

# Additional Information

Water Sample Results  
Received: 01/24/2020



### Legend

★ Proposed SWD

### NMOSE PODs

#### Status

- Active (2)
- Pending (1)
- Change Location of Well (0)
- Capped (1)
- Plugged (0)
- Incomplete (0)
- Unknown (1)

## Water Wells Area of Review

### BRAN 1 FEDERAL SWD #1 Lea County, New Mexico

Proj Mgr:  
Dan Arthur

November 14, 2019

Mapped by:  
Ben Bockelmann

Prepared for:  
**SELECT**  
ENERGY SERVICES

Prepared by:  
**ALL**CONSULTING

0 0.25 0.5 1 Miles

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Water Well Sampling Rationale					
Select Energy Services - Bran 1 Federal SWD #1					
Water Wells	Owner	Available Contact Information	Use	Sampling Required	Notes
C 03537 POD1	Kiehne Oliver	Oliver D. Kiehe Phone: 432-448-6337	Domestic & Live Stock	No	Mr. Keihe provided us with permission to sample any of his active water wells. Upon arriving at the location, we were informed by the ranch manager Abraham, that only one of the 5 water wells were currently active, as the other 4 either had broken water pumps or no water pump. The water well (C 02271) was not located where the state engineer office shows it on their pod viewer map. Abraham was able to confirm that the water well sampled was water well C-02271 but was unsure if it was POD 1 or POD 2. The location of the water well, that was sampled on 11-12-2019, is shown on the water well AOR map.  A copy of the water sampling result will be provided to the water well owner. (Oliver_Kiehne@yahoo.com)
C 02271				Yes	
C 02271 POD2				No	
C 02323				No	
C 03595 POD1				No	
Notes:					

## Water Sampling Results Summary for Select Energy, LLC

Proposed SWD:		Bran 1 Federal SWD #1	
Sample ID:		C-02323-GW1	
Water Well ID:		C-02271	
Group	Analyte	Results	Units
<b>Inorganic Compounds</b>	Alkalinity, Bicarbonate	229	mg/L
	Alkalinity Carbonate	<1.00	mg/L
	Chloride	332	mg/L
	Conductivity	3040	uS/cm
	pH	7.24	pH/Units
	Resistivity	3.29	Ohms/m
	Sulfate	434	mg/L
	TDS	1940	mg/L
	Alkalinity Total	188	mg/L
	TSS	<2.00	mg/L
<b>Volatile Organic Compounds (VOC)</b>	Benzene	<0.001	mg/L
	Toluene	<0.001	mg/L
	Ethylbenzene	<0.001	mg/L
	Total Xylenes	<0.003	mg/L
	Total BTEX	<0.006	mg/L
<b>Total Recoverable Metals</b>	Barium	0.027	mg/L
	Calcium	338	mg/L
	Hardness As CaCo <sup>3</sup>	1350	mg/L
	Iron	<0.174	mg/L
	Magnesium	124	mg/L
	Potassium	9.77	mg/L
	Sodium	125	mg/L
Strontium	6.84	mg/L	



January 10, 2020

NATE ALLEMAN  
ALL CONSULTING, LLC  
1718 S. CHEYENNE AVE.  
TULSA, OK 74119

RE: GW-1 WATER SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 11/12/19 13:40.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/ga/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/ga/lab_accred_certif.html).

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

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

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B	Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2	Regulated VOCs and Total Trihalomethanes (TTHM)
Method EPA 552.2	Total Haloacetic Acids (HAA-5)

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

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

Sincerely,

Celey D. Keene  
Lab Director/Quality Manager

**Analytical Results For:**ALL CONSULTING, LLC  
1718 S. CHEYENNE AVE.  
TULSA OK, 74119Project: GW-1 WATER SAMPLES  
Project Number: NONE GIVEN  
Project Manager: NATE ALLEMAN  
Fax To: NAReported:  
10-Jan-20 15:05

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C-02323 - GW-1	H903838-01	Water	12-Nov-19 08:35	12-Nov-19 13:40

01/10/2020- Client asked to split report into two separate reports. This is the revised report and will replace the one sent on 12/01/19.

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**C-02323 - GW-1**  
**H903838-01 (Water)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories**
**Inorganic Compounds**

Alkalinity, Bicarbonate	229		5.00	mg/L	1	9111204	AC	13-Nov-19	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	9111204	AC	13-Nov-19	310.1	
Chloride*	332		4.00	mg/L	1	9111209	AC	13-Nov-19	4500-Cl-B	
Conductivity*	3040		1.00	uS/cm	1	9111312	AC	13-Nov-19	120.1	
pH*	7.24		0.100	pH Units	1	9111312	AC	13-Nov-19	150.1	
Resistivity	3.29			Ohms/m	1	9111312	AC	13-Nov-19	120.1	
Sulfate*	434		62.5	mg/L	6.25	9111301	AC	13-Nov-19	375.4	
TDS*	1940		5.00	mg/L	1	9111205	AC	19-Nov-19	160.1	
Alkalinity, Total*	188		4.00	mg/L	1	9111204	AC	13-Nov-19	310.1	
TSS*	<2.00		2.00	mg/L	1	9111402	AC	15-Nov-19	160.2	

