was excavated to the extent practicable five feet (5') below bgs. Soil samples collected from the discrete hand-auguring, soil boring, floor, and sidewalls of the excavation were analyzed by an NMOCD-approved laboratory. The concentrations of BTEX and TPH were below the RRALs established for the site.

A twenty (20) mil, impermeable, polyethylene liner was installed on the floor of the excavation prior to backfilling as chloride concentrations were above the RRAL's established for this site. The liner was extended horizontally into a four-foot (4') buffer zone around the excavation to facilitate shedding of moisture outside the footprint of the excavation and the maximum horizontal extent of in-situ impacted soil. This engineered control will serve to inhibit vertical migration of contaminants left in-situ both upward to the vegetative zone and downward to the underlying groundwater.

Basin Environmental recommends Echo Production provide the NMOCD's Hobbs District Office and the BLM's Carlsbad Field Office a copy of this *Remediation Summary & Risk-Based Site Closure Request* and request the NMOCD grant site closure to the East Livingston Ridge Delaware Area 1 release site.

### 6.0 LIMITATIONS

Basin Environmental Service Technologies, LLC, has prepared this *Remediation Summary & Site Closure Request* to the best of its ability. No other warranty, expressed or implied, is made or intended. Basin Environmental has examined and relied upon documents referenced in the report and on oral statements made by certain individuals. Basin Environmental has not conducted an independent examination of the facts contained in referenced materials and statements. Basin Environmental has presumed the genuineness of these documents and statements and that the information provided therein is true and accurate. Basin Environmental has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Basin Environmental notes that the facts and conditions referenced in this report may change over time, and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of Echo Production. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of Basin Environmental Service Technologies, LLC, and/or Echo Production.

# 7.0 **DISTRIBUTION:**

Copy 1:	Olivia Yu New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (District 1) 1625 N French Drive Hobbs, NM 88240
Copy 2:	Yolanda Jordan Bureau of Land Management 602 E. Greene Street Carlsbad, NM 88220
Copy 3:	Buck Dollar Echo Production P.O. Box 1210 Graham, Texas 76450
Copy 4:	Don Belleh Bitco Insurance Companies Old Republic Insurance Group P.O. Box 16627 Lubbock, Texas 79490
Copy 5:	Basin Environmental Service Technologies, LLC P.O. Box 301 Lovington, New Mexico 88260

# FIGURES

# Site Locations

198 32E NM 243 208 32E	198 33E US 62 US 62 208 33E	19 <del>S 34E</del> 20S 34E NM 176	193 35E 20S 35E	193 36E 20S 36E	20S 37E 20S 38E
21S 31E	21S 32E	21S 33E	21S 34E	21S 35E	21S 37E EUNICE 21S 36E COYOTE HILL ROAD
22S 31E ≠-	22S 32E	22S 33E	22S 34E	22S 35E	DELAWARE BASIN ROAD 22S 36E 22S 37E KING FOAD W
23S 31E	RIDGE DELA		23S 34E	23S 35E	23S 36E 23S 37E
24S 31E	24S 32E	NM 128 24S 33E	24S 34E	24S 35E	24S 36E
25S 31E	25S 32E	25S 33E	25S 34E	25S 35E	JAL 25\$ 37Eg 25\$ 37Eg 100 100 100 100 100 100 100 100 100 10
26S 31E <sub>26</sub> Landowner DGW: 400+	r: BLM	26S 33E	26S 34E Source: E DS, USDA	26S 35E ari, DigitalGlobe, G , USGS, Aero GRID	26S 36E Legend → RAILROAD → ROAD , IGN, and the GIS Use
Basin Er	avironme.	ECH ELIV	O PRODUC INGSTON DELAWAR	CTION RIDGE	GPS: 32.344590 -103.716479 Figure 1
Effect	tive Solutions Technolog	iles UL K	1RP-4250 X, M & N SECT T-22-S R-32-H LEA COUNTY, 1	$E  _{C}$	Drawing date: 1/31/18 Drafted by: T. Grieco

# Depth to Groundwater

5	4	3	2	1	6	5	4	3	2	1
8	9	10	11	12	7	8	9	10	11	12
17	16 <b>448</b>	15	14	13	18	17	16	15	14 <b>360</b>	13
20 <b>48</b>	21	22S 3 22	1E 23	24	19	20	22S 32 21	22	23	24 8775 ft
29	28 <b>450 4</b>	<b>01</b> 27	3004 ft 26	25	30	29	28	27	26	25
32	33	34 <b>428</b> Rd	35	36	11	32 IO PROD		34	35	36
<b>354</b> 5	X	3	2	TT H	- 1	GE DELA	100	3	2	1 and
8	9	10	11 639	Par 12	7	8	9	10	11	12
17	16	15 23S 3	14 1E	13	18	17	<sup>16</sup> 23S 32	15 Part 15	14	13
20	21	22	23	24	19	20	21	<b>400</b> 22	23	24
	downer: E GW: 4	BLM 100+ F	- <b>T</b> 430	25 Dines Oil Field 36	Survey,	Esri, Belorme, USGS, FAO, N Esri Japan, MET	NAVTEQ, Tom PS, NRCAN, Ge I, Esri China (He 33	iom, Inti oBase, ong Kon	Legend WAIDS WEI	; _L
a a a	Effective	ironm Se Solutions	ental	ECHO I E LIVIN	PRODU	CTION RIDGE	GPS		-103.716479	
Sel	Vice T	echnol	ogies	Т	& N SECT -22-S R-32-1 COUNTY, 1	E	Drawing dat	Miles	W	E

# **Initial Sampling**



# **Proposed Liner**



# TABLES

#### TABLE 1 CONCENTRATIONS OF BENZENE, BTEX, TPH & CHLORIDE IN SOIL Initial and Final Samples ECHO PRODUCTION EAST LIVINGSTON RIDGE DELAWARE - AREA 1 LEA COUNTY, NEW MEXICO NMOCD # - 1RP - 3985 Unit Letter M, Section 31, Township 22 South, Range 32 East

