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Automated Report

Technical Report for

Kerr-McGee Oil & Gas Onshore LP

GWA_High_Sierra_Water_Well

FID:754022 Reg:Vol. Freq.:Q1

SGS Job Number: DA13311

Sampling Date: 02/04/19

Report to:

Kerr-McGee Oil & Gas Onshore LP
112 High Street
Buffalo, WY 82834
tanya.cude@absarokasolutions.com; anadarkodatamanagement@ghd.com; joel.mason@absarokasolutions.com; max.moran@absarokasolutions.com
ATTN: Tanya Cude

Total number of pages in report: 51

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Scott Heideman
Laboratory Director

Client Service contact: Carissa Cumine 303-425-6021

Certifications: CO (CO00049), ID (CO00049), NE (NE-OS-06-04), ND (R-027), NJ (CO007), OK (D9942) UT (NELAP CO00049), LA (LA150028), TX (T104704511), WY (8TMS-L)

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Sample Summary

Kerr-McGee Oil & Gas Onshore LP

Job No: DA13311

GWA_High_Sierra_Water_Well
Project No: FID:754022 Reg:Vol. Freq.:Q1

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
DA13311-1	02/04/19	16:37	TS	02/05/19	AQ	Ground Water	BW_SIERRA_272956 SESE_30_3N_65W
DA13311-1A	02/04/19	16:37	TS	02/05/19	AQ	Ground Water	BW_SIERRA_272956 SESE_30_3N_65W
DA13311-1B	02/04/19	16:37	TS	02/05/19	AQ	Ground Water	BW_SIERRA_272956 SESE_30_3N_65W
DA13311-1F	02/04/19	16:37	TS	02/05/19	AQ	Groundwater Filtered	BW_SIERRA_272956 SESE_30_3N_65W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Kerr-McGee Oil & Gas Onshore LP	**Job No**	DA13311
Site:	GWA_High_Sierra_Water_Well	**Report Date**	2/19/2019 2:51:31 PM

On 02/05/2019, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 1.5 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA13311 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Volatiles By Method SW846 8260B

Matrix: AQ **Batch ID:** V7V2990

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12306-11MS, DA12306-11MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

GC Volatiles By Method RSK175 MOD

Matrix: AQ **Batch ID:** GFB1050

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12301-24MS, DA12301-24MSD were used as the QC samples indicated.
- DA13311-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2305

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12301-7MS, DA12301-7MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

GC/LC Semi-volatiles By Method SW846-8015B

Matrix: AQ **Batch ID:** OP17434

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) DA12301-2MS, DA12301-2MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals Analysis By Method EPA 200.7

Matrix: AQ **Batch ID:** MP27288

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13316-1AMS, DA13316-1AMSD were used as the QC samples for the metals analysis.

Metals Analysis By Method EPA 200.8

Matrix: AQ	Batch ID: MP27300

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13293-2AMS, DA13293-2AMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ	Batch ID: R46571

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA13311-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ	Batch ID: GP24561

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13311-1MS, DA13388-1DUP were used as the QC samples for the Phosphorus, Total analysis.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ	Batch ID: GP24531

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12301-8MS, DA12301-8MSD were used as the QC samples for the Bromide, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Bromide analysis.
- DA13311-1 for Nitrogen, Nitrate: Elevated detection limit due to matrix interference.

Matrix: AQ	Batch ID: GP24536

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13311-1MS, DA13311-1MSD were used as the QC samples for the Chloride, Sulfate, Chloride analysis.

General Chemistry By Method HACH IRB-BART

Matrix: AQ	Batch ID: MB1143

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method HACH SLYM-BART

Matrix: AQ	Batch ID: MB1144

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method HACH SRB-BART

Matrix: AQ	Batch ID: MB1145

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method SM 2320B-2011

Matrix: AQ	Batch ID: GN46040

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13256-1AMS, DA13256-1AMSD, DA13259-1DUP were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

Matrix: AQ	Batch ID: GN46041

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

Matrix: AQ	Batch ID: GN46043

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

General Chemistry By Method SM 2510B-2011

Matrix: AQ	Batch ID: GP24542

- Sample(s) DA13259-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ	Batch ID: GN46030

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA13369-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ	Batch ID: GN46076

- The data for SM1030E-2011 meets quality control requirements.

