



October 16, 2017

Reference No. 088210-35

Mr. Zane Kurtz
Sr. Safety and Environmental Representative
5509 Champions Dr.
Midland, TX 79706
VIA E-Mail: zane_kurtz@eogresources.com

Dear Mr. Kurtz:

**Re: Assessment Summary Report
Livingston Ridge SWD Water Line
2RP-2044
EOG Resources, Inc.
Site Location: Sec. 1, T 22-S, R 31-E
(Lat 32.41751°, Long -103.73427°)
Eddy County, New Mexico**

GHD Services, Inc. (GHD) is pleased to present this report for the above referenced site. Assessment activities were performed at the Livingston Ridge SWD Water Line (hereafter referred to as the "Site"), from June 9 to August 18, 2017 by GHD. The Site is located within Section 1, Township 22 South, Range 31 East, in Eddy County, New Mexico (Figure 1). The property is owned by the U.S. Bureau of Land Management (BLM).

The Site is an active pipeline located approximately 30 miles east-northeast of Carlsbad, New Mexico. According to EOG Resources, Inc. (EOG) supplied Site information, a release of approximately 50 barrels (bbls) of crude oil and 3,200 bbls of produced water occurred when a flowline ruptured. Approximately 30 bbls of crude oil and 480 bbls of produced water were recovered after the release utilizing vacuum trucks. The release was discovered on October 27, 2013. A C-141 Form was submitted to the New Mexico Oil Conservation Division (NMOCD) and the BLM on November 5, 2013 and remediation permit (RP) number 2RP-2044 was assigned.

Initial delineation samples were collected on November 4, 2013 in five areas within the release area (green outlined area on Figure 2) by Yates Petroleum Corporation (Yates). Thirty-nine samples were collected from depths ranging from 2 to 16 feet below ground surface (ft. bgs) and submitted for laboratory analyses. The samples were submitted to Cardinal Laboratories (Cardinal) in Hobbs, New Mexico for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021B, total petroleum hydrocarbons (TPH) gasoline and diesel range organics by EPA Method 8015M, and chlorides by Method SM4500CL-B analysis.

None of the samples contained BTEX or TPH constituents above the laboratory reporting limits. Chloride concentrations ranged from 6,280 to 29,600 milligrams per kilogram (mg/kg).



Additional vertical delineation samples were collected on January 16, 2014 by Yates utilizing a core drill rig. Twenty-four samples were collected from depths ranging from 20 to 55 ft. bgs within three areas of the release area. The samples were submitted to Cardinal for chloride analysis by Method SM4500CL-B. Chloride concentrations ranged from 128 to 14,800 mg/kg. A sample collected from one boring centrally located in the release area contained a chloride concentration of 752 mg/kg at a depth 55 ft. bgs. This sample represented the deepest chloride concentration greater than the NMOCD Recommended Remedial Action Level (RRAL) of 600 mg/kg established for this Site (see below).

1. Recommended Remediation Action Limits

There are relatively few groundwater wells in the area of the Site with which to obtain a depth to groundwater. Based on information available from the New Mexico Office of the State Engineer, New Mexico Water Rights Reporting System website, the closest well with a reported depth to water is approximately 3.5 miles from the site. The depth to groundwater measured in this well was 448 feet below ground surface (ft. bgs).

Based on information available from the United States Geological Survey (USGS) website, the closest USGS gauging site, approximately 2.7 miles southeast of the site, indicates groundwater at a depth of approximately 125 feet below ground surface (ft. bgs) in 1988. The well information is included in Appendix A.

Groundwater was not encountered in soil boring SB-5 that was advanced to a depth of 130 ft. bgs during GHD's assessment activities.

There do not appear to be any wellhead protection areas and no surface water bodies within 200 ft. to 1000 ft. of the Site. Therefore, the preliminary total ranking score for the Site is 0 (see table below).

Based on this score, the applicable NMOCD Site-specific RRALs are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 5,000 mg/kg for total TPH, and 600 mg/kg for chlorides.

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

New Mexico Oil Conservation Division Site Assessment	
Ranking Criteria	Score
Depth to Ground Water (> 100 ft. bgs)	0
Wellhead Protection Area (> 1000 ft. from water source, > 200 ft. from domestic source)	0
Distance to Surface Body Water (200-1000 ft.)	0
Ranking Criteria Total Score	0*



New Mexico Oil Conservation Division Site Assessment

*Because the ranking criteria total score is 0, NMOCD established RRALs are 10 mg/kg for benzene, 50 mg/kg for total BTEX, 5,000 mg/kg for TPH¹, and 600 mg/kg for chlorides.

1. NMOCD Guidelines for Remediation of Leaks, Spills and Releases, August 13, 1993.

2. Assessment Activities

GHD and SDR Enterprises, LLC (SDR) performed additional delineation from June 9 to August 18, 2017 that included the collection of 36 soil samples from 18 test pits and 18 samples from 6 soil borings. Soil samples were collected from 2 ft. bgs and 10 ft. bgs in each test pit and submitted to Hall Environmental Analysis Laboratory (HEAL) located in Albuquerque, New Mexico. Two samples (TP-5 and TP-7) were submitted for TPH (gasoline, diesel, and motor oil range) by EPA Method 8015 BTEX by EPA Method 8021B. All of the samples were submitted for chloride analysis by EPA 300.

BTEX and TPH constituents were not detected above the laboratory reporting limits and chlorides ranged from below the laboratory reporting limit to 17,000 mg/kg. Chloride was detected above the NMOCD RRAL in five of the test pit samples (TP-2, TP-4, TP-5, TP-6, and TP-7) all at depths of 10 ft. bgs. These test pits were located in the southern area of the release. The analytical data is summarized on Table 1 and the laboratory reports are included in Appendix A.

The horizontal and vertical extent of the chloride concentrations within the northern portion of the spill area had been delineated to below the RRAL for chloride. However, the horizontal and vertical extent of chloride concentrations in the southern portion of the impacted area was not fully assessed.

Further soil sampling and soil boring activities were performed by GHD and Enviro-Drill, Inc. of Albuquerque, New Mexico from July 17 through 19, 2017 to assess the vertical extent of chloride concentrations in the soil in the southern portion of the impacted area. Thirteen additional soil samples were collected from four soil borings (SB-1 to SB-4) at depths ranging from 40 ft. bgs to 90 ft. bgs. The samples were submitted to HEAL for analysis of chloride by EPA Method 300.0.

Chloride concentrations in these samples ranged from 62 to 13,000 mg/kg. A summary of the soil boring laboratory results is presented in the following table.

Soil Boring ID	Depth	Chloride Concentration in mg/kg
SB-1	50	8,300
SB-1	60	8,300
SB-1	70	13,000
SB-1	80	11,000
SB-1	90	3,400



Soil Boring ID	Depth	Chloride Concentration in mg/kg
SB-2	50	7,600
SB-2	60	7,700
SB-2	70	6,200
SB-2	75	980
SB-3	50	62
SB-3	60	88
SB-4	40	870
SB-4	50	79
SB-5 (near SB-1)	100	48
SB-5 (near SB-1)	110	760
SB-5 (near SB-1)	120	82
SB-6 (near SB-2)	85	<30
SB-6 (near SB-2)	95	<30

The analytical data is summarized on Table 1 and the laboratory reports are included in Appendix A.

Two additional soil borings, SB-5 and SB-6 were advanced in close proximity to SB-1 and SB-2, respectively between August 16 and 18, 2017. Borings SB-1 and SB-2 experienced drilling refusal at depths of 90 and 75 ft. bgs. The two additional soil borings (SB-5 and SB-6) were advanced to collect additional samples from below these depths.

Three soil samples were collected from SB-5 (near SB-1) from 100, 110, and 120 ft. bgs and two samples were collected from SB-6 (near SB-2) at depths of 85 and 95 ft. bgs. The samples were submitted to HEAL for analysis of chloride by EPA Method 300.0.

Soils at the Site consisted primarily of clayey sands and silty sands with the sands being either very fine or fine grained. A clay with sand unit was encountered at varying depths in all of the soil borings. The soil boring logs are included as Appendix C.