					METHOD: E	PA SW 846	6-8021B, 503	0	MET	HOD: 80	15M		4500 CI-B
SAMPLE LOCATION	SAMPLE DEPTH	SAMPLE	SOIL	BENZENE		ETHYL-	TOTAL	TOTAL	GRO	DRO	ORO	<b>TPH</b> <b>C</b> <sub>6</sub> -C <sub>35</sub>	CHLORIDE
SAMI LE LOCATION	(BGS)	DATE	STATUS	(mg/Kg)	(mg/Kg)	BENZENE	XYLENES	BTEX	<b>C</b> <sub>6</sub> -C <sub>10</sub>	C <sub>10</sub> -C <sub>28</sub>	<b>C</b> <sub>28</sub> -C <sub>35</sub>	(mg/Kg)	(mg/Kg)
	(600)			(iiig/Kg)	(iiig/rtg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(ing/itg)	(ing/rtg)
Area #1 SP1@Surface	0'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	28.8	9960.0	2470.0	12459	4160
Area #1 SP2@Surface	0'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	37.6	7260.0	2640.0	9938	3640
Area #1 SP5@Surface	0'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	<100	10900.0	5580.0	16480	3240
Area #1 SP1 @ 4'	4'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	124.0	4250.0	1450.0	5824	2520
Area #1 SP2 @ 4'	4'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	34.5	2810.0	684.0	3529	3040
Area #1 SP5 @ 4'	4'	4/19/2016	In-Situ	NA	NA	NA	NA	NA	<100	3360.0	1030.0	4390	1600
Area #1 Floor 4 @ 5'	5'	1/11/2017	In-Situ	< 0.050	<0.050	<0.050	<0.150	< 0.300	<10.0	<10.0	NA	<10.0	256.0
Area #1 NW 1 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	384.0
Area #1 NW 3 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	32.0
Area #1 SW 2 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	48.0
Area #1 EW 1 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	320.0
Area #1 EW 3 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	64.0
Area #1 EW 4 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	32.0
Area #1 EW 5 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	48.0
Area #1 WW 2 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	400.0
Area #1 WW 3 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	160.0
Area #1 WW 4 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	48.0
Area #1 WW 5 @ 4'	4'	1/11/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	32.0
Area #1 Floor 1 @ 7'	7'	1/31/2017	In-Situ	< 0.050	< 0.050	< 0.050	<0.150	< 0.300	<10.0	<10.0	NA	<10.0	10,400.0
Area #1 Floor 1 @ 9'	9'	1/31/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	18,000.0
Area #1 Floor 2 @ 9'	9'	1/31/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	20,000.0
Area #1 Floor 3 @ 7'	7'	1/31/2017	In-Situ	< 0.050	<0.050	< 0.050	<0.150	< 0.300	<10.0	<10.0	NA	<10.0	13,200.0
Area #1 Floor 3 @ 9'	9'	1/31/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	17,600.0
Area #1 WW 1 @ 4'	4'	1/31/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	32.0
Area #1 Floor 1 @ 23'	23'	2/1/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	7,330.0
Area #1 EW 2 @ 4'	4'	4/19/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	64.0
Area #1 SW 1 @ 4'	4'	4/19/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	32.0
Area #1 NW 1 @ 4'	4'	4/19/2017	In-Situ	NA	NA	NA	NA	NA	<10.0	<10.0	NA	<10.0	48.0
SB1 @ 90'	90	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	192.0
SB1 @ 95'	95'	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	160.0
SB1 @ 100'	100'	9/21/2107	In-Situ	< 0.050	< 0.050	< 0.050	<0.150	< 0.300	<10.0	<10.0	<10.0	<10.0	128.0
SB2 @ 110'	110'	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	256.0
SB2 @ 115'	115'	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	176.0
SB2 @ 120'	120'	9/21/2107	In-Situ	<0.050	< 0.050	<0.050	<0.150	< 0.300	<10.0	<10.0	<10.0	<10.0	272.0
SB3 @ 130'	130'	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	224.0
SB3 @ 135'	135'	9/21/2107	In-Situ	NA	NA	NA	NA	NA	NA	NA	NA	NA	224.0
SB3 @ 140'	140'	9/21/2107	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	208.0

#### TABLE 1 CONCENTRATIONS OF BENZENE, BTEX, TPH & CHLORIDE IN SOIL Initial and Final Samples ECHO PRODUCTION EAST LIVINGSTON RIDGE DELAWARE - AREA 1 LEA COUNTY, NEW MEXICO NMOCD # - 1RP - 3985 Unit Letter M, Section 31, Township 22 South, Range 32 East

NMOCD Recommended Remediation Action Level	10		50		5000	1,000
NA = Not analyzed						,

NA = Not analyzed.

# APPENDICES

# APPENDIX –A C-141

# APPENDIX – B Photo Documentation

# Echo Production – E. Livingston Ridge Delaware Area 1 Unit Letter M of Section 31, T22S, R32E



Excavated area, facing northeast

2/1/17



Liner placement, facing north

2/1/17



Excavated area, facing west

2/1/17



Installed liner, facing northeast

4/27/17

# Echo Production – E. Livingston Ridge Delaware Area 1 Unit Letter M of Section 31, T22S, R32E



Installed conduit, facing west

4/27/17



Backfilling complete, west

4/28/17



Backfilling, facing north

4/27/17



Backfilling complete, facing southwest

4/28/17

# APPENDIX – C Analytical Reports



April 29, 2016

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 04/22/16 9:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-15-7. 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 <a href="https://www.tceq.texas.gov/field/qa/lab\_accred\_certif.html">www.tceq.texas.gov/field/qa/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #4 SP 1 @ SURFACE (H600874-01)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	864	16.0	04/27/2016	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	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	729	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	394	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	68.1	% 35-147	,						
Surrogate: 1-Chlorooctadecane	108	% 28-171							

#### Sample ID: AREA #4 SP 2 @ SURFACE (H600874-02)

Chloride, SM4500Cl-B	M4500Cl-B mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	912	16.0	04/27/2016	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	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	950	10.0	04/25/2016	ND	213	106	200	5.30	QM-07, QR-03
EXT DRO >C28-C35	434	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	76.8	% 35-147	,						
Surrogate: 1-Chlorooctadecane	99.3	% 28-171							

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Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #4 SP 5 @ SURFACE (H600874-03)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	784	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	618	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	310	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	76.3	% 35-147							
Surrogate: 1-Chlorooctadecane	109	% 28-171							

#### Sample ID: AREA #4 SP 1 @ 6' (H600874-04)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1260	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	6360	50.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2820	50.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	77.1	% 35-147	,						
Surrogate: 1-Chlorooctadecane	492	% 28-171							

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



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Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #4 SP 2 @ 6' (H600874-05)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1230	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	4550	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2050	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	81.9	% 35-147							
Surrogate: 1-Chlorooctadecane	425	% 28-171							