**Volatile Organic Compounds by EPA Method 8021**

Benzene*	<0.001		0.001	mg/L	1	9111314	MS	13-Nov-19	8021B	
Toluene*	<0.001		0.001	mg/L	1	9111314	MS	13-Nov-19	8021B	
Ethylbenzene*	<0.001		0.001	mg/L	1	9111314	MS	13-Nov-19	8021B	
Total Xylenes*	<0.003		0.003	mg/L	1	9111314	MS	13-Nov-19	8021B	
Total BTEX	<0.006		0.006	mg/L	1	9111314	MS	13-Nov-19	8021B	
Surrogate: 4-Bromofluorobenzene (PID)			102 %		74-98	9111314	MS	13-Nov-19	8021B	

**Green Analytical Laboratories**
**Total Recoverable Metals by ICP (E200.7)**

Barium*	0.027	0.010	0.500	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	J
Calcium*	338	0.143	1.00	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	
Hardness as CaCO3	1350		6.62	mg/L	10	[CALC]	AES	22-Nov-19	2340 B	
Iron*	<0.174	0.174	0.500	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	
Magnesium*	124	0.226	1.00	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	
Potassium*	9.77	0.677	10.0	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	J
Sodium*	125	4.83	10.0	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**C-02323 - GW-1**  
**H903838-01 (Water)**

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Green Analytical Laboratories**
**Total Recoverable Metals by ICP (E200.7)**

<b>Strontium*</b>	<b>6.84</b>	0.020	1.00	mg/L	10	B911177	AES	22-Nov-19	EPA200.7	
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\*=Accredited Analyte

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 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**Inorganic Compounds - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	%REC Limits	RPD RPD	RPD Limit	Notes
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**Batch 9111204 - General Prep - Wet Chem**
**Blank (9111204-BLK1)**

Prepared &amp; Analyzed: 13-Nov-19

Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	5.00	5.00	mg/L							
Alkalinity, Total	4.00	4.00	mg/L							

**LCS (9111204-BS1)**

Prepared &amp; Analyzed: 13-Nov-19

Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	318	12.5	mg/L				80-120			
Alkalinity, Total	260	10.0	mg/L	250		104	80-120			

**LCS Dup (9111204-BSD1)**

Prepared &amp; Analyzed: 13-Nov-19

Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	305	12.5	mg/L				80-120	4.02	20	
Alkalinity, Total	250	10.0	mg/L	250		100	80-120	3.92	20	

**Batch 9111205 - Filtration**
**Blank (9111205-BLK1)**

Prepared: 12-Nov-19 Analyzed: 14-Nov-19

TDS	ND	5.00	mg/L							
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**LCS (9111205-BS1)**

Prepared: 12-Nov-19 Analyzed: 14-Nov-19

TDS	564		mg/L	527		107	80-120			
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**Duplicate (9111205-DUP1)**

Source: H903816-01

Prepared: 12-Nov-19 Analyzed: 14-Nov-19

TDS	122000	5.00	mg/L		121000			0.964	20	
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**Batch 9111209 - General Prep - Wet Chem**
**Blank (9111209-BLK1)**

Prepared: 12-Nov-19 Analyzed: 13-Nov-19

Chloride	ND	4.00	mg/L							
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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**Inorganic Compounds - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9111209 - General Prep - Wet Chem**
**LCS (9111209-BS1)**

Prepared: 12-Nov-19 Analyzed: 13-Nov-19

Chloride	104	4.00	mg/L	100		104	80-120			
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**LCS Dup (9111209-BSD1)**

Prepared: 12-Nov-19 Analyzed: 13-Nov-19

Chloride	104	4.00	mg/L	100		104	80-120	0.00	20	
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**Batch 9111301 - General Prep - Wet Chem**
**Blank (9111301-BLK1)**

Prepared &amp; Analyzed: 13-Nov-19

Sulfate	ND	10.0	mg/L							
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**LCS (9111301-BS1)**

Prepared &amp; Analyzed: 13-Nov-19

Sulfate	19.5	10.0	mg/L	20.0		97.4	80-120			
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**LCS Dup (9111301-BSD1)**

Prepared &amp; Analyzed: 13-Nov-19

Sulfate	19.2	10.0	mg/L	20.0		95.8	80-120	1.60	20	
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**Batch 9111312 - General Prep - Wet Chem**
**LCS (9111312-BS1)**

Prepared &amp; Analyzed: 13-Nov-19

pH	7.06		pH Units	7.00		101	90-110			
Conductivity	52100		uS/cm	50000		104	80-120			