Based on the collected assessment data, it appears that the vertical and horizontal extent of chloride-impacted soil has been fully assessed as shown on Figure 2.

3. Summary and Recommendations

Based on the assessment of the chloride concentrations, GHD recommends the following:

- Excavating the spill area to a depth of 4 ft. bgs and stockpiling the soil to be used for future backfill at the Site. Soil samples will be collected and submitted for chloride analysis to determine if the excavated soil can be used as backfill.
- Placement of a 20-mil polyethylene liner in the bottom of the excavation (see Figure 2 for the excavation area) at a depth of 4 ft. bgs.



- Backfilling of the excavation with clean fill material and wheel compacting to grade.
- Fertilizing and reseeded of the disturbed area with a BLM-approved seed mix.

Following completion of the backfilling, revegetation of the site will be performed. Disturbed areas associated with the remediation efforts will be re-seeded. If after one growing season the vegetation has not taken hold, seeding may need to be repeated until revegetation is successful. The seed mix will be determined by the BLM.

Should you have any questions, or require additional information regarding this submittal please feel free to contact myself, or Bernie Bockisch at (505) 884-0672 or Bernard.Bockisch@ghd.com.

Sincerely,

GHD

A handwritten signature in black ink that reads "Alan Brandon". The signature is fluid and cursive.

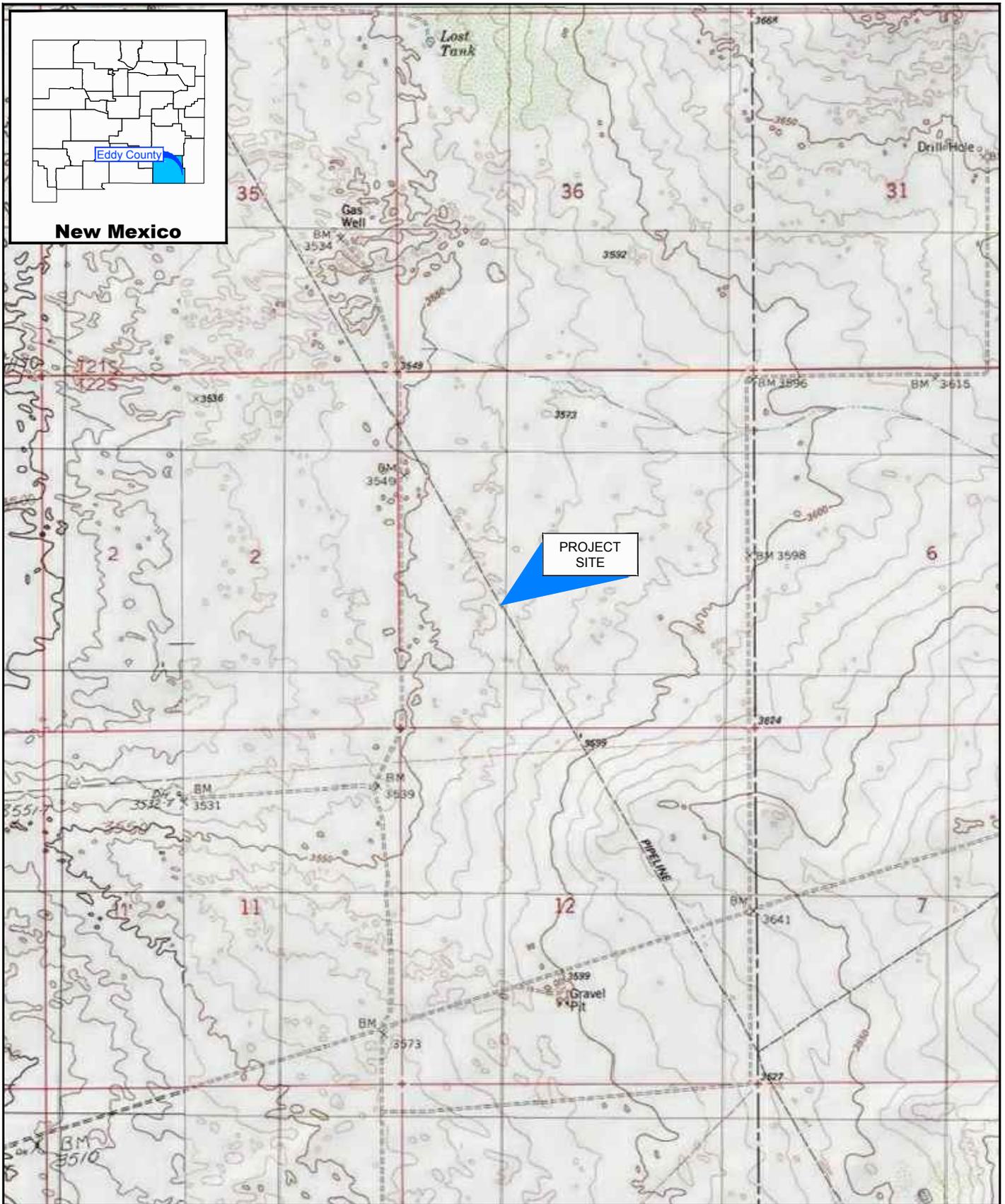
Alan Brandon
Senior Project Manager

A handwritten signature in blue ink that reads "Bernard Bockisch". The signature is fluid and cursive.

Bernard Bockisch
Albuquerque Operations Manager

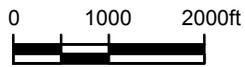
BB/mc/30

Figures



Source: USGS 7.5 Minute Quad "The Divide and Livingston Ridge, New Mexico"