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ	Batch ID: GN46038

- Sample(s) DA13259-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA13311-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ	Batch ID: R46582

- The data for FIELD meets quality control requirements.

SGS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting SGS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by SGS indicated via signature on the report cover.

Summary of Hits

Job Number: DA13311
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well
Collected: 02/04/19

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA13311-1	**BW_SIERRA_272956 SESE_30_3N_65W**					
Alkalinity, Bicarbonate as CaCO3		232	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		232	5.0		mg/l	SM 2320B-2011
Bromide		1.4	0.25		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance		2.2			%	SM1030E-2011
Chloride		191	50		mg/l	EPA300.0/SW846 9056A
Fluoride		0.58	0.50		mg/l	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [a]		0.12	0.070		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrite		0.12	0.020		mg/l	EPA300.0/SW846 9056A
Solids, Total Dissolved		2630	10		mg/l	SM 2540C-2011
Specific Conductivity		3880	1.0		umhos/cm	SM 2510B-2011
Sulfate		1520	50		mg/l	EPA300.0/SW846 9056A
pH [b]		7.89			su	SM4500HB+-2011/9040C
pH (Field)		7.47			su	FIELD
Turbidity		0.02			NTU	FIELD
Temperature (Field)		8.9			Deg. C	FIELD
Specific Conductivity (Field)		4038	0.50		umhos/cm	FIELD
DA13311-1A	**BW_SIERRA_272956 SESE_30_3N_65W**					
Methane [c]		0.796	0.0040	0.0020	mg/l	RSK175 MOD
DA13311-1B	**BW_SIERRA_272956 SESE_30_3N_65W**					
Iron-Related Bacteria		9000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		13000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		1400	200		CFU/ml	HACH SRB-BART
DA13311-1F	**BW_SIERRA_272956 SESE_30_3N_65W**					
Barium		0.0085	0.0040		mg/l	EPA 200.8
Boron		0.116	0.050		mg/l	EPA 200.7
Calcium		59.5	0.40		mg/l	EPA 200.7
Magnesium		12.1	0.20		mg/l	EPA 200.7
Manganese		0.0868	0.0050		mg/l	EPA 200.7
Potassium		5.88	1.0		mg/l	EPA 200.7
Sodium		823	0.40		mg/l	EPA 200.7
Strontium		1.51	0.0050		mg/l	EPA 200.7

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Analysis performed past recommended hold time.
(c) The pH of the sample was > 2 at time of analysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1	**Date Sampled:**	02/04/19
Matrix:	AQ - Ground Water	**Date Received:**	02/05/19
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	GWA_High_Sierra_Water_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V58598.D	1	02/06/19 19:31	MB	n/a	n/a	V7V2990
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		70-130%
17060-07-0	1,2-Dichloroethane-D4	95%		70-130%
2037-26-5	Toluene-D8	95%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1	**Date Sampled:**	02/04/19
Matrix:	AQ - Ground Water	**Date Received:**	02/05/19
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	GWA_High_Sierra_Water_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB48980.D	1	02/07/19 00:06	BB	n/a	n/a	GGB2305
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.050	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	92%		60-140%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1	**Date Sampled:**	02/04/19
Matrix:	AQ - Ground Water	**Date Received:**	02/05/19
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	GWA_High_Sierra_Water_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FC62532.D	1	02/08/19 16:44	RB	02/07/19	OP17434	GFC2558
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.19	0.17	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	64%		11-142%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: BW_SIERRA_272956 SESE_30_3N_65W
Lab Sample ID: DA13311-1
Matrix: AQ - Ground Water
Project: GWA_High_Sierra_Water_Well