#### Sample ID: AREA #4 SP 5 @ 6' (H600874-06)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1420	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	11.6	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	6450	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2950	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	79.8	% 35-147	,						
Surrogate: 1-Chlorooctadecane	263	% 28-171							

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Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #3 SP 2 @ SURFACE (H600874-07)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	800	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg/	kg	Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<200	200	04/26/2016	ND	206	103	200	7.10	
DRO >C10-C28	11000	200	04/26/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	4070	200	04/26/2016	ND					
Surrogate: 1-Chlorooctane	143 9	% 35-147							
Surrogate: 1-Chlorooctadecane	411 9	28-171							

#### Sample ID: AREA #3 SP 4 @ SURFACE (H600874-08)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	816	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DR0 >C10-C28	6590	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2810	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	84.2	% 35-147	,						
Surrogate: 1-Chlorooctadecane	241	% 28-171							

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Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #3 SP 7 @ SURFACE (H600874-09)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	880	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	8530	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	3500	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	87.3	% 35-147							
Surrogate: 1-Chlorooctadecane	285	% 28-171							

#### Sample ID: AREA #3 SP 2 @ 4' (H600874-10)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2120	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	30.2	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	2140	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	639	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	90.5	% 35-147	,						
Surrogate: 1-Chlorooctadecane	178	% 28-171							

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Received:	04/22/2016	Sampling Date:	04/18/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #3 SP 4 @ 6' (H600874-11)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2600	16.0	04/27/2016	ND	400	100	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	82.4	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	5330	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	1480	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	94.9	% 35-147	,						
Surrogate: 1-Chlorooctadecane	177	% 28-171							

### Sample ID: AREA #3 SP 7 @ 6' (H600874-12)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2800	16.0	04/26/2016	ND	416	104	400	0.00	QM-07
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	72.7	10.0	04/25/2016	ND	206	103	200	7.10	
DR0 >C10-C28	4940	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	1410	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	96.8	% 35-147	,						
Surrogate: 1-Chlorooctadecane	293	% 28-171							

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Celey D. Keene, Lab Director/Quality Manager



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Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #2 SP 3 @ SURFACE (H600874-13)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2000	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	8015M mg/kg		Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	15.9	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	5740	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2000	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	87.5	% 35-147	,						
Surrogate: 1-Chlorooctadecane	203	% 28-171							

#### Sample ID: AREA #2 SP 4 @ SURFACE (H600874-14)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2320	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	′kg	Analyze	d By: MS					S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	24.6	10.0	04/25/2016	ND	206	103	200	7.10	
DR0 >C10-C28	7900	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2500	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	94.4	% 35-147	,						
Surrogate: 1-Chlorooctadecane	248	28-171							

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Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #2 SP 7 @ SURFACE (H600874-15)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	4960	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	H 8015M mg/kg		Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<200	200	04/26/2016	ND	206	103	200	7.10	
DRO >C10-C28	20700	200	04/26/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	5380	200	04/26/2016	ND					
Surrogate: 1-Chlorooctane	160	% 35-147	,						
Surrogate: 1-Chlorooctadecane	1300	% 28-171							

### Sample ID: AREA #2 SP 3 @ 5' (H600874-16)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2480	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	′kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	17.6	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	1290	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	334	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	79.0	% 35-147	7						
Surrogate: 1-Chlorooctadecane	133	28-171							

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Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #2 SP 4 @ 5' (H600874-17)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1180	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	<10.0	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	14.5	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	75.4	% 35-147	,						
Surrogate: 1-Chlorooctadecane	89.7	% 28-171							

### Sample ID: AREA #2 SP 7 @ 5' (H600874-18)

Chloride, SM4500Cl-B	mg/kg		Analyze	Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1230	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	247	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	51.3	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	73.3	% 35-147	,						
Surrogate: 1-Chlorooctadecane	89.3	% 28-171							

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #1 SP 1 @ SURFACE (H600874-19)

Chloride, SM4500CI-B Analyte	mg/kg		Analyzed By: AP						
	Result	Reporting Limit	Analyzed	Method Blank	BS % R	% Recovery	True Value QC	RPD	Qualifier
Chloride	4160	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg/kg		Analyzed By: MS						S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	28.8	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	9960	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2470	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	85.3	% 35-147							
Surrogate: 1-Chlorooctadecane	547	% 28-171							

#### Sample ID: AREA #1 SP 2 @ SURFACE (H600874-20)

Chloride, SM4500Cl-B	mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3640	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg/kg		Analyzed By: MS						S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	37.6	10.0	04/25/2016	ND	206	103	200	7.10	
DRO >C10-C28	7260	10.0	04/25/2016	ND	213	106	200	5.30	
EXT DRO >C28-C35	2640	10.0	04/25/2016	ND					
Surrogate: 1-Chlorooctane	85.9	% 35-147	,						
Surrogate: 1-Chlorooctadecane	887	% 28-171							

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Celeg D. Keine


Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #1 SP 5 @ SURFACE (H600874-21)

Chloride, SM4500Cl-B	mg,	′kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3240	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	′kg	Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<100	100	04/26/2016	ND	206	103	200	0.134	
DRO >C10-C28	10900	100	04/26/2016	ND	215	108	200	3.54	
EXT DRO >C28-C35	5580	100	04/26/2016	ND					
Surrogate: 1-Chlorooctane	91.4	% 35-147							
Surrogate: 1-Chlorooctadecane	911 9	28-171							

# Sample ID: AREA #1 SP 1 @ 4' (H600874-22)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2520	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	124	100	04/26/2016	ND	206	103	200	0.134	
DRO >C10-C28	4250	100	04/26/2016	ND	215	108	200	3.54	
EXT DRO >C28-C35	1450	100	04/26/2016	ND					
Surrogate: 1-Chlorooctane	105	% 35-147	7						
Surrogate: 1-Chlorooctadecane	330	% 28-171							

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/22/2016	Sampling Date:	04/19/2016
Reported:	04/29/2016	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 SP 2 @ 4' (H600874-23)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	3040	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	34.5	10.0	04/26/2016	ND	206	103	200	0.134	
DRO >C10-C28	2810	10.0	04/26/2016	ND	215	108	200	3.54	
EXT DRO >C28-C35	684	10.0	04/26/2016	ND					
Surrogate: 1-Chlorooctane	97.5	% 35-147							
Surrogate: 1-Chlorooctadecane	149	% 28-171							

# Sample ID: AREA #1 SP 5 @ 4' (H600874-24)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1600	16.0	04/26/2016	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					S-06
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<100	100	04/26/2016	ND	206	103	200	0.134	
DRO >C10-C28	3360	100	04/26/2016	ND	215	108	200	3.54	
EXT DRO >C28-C35	1030	100	04/26/2016	ND					
Surrogate: 1-Chlorooctane	95.3	% 35-147	,						
Surrogate: 1-Chlorooctadecane	246	% 28-171							

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



### **Notes and Definitions**

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside if QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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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Celey D. Keine

Celey D. Keene, Lab Director/Quality Manager

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ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240

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ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240

City: Sampler Name: Abe Redacop Project Location: Project Name: E. Livingston Ridge Delaware Project #: Phone #: Project Manager: Company Name: Address: P.O. Box 301 analyses. All claims including those for negligence and any other cause whatsoever H600874 LEASE NOTE: Liability and FOR LAB USE ONLY Lab I.D. Lovington 55 12 いで W 8 ā 5 (575)396-2378 Area #1 SP 2 @ surface Area #3 SP 7 @ 6' Area #2 SP 3 @ 5' Area #2 SP 7 @ Surface Area #2 SP 4 @ surface Area #2 SP 3 @ surface Area #3 SP 4 @ 6' Area #1 SP 1 @ surface Area #2 SP 7 @ 5' Area #2 SP 4 @ 5' (575) 393-2326 FAX (575) 393-2476 Lea **Rubbie Runnels** Basin Environmental Service Technologies, LLC safin Cardinal's Sample I.D. for incidental or It's exclusive Fax #: (575)396-1429 Project Owner: State: NM shall be deemed waived dy for any Zip: (G)RAB OR (C)OMP g g g claim g g G g 9 g g Echo Production # CONTAINERS 88260 ------arising whether --GROUNDWATER unless made in writing and received by Cardinal within 30 days after cor WASTEWATER based in contract or fort, shall MATRIX SOIL × × × × × × × × × × OIL SLUDGE loss City: State: NM P.O. #: OTHER Attn: Fax #: Phone #: Address: Company: esn jo ACID/BASE PRESERV × × × ICE / COOL × × × × × × × BILL TO OTHER Zip: (575) 396-1429 4/19/2016 4/19/2016 4/19/2016 4/19/2016 4/19/2016 4/19/2016 4/19/2016 4/19/2016 4/18/2016 4/18/2016 DATE SAMPLING (575) 396-2378 Lovington P.O. Box 301 Jody Basin Env aid by the client olient 88260 mpletion of the applicable this subsidiaries 10:10 9:40 9:30 9:10 9:00 8:50 8:30 10:20 9:20 8:40 TIME × × × Chloride × × × × × × × TPH (8015M) × × × × × × × × × × BTEX (8021B) ANALYSIS REQUEST

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ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240

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Covidence + Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476



January 17, 2017

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 01/12/17 12:45.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. 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 <a href="https://www.tceq.texas.gov/field/ga/lab\_accred\_certif.html">www.tceq.texas.gov/field/ga/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 FLOOR 1 @ 5' (H700084-01)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2640	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	87.5	% 35-147	,						
Surrogate: 1-Chlorooctadecane	100	% 28-171							

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\*=Accredited Analyte

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #1 FLOOR 2 @ 5' (H700084-02)

BTEX 8021B	mg/	kg	Analyze	d By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/16/2017	ND	2.25	113	2.00	0.346	
Toluene*	<0.050	0.050	01/16/2017	ND	2.22	111	2.00	0.116	
Ethylbenzene*	<0.050	0.050	01/16/2017	ND	2.24	112	2.00	0.289	
Total Xylenes*	<0.150	0.150	01/16/2017	ND	6.31	105	6.00	0.427	
Total BTEX	<0.300	0.300	01/16/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	101 9	73.6-14	0						
Chloride, SM4500Cl-B	mg/	'kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2680	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg/	'kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	86.4	% 35-147	7						
Surrogate: 1-Chlorooctadecane	91.5	% 28-171							

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Celey D. Keene, Lab Director/Quality Manager



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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

#### Sample ID: AREA #1 FLOOR 3 @ 5' (H700084-03)

Chloride, SM4500Cl-B	mg/	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1500	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	85.0	% 35-147	,						
Surrogate: 1-Chlorooctadecane	91.5	% 28-171							

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 FLOOR 4 @ 5' (H700084-04)

BTEX 8021B	mg/	kg	Analyze	d By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	01/16/2017	ND	2.25	113	2.00	0.346	
Toluene*	<0.050	0.050	01/16/2017	ND	2.22	111	2.00	0.116	
Ethylbenzene*	<0.050	0.050	01/16/2017	ND	2.24	112	2.00	0.289	
Total Xylenes*	<0.150	0.150	01/16/2017	ND	6.31	105	6.00	0.427	
Total BTEX	<0.300	0.300	01/16/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	102 9	73.6-14	0						
Chloride, SM4500Cl-B	mg/	kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	256	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	92.1	% 35-147							
Surrogate: 1-Chlorooctadecane	96.3	% 28-171							

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Celey D. Keene, Lab Director/Quality Manager



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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 NW 1 @ 4' (H700084-05)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	752	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	91.9	% 35-147	7						
Surrogate: 1-Chlorooctadecane	93.3	% 28-171	,						

## Sample ID: AREA #1 NW 2 @ 4' (H700084-06)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	384	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	89.5	% 35-147	7						
Surrogate: 1-Chlorooctadecane	99.5	% 28-171							

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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 NW 3 @ 4' (H700084-07)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	80.3	% 35-147	7						
Surrogate: 1-Chlorooctadecane	81.1	% 28-171							

## Sample ID: AREA #1 SW 1 @ 4' (H700084-08)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	720	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	80.9	% 35-147	,						
Surrogate: 1-Chlorooctadecane	92.4	% 28-171							

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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 SW 2 @ 4' (H700084-09)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	83.5	% 35-147	7						
Surrogate: 1-Chlorooctadecane	93.1	% 28-171	,						

## Sample ID: AREA #1 EW 1 @ 4' (H700084-10)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	320	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	93.2	% 35-147	7						
Surrogate: 1-Chlorooctadecane	104	% 28-171							

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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 EW 2 @ 4' (H700084-11)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	704	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	87.9	% 35-147	7						
Surrogate: 1-Chlorooctadecane	96.5	% 28-171							

## Sample ID: AREA #1 EW 3 @ 4' (H700084-12)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	89.6	% 35-147	,						
Surrogate: 1-Chlorooctadecane	93.5	% 28-171							