Lat/Long: 32.41827° North, 103.73503° West



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

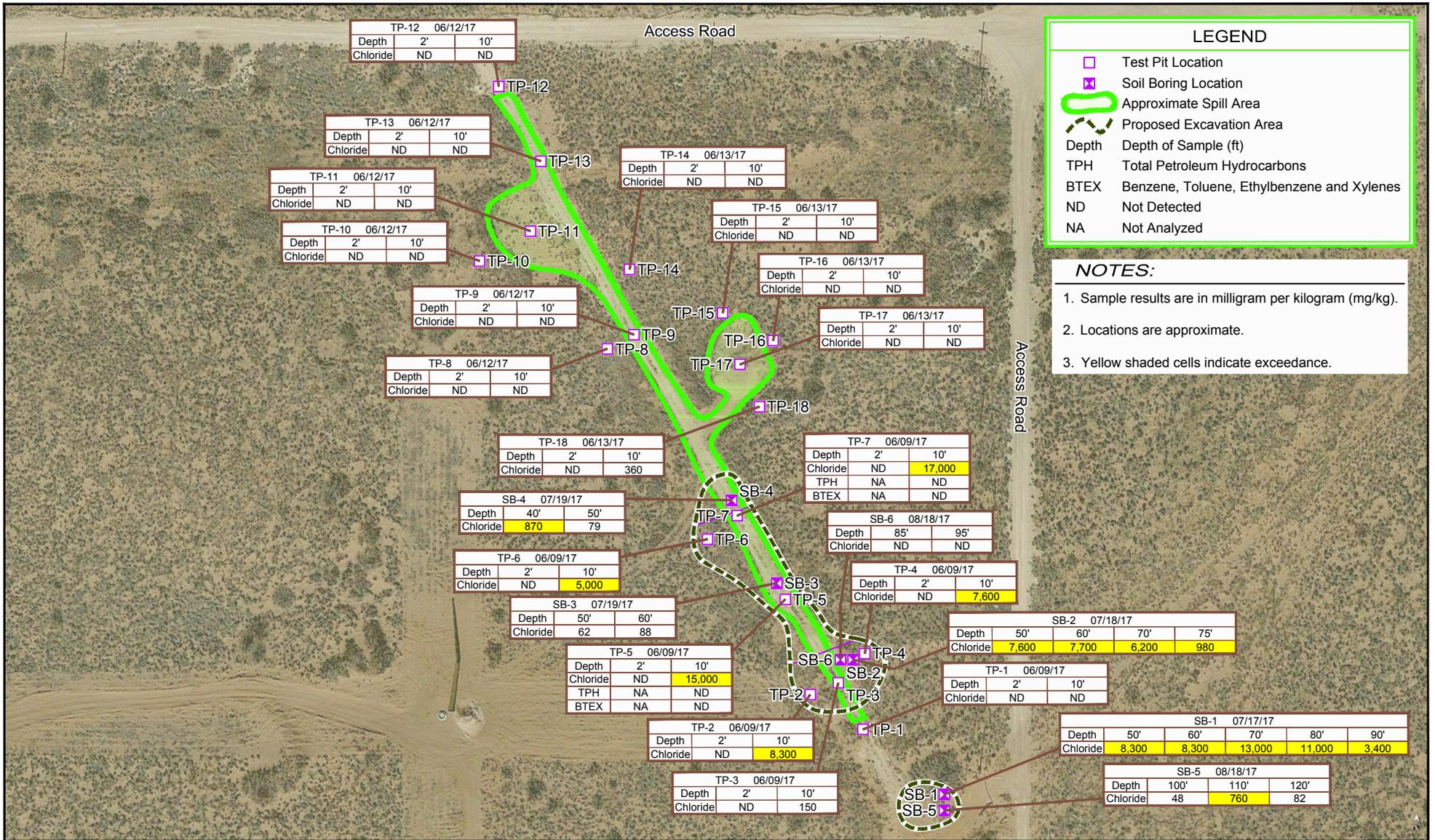


EOG RESOURCES
EDDY COUNTY, NEW MEXICO
LIVINGSTON RIDGE SWD No.2

088210-35
Jun 21, 2017

SITE LOCATION MAP

FIGURE 1



Source: Image © 2016 Google - Imagery Date: February 1, 2017

Lat/Long: 32.41827° North, 103.73503° West



EOG RESOURCES
EDDY COUNTY, NEW MEXICO
LIVINGSTON RIDGE SWD No.2

SAMPLE LOCATION MAP

088210-35
Oct 11, 2017

FIGURE 2

Tables

Table 1

Livingston Ridge SWD #2 Water Line - Summary of Soil Analytical Data

Sample ID	Depth (feet)	Date	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX	TPH (GRO)	TPH (DRO)	TPH (MRO)	Total TPH	Chloride
088210-35-060917-MG-TP-1-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-1-10	10	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-060917-MG-TP-2-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-2-10	10	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	8300
088210-35-060917-MG-TP-3-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-3-10	10	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	150
088210-35-060917-MG-TP-4-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-4-10	10	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	7600
088210-35-060917-MG-TP-5-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-5-10	10	06/09/2017	<0.024	<0.048	<0.048	<0.097	<0.217	<4.8	<9.6	<48	<62.4	15000
088210-35-060917-MG-TP-6-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-6-10	10	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	5000
088210-35-060917-MG-TP-7-2	2	06/09/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-060917-MG-TP-7-10	10	06/09/2017	<0.024	<0.049	<0.049	<0.097	<0.219	<4.9	<10	<50	<64.9	17000
088210-35-061217-MG-TP-8-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-8-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061217-MG-TP-9-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-9-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061217-MG-TP-10-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-10-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061217-MG-TP-11-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-11-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061217-MG-TP-12-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-12-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061217-MG-TP-13-2	2	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061217-MG-TP-13-10	10	06/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061317-MG-TP-14-2	2	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061317-MG-TP-14-10	10	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061317-MG-TP-15-2	2	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061317-MG-TP-15-10	10	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061317-MG-TP-16-2	2	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061317-MG-TP-16-10	10	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061317-MG-TP-17-2	2	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061317-MG-TP-17-10	10	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-061317-MG-TP-18-2	2	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-33-061317-MG-TP-18-10	10	06/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	360

Table 1

Livingston Ridge SWD #2 Water Line - Summary of Soil Analytical Data

Sample ID	Depth (feet)	Date	Benzene	Toluene	Ethylbenzene	Xylenes	BTEX	TPH (GRO)	TPH (DRO)	TPH (MRO)	Total TPH	Chloride
088210-35-071717-MG-SB-1-50	50	07/17/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	8300
088210-35-071717-MG-SB-1-60	60	07/17/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	8300
088210-35-071717-MG-SB-1-70	70	07/17/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	13000
088210-35-071817-MG-SB-1-80	80	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	11000
088210-35-071817-MG-SB-1-90	90	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	3400
088210-35-071817-MG-SB-2-50	50	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	7600
088210-35-071817-MG-SB-2-60	60	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	7700
088210-35-071817-MG-SB-2-70	70	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	6200
088210-35-071817-MG-SB-2-75	75	07/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	980
088210-35-071817-MG-SB-3-50	50	07/19/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	62
088210-35-071817-MG-SB-3-60	60	07/19/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	88
088210-35-071817-MG-SB-4-40	40	07/19/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	870
088210-35-071817-MG-SB-4-50	50	07/19/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	79
088210-35-081817-SP-SB-5-100	100	08/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	48
088210-35-081817-SP-SB-5-110	110	08/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	760
088210-35-081817-SP-SB-5-120	120	08/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	82
088210-35-081617-SP-SB-6-85	85	08/16/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
088210-35-081617-SP-SB-6-95	95	08/16/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<30
NMOCD RRALs (Total Ranking Score = 0)			10	50			Total TPH: 5,000				600	

Notes:

All sample results are in milligrams per kilogram

NA = Not Analyzed

NMOCD = New Mexico Oil Conservation Division

RRALs = Recommended Remediation Action Limits

Highlighted = Exceeds NMOCD RRAL

Appendices

Appendix A

Water Well Report

Livingston Ridge SWD #2



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

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q	Q	Q	Sec	Tws	Rng	X	Y	Distance	Well Depth	Water Column
C 02744		ED		3	2	1	11	22S	31E	617374	3586631*	1839	4911	
C 02745		ED		4	2	2	15	22S	31E	616789	3585013*	3300	925	
C 02746		ED		4	2	2	15	22S	31E	616789	3585013*	3300	930	
C 02747		ED		4	2	2	15	22S	31E	616789	3585013*	3300	1076	
C 02949 EXPL		ED		1	1	4	34	21S	31E	616140	3589231*	3397	970	
C 03150		ED		2	4	4	14	22S	31E	618412	3584025*	3469	981	
C 02939	C	LE		3	3	1	19	22S	32E	620234	3583042*	4560	280	
C 03717 POD1	C	LE		4	4	1	09	22S	32E	624094	3586365	5179	650	
C 03112 EXPLORE		ED		3	1	1	09	22S	31E	613753	3586590*	5341	3567	
C 02415		ED		3	3	4	16	22S	31E	614592	3583785*	5746	880	448 432
C 02727		ED		3	1	1	33	21S	31E	613716	3589809*	5815	913	
C 02682		ED		4	4	4	08	22S	31E	613566	3585379*	5836	4400	

Average Depth to Water: **448 feet**
Minimum Depth: **448 feet**
Maximum Depth: **448 feet**

Record Count: 12

UTM NAD83 Radius Search (in meters):

Easting (X): 619026.33

Northing (Y): 3587439.34

Radius: 6000

*UTM location was derived from PLSS - see Help

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

8/24/17 8:17 AM

WATER COLUMN/ AVERAGE DEPTH TO WATER



[USGS Home](#)
[Contact USGS](#)
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National Water Information System: Web Interface

[USGS Water Resources](#)

Data Category: Geographic Area:

Click to hide News Bulletins

- [Please see news on new formats](#)
- [Full News](#) 

