December 23, 2016

Characterization Activities and Results at the State C AC I #3 SWD Unit L of Section 2, T12 S, R 33 E Lea County, New Mexico

Prepared For:
Samson Resources

Prepared by
R.T. Hicks Consultants, Ltd.
Albuquerque, New Mexico

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745
Artesia ▲ Carlsbad ▲ Durango ▲ Midland

On April 18, 2016, there was a release of produced water at the State C AC I #3 Tank Battery. Plate 1 shows the location of the tank battery in Unit L of Section 2, T 12 S, R 33E.

Characterization Activities

Trench Sampling

In order to characterize the effect of the produced water release at the State C AC I #3 Battery, three trench locations were chosen for sampling. All three locations were within the release footprint. This was accomplished on May 6, 2016 using a backhoe (see Plate 2).

Samples were taken every foot. At all three locations, a dense caliche horizon encountered at depths from 3.0 feet to 5.5 feet prevented sampling at greater depth. The results of field titrations of the samples are presented in the following table.

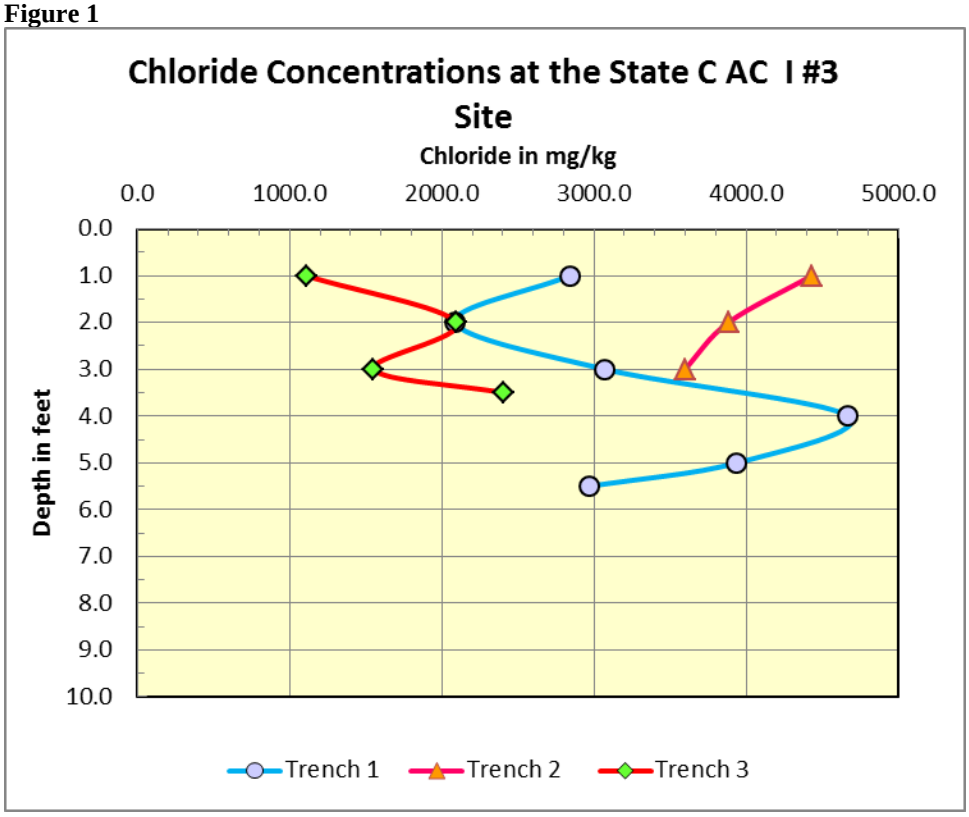
Table 1

Sample Location	Depth [feet]	Chloride Conc. [mg/kg]
Trench 1	1.0	2839
	2.0	2088
	3.0	3074
	4.0	4668
	5.0	3940
	5.5	2969
Trench 2	1.0	4430
	2.0	3883
	3.0	3596
Trench 3	1.0	1109
	2.0	2094
	3.0	1551
	3.5	2404

The data is presented as chloride concentration profiles in Figure 1 below. As can be seen,

- All concentrations were less 4800 mg/kg and greater than 1000 mg/kg.
- Trench 1 had the lowest average concentration while Trench 2 had the highest average concentration.