**Duplicate (9111312-DUP1)**

Source: H903838-01

Prepared &amp; Analyzed: 13-Nov-19

pH	7.29	0.100	pH Units		7.24			0.688	20	
Conductivity	3030	1.00	uS/cm		3040			0.329	20	
Resistivity	3.30		Ohms/m		3.29			0.329	20	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**Inorganic Compounds - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9111402 - Filtration**
**Blank (9111402-BLK1)**

Prepared: 14-Nov-19 Analyzed: 15-Nov-19

TSS	ND	2.00	mg/L							
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**Duplicate (9111402-DUP1)**

Source: H903838-01

Prepared: 14-Nov-19 Analyzed: 15-Nov-19

TSS	ND	2.00	mg/L		ND				52.7	
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 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**Volatile Organic Compounds by EPA Method 8021 - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 9111314 - Volatiles**
**Blank (9111314-BLK1)**

Prepared &amp; Analyzed: 13-Nov-19

Benzene	ND	0.001	mg/L							
Toluene	ND	0.001	mg/L							
Ethylbenzene	ND	0.001	mg/L							
Total Xylenes	ND	0.003	mg/L							
Total BTEX	ND	0.006	mg/L							
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0488</i>		mg/L	<i>0.0500</i>		<i>97.7</i>	<i>74-98</i>			

**LCS (9111314-BS1)**

Prepared &amp; Analyzed: 13-Nov-19

Benzene	0.020	0.001	mg/L	0.0200		99.3	83.2-115			
Toluene	0.020	0.001	mg/L	0.0200		99.5	77.4-114			
Ethylbenzene	0.021	0.001	mg/L	0.0200		103	71.7-116			
Total Xylenes	0.060	0.003	mg/L	0.0600		101	73.4-116			
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0478</i>		mg/L	<i>0.0500</i>		<i>95.5</i>	<i>74-98</i>			

**LCS Dup (9111314-BSD1)**

Prepared &amp; Analyzed: 13-Nov-19

Benzene	0.020	0.001	mg/L	0.0200		101	83.2-115	1.96	4.87	
Toluene	0.021	0.001	mg/L	0.0200		103	77.4-114	3.37	2.88	QR-02
Ethylbenzene	0.021	0.001	mg/L	0.0200		106	71.7-116	3.11	3.24	
Total Xylenes	0.062	0.003	mg/L	0.0600		104	73.4-116	3.25	2.62	QR-02
<i>Surrogate: 4-Bromofluorobenzene (PID)</i>	<i>0.0494</i>		mg/L	<i>0.0500</i>		<i>98.8</i>	<i>74-98</i>			

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 ALL CONSULTING, LLC  
 1718 S. CHEYENNE AVE.  
 TULSA OK, 74119

 Project: GW-1 WATER SAMPLES  
 Project Number: NONE GIVEN  
 Project Manager: NATE ALLEMAN  
 Fax To: NA

 Reported:  
 10-Jan-20 15:05

**Total Recoverable Metals by ICP (E200.7) - Quality Control**
**Green Analytical Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch B911177 - Total Rec. 200.7/200.8/200.2**
**Blank (B911177-BLK1)**

Prepared: 19-Nov-19 Analyzed: 21-Nov-19

Calcium	ND	0.100	mg/L							
Strontium	ND	0.100	mg/L							
Iron	ND	0.050	mg/L							
Magnesium	ND	0.100	mg/L							
Potassium	ND	1.00	mg/L							
Sodium	ND	1.00	mg/L							
Barium	ND	0.050	mg/L							

**LCS (B911177-BS1)**

Prepared: 19-Nov-19 Analyzed: 21-Nov-19

Magnesium	20.2	0.100	mg/L	20.0		101	85-115			
Sodium	3.26	1.00	mg/L	3.24		101	85-115			
Barium	1.98	0.050	mg/L	2.00		99.0	85-115			
Potassium	8.45	1.00	mg/L	8.00		106	85-115			
Calcium	4.05	0.100	mg/L	4.00		101	85-115			
Iron	4.01	0.050	mg/L	4.00		100	85-115			
Strontium	4.03	0.100	mg/L	4.00		101	85-115			

**LCS Dup (B911177-BSD1)**

Prepared: 19-Nov-19 Analyzed: 21-Nov-19

Barium	2.00	0.050	mg/L	2.00		100	85-115	1.03	20	
Strontium	4.04	0.100	mg/L	4.00		101	85-115	0.372	20	
Sodium	3.27	1.00	mg/L	3.24		101	85-115	0.213	20	
Calcium	4.05	0.100	mg/L	4.00		101	85-115	0.0388	20	
Magnesium	20.2	0.100	mg/L	20.0		101	85-115	0.0360	20	
Iron	4.00	0.050	mg/L	4.00		100	85-115	0.251	20	
Potassium	8.41	1.00	mg/L	8.00		105	85-115	0.486	20	

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
J	Estimated concentration. Analyte concentration between MDL and RL.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager