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 322333103461401

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

USGS 322333103461401 22S.31E.15.13214

Available data for this site

Eddy County, New Mexico

Hydrologic Unit Code --

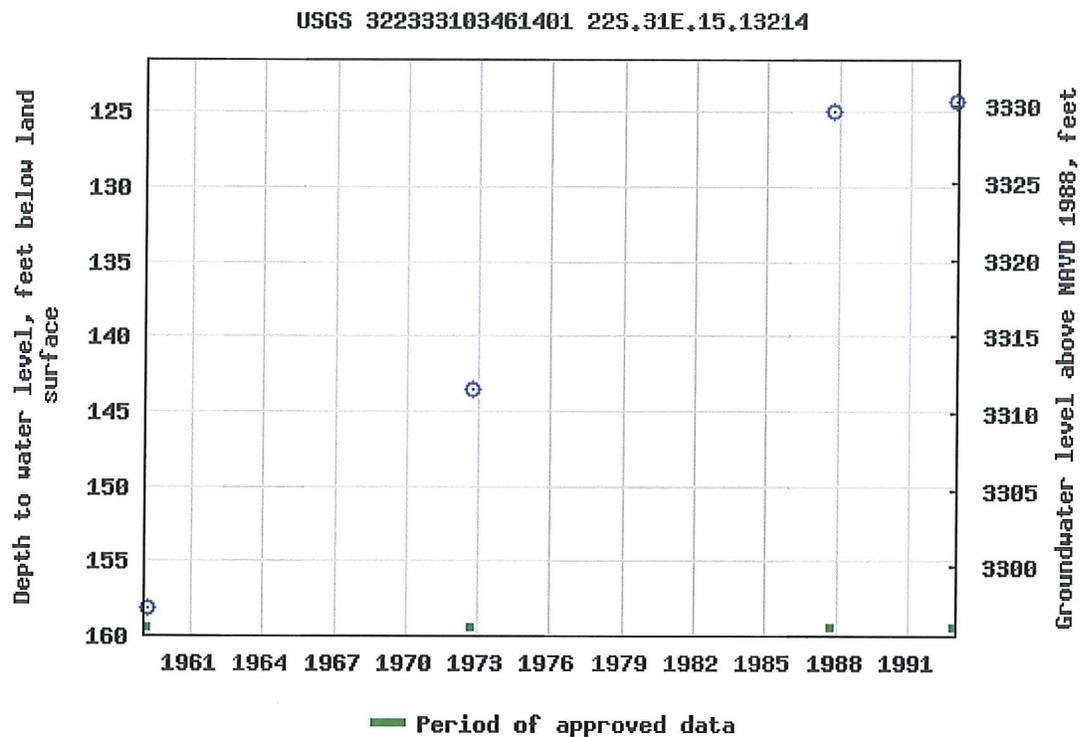
Latitude 32°23'40", Longitude 103°46'16" NAD27

Land-surface elevation 3,455 feet above NAVD88

This well is completed in the Santa Rosa Sandstone (231SNRS) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.

[Download a presentation-quality graph](#)

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Title: Groundwater for USA: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nwis/gwlevels?>



Page Contact Information: [USGS Water Data Support Team](#)

Page Last Modified: 2017-10-04 09:30:06 EDT

0.97 0.88 nadww02

Appendix B

Laboratory Analytical Reports



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

June 19, 2017

Bernie Bockish

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX

RE: Livingston 2

OrderNo.: 1706844

Dear Bernie Bockish:

Hall Environmental Analysis Laboratory received 36 sample(s) on 6/15/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-1-2'

Project: Livingston 2

Collection Date: 6/9/2017 9:55:00 AM

Lab ID: 1706844-001

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:56:39 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-1-10

Project: Livingston 2

Collection Date: 6/9/2017 10:05:00 AM

Lab ID: 1706844-002

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 2:58:41 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-2-10

Project: Livingston 2

Collection Date: 6/9/2017 10:55:00 AM

Lab ID: 1706844-003

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	8300	300		mg/Kg	200	6/18/2017 10:18:05 PM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-3-2'

Project: Livingston 2

Collection Date: 6/9/2017 11:10:00 AM

Lab ID: 1706844-004

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:23:31 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-3-10

Project: Livingston 2

Collection Date: 6/9/2017 11:25:00 AM

Lab ID: 1706844-005

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	150	30		mg/Kg	20	6/17/2017 3:35:56 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-4-2'

Project: Livingston 2

Collection Date: 6/9/2017 11:35:00 AM

Lab ID: 1706844-006

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:48:20 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-4-10

Project: Livingston 2

Collection Date: 6/9/2017 11:50:00 AM

Lab ID: 1706844-007

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	7600	300		mg/Kg	200	6/18/2017 10:30:30 PM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-5-2'

Project: Livingston 2

Collection Date: 6/9/2017 1:05:00 PM

Lab ID: 1706844-008

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 4:13:09 AM	32339

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-5-10

Project: Livingston 2

Collection Date: 6/9/2017 1:20:00 PM

Lab ID: 1706844-009

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	15000	750		mg/Kg	500	6/18/2017 10:42:55 PM	32340
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	9.6		mg/Kg	1	6/16/2017 4:23:31 PM	32315
Motor Oil Range Organics (MRO)	ND	48		mg/Kg	1	6/16/2017 4:23:31 PM	32315
Surr: DNOP	102	70-130		%Rec	1	6/16/2017 4:23:31 PM	32315
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	6/16/2017 6:45:47 PM	32311
Surr: BFB	102	54-150		%Rec	1	6/16/2017 6:45:47 PM	32311
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	6/16/2017 6:45:47 PM	32311
Toluene	ND	0.048		mg/Kg	1	6/16/2017 6:45:47 PM	32311
Ethylbenzene	ND	0.048		mg/Kg	1	6/16/2017 6:45:47 PM	32311
Xylenes, Total	ND	0.097		mg/Kg	1	6/16/2017 6:45:47 PM	32311
Surr: 4-Bromofluorobenzene	129	66.6-132		%Rec	1	6/16/2017 6:45:47 PM	32311

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-6-2'

Project: Livingston 2

Collection Date: 6/9/2017 1:40:00 PM

Lab ID: 1706844-010

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 10:48:00 AM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-6-10

Project: Livingston 2

Collection Date: 6/9/2017 1:55:00 PM

Lab ID: 1706844-011

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	5000	150		mg/Kg	100	6/18/2017 10:55:19 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-2-2'

Project: Livingston 2

Collection Date: 6/9/2017 10:40:00 AM

Lab ID: 1706844-012

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 11:37:38 AM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-7-2'

Project: Livingston 2

Collection Date: 6/9/2017 2:05:00 PM

Lab ID: 1706844-013

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 12:14:51 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-060917-MG-TP-7-10

Project: Livingston 2

Collection Date: 6/9/2017 2:40:00 PM

Lab ID: 1706844-014

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	17000	750		mg/Kg	500	6/18/2017 11:07:43 PM	32340
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: TOM
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	6/16/2017 4:45:37 PM	32315
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	6/16/2017 4:45:37 PM	32315
Surr: DNOP	102	70-130		%Rec	1	6/16/2017 4:45:37 PM	32315
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	6/16/2017 7:10:02 PM	32311
Surr: BFB	96.5	54-150		%Rec	1	6/16/2017 7:10:02 PM	32311
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Benzene	ND	0.024		mg/Kg	1	6/16/2017 7:10:02 PM	32311
Toluene	ND	0.049		mg/Kg	1	6/16/2017 7:10:02 PM	32311
Ethylbenzene	ND	0.049		mg/Kg	1	6/16/2017 7:10:02 PM	32311
Xylenes, Total	ND	0.097		mg/Kg	1	6/16/2017 7:10:02 PM	32311
Surr: 4-Bromofluorobenzene	122	66.6-132		%Rec	1	6/16/2017 7:10:02 PM	32311

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:		
*	Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E Value above quantitation range
H	Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P Sample pH Not In Range
PQL	Practical Quantitative Limit	R RPD outside accepted recovery limits
RL	Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-8-2'

Project: Livingston 2

Collection Date: 6/12/2017 10:50:00 AM

Lab ID: 1706844-015

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 12:39:40 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-8-10

Project: Livingston 2

Collection Date: 6/12/2017 11:10:00 AM

Lab ID: 1706844-016

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 12:52:04 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-9-2'