Figure 1



As all chloride concentrations were greater than 250 mg/kg, it was concluded that a boring was necessary to establish a vertical characterization of the release at the site.

Soil Boring

Based upon the trench sampling results and the physical difficulties of maneuvering the drill rig within the tank battery site, the boring location for SB-1 was chosen as the Trench 2 sampling site. On November 2, 2016, Hicks Consultants met with Atkins Engineering to drill SB-1. To access the location, a minimal section of the berm was removed. This was replaced after the boring was completed (Plate 2)

The Boring Log is presented in Plate 3.

Soil samples were obtained at depth intervals of five feet by use of a split-spoon sampler. The samples were field tested for chloride concentration.

To determine if soil chloride concentrations demonstrated a complete vertical characterization of the site, the following protocol was used.

- If the two lowermost samples had chloride concentrations less than 250 mg/kg, the boring would be terminated.

- If not, the boring would be extended.
- If the boring was continued to the water table (approximately 47 feet bgs at the site), the boring would be extended 15 feet below the water table and a representative sample of ground water was to be collected and field titrated.

During the field work, no sample had a chloride concentration less than 250 mg/kg with the exception of the sample from the depth of 45 feet (216 mg/kg). Following the field protocols, the boring was extended 15 feet below the water table and a sample of ground water was obtained.

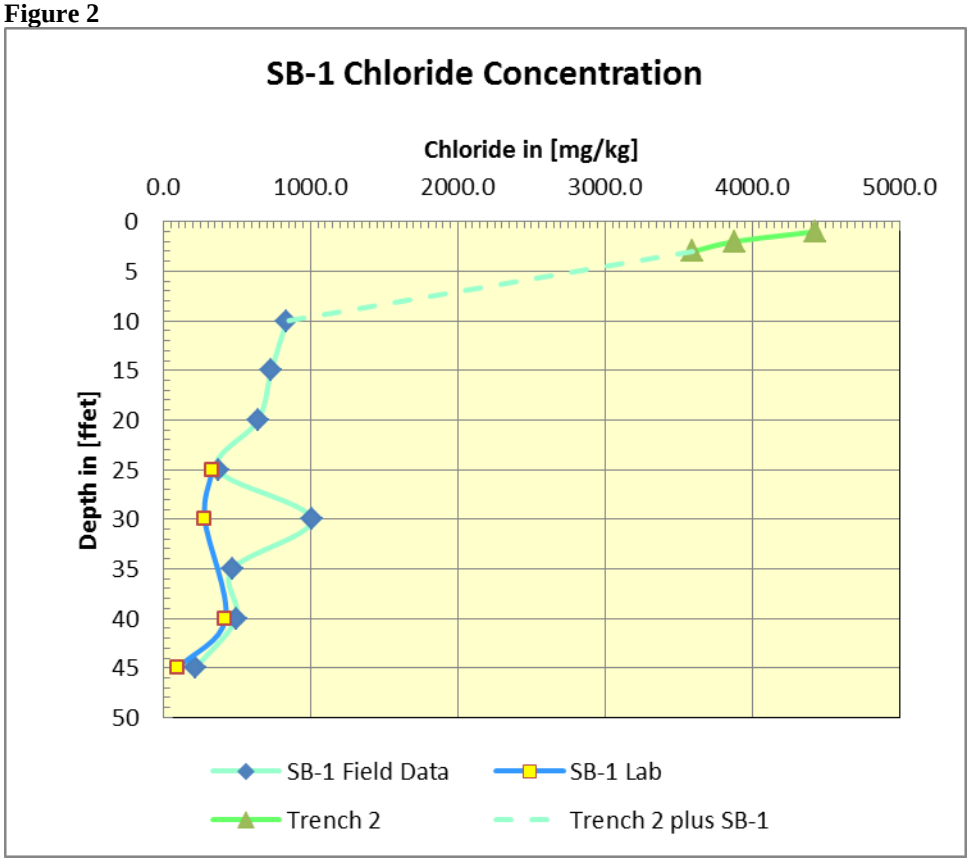
All chloride concentration data is presented in Table 2. Laboratory Results are presented in the Appendix.

Table 2

SB-1	Field Titration	Laboratory Result
Depth in {feet]	[mg/L]	
10	836.9	
15	731.8	
20	642.9	
25	369.5	330
30	1006.4	280
35	468.1	
40	491.0	420
45	216.4	97
Ground Water	749.8	760

The data is also presented as a graph of chloride concentration as a function of depth in Figure 2. Because SB-1 was placed in the footprint of Trench 2, the Trench 2 data is shown with an interpolated line connecting the datasets.

Figure 2



As can be seen from the data in Table 2 and the Graph in Figure 2:

- With one exception, the lowest concentration observed in the field data was about 370 mg/kg at a depth of 25 feet.
- The exception is from the sample at 45 feet (216 mg/kg). This soil is within the capillary fringe and has a higher moisture content. As such, it is diluted by ground water from below.
- The highest concentration observed was about 1000 mg/kg at a depth of 30 feet.

We submitted samples from the depth intervals of 25 feet, 30, 40, and 45 feet to the laboratory. The first two samples are of the lowest and highest concentrations respectively while the last two are from the bottom of the vadose zone.

- The laboratory result for the sample from 25 feet agrees favorably with the field result (330 mg/kg and 370 mg/kg respectively).
- The laboratory result from the sample at 30 feet is rather different from the field result (280 mg/kg and 1006 mg/kg respectively). Obviously, field and lab tests can never use the exact same soil although the samples come from within close proximity to each other. A second sample of this material was field tested and had a concentration of 594 mg/kg.
- The samples from 40 and 45 feet also agree well (see Table 2).

Observations Regarding the Vadose Zone Chloride Profile

As mentioned above, the datasets from Trench 2 and SB-1 are shown on the graph.

- Samples from Trench 2 are all from above the caliche beds (present to a depth of about 20 feet with additional thin layers at depth, Plate 2)
- Concentrations in Trench 2 are an order of magnitude higher than those observed in SB-1.
- Concentrations within and below the caliche are above 250 mg/kg, the soil screening guideline.

Ground Water Concentrations

Chloride concentration of the ground water sample exceeded The New Mexico WQCC standard of 250 mg/L for chloride. The field and laboratory ground water results agree quite closely (750 mg/L and 760 mg/L respectively).