Date Sampled: 02/04/19
Date Received: 02/05/19
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	232	5.0	mg/l	1	02/07/19 09:00	PV	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	02/07/19 09:00	PV	SM 2320B-2011
Alkalinity, Total as CaCO3	232	5.0	mg/l	1	02/07/19 09:00	PV	SM 2320B-2011
Bromide	1.4	0.25	mg/l	5	02/05/19 16:58	JB	EPA300.0/SW846 9056A
Cation Anion Balance	2.2		%	1	02/12/19	KM	SM1030E-2011
Chloride	191	50	mg/l	100	02/06/19 11:32	JB	EPA300.0/SW846 9056A
Fluoride	0.58	0.50	mg/l	5	02/05/19 16:58	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate [a]	< 0.050	0.050	mg/l	5	02/05/19 16:58	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [b]	0.12	0.070	mg/l	1	02/05/19 16:58	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.12	0.020	mg/l	5	02/05/19 16:58	JB	EPA300.0/SW846 9056A
Phosphorus, Total	< 0.010	0.010	mg/l	1	02/09/19 11:46	AM	EPA 365.1
Solids, Total Dissolved	2630	10	mg/l	1	02/07/19	SK	SM 2540C-2011
Specific Conductivity	3880	1.0	umhos/cm	1	02/07/19 09:00	PV	SM 2510B-2011
Sulfate	1520	50	mg/l	100	02/06/19 11:32	JB	EPA300.0/SW846 9056A
pH [c]	7.89		su	1	02/07/19 09:00	PV	SM4500HB+-2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0		mg/l	1	02/11/19	SUB	FIELD
Redox Potential Vs H2	-53.5		mv	1	02/11/19	SUB	FIELD
Specific Conductivity (Field)	4038	0.50	umhos/cm	1	02/11/19	SUB	FIELD
Temperature (Field)	8.9		Deg. C	1	02/11/19	SUB	FIELD
Turbidity	0.02		NTU	1	02/11/19	SUB	FIELD
pH (Field)	7.47		su	1	02/11/19	SUB	FIELD

(a) Elevated detection limit due to matrix interference.
(b) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(c) Analysis performed past recommended hold time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1A	**Date Sampled:**	02/04/19
Matrix:	AQ - Ground Water	**Date Received:**	02/05/19
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	GWA_High_Sierra_Water_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB23138.D	1	02/11/19 13:38	BB	n/a	n/a	GFB1050
Run #2 [a]	FB23139.D	5	02/11/19 13:46	BB	n/a	n/a	GFB1050

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	18.8 Deg. C
Run #2	39.0 ml	4.0 ml	500 ul	18.8 Deg. C

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.796 [b]	0.0040	0.0020	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

(a) The pH of the sample was > 2 at time of analysis.
(b) Result is from Run# 2

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1B	**Date Sampled:**	02/04/19
Matrix:	AQ - Ground Water	**Date Received:**	02/05/19
		Percent Solids:	n/a
Project:	GWA_High_Sierra_Water_Well		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	9000	25	CFU/ml	1	02/11/19 13:30	SK	HACH IRB-BART
Slime Forming Bacteria	13000	500	CFU/ml	1	02/11/19 13:30	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	1400	200	CFU/ml	1	02/11/19 13:30	SK	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_SIERRA_272956 SESE_30_3N_65W		
Lab Sample ID:	DA13311-1F	**Date Sampled:**	02/04/19
Matrix:	AQ - Groundwater Filtered	**Date Received:**	02/05/19
		Percent Solids:	n/a
Project:	GWA_High_Sierra_Water_Well		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.0085	0.0040	mg/l	2	02/06/19	02/06/19	EP	EPA 200.8 [2]	EPA 200.8 [5]
Boron	0.116	0.050	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]
Calcium	59.5	0.40	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]
Iron	< 0.010	0.010	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]
Magnesium	12.1	0.20	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]
Manganese	0.0868	0.0050	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]
Potassium	5.88	1.0	mg/l	1	02/06/19	02/07/19	JR	EPA 200.7 [3]	EPA 200.7 [4]
Selenium	< 0.00080	0.00080	mg/l	2	02/06/19	02/06/19	EP	EPA 200.8 [2]	EPA 200.8 [5]
Sodium	823	0.40	mg/l	1	02/06/19	02/07/19	JR	EPA 200.7 [3]	EPA 200.7 [4]
Strontium	1.51	0.0050	mg/l	1	02/06/19	02/06/19	JR	EPA 200.7 [1]	EPA 200.7 [4]