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Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 EW 4 @ 4' (H700084-13)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	87.1	% 35-147	7						
Surrogate: 1-Chlorooctadecane	92.2	% 28-171							

## Sample ID: AREA #1 EW 5 @ 4' (H700084-14)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	95.9	% 35-147	7						
Surrogate: 1-Chlorooctadecane	108	% 28-171							

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Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 WW 1 @ 4' (H700084-15)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1580	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg,	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	83.2	% 35-147	,						
Surrogate: 1-Chlorooctadecane	91.2	% 28-171							

## Sample ID: AREA #1 WW 2 @ 4' (H700084-16)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	400	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	85.2	% 35-147	7						
Surrogate: 1-Chlorooctadecane	95.5	% 28-171	,						

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Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 WW 3 @ 4' (H700084-17)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	88.7	% 35-147	,						
Surrogate: 1-Chlorooctadecane	94.0	% 28-171							

## Sample ID: AREA #1 WW 4 @ 4' (H700084-18)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	87.5	% 35-147	7						
Surrogate: 1-Chlorooctadecane	94.4	% 28-171							

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Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	01/12/2017	Sampling Date:	01/11/2017
Reported:	01/17/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 WW 5 @ 4' (H700084-19)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	01/13/2017	ND	416	104	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	01/16/2017	ND	208	104	200	2.59	
DRO >C10-C28	<10.0	10.0	01/16/2017	ND	247	123	200	2.12	
Surrogate: 1-Chlorooctane	85.4	% 35-147	,						
Surrogate: 1-Chlorooctadecane	90.7	% 28-171							

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\*=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 sample identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



### **Notes and Definitions**

BS1	Blank spike recovery above laboratory acceptance criteria. Results for analyte potentially biased high.
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

#### **Cardinal Laboratories**

### \*=Accredited Analyte

Celey D. Keine

Celey D. Keene, Lab Director/Quality Manager

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**RDINAL LABORATORIES** 

Sampler - UPS - Bus - Other: #75 Relinquished By: Relinquished By: malyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal envice. In no event shall Cardinal be liable for incidental or City: Delivered By: (Circle One) LEASE NOTE: Liability and Sampler Name: Matt Taylor Company Name: Project Name: Project Manager: Project Location: Project #: Phone #: Address: 8000L FOR LAB USE ONLY Lab I.D. FORM-006 Lovington 2 3 P.O. Box 301 6 Matt Taylor S S N N (575)396-2378 Area#1 EW 1@4" Area#1 SW 2@4' Area#1 NW 2@4' Area#1 NW 3@4" Area#1 NW 1@4' Area#1 Floor 4@5' Area#1 Floor 3@5' out of or related to the p Area#1 SW 1@4' Area#1 Floor 2@5 Area#1 Floor 1@5 E. Livingston Delaware Ridge 101 East Marland, Hobbs, NM 88240 ages. Cardinal's lability and client's exclusive remedy for any clai Lea 575) 393-2326 FAX (575) 393-2476 **Robbie Runnels** Basin Environmental Service Technologies, LLC Sample I.D. Time: Date: damages, including without limitation, business interru Project Owner: Fax #: (575)396-1429 State: NM 1/12/2016 sunder by Car 1 4,40 630 † Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476 Received By: Zip: Received By: 9 9 9 9 9 g 9 9 9 9 G)RAB OR (C)OMP. -# CONTAINERS --------Echo Production 88260 GROUNDWATER Ves Yes No No . Sample Condition WASTEWATER such claim is based upon any of the above MATRIX ptions, loss of use, or loss of profits incurred by client, its subsidiaries × × × × × × × SOIL × × OIL **Robbie Runnels** SLUDGE City: OTHER P.O. #: Fax #: State: Attn: Phone #: Company: Address: ACID/BASE: mited to the amount paid by the client for the PRESERV. CHECKED BY: within 30 days after completion of the applicable × × × × × × × × ICE / COOL × NM OTHER BILL TO (575) 396-1429 Zip: 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 1/11/16 DATE (575) 396-2378 SAMPLING Lovington P.O. Box 301 Jody Basin Please email results to pm@basinenv.com Fax Result: REMARKS: 88260 Phone Result: Env 9:45 9:40 9:35 9:30 9:20 9:05 9:25 9:15 9:10 9:00 TIME × × × × × × × × × Chloride × × × × × × × Yes × × × TPH (8015M) × × BTEX (8021B) No Add'l Fax #: Add'l Phone #: ANALYSIS REQUEST

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FORM-006	Sampler - UPS - Bus - Other:	Relinquished By:	Matt Taylor	affiliates or successors arising out of or relat Relinquished By:	analyses. All claims including those for negligence and any oth service. In no event shall Cardinal be liable for incidental or co	PLEASE NOTE: Liability and Damac		-	-	-				IZ Are			_	Sampler Name: Mat	ä	ime: E	Project #:	Phone #: (575)396-2378	City: Lovington	Address: P.O. Box 301	Project Manager:	Company Name:
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February 08, 2017

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 02/01/17 15:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. 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 <a href="https://www.tceq.texas.gov/field/qa/lab\_accred\_certif.html">www.tceq.texas.gov/field/qa/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/01/2017	Sampling Date:	01/31/2017
Reported:	02/08/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA 1 FLOOR 1 @ 7' (H700245-01)

BTEX 8021B	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	02/03/2017	ND	2.14	107	2.00	0.0867	
Toluene*	<0.050	0.050	02/03/2017	ND	2.10	105	2.00	0.136	
Ethylbenzene*	<0.050	0.050	02/03/2017	ND	2.11	106	2.00	0.0711	
Total Xylenes*	<0.150	0.150	02/03/2017	ND	5.99	99.8	6.00	0.215	
Total BTEX	<0.300	0.300	02/03/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	103 %	73.6-14	0						
Chloride, SM4500Cl-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	10400	16.0	02/03/2017	ND	432	108	400	0.00	
TPH 8015M	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	95.1 9	% 35-147	,						

#### Cardinal Laboratories

\*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/01/2017	Sampling Date:	01/31/2017
Reported:	02/08/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA 1 FLOOR 1 @ 9' (H700245-02)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	18000	16.0	02/03/2017	ND	432	108	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	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	92.4	% 35-147	,						
Surrogate: 1-Chlorooctadecane	101	% 28-171							

## Sample ID: AREA 1 FLOOR 2 @ 7' (H700245-03)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7600	16.0	02/03/2017	ND	432	108	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	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	98.2	% 35-147	7						
Surrogate: 1-Chlorooctadecane	102	% 28-171							

### **Cardinal Laboratories**

#### \*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/01/2017	Sampling Date:	01/31/2017
Reported:	02/08/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA 1 FLOOR 2 @ 9' (H700245-04)

Chloride, SM4500Cl-B	mg,	′kg	Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	20000	16.0	02/03/2017	ND	432	108	400	0.00	
TPH 8015M	mg,	′kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	91.9	% 35-147							
Surrogate: 1-Chlorooctadecane	91.0	% 28-171							

#### **Cardinal Laboratories**

\*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/01/2017	Sampling Date:	01/31/2017
Reported:	02/08/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA 1 FLOOR 3 @ 7' (H700245-05)

BTEX 8021B	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	02/03/2017	ND	2.14	107	2.00	0.0867	
Toluene*	<0.050	0.050	02/03/2017	ND	2.10	105	2.00	0.136	
Ethylbenzene*	<0.050	0.050	02/03/2017	ND	2.11	106	2.00	0.0711	
Total Xylenes*	<0.150	0.150	02/03/2017	ND	5.99	99.8	6.00	0.215	
Total BTEX	<0.300	0.300	02/03/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	103 %	6 73.6-14	0						
Chloride, SM4500Cl-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	13200	16.0	02/03/2017	ND	432	108	400	0.00	
TPH 8015M	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	92.8 9	% 35-147							
Surrogate: 1-Chlorooctadecane	100 %	6 28-171							

#### Cardinal Laboratories

\*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/01/2017	Sampling Date:	01/31/2017
Reported:	02/08/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA 1 FLOOR 3 @ 9' (H700245-06)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	17600	16.0	02/03/2017	ND	432	108	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	102	% 35-147	,						
Surrogate: 1-Chlorooctadecane	95.8	% 28-171							

## Sample ID: AREA 1 WW 1 @ 4' (H700245-07)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	02/03/2017	ND	432	108	400	0.00	
TPH 8015M	mg	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	02/02/2017	ND	194	97.1	200	4.66	
DRO >C10-C28	<10.0	10.0	02/02/2017	ND	213	107	200	9.16	
Surrogate: 1-Chlorooctane	88.7	% 35-147							
Surrogate: 1-Chlorooctadecane	101	% 28-171							

#### **Cardinal Laboratories**

#### \*=Accredited Analyte

Celez D. Keine

Celey D. Keene, Lab Director/Quality Manager



### **Notes and Definitions**

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
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

#### **Cardinal Laboratories**

### \*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager

Box 3011         State: NM         ZIp:         802600         Atm:         boy           986-2378         Fast #:         (GT)396-1423         Address:         PO. Box 301           Project Owner:         Echo Production         City:         Longston         Bain En.           Librigston Delevere Ridge         Matrix:         Modess:         PO. Box 301         Project Owner:           Librigston Delevere Ridge         Matrix:         Modess:         PO. Box 301         Project Owner:         Echo Production           Librigston Delevere Ridge         Matrix:         Modess:         PO. Box 301         Project Owner:         Echo Production           Librigston Delevere Ridge         Matrix:         Matrix:         Modess:         PO. Box 301           Librigston Delevere Ridge         Matrix:         Matrix:         Modess:         PO. Box 301           Librigston Delevere Ridge         Matrix:         Matrix:         Matrix:         Modess:         PO. Box 301           Librigston Delevere Ridge         Matrix:         Matrix:         Matrix:         Matrix:         Matrix:         Modess:         PO. Box 301           Real Floor 2@D'         9         1         X         Matrix:         Matrix:         Matrix:         Matrix:         Matrix: </th <th>Project Manager:</th> <th>ar: Robbie Runnels</th> <th>noiogie</th> <th>F</th> <th>C</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>8</th> <th>BILL TO</th> <th></th> <th></th> <th>1</th> <th></th> <th></th> <th>ANALYSIS</th> <th>FY</th> <th>SIS</th> <th>R</th> <th>REQUEST</th> <th>ST</th> <th></th> <th></th> <th></th>	Project Manager:	ar: Robbie Runnels	noiogie	F	C						8	BILL TO			1			ANALYSIS	FY	SIS	R	REQUEST	ST			
on         State: NM         Zip:         B3260         Company: Project Owner:         Echo Production (Ey:         Basin Env. Using Net         Dispect Owner:         Echo Production (Ey:         Longing Network         Matrix: (STS) 396-2378         Matrix: No         No         Same (STS) 396-2378         Matrix: No         Project Owner:         Echo Production (Ey:         Longing Network         Same (STS) 396-2378         Matrix:         Project Owner:         Company:         Same (STS) 396-2378         Matrix:         No         Project Owner:         Company:         Same (STS) 396-2378         Matrix:         For #:         Company:         Same (STS) 396-2378         Matrix:         Project Owner:         Same         Company:         Same	Address: P.(	B							P.O	.#:				-					-	_			$\neg$	_		-
System         Same IVM         Address:         Polget Owner:         Echo Production Address:         Polget Owner:         Echo Production Address:         Polget Owner:         Echo Production Phone #:         Long 30           FL         Lingston         Base:         Nult Taylor         Same IVM         Polget Owner:         Echo Production         City         Long 30           FL         Lingston         Same IVM         Prose #:         (575) 396-2378         Polget Owner:         Fax #:         (575) 396-2378           Matt Taylor         Fax #:         (575) 396-1429         Prose #:         (575) 396-1429         Polget Owner:         Fax #:         (575) 396-1429           Area 1 Floor 1@7         9         1         X         Pressent         Sample Inflo         Date         Time         Time           Area 1 Floor 2@7         9         1         X         13/1/7         13:00         X <td>Invi</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Con</td> <td>npar</td> <td>iy:</td> <td>Basi</td> <td>in Env.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td>-</td> <td>_</td> <td></td> <td>-</td>	Invi								Con	npar	iy:	Basi	in Env.						-				-	_		-
E. Livingston Delaware Ridge         Project Owner:         Echo Production         City:         Lovingston           E. Livingston Delaware Ridge         Project Owner:         Echo Production         City:         Lovingston           E. Livingston Delaware Ridge         Sample I.D.         State:         NM TRX         Faxe:         (S75) 396-12/3           Mett Taylor         Faxe:         (S75) 396-12/3         Faxe:	-	2000 0000	11	0	0200	0			Attn			Jody											-	_		-
Project Owner:         Echo Production         City:         Lonington           Itele         Nett Taylor         Faste:         NM         Zip:         82260           Wett Taylor         Faste:         (T5) 396-1429         Faste:         (T5) 396-1429         Chioride           Sample I.D.         Gi RAB OR (C)OMP:         Faste:         (T5) 396-1429         Chioride         Chioride           Area 1 Floor 1@?         gi 1         Sample I.D.         Gi RAB OR (C)OMP:         DATE         TIME         Chioride           Area 1 Floor 2@?         gi 1         X         Gi RAB OR (C)OMP:         1/3/1/7         1/3/00         X         X         X           Area 1 Floor 2@?         gi 1         X         Gi RAB OR (C)OMP:         1/3/1/7         1/3/00         X	10		)396-14	129					Add	ress	6	P.O. Bo	× 301	-									-	_	_	-
E. Livingston Delaware Ridge       State:       NM       Zip:       88260         Wett Taylor       Faxet:       (575) 396-14.29       Faxet:       (575) 396-14.29       Chloride         Mett Taylor       Faxet:       (575) 396-14.29       Faxet:       (575) 396-14.29       Chloride         Area 1 Floor 1@7       G       G       R Receiver       Samplu S       Chloride       Time       Chloride         Area 1 Floor 2@7       G       I       X       G       GROUNDWATER       IJ31/17       13:00       X       X       X       IJ31/17       13:00       X	Project #:	Project Own	Ier:	Ec	ho P	rodu	Ictio	-	Citv			Lovingto	5						-	_			-		_	
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† Cardinal cannot accept verbal dhanges. Please fax written changes to 575-393-2476