Observations and Conclusions

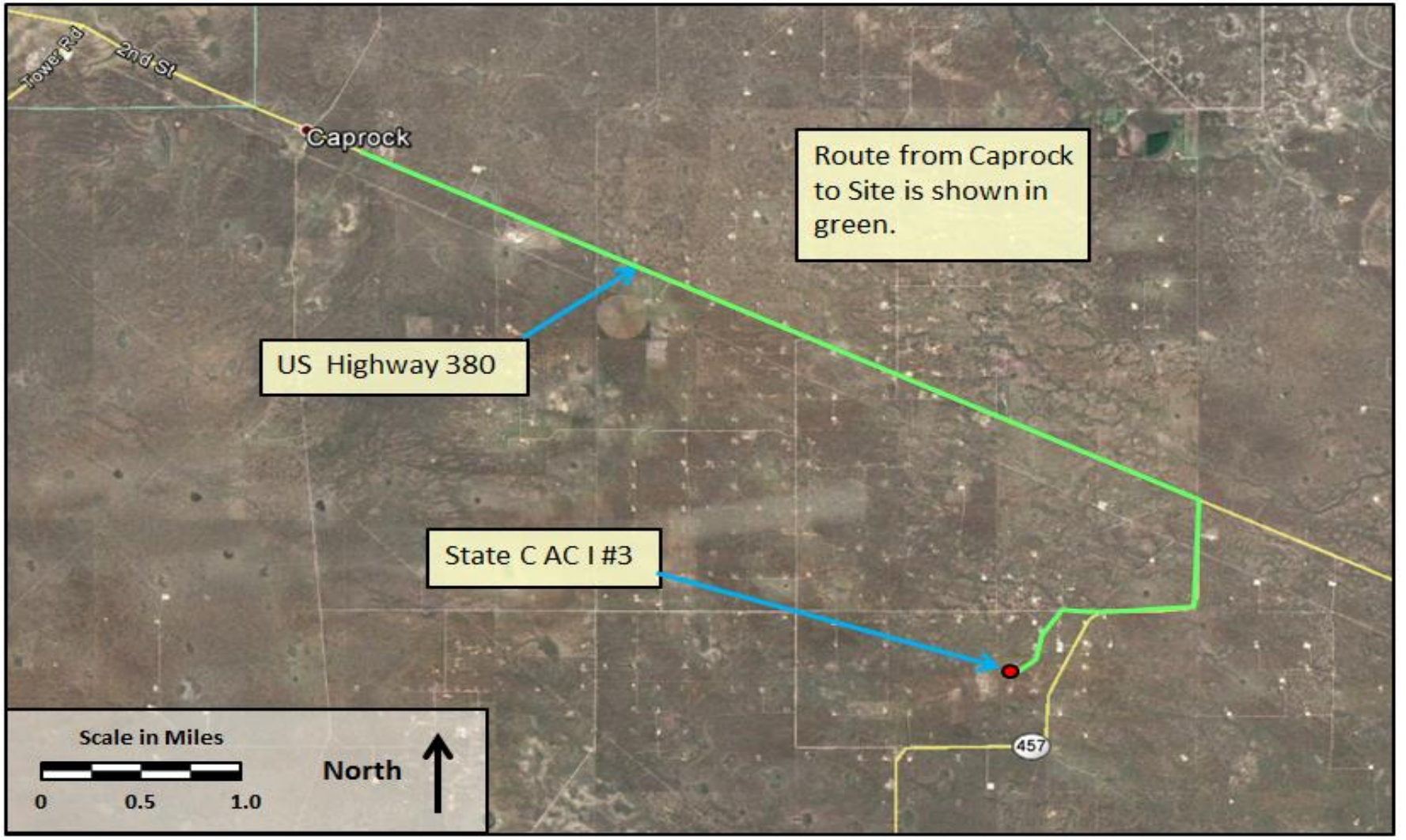
- The fluid from the recent release is present in the upper vadose zone (perhaps 5 to 8 feet or less)
- Chloride in the lower vadose zone (10 feet to 45 feet) is an order of magnitude less in concentration than the chloride concentration above the caliche horizon. This material could possibly be attributed to previous oilfield events. Vadose zone migration rates in SE New Mexico are commonly 1 to 3 feet/year. Hence, it would be unlikely for the recent release to have attained the greater depths.
- Ground water (at 760 mg/L) is impacted at a level about three times the drinking water standard (250 mg/L).
- Ground water flows to the east-southeast in the area (Tillery, 2008). There is some distance down gradient from the tank battery at which dispersion and diffusion dilute chloride within ground water to a concentration less than 250 mg/L.
- The site is about 750 feet east and 500 feet south of the midpoint of the western boundary of Section 2. There are no known wells or other ground water diversions providing drinking water in Section 2.
- The site is an operating tank battery. Installation of an evapotranspiration barrier to lower the chloride flux entering ground water from the vadose zone is not currently practical.