(1) Instrument QC Batch: MA11006
(2) Instrument QC Batch: MA11007
(3) Instrument QC Batch: MA11012
(4) Prep QC Batch: MP27288
(5) Prep QC Batch: MP27300

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

4036 Youngfield Street, Wheat Ridge, CO 80033
TEL: 303-425-6021 FAX: 303-425-6854
www.accutest.com

Bottle Order Control #	FED-EX Tracking #
SGS Quote #	SGS Job # DA13311

Client / Reporting Information		Project Information		Billing Information (if different from Report to)	
Company:	(Report to) Absaroka Solutions	Project Name:	GWA_High_Sierra_Water_Well	Frequency:	Q1
Street:	112 High Street	Regulation:	Voluntary		
City, State:	Buffalo, WY 82834	Facility ID:	754022	Company:	Anadarko Petroleum Corportation (APC)
Project Contact:	Tanya Cude	EQuIS Facility Code:	0089019-AN-GWABWQ	Street Address:	1099 18th Street, Suite 1800
Phone:	352-318-4034	Client Purchase Order #:	WO#89225209	City, State ZIP:	Denver, CO 80202-1918
Email:					
Sampler(s) Name(s):	Tyler Scherden	Project Manager:	Joel Mason	Attention:	Erik Mickelson User ID: fvv451

	Collection					Number of preserved Bottles											Requested Analysis (see TEST CODE sheet)										Matrix Codes
Field ID / Point of Collection	Date	Time	Sampled by	Matrix	# of bottles	NONE	HCl	NaOH	HNO3	H2SO4	DI Water	MEOH	ENCORE	Na2S2O4	Other		PH, SCON, TDS	XCARBICALK	BRO, CHL, F, NO2, XNO3O, NO32, SO4	TPO4	Dissolved Metals - Lab Filtered*	VRSK175DGMEP	V8260BTX	B8015DRO	V8015GRO	IRBAC, SFBAC, SO4RBAC	CABAL	LAB USE ONLY
BW_Sierra_272956	2/4/2019	1637	TS	GW	17	9	6			1					1		X	X	X	X	X	X	X	X	X	X	X	C1
SESE_30_3N_65W																												
Temperature, field	8.9	°C																										
pH, field	7.47	s.u.																										
Specific Conductivity, field	4038	uS/cm																										
Oxidation Reduction Potential, field	-53.5	mV																										
Dissolved Oxygen, field	0.00	mg/L																										
Turbidity, field	0.02	NTU																										

Turnaround Time (Business days)

- [x] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day Emergency
- [ ] 2 Day Emergency
- [ ] 1 Day Emergency

Special Reporting Instructions
- [ ] Report in PPB
- [ ] Report in PPM
- [ ] Report MDLs

Emergency & Rush T/A data available VIA LabLink. RUSH TAT approval needed.

Data Deliverable Information

- [ ] Commercial "A" (Level 1, Results Only)
- [ ] Commercial "B" (Level 2, Results + QC Summary)
- [ ] COMMBN (Results/QC/Narrative)
- [ ] COMMBN+ [Results/QC/Narrative (+ chromatograms)]
- [ ] REDT2
- [ ] FULT1
- [x] EDD Format: COGCC Compatible

Comments / Special Instructions

*Dissolved Metals (200.7/200.8): BaMS, B, Ca, Fe,Mg, Mn, K, SeMS, Na, Sr

Please also send reports to Joel.Mason@Absarokasolutions.com and Max.Moran@Absarokasolutions.com

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date/Time:	Received By:	Relinquished By:	Date/Time:	Received By:
1	2/4/19 1800	1	2/5/19 213:05		2
Relinquished by Sampler:	Date/Time:	Received By:	Relinquished By:	Date/Time:	Received By:
3		3	4		4

Custody Seal # 0010720 Intact [x] Not Intact [ ] Absent [ ] Preserved where applicable [ ] Cooler Temp. °C: 4 Therm. ID: [ ] On Ice [x]

SGS Accutest Sample Receipt Summary

Job Number: DA13311 **Client:** ABSAROKA **Project:** GWA

Date / Time Received: 2/5/2019 1:05:00 PM **Delivery Method:** **Airbill #'s:** CO

Cooler Temps (Initial/Adjusted): #1: (1.5/1.5);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun;		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	1		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☑		☐	☐
2. Trip Blank listed on COC:	☑		☐	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☑		☐	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

MS Volatiles

6

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2990-MB	7V58582A.D	1	02/06/19	MB	n/a	n/a	V7V2990

The QC reported here applies to the following samples: **Method:** SW846 8260B

DA13311-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.50	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
	m,p-Xylene	ND	1.0	0.70	ug/l	
95-47-6	o-Xylene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
17060-07-0	1,2-Dichloroethane-D4	95%	70-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	103%	70-130%

Blank Spike Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2990-BS	7V58583A.D	1	02/06/19	MB	n/a	n/a	V7V2990

The QC reported here applies to the following samples: **Method:** SW846 8260B

DA13311-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	50.8	102	70-130
100-41-4	Ethylbenzene	50	47.6	95	69-130
108-88-3	Toluene	50	47.3	95	70-130
	m,p-Xylene	100	96.6	97	70-130
95-47-6	o-Xylene	50	48.1	96	70-130
1330-20-7	Xylene (total)	150	145	97	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	70-130%
17060-07-0	1,2-Dichloroethane-D4	96%	70-130%
2037-26-5	Toluene-D8	95%	70-130%
460-00-4	4-Bromofluorobenzene	104%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12306-11MS	7V58584A.D	1	02/06/19	MB	n/a	n/a	V7V2990
DA12306-11MSD	7V58585A.D	1	02/06/19	MB	n/a	n/a	V7V2990
DA12306-11	7V58587A.D	1	02/06/19	MB	n/a	n/a	V7V2990

The QC reported here applies to the following samples: **Method:** SW846 8260B

DA13311-1

CAS No.	Compound	DA12306-11 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		50	53.1	106	50	51.4	103	3	67-130/30
100-41-4	Ethylbenzene	ND		50	50.0	100	50	49.4	99	1	69-130/30
108-88-3	Toluene	1.3		50	49.5	96	50	49.2	96	1	70-130/30
	m,p-Xylene	ND		100	100	100	100	100	100	0	70-130/30
95-47-6	o-Xylene	ND		50	50.3	101	50	49.7	99	1	70-130/30
1330-20-7	Xylene (total)	ND		150	151	101	150	150	100	1	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12306-11	Limits
1868-53-7	Dibromofluoromethane	101%	101%	99%	70-130%
17060-07-0	1,2-Dichloroethane-D4	100%	96%	94%	70-130%
2037-26-5	Toluene-D8	94%	94%	96%	70-130%
460-00-4	4-Bromofluorobenzene	100%	104%	102%	70-130%

* = Outside of Control Limits.

GC Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2305-MB	GB48962.D	1	02/06/19	BB	n/a	n/a	GGB2305

The QC reported here applies to the following samples: **Method:** SW846 8015B

DA13311-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.050	0.050	mg/l	

CAS No.	Surrogate Recoveries		Limits
120-82-1	1,2,4-Trichlorobenzene	90%	60-140%

Method Blank Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1050-MB	FB23131.D	1	02/11/19	BB	n