Revision 1.0 FORM-006



February 09, 2017

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 02/03/17 15:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. 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 <a href="https://www.tceq.texas.gov/field/qa/lab\_accred\_certif.html">www.tceq.texas.gov/field/qa/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	02/03/2017	Sampling Date:	02/01/2017
Reported:	02/09/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	LEA COUNTY, NM		

### Sample ID: AREA #1 FLOOR 3 @ 23' (H700284-01)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	7330	16.0	02/09/2017	ND	400	100	400	3.92	

#### **Cardinal Laboratories**

\*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



### **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

#### Cardinal Laboratories

#### \*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager

(575) 393-2326 FAX (575) 393-2470	BILL TO		AN	ANALYSIS REQUEST
nental Service Technologies, LLV	#			
Robbie Runnels		Inv		
	Jany.			
State: NM Zip: 88260		22		
Fax #: (575)396-1429	Address: P.O. Box :	106		
Project Owner: Echo Production	vingto		-	
vare Ridge		ride	-	
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Page 4 of 4

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April 28, 2017

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 04/21/17 15:40.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. 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 <a href="https://www.tceq.texas.gov/field/qa/lab\_accred\_certif.html">www.tceq.texas.gov/field/qa/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	04/21/2017	Sampling Date:	04/19/2017
Reported:	04/28/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA COUNTY, NM		

### Sample ID: EW-2 (H701076-01)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	04/26/2017	ND	416	104	400	3.77	

### Sample ID: SW-1 (H701076-02)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	04/26/2017	ND	416	104	400	3.77	

### Sample ID: NW-1 (H701076-03)

Chloride, SM4500Cl-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	48.0	16.0	04/26/2017	ND	416	104	400	3.77	

#### **Cardinal Laboratories**

\*=Accredited Analyte

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager


# **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

#### 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 sample identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager

Delivered By: (Circle One) Sampler - UPS - Bus - Other:	In L	Matt Laylor	filiates or successors arising out of or related to the performa Relinquished By:	EASE NOTE: Liability and Damages. Cardinal's liability and alyses. All claims including those for negligence and any other price in proceeding the second				2 NW-1	-	EW-2	Lab I.D. Samp	I WIT WHE WEEL WHELT	FOR LARISE ONLY	- 13	n.	Project Name: E. Livingston Delaware Ridge	Project #:	Phone #: (575)396-2378	City: Lovington	Address: P.U. Box 301	anager:		135
	Time: 3:40 AUUDRA ( Sample Condition Cool Intact Cool Intact Cool Intact Yes Yes		nrequestal damages, including without limitation, business interruptions, bas of use, or loss of profits incurred by claim, it subsidiaries ance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stand reasons or otherwise Date: Received By: Date	LEASE MOTE: Lability and Camages. Cardinal's lability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be immed to the amount paid by the client for the manyees. All claims including these for megligence and any other cause whatsoever shall be deemed wakeer unless made in writing and movieed to the amount paid by the client for the project in the movie and any other cause whatsoever shall be deemed wakeer unless made in writing and movieed by Cardinal sales on a survey of the client for the project in the movie and any other cause whatsoever shall be deemed wakeer unless made in writing and movieed by cardinal sales on an other other and the sales of the client for the project in the movie and any other cause whatsoever shall be deemed wakeer unless made in writing and movies to the amount paid by the client for the			9		-	# G S	G)RAB OR (C)OMP CONTAINERS GROUNDWATER VASTEWATER GOIL	MATRIX				ware Ridge	Project Owner: Echo Producti	Fax #: (575)396-1429	State: NM Zip: 88260		els	Basin Environmental Service Technologies, LLC	ARDINAL LABORATORIES 101 East Marland, Hobbs, NM 88240 (575) 393-2326 FAX (575) 393-2476
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September 29, 2017

ROBBIE RUNNELS Basin Environmental Service P.O. Box 301 Lovington, NM 88260

RE: E. LIVINGSTON RIDGE DELAWARE

Enclosed are the results of analyses for samples received by the laboratory on 09/25/17 11:40.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. 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 <a href="https://www.tceq.texas.gov/field/qa/lab\_accred\_certif.html">www.tceq.texas.gov/field/qa/lab\_accred\_certif.html</a>.

Cardinal Laboratories is accreditated 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,

Celey D. Keine

Celey D. Keene Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	09/25/2017	Sampling Date:	09/21/2017
Reported:	09/29/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	AREA 1	Sample Received By:	Celey D. Keene
Project Location:	LEA COUNTY, NM		

## Sample ID: SB1 @ 90' (H702601-01)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	192	16.0	09/27/2017	ND	432	108	400	3.77	

# Sample ID: SB1 @ 95' (H702601-02)

Chloride, SM4500Cl-B	mg,	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	09/27/2017	ND	432	108	400	3.77	

# Sample ID: SB1 @ 100' (H702601-03)

BTEX 8021B	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/28/2017	ND	1.78	88.9	2.00	1.68	
Toluene*	<0.050	0.050	09/28/2017	ND	1.61	80.7	2.00	2.06	
Ethylbenzene*	<0.050	0.050	09/28/2017	ND	1.63	81.3	2.00	0.562	
Total Xylenes*	<0.150	0.150	09/28/2017	ND	4.94	82.3	6.00	0.354	
Total BTEX	<0.300	0.300	09/28/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	105 9	72-148							
Chloride, SM4500Cl-B	mg/	kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	128	16.0	09/27/2017	ND	432	108	400	3.77	
ТРН 8015М	mg/	kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier

## **Cardinal Laboratories**

\*=Accredited Analyte

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Celeg D. Keine



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	09/25/2017	Sampling Date:	09/21/2017
Reported:	09/29/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	AREA 1	Sample Received By:	Celey D. Keene
Project Location:	LEA COUNTY, NM		

### Sample ID: SB1 @ 100' (H702601-03)

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	09/27/2017	ND	224	112	200	1.88	
DRO >C10-C28	<10.0	10.0	09/27/2017	ND	230	115	200	0.344	
EXT DRO >C28-C36	<10.0	10.0	09/27/2017	ND					
Surrogate: 1-Chlorooctane	87.4	% 28.3-16	4						
Surrogate: 1-Chlorooctadecane	90.4	% 34.7-15	7						

# Sample ID: SB2 @ 110' (H702601-04)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	256	16.0	09/27/2017	ND	432	108	400	3.77	

# Sample ID: SB2 @ 115' (H702601-05)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	176	16.0	09/27/2017	ND	432	108	400	3.77	

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Celez D. Keine



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	09/25/2017	Sampling Date:	09/21/2017
Reported:	09/29/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	AREA 1	Sample Received By:	Celey D. Keene
Project Location:	LEA COUNTY, NM		

#### Sample ID: SB2 @ 120' (H702601-06)

BTEX 8021B	mg/	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/28/2017	ND	1.78	88.9	2.00	1.68	
Toluene*	<0.050	0.050	09/28/2017	ND	1.61	80.7	2.00	2.06	
Ethylbenzene*	<0.050	0.050	09/28/2017	ND	1.63	81.3	2.00	0.562	
Total Xylenes*	<0.150	0.150	09/28/2017	ND	4.94	82.3	6.00	0.354	
Total BTEX	<0.300	0.300	09/28/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	104 9	% 72-148	}						
Chloride, SM4500Cl-B	mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	272	16.0	09/27/2017	ND	432	108	400	3.77	
TPH 8015M	mg/	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/27/2017	ND	224	112	200	1.88	
DRO >C10-C28	<10.0	10.0	09/27/2017	ND	230	115	200	0.344	
EXT DRO >C28-C36	<10.0	10.0	09/27/2017	ND					
Surrogate: 1-Chlorooctane	64.5	% 28.3-16	4						
Surrogate: 1-Chlorooctadecane	66.4	% 34.7-15	7						

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	09/25/2017	Sampling Date:	09/21/2017
Reported:	09/29/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	AREA 1	Sample Received By:	Celey D. Keene
Project Location:	LEA COUNTY, NM		

#### Sample ID: SB3 @ 130' (H702601-07)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	224	16.0	09/27/2017	ND	432	108	400	3.77	

# Sample ID: SB3 @ 135' (H702601-08)

Chloride, SM4500Cl-B	mg	/kg	Analyze	d By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	224	16.0	09/27/2017	ND	432	108	400	3.77	

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Celeg D. Keine



Basin Environmental Service ROBBIE RUNNELS P.O. Box 301 Lovington NM, 88260 Fax To: (575) 396-1429

Received:	09/25/2017	Sampling Date:	09/21/2017
Reported:	09/29/2017	Sampling Type:	Soil
Project Name:	E. LIVINGSTON RIDGE DELAWARE	Sampling Condition:	Cool & Intact
Project Number:	AREA 1	Sample Received By:	Celey D. Keene
Project Location:	LEA COUNTY, NM		

#### Sample ID: SB3 @ 140' (H702601-09)

BTEX 8021B	mg/	/kg	Analyze	d By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/28/2017	ND	1.78	88.9	2.00	1.68	
Toluene*	<0.050	0.050	09/28/2017	ND	1.61	80.7	2.00	2.06	
Ethylbenzene*	<0.050	0.050	09/28/2017	ND	1.63	81.3	2.00	0.562	
Total Xylenes*	<0.150	0.150	09/28/2017	ND	4.94	82.3	6.00	0.354	
Total BTEX	<0.300	0.300	09/28/2017	ND					
Surrogate: 4-Bromofluorobenzene (PID	105	% 72-148	}						
Chloride, SM4500Cl-B	mg/	/kg	Analyze	ed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	208	16.0	09/27/2017	ND	432	108	400	3.77	
TPH 8015M	mg/	/kg	Analyze	ed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/27/2017	ND	224	112	200	1.88	
DRO >C10-C28	<10.0	10.0	09/27/2017	ND	230	115	200	0.344	
EXT DRO >C28-C36	<10.0	10.0	09/27/2017	ND					
Surrogate: 1-Chlorooctane	83.5	% 28.3-16	4						
Surrogate: 1-Chlorooctadecane	86.1	% 34.7-15	7						

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Celeg D. Keine

Celey D. Keene, Lab Director/Quality Manager



# **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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Celeg D. Keine

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R	SB3 @ 135'		9	-			×	-			×		9/21/17	11:35	×					-			-			-	
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# APPENDIX – D Soil Bore Logs





# Soil Boring Log

Owner	Echo Production
Contractor	HCI Drilling
Date Completed	09/20/2017
Location	Area 1
Soil Boring Number	SB-1
Lithology	
0' - 2'	Topsoil
2' – 100'	Red Silty Clay w/ Stringers of Gypsum
Total Depth	100'
GPS Coordinates	32.343859, -103.718976

Copies: Email (Basin Env.)





# Soil Boring Log

Owner	Echo Production
Contractor	HCI Drilling
Date Completed	09/20/2017
Location	Area 1
Soil Boring Number	SB-2
Lithology	
0' - 2'	Topsoil
2' – 120'	Red Silty Clay w/ Stringers of Gypsum
Total Depth	120'
GPS Coordinates	32.343859, -103.718976

Copies: Email (Basin Env.)





# Soil Boring Log

Echo Production
HCI Drilling
09/20/2017
Area 1
SB-3
Topsoil
Red Silty Clay w/ Stringers of Gypsum
140'
32.343859, -103.718976

Copies: Email (Basin Env.)