Project: Livingston 2

Collection Date: 6/12/2017 11:20:00 AM

Lab ID: 1706844-017

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:04:29 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-9-10

Project: Livingston 2

Collection Date: 6/12/2017 11:35:00 AM

Lab ID: 1706844-018

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:16:53 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-10-2

Project: Livingston 2

Collection Date: 6/12/2017 11:55:00 AM

Lab ID: 1706844-019

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:29:17 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-10-1

Project: Livingston 2

Collection Date: 6/12/2017 1:05:00 PM

Lab ID: 1706844-020

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:41:41 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-11-2

Project: Livingston 2

Collection Date: 6/12/2017 1:15:00 PM

Lab ID: 1706844-021

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 1:54:06 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-11-1

Project: Livingston 2

Collection Date: 6/12/2017 1:30:00 PM

Lab ID: 1706844-022

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 2:06:30 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-12-2

Project: Livingston 2

Collection Date: 6/12/2017 1:45:00 PM

Lab ID: 1706844-023

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 2:43:43 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-12-1

Project: Livingston 2

Collection Date: 6/12/2017 2:00:00 PM

Lab ID: 1706844-024

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 2:56:08 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-13-2

Project: Livingston 2

Collection Date: 6/12/2017 2:10:00 PM

Lab ID: 1706844-025

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:08:34 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061217-MG-TP-13-1

Project: Livingston 2

Collection Date: 6/12/2017 2:30:00 PM

Lab ID: 1706844-026

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:20:58 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-14-2

Project: Livingston 2

Collection Date: 6/13/2017 8:15:00 AM

Lab ID: 1706844-027

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:33:23 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-14-1

Project: Livingston 2

Collection Date: 6/13/2017 8:40:00 AM

Lab ID: 1706844-028

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 3:45:47 PM	32340

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-15-2

Project: Livingston 2

Collection Date: 6/13/2017 9:00:00 AM

Lab ID: 1706844-029

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 4:23:00 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-15-1

Project: Livingston 2

Collection Date: 6/13/2017 9:15:00 AM

Lab ID: 1706844-030

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 5:25:03 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-16-2

Project: Livingston 2

Collection Date: 6/13/2017 9:25:00 AM

Lab ID: 1706844-031

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 5:37:27 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-16-1

Project: Livingston 2

Collection Date: 6/13/2017 9:40:00 AM

Lab ID: 1706844-032

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 5:49:52 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-17-2

Project: Livingston 2

Collection Date: 6/13/2017 9:50:00 AM

Lab ID: 1706844-033

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 6:02:17 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order **1706844**

Date Reported: **6/19/2017**

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-17-1

Project: Livingston 2

Collection Date: 6/13/2017 10:00:00 AM

Lab ID: 1706844-034

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 6:14:42 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-18-2

Project: Livingston 2

Collection Date: 6/13/2017 10:25:00 AM

Lab ID: 1706844-035

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	ND	30		mg/Kg	20	6/17/2017 6:27:07 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	R	RPD outside accepted recovery limits
	RL	Reporting Detection Limit	S	% Recovery outside of range due to dilution or matrix

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1706844

Date Reported: 6/19/2017

CLIENT: GHD

Client Sample ID: 088210-35-061317-MG-TP-18-1

Project: Livingston 2

Collection Date: 6/13/2017 11:00:00 AM

Lab ID: 1706844-036

Matrix: SOIL

Received Date: 6/15/2017 9:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: MRA
Chloride	360	30		mg/Kg	20	6/17/2017 6:39:31 PM	32341

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	PQL Practical Quantitative Limit	R RPD outside accepted recovery limits
	RL Reporting Detection Limit	S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1706844

19-Jun-17

Client: GHD
Project: Livingston 2

Sample ID MB-32339	SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS	Batch ID: 32339		RunNo: 43583							
Prep Date: 6/16/2017	Analysis Date: 6/16/2017		SeqNo: 1372810		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID LCS-32339	SampType: ics		TestCode: EPA Method 300.0: Anions							
Client ID: LCSS	Batch ID: 32339		RunNo: 43583							
Prep Date: 6/16/2017	Analysis Date: 6/16/2017		SeqNo: 1372811		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.9	90	110			

Sample ID MB-32340	SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS	Batch ID: 32340		RunNo: 43585							
Prep Date: 6/17/2017	Analysis Date: 6/17/2017		SeqNo: 1372868		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID LCS-32340	SampType: ics		TestCode: EPA Method 300.0: Anions							
Client ID: LCSS	Batch ID: 32340		RunNo: 43585							
Prep Date: 6/17/2017	Analysis Date: 6/17/2017		SeqNo: 1372869		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	94.4	90	110			

Sample ID MB-32341	SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS	Batch ID: 32341		RunNo: 43585							
Prep Date: 6/17/2017	Analysis Date: 6/17/2017		SeqNo: 1372898		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID LCS-32341	SampType: ics		TestCode: EPA Method 300.0: Anions							
Client ID: LCSS	Batch ID: 32341		RunNo: 43585							
Prep Date: 6/17/2017	Analysis Date: 6/17/2017		SeqNo: 1372899		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.5	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1706844

19-Jun-17

Client: GHD
Project: Livingston 2

Sample ID MB-32315	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 32315		RunNo: 43560							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1372149		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		96.0	70	130			

Sample ID LCS-32315	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 32315		RunNo: 43560							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1372317		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	10	50.00	0	99.8	73.2	114			
Surr: DNOP	4.8		5.000		95.6	70	130			

Qualifiers:

- | | |
|--|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| PQL Practical Quantitative Limit | R RPD outside accepted recovery limits |
| RL Reporting Detection Limit | S % Recovery outside of range due to dilution or matrix |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1706844

19-Jun-17

Client: GHD
Project: Livingston 2

Sample ID MB-32311	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: 32311		RunNo: 43568							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1373048		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	970		1000		96.9	54	150			

Sample ID LCS-32311	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 32311		RunNo: 43568							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1373049		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	76.4	125			
Surr: BFB	1100		1000		108	54	150			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1706844

19-Jun-17

Client: GHD
Project: Livingston 2

Sample ID MB-32311	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 32311		RunNo: 43568							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1373066		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.2		1.000		124	66.6	132			

Sample ID LCS-32311	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 32311		RunNo: 43568							
Prep Date: 6/15/2017	Analysis Date: 6/16/2017		SeqNo: 1373067		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	107	80	120			
Toluene	1.1	0.050	1.000	0	108	80	120			
Ethylbenzene	1.1	0.050	1.000	0	109	80	120			
Xylenes, Total	3.3	0.10	3.000	0	110	80	120			
Surr: 4-Bromofluorobenzene	1.3		1.000		126	66.6	132			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- RL Reporting Detection Limit
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix

Sample Log-In Check List

Client Name: GHD

Work Order Number: 1706844

RcptNo: 1

Received By: Erin Melendrez

6/15/2017 9:30:00 AM

EM

Completed By: Ashley Gallegos

6/15/2017 10:29:02 AM

AG

Reviewed By:

AG

06/15/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? Courier

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? Yes No
(Note discrepancies on chain of custody)
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? Yes No
(If no, notify customer for authorization.)

of preserved bottles checked for pH: _____
 (<2 or >12 unless noted)
 Adjusted? _____
 Checked by: _____

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified:	_____	Date:	_____
By Whom:	_____	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	_____		
Client Instructions:	_____		

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.1	Good	Yes			

Chain-of-Custody Record

Client: GHD Services, Inc.

Mailing Address: 6121 Indian School Rd.