Reference

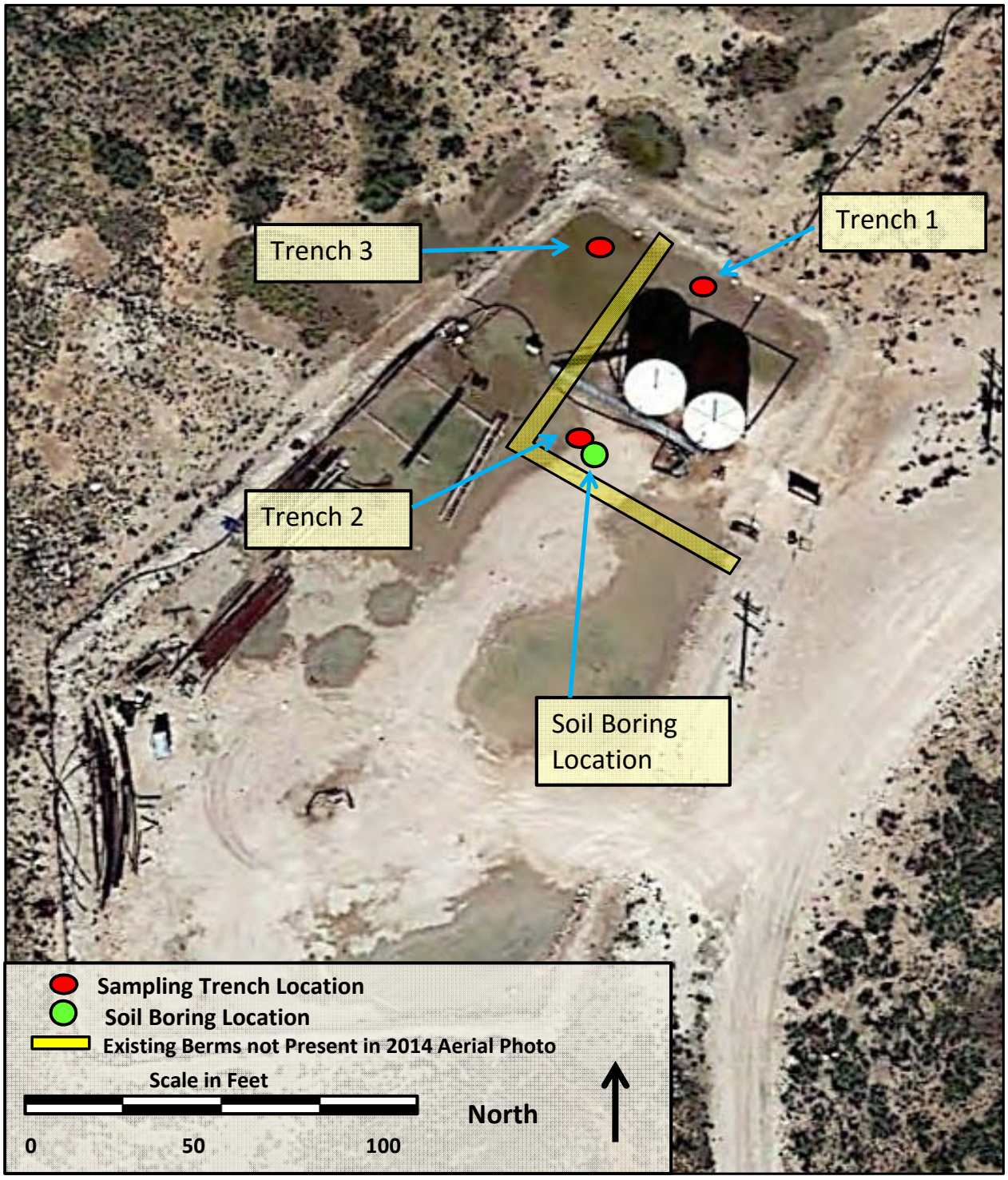
Tillery, A., Current (2004-07) Conditions and Changes in Ground-Water Levels from Pre-development to 2007, Southern High Plains Aquifer, Southeast New Mexico-Lea County Underground Water Basin, United States Geologic Survey, 2008

Plates

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 505-266-5004	**Aerial Photograph With Roads Showing Location of State C AC I #3**	**Plate 1**
	Samson Resources	**December 2016**



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 505-266-5004	**Sept. 2014 Aerial Photograph of State C AC l #0 Site Showing Sampling Locations**	**Plate H**
	Samson Resources	**5ŜŎŜYŏŜ 2016**

Logger:	David Hamilton	**Client:**	**Well ID:**
Driller:	Atkins Engineering	Samson Resources L.L.C.	**SB-1**
Drilling Method:	Hollw Stem Augur	**Project Name:**	
Start Date:	11/2/2016	Samson State C AC #3	
End Date:	11/2/2016	**Location:**	
		Section 2, T 12S, R 33E, Unit L	

Depth (feet)	Description	Lithology	Comments	Depth (feet)
0.0	Surface, 0 - 0.5 feet, tan			0.0
1.0	Sand, silt, clay, brown, 0.5-2 feet			1.0
2.0	Caliche,composed of very fine grained sand, silt, sand, silt, white, 2- 21 feet			2.0
3.0				3.0
4.0				4.0
5.0				5.0
6.0				6.0
7.0				7.0
8.0				8.0
9.0			Hard drilling	9.0
10.0				10.0
11.0				11.0
12.0				12.0
13.0				13.0
14.0				14.0
15.0				15.0
16.0				16.0
17.0				17.0
18.0				18.0
19.0				19.0
20.0				20.0
21.0	Very fine grained sand, silt, caliche layers, white-tan, 21-25 feet			21.0
22.0				22.0
23.0				23.0
24.0				24.0
25.0	Very fine grained sand, silt, caliche layer between 29 and 32, white tan, 25-33 feet			25.0
26.0				26.0
27.0				27.0
28.0				28.0
29.0				29.0
30.0				30.0
31.0				31.0
32.0				32.0
33.0	Very fine grained sand, silt, light tan, 33-47 feet			33.0
34.0				34.0
35.0				35.0
36.0				36.0
37.0				37.0
38.0				38.0
39.0				39.0
40.0				40.0
41.0				41.0
42.0				42.0
43.0				43.0
44.0			Sample was moist to touch	44.0
45.0				45.0
46.0				46.0
47.0	Very fine grained sand, silt, Clay content increasing with depth, grey, 47-52 feet			47.0
48.0				48.0
49.0				49.0
50.0				50.0
51.0				51.0
52.0	Very fine grained sand, silt, clay, darker grey, 52-60 feet			52.0
53.0				53.0
54.0				54.0
55.0				55.0
56.0				56.0
57.0				57.0
58.0				58.0
59.0				59.0
60.0				60.0

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Samson Resources LLC

Soil Boring Log

Plate 3

December 2016

Appendix

R.T. Hicks Consultants, Ltd.
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Albuquerque, NM 87104

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

November 11, 2016

David Hamilton

R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104
TEL: (505) 266-5004
FAX (505) 266-0745

RE: State CAC 3 OrderNo.: 1611296

Dear David Hamilton:

Hall Environmental Analysis Laboratory received 3 sample(s) on 11/4/2016 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 qualifers 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1611296**
Date Reported: **11/11/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: SB-1 25'
Project: State CAC 3
Collection Date: 11/2/2016 11:45:00 AM
Lab ID: 1611296-001
Matrix: SOIL
Received Date: 11/4/2016 4:55:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	330	30		mg/Kg	20	11/8/2016 3:56:20 PM	28541

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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: SB-1 30'
Project: State CAC 3
Collection Date: 11/2/2016 1:10:00 PM
Lab ID: 1611296-002
Matrix: SOIL
Received Date: 11/4/2016 4:55:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	280	30		mg/Kg	20	11/8/2016 4:21:08 PM	28541

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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Client Sample ID: SB-1 45'-60'
Project: State CAC 3
Collection Date: 11/2/2016 6:10:00 PM
Lab ID: 1611296-003
Matrix: AQUEOUS
Received Date: 11/4/2016 4:55:00 PM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	760	25	*	mg/L	50	11/9/2016 4:51:02 PM	R38595

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
R	RPD outside accepted recovery limits	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#: **1611296**

11-Nov-16

Client: R.T. Hicks Consultants, LTD

Project: State CAC 3

Sample ID	**MB-28541**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**28541**	RunNo:	**38555**					
Prep Date:	**11/8/2016**	Analysis Date:	**11/8/2016**	SeqNo:	**1204508**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-28541**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**28541**	RunNo:	**38555**					
Prep Date:	**11/8/2016**	Analysis Date:	**11/8/2016**	SeqNo:	**1204509**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	91.4	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
R	RPD outside accepted recovery limits	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#: **1611296**

11-Nov-16

Client: R.T. Hicks Consultants, LTD

Project: State CAC 3

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R38595**	RunNo: **38595**
Prep Date:	Analysis Date: **11/9/2016**	SeqNo: **1205548** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R38595**	RunNo: **38595**
Prep Date:	Analysis Date: **11/9/2016**	SeqNo: **1205550** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	94.4	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
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: RT HICKS | Work Order Number: 1611296 | RcptNo: 1

Received by/date: LC 11/04/16

Logged By: **Lindsay Mangin** 11/4/2016 4:55:00 PM

Completed By: **Lindsay Mangin** 11/7/2016 9:00:29 AM

Reviewed By: AJ 11/07/16

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?	Client		

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	Approved by client. Yes ☐	No ☑	NA ☐
6. Sample(s) in proper container(s)?	Approved by client. 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: For Sample -003: Poured off water from the 2-4oz. jars that were submitted, into a 125mL unp. container for Cl analysis. mg 11/7/16

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	20.3	Good	Not Present			

Chain-of-Custody Record

Client: RT Hicks Consultants

Mailing Address: 901 Rio Grande NW Suite F-142 Alb. N.M. 87104

Phone #: 505 266 5004

Mail or Fax#: david@rthicksconsult.com

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

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name: State CAC #3

Project #:

Project Manager: David Hamilton

Sampler: DH

On Ice: ☐ Yes ☒ No

Sample Temperature: 20.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1611296	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^-, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)				Air Bubbles (Y or N)
-2	11:45	Soil	SB-1 25'	1 4oz glass	I	-001								X							
↓	13:10	Soil	SB-1 30'	↓	I	-002								X							
↓	18:10	water	SB-1 45'-60'	2 4oz glass	↓	-003								X							

Date	Time	Relinquished by	Received by	Date	Time
:4	16:55	David Hamilton	Lindsey Concha	11/04/16	1655
		Relinquished by:	Received by:		

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

December 19, 2016

David Hamilton

R.T. Hicks Consultants, LTD
901 Rio Grande Blvd. NW
Suite F-142
Albuquerque, NM 87104
TEL: (505) 266-5004
FAX (505) 266-0745

RE: State C AC #3 OrderNo.: 1612592

Dear David Hamilton:

Hall Environmental Analysis Laboratory received 2 sample(s) on 12/12/2016 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 qualifers 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,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order: **1612592**
Date Reported: **12/19/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD
Project: State C AC #3
Lab Order: 1612592

Lab ID: 1612592-001 **Collection Date:** 11/2/2016
Client Sample ID: SB-1 40' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	420	30	H	mg/Kg	20	12/16/2016 2:11:43 PM	29244

Lab ID: 1612592-002 **Collection Date:** 11/2/2016
Client Sample ID: SB-1 45' **Matrix:** SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	97	30	H	mg/Kg	20	12/16/2016 2:48:57 PM	29244

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
R	RPD outside accepted recovery limits	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#: **1612592**

19-Dec-16

Client: R.T. Hicks Consultants, LTD

Project: State C AC #3

Sample ID	**MB-29244**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**29244**	RunNo:	**39479**					
Prep Date:	**12/16/2016**	Analysis Date:	**12/16/2016**	SeqNo:	**1236224**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-29244**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**29244**	RunNo:	**39479**					
Prep Date:	**12/16/2016**	Analysis Date:	**12/16/2016**	SeqNo:	**1236225**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	15	1.5	15.00	0	98.7	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
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HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

Sample Log-In Check List

Client Name: RT HICKS | Work Order Number: 1612592 | RcptNo: 1

Received by/date: AT 12/12/16

Logged By: Anne Thorne 12/12/2016 9:40:00 AM

Completed By: Anne Thorne 12/12/2016 10:45:55 AM

Reviewed By: AT 12/12/16

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?	Client		

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**

Chain-of-Custody Record

Client: RT Hicks Consultants
901 Rio Grande NW Alb. NM 87104
Mailing Address:

Phone #: 505 266 5004
email or Fax#: david@rthicksconsult.com
QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush
Project Name: State C AC #3
Project #:
Project Manager: D. Hamilton
Sampler: DH
On Ice: ☐ Yes ☒ No
Sample Temperature: 20.2

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

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1612592	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)
11-2		Soil	~~SB-1~~ SB-1 40'			-001								X								
11-2		Soil	SB-1 45'			-002								X								

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
12-12	9:40	David Hamilton		12/12/16	0940	
Date:	Time:	Relinquished by:	Received by:	Date	Time	

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.