Ste 200 Albuquerque, NM 87110

Phone #: 505 884 0672

email or Fax#: Bernard.Bockisch@ghd.com

QA/QC Package:

Standard Level 4 (Full Validation)

Accreditation

NELAP Other

EDD (Type)

Turn-Around Time:

Standard Rush 48hr

Project Name:

Livingston 2

Project #:

088210-35

Project Manager:

Bernard Bockisch

Sampler: Michael Gant

On Ice: Yes No

Sample Temperature: 5.1

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
6/9	0955	S	S-088210-35-060917-MG-TP-1-2	4oz Soil/ICE		17DU844
6/9	1005	S	S-088210-35-060917-MG-TP-1-10			-001
6/9	1055	S	S-088210-35-060917-MG-TP-2-10			-002
6/9	1110	S	S-088210-35-060917-MG-TP-3-2			-003
6/9	1125	S	S-088210-35-060917-MG-TP-3-10			-004
6/9	1135	S	S-088210-35-060917-MG-TP-4-2			-005
6/9	1150	S	S-088210-35-060917-MG-TP-4-10			-006
6/9	1305	S	S-088210-35-060917-MG-TP-5-2			-007
6/9	1320	S	S-088210-35-060917-MG-TP-5-10			-008
6/9	1340	S	S-088210-35-060917-MG-TP-6-2			-009
6/9	1355	S	S-088210-35-060917-MG-TP-6-10			-010
6/9	1040	S	S-088210-35-060917-MG-TP-2-2			-011
6/14	1600					-012
Date:	Time:	Relinquished by:	Relinquished by:	Received by:	Date	Time
6/14	1600	<u>Michael Gant</u>	<u>Michael Gant</u>	<u>[Signature]</u>	6/14/17	1600
6/14	1900	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	6/15/17	0930

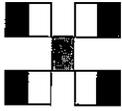
Remarks:

Hold for possible BTEX

Analysis Request

BTEX + MTBE + TMBs (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	
8270 (Semi-VOA)	X
	X Chloride (300)
	BTEX (8021)

Air Bubbles (Y or N)



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Chain-of-Custody Record

Client: GHD Services, Inc.
 Mailing Address: 6121 Indian School Rd Ste 200
Albuquerque, NM 87110
 Phone #: 505 884 0672
 email or Fax#: Bernard.Backisch@ghd.com

QA/QC Package:
 Standard Level 4 (Full Validation)
 Accreditation
 NELAP Other _____
 EDD (Type) _____

Turn-Around Time:
 Standard Rush 48 hr
 Project Name:
Livingston 2
 Project #:
088210-35
 Project Manager:
Bernard Backisch

HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Chloride (300)	BTEX (8021)	Air Bubbles (Y or N)
											X	X	

Sampler:		On Ice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Temperature: <u>5</u>		
Container Type and #	Preservative Type	HEAL No.
<u>4oz Soil Jar Ice</u>		<u>17060844</u>
		<u>-025</u>
		<u>-020</u>
		<u>-027</u>
		<u>-028</u>
		<u>-029</u>
		<u>-030</u>
		<u>-031</u>
		<u>-032</u>
		<u>-033</u>
		<u>-034</u>
		<u>-035</u>
		<u>-036</u>

Received by: [Signature] Date: 1/10
 Relinquished by: [Signature] Date: 0930
 Received by: [Signature] Date: 06/15/17
 Relinquished by: [Signature] Date: 1/11

Remarks: Hold for possible BTEX

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 01, 2017

Bernie Bockish

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX

RE: Livingston 2

OrderNo.: 1707B18

Dear Bernie Bockish:

Hall Environmental Analysis Laboratory received 13 sample(s) on 7/21/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order: 1707B18

Date Reported: 8/1/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: Livingston 2

Lab Order: 1707B18

Lab ID: 1707B18-001 Collection Date: 7/17/2017 4:20:00 PM

Client Sample ID: S088210-35-071717MG-SB-1-50' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 8300 300 mg/Kg 200 7/27/2017 5:15:27 PM 33021

Lab ID: 1707B18-002 Collection Date: 7/17/2017 5:05:00 PM

Client Sample ID: S088210-35-071717MG-SB-1-60' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 8300 300 mg/Kg 200 7/27/2017 5:27:52 PM 33021

Lab ID: 1707B18-003 Collection Date: 7/17/2017 5:50:00 PM

Client Sample ID: S088210-35-071717MG-SB-1-70' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 13000 750 mg/Kg 500 7/27/2017 5:40:17 PM 33021

Lab ID: 1707B18-004 Collection Date: 7/18/2017 9:10:00 AM

Client Sample ID: S088210-35-071817MG-SB-1-80' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 11000 750 mg/Kg 500 7/27/2017 5:52:42 PM 33021

Lab ID: 1707B18-005 Collection Date: 7/18/2017 10:05:00 AM

Client Sample ID: S088210-35-071817MG-SB-1-90' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 3400 150 mg/Kg 100 7/27/2017 6:29:56 PM 33021

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Table with 2 columns: Qualifiers and descriptions. Includes codes like *, D, H, ND, PQL, S, B, E, J, P, RL, W and their corresponding meanings.

Analytical Report

Lab Order: 1707B18

Date Reported: 8/1/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: Livingston 2

Lab Order: 1707B18

Lab ID: 1707B18-006 Collection Date: 7/18/2017 2:10:00 PM

Client Sample ID: S088210-35-071817MG-SB-2-50' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 7600 750 mg/Kg 500 7/27/2017 6:42:20 PM 33021

Lab ID: 1707B18-007 Collection Date: 7/18/2017 2:55:00 PM

Client Sample ID: S088210-35-071817MG-SB-2-60' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 7700 300 mg/Kg 200 7/27/2017 6:54:45 PM 33021

Lab ID: 1707B18-008 Collection Date: 7/18/2017 3:30:00 PM

Client Sample ID: S088210-35-071817MG-SB-2-70' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: SRM

Chloride 6200 300 mg/Kg 200 7/27/2017 7:07:10 PM 33021

Lab ID: 1707B18-009 Collection Date: 7/18/2017 4:15:00 PM

Client Sample ID: S088210-35-071817MG-SB-2-75' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride 980 30 mg/Kg 20 7/26/2017 4:12:52 PM 33021

Lab ID: 1707B18-010 Collection Date: 7/19/2017 11:15:00 AM

Client Sample ID: S088210-35-071917MG-SB-3-50' Matrix: SOIL

Analyses Result PQL Qual Units DF Date Analyzed Batch ID

EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride 62 30 mg/Kg 20 7/26/2017 4:25:17 PM 33021

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Table with 2 columns: Qualifiers and descriptions. Includes codes like *, D, H, ND, PQL, S, B, E, J, P, RL, W and their corresponding meanings.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: Livingston 2

Lab Order: 1707B18

Lab ID: 1707B18-011 **Collection Date:** 7/19/2017 11:45:00 AM

Client Sample ID: S088210-35-071917MG-SB-3-60' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	88	30		mg/Kg	20	7/26/2017 4:37:42 PM	33021
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Lab ID: 1707B18-012 **Collection Date:** 7/19/2017 3:05:00 PM

Client Sample ID: S088210-35-071917MG-SB-4-40' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	870	30		mg/Kg	20	7/26/2017 4:50:07 PM	33021
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Lab ID: 1707B18-013 **Collection Date:** 7/19/2017 3:35:00 PM

Client Sample ID: S088210-35-071917MG-SB-4-50' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	79	30		mg/Kg	20	7/26/2017 5:02:32 PM	33021
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank	
	D Sample Diluted Due to Matrix	E Value above quantitation range	
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits	Page 3 of 4
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range	
	PQL Practical Quantitative Limit	RL Reporting Detection Limit	
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified	

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1707B18

01-Aug-17

Client: GHD
Project: Livingston 2

Sample ID	MB-33021	SampType:	MBLK	TestCode:	EPA Method 300.0: Anions					
Client ID:	PBS	Batch ID:	33021	RunNo:	44523					
Prep Date:	7/26/2017	Analysis Date:	7/26/2017	SeqNo:	1407865	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	LCS-33021	SampType:	LCS	TestCode:	EPA Method 300.0: Anions					
Client ID:	LCSS	Batch ID:	33021	RunNo:	44523					
Prep Date:	7/26/2017	Analysis Date:	7/26/2017	SeqNo:	1407866	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.9	90	110			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| PQL Practical Quantitative Limit | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

Client Name: GHD

Work Order Number: 1707B18

RcptNo: 1

Received By: Sophia Campuzano

7/21/2017 9:45:00 AM

Sophia Campuzano

Completed By: Erin Melendrez

7/21/2017 10:32:15 AM

Erin Melendrez

Reviewed By: *[Signature]*

7/21/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? Courier

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? Yes No
 (Note discrepancies on chain of custody)
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? Yes No
 (If no, notify customer for authorization.)

of preserved bottles checked for pH: _____
 (<2 or >12 unless noted)
 Adjusted? _____
 Checked by: _____

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.4	Good	Yes			

Chain-of-Custody Record

Client: GHD Services, Inc.
 Mailing Address: 6121 Indian School Rd Ste 200
NE Albuquerque, NM 87110
 Phone #: 505 884 0672
 email or Fax#: Bernard.Bockisch@ghd.com
 QA/QC Package: Standard Level 4 (Full Validation)
 Accreditation: NELAP Other _____
 EDD (Type) _____

Turn-Around Time: Standard Rush
 Project Name: Livingston 2
 Project #: 088210-35
 Project Manager: Bernard Bockisch
 Sampler: Michael Gant
 On Ice: Yes No
 Sample Temperature: 2.4



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Air Bubbles (Y or N)
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Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
7/17	1620	S	5-088210-35-071717-M6-SB-1-50	4oz Soil Jar	ICE	1707B18
7/17	1705	S	5-088210-35-071717-M6-SB-1-60			-001
7/17	1750	S	5-088210-35-071717-M6-SB-1-70			-002
7/18	0910	S	5-088210-35-071817-M6-SB-1-80			-003
7/18	1005	S	5-088210-35-071817-M6-SB-1-90			-004
7/18	1410	S	5-088210-35-071817-M6-SB-2-50			-005
7/18	1455	S	5-088210-35-071817-M6-SB-2-60			-006
7/18	1530	S	5-088210-35-071817-M6-SB-2-70			-007
7/18	1615	S	5-088210-35-071817-M6-SB-2-75			-008
7/19	1115	S	5-088210-35-071917-M6-SB-3-50			-009
7/19	1145	S	5-088210-35-071917-M6-SB-3-60			-010
7/19	1505	S	5-088210-35-071917-M6-SB-4-40			-011
7/20	0800	Relinquished by: <u>Michael Gant</u>				-012
7/20/17	1900	Relinquished by: <u>[Signature]</u>				

Received by: [Signature] Date: 7/20/17 Time: 0850
 Received by: Sophi Carr Date: 07/21/17 Time: 0945

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 01, 2017

Alan Brandon

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX

RE: Livingston Ridge SWD No 2

OrderNo.: 1708C84

Dear Alan Brandon:

Hall Environmental Analysis Laboratory received 3 sample(s) on 8/22/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order: 1708C84

Date Reported: 9/1/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: Livingston Ridge SWD No 2

Lab Order: 1708C84**Lab ID:** 1708C84-001 **Collection Date:** 8/18/2017 10:53:00 AM**Client Sample ID:** S-088210-35-081817-SP-SB-5-100 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	48	30		mg/Kg	20	8/28/2017 6:01:52 PM	33585
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Lab ID: 1708C84-002 **Collection Date:** 8/18/2017 11:40:00 AM**Client Sample ID:** S-088210-35-081817-SP-SB-5-110 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	760	30		mg/Kg	20	8/28/2017 6:14:16 PM	33585
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Lab ID: 1708C84-003 **Collection Date:** 8/18/2017 12:22:00 PM**Client Sample ID:** S-088210-35-081817-SP-SB-5-120 **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
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EPA METHOD 300.0: ANIONS

Analyst: MRA

Chloride	82	30		mg/Kg	20	8/28/2017 6:26:40 PM	33585
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1708C84

01-Sep-17

Client: GHD
Project: Livingston Ridge SWD No 2

Sample ID MB-33585	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBS	Batch ID: 33585	RunNo: 45254								
Prep Date: 8/28/2017	Analysis Date: 8/28/2017	SeqNo: 1434156	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID LCS-33585	SampType: lcs	TestCode: EPA Method 300.0: Anions								
Client ID: LCSS	Batch ID: 33585	RunNo: 45254								
Prep Date: 8/28/2017	Analysis Date: 8/28/2017	SeqNo: 1434157	Units: mg/Kg							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.3	90	110			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| PQL Practical Quantitative Limit | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

Sample Log-In Check List

Client Name: **GHD** Work Order Number: **1708C84** RcptNo: **1**

Received By: **Isaiah Ortiz** 8/22/2017 8:57:00 AM *I Ortiz*
 Completed By: **Michelle Garcia** 8/22/2017 4:08:36 PM *Michelle Garcia*
 Reviewed By: **IMO** 8/23/2017

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
 - 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
 - 6. Sample(s) in proper container(s)? Yes No
 - 7. Sufficient sample volume for indicated test(s)? Yes No
 - 8. Are samples (except VOA and ONG) properly preserved? Yes No
 - 9. Was preservative added to bottles? Yes No NA
 - 10. VOA vials have zero headspace? Yes No No VOA Vials
 - 11. Were any sample containers received broken? Yes No
 - 12. Does paperwork match bottle labels? Yes No
 (Note discrepancies on chain of custody)
 - 13. Are matrices correctly identified on Chain of Custody? Yes No
 - 14. Is it clear what analyses were requested? Yes No
 - 15. Were all holding times able to be met? Yes No
 (If no, notify customer for authorization.)
- # of preserved bottles checked for pH: _____
 (<2 or >12 unless noted)
 Adjusted? _____
 Checked by: _____

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified:		Date	
By Whom:		Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.1	Good	Not Present			



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 28, 2017

Alan Brandon

GHD

6121 Indian School Road, NE #200

Albuquerque, NM 87110

TEL: (505) 884-0672

FAX

RE: Livingston Ridge SWD No 2

OrderNo.: 1708B40

Dear Alan Brandon:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/18/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Analytical Report

Lab Order: 1708B40

Date Reported: 8/28/2017

Hall Environmental Analysis Laboratory, Inc.

CLIENT: GHD
Project: Livingston Ridge SWD No 2

Lab Order: 1708B40

Lab ID: 1708B40-001 Collection Date: 8/16/2017 11:41:00 AM
Client Sample ID: S-088210-35-081617-SP-SB-6-85' Matrix: SOIL

Table with 8 columns: Analyses, Result, PQL, Qual, Units, DF, Date Analyzed, Batch ID. Row 1: EPA METHOD 300.0: ANIONS, Chloride, ND, 30, mg/Kg, 20, 8/26/2017 12:09:13 AM, 33563. Analyst: MRA

Lab ID: 1708B40-002 Collection Date: 8/16/2017 11:44:00 AM
Client Sample ID: S-088210-35-081617-SP-SB-6-95' Matrix: SOIL

Table with 8 columns: Analyses, Result, PQL, Qual, Units, DF, Date Analyzed, Batch ID. Row 1: EPA METHOD 300.0: ANIONS, Chloride, ND, 30, mg/Kg, 20, 8/26/2017 12:21:37 AM, 33563. Analyst: MRA

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Table with 2 columns: Qualifiers and descriptions. Includes codes like *, D, H, ND, PQL, S, B, E, J, P, RL, W and their corresponding meanings. Page 1 of 2

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1708B40

28-Aug-17

Client: GHD
Project: Livingston Ridge SWD No 2

Sample ID MB-33563	SampType: mblk		TestCode: EPA Method 300.0: Anions							
Client ID: PBS	Batch ID: 33563		RunNo: 45224							
Prep Date: 8/25/2017	Analysis Date: 8/25/2017		SeqNo: 1433002	Units: mg/Kg						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID LCS-33563	SampType: lcs		TestCode: EPA Method 300.0: Anions							
Client ID: LCSS	Batch ID: 33563		RunNo: 45224							
Prep Date: 8/25/2017	Analysis Date: 8/25/2017		SeqNo: 1433003	Units: mg/Kg						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	96.3	90	110			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| PQL Practical Quantitative Limit | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

Client Name: GHD

Work Order Number: 1708B40

RcptNo: 1

Received By: Sophia Campuzano 8/18/2017 9:15:00 AM

Sophia Campuzano

Completed By: Ashley Gallegos 8/18/2017 11:28:06 AM

Ashley Gallegos

Reviewed By: *SRC 08/18/17*

Chain of Custody

1. Custody seals intact on sample bottles? Yes No Not Present
2. Is Chain of Custody complete? Yes No Not Present
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes No NA
5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
6. Sample(s) in proper container(s)? Yes No
7. Sufficient sample volume for indicated test(s)? Yes No
8. Are samples (except VOA and ONG) properly preserved? Yes No
9. Was preservative added to bottles? Yes No NA
10. VOA vials have zero headspace? Yes No No VOA Vials
11. Were any sample containers received broken? Yes No
12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes No
13. Are matrices correctly identified on Chain of Custody? Yes No
14. Is it clear what analyses were requested? Yes No
15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: _____
(<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
By Whom: _____ Via: eMail Phone Fax In Person
Regarding: _____
Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Not Present			

Chain-of-Custody Record

Client: CHJ Albuquerque

Mailing Address: 621 Indian School Rd NE

Phone #: 505-884-0672

email or Fax#: Alan.Brandon@ghel.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other

EDD (Type)

Turn-Around Time: Standard Rush

Project Name: Livingston Ridge SWD No. 2

Project #: 088210/35

Project Manager: Alan Brandon

Sampler: Steve Perez

On Ice: Yes No

Sample Temperature: 1.0

Container Type and #

Preservative Type

HEAL No. 1708BAD

4oz jug-1

↓

-001

↓

-002

Date: 8-16-17 Time: 11:41

Date: 8-17-17 Time: 0745

Date: 8/17/17 Time: 1200

Relinquished by: [Signature]

Relinquished by: [Signature]

Received by: [Signature] Date: 8/17/17 Time: 0245

Received by: [Signature] Date: 08/18/17 Time: 0915

Remarks:



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)

BTEX + MTBE + TPH (Gas only)

TPH 8015B (GRO / DRO / MRO)

TPH (Method 418.1)

EDB (Method 504.1)

PAH's (8310 or 8270 SIMS)

RORA 8 Metals

Anions (F, Cl, NO₃, NO₂, PO₄, SO₄)

8081 Pesticides / 8082 PCB's

8260B (VOA)

8270 (Semi-VOA)

X Chloride 300.0

X

Air Bubbles (Y or N)

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

CONVIEW

Appendix C Boring Logs



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-1
 DATE COMPLETED: July 17, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
			CUTTINGS					
50	SC-CLAYEY SAND, very fine grained, light brown, well sorted, dry	50.00		SB-1-50				8300
52								
54								
56								
58								
60	- brown at 60.0ft BGS			SB-1-60				8300
62								
64								
66								
68								
70	CL-SANDY CLAY, very fine grained, well sorted, reddish brown, dry	70.00		SB-1-70				13000
72								
74								
76								
78								
80	SC-CLAYEY SAND, very fine grained, well sorted, brown, dry	80.00		SB-1-80				11000
82								
84								
86	- reddish brown at 85.0ft BGS			SB-1-85				
88								
90	END OF BOREHOLE @ 90.0ft BGS	90.00		SB-1-90				3400
92								
94								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-2
 DATE COMPLETED: July 18, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
50	CL-SANDY CLAY, very fine grained, well sorted, slightly plastic, strong brown, dry - with sand at 60.0ft BGS	50.00		SB-2-50				7600
52								
54								
56								
60				SB-2-60				7700
62								
64								
66								
68								
70	SM-SILTY SAND, fine grained, well sorted, reddish yellow, dry	70.00		SB-2-70				6200
72								
74								
75	END OF BOREHOLE @ 75.0ft BGS	75.00		SB-2-75				980
76								
78								
80								
82								
84								
86								
88								
90								
92								
94								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-3
 DATE COMPLETED: July 19, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46	SC-CLAYEY SAND, fine grained, well sorted, reddish yellow, dry - very fine grained, light brown at 10.0ft BGS SM-SILTY SAND, very fine grained, well sorted, reddish yellow, dry - strong brown at 25.0ft BGS SC-CLAYEY SAND, very fine grained, well sorted, reddish brown, dry CL-SANDY CLAY, very fine grained, well sorted, low plasticity, strong brown, dry SC-clAYEY SAND, very fine grained, well sorted, reddish brown, dry	15.00 30.00 35.00 40.00		SB-3-20 SB-3-25 SB-3-30 SB-3-35 SB-3-40 SB-3-45				

← BACKFILLED WITH BENTONITE CHIPS AND SOIL CUTTINGS

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-4
 DATE COMPLETED: July 19, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46	SC-CLAYEY SAND, fine grained, well sorted, reddish yellow, dry - very fine grained at 10.0ft BGS							
		15.00						
	SM-SILTY SAND, very fine grained, well sorted, light brown, dry							
		20.00			SB-4-20			
	SC-CLAYEY SAND, very fine grained, well sorted, light brown, dry							
		25.00		← BACKFILLED WITH BENTONITE CHIPS AND SOIL CUTTINGS	SB-4-25			
	SM-SILTY SAND, very fine grained, well sorted, strong brown, dry							
		35.00			SB-4-30			
	CL-SANDY CLAY, very fine grained, well sorted, low plasticity, reddish brown, dry							
		35.00			SB-4-35			
	- strong brown at 40.0ft BGS							870
		45.00			SB-4-40			
	SC-CLAYEY SAND, very fine grained, well sorted, reddish brown, dry							
		45.00			SB-4-45			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-4
 DATE COMPLETED: July 19, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: M. GANT

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94	END OF BOREHOLE @ 50.0ft BGS	50.00		SB-4-50				79

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-5
 DATE COMPLETED: August 18, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: S. PEREZ

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46	SEE SB-1 FOR STRATIGRAPHIC DETAILS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-5
 DATE COMPLETED: August 18, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: S. PEREZ

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94	SC-CLAYEY SAND, with silt, coarse grained, poorly graded, brown, dry	90.00						

← BACKFILLED WITH BENTONITE CHIPS AND SOIL CUTTINGS

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-5
 DATE COMPLETED: August 18, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: S. PEREZ

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE					
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)	
98			[Hatched pattern]						
100	SP-SAND, with silt, trace clay, coarse grained sandstone, poorly graded, brown, dry	100.00	[Hatched pattern]	SB-5-20				48	
102			[Dotted pattern]						
104			[Dotted pattern]						
106			[Dotted pattern]						
108			[Dotted pattern]						
110			[Dotted pattern]	SB-5-25				760	
112			[Dotted pattern]						
114			[Dotted pattern]						
116			[Dotted pattern]						
118			[Dotted pattern]						
120	- trace silt and clay at 120.0ft BGS		[Dotted pattern]	SB-5-30				82	
122			[Dotted pattern]						
124			[Dotted pattern]						
126			[Dotted pattern]						
128			[Dotted pattern]						
130	END OF BOREHOLE @ 130.0ft BGS	130.00	[Hatched pattern]	SB-5-35					
132									
134									
136									
138									
140									
142									

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-6
 DATE COMPLETED: August 16, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: S. PEREZ

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	Chloride (mg/kg)
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46	SEE SB-1 FOR STRATIGRAPHIC DETAILS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: LIVINGSTON RIDGE SWD NO. 2
 PROJECT NUMBER: 088210-35
 CLIENT: EOG RESOURCES
 LOCATION: EDDY COUNTY, NEW MEXICO

HOLE DESIGNATION: SB-6
 DATE COMPLETED: August 16, 2017
 DRILLING METHOD: HSA
 FIELD PERSONNEL: S. PEREZ

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	Chloride (mg/kg)
98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130 132 134 136 138 140 142	END OF BOREHOLE @ 96.5ft BGS	96.50			X			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 088210-WI.GPJ CRA_CORP.GDT 9/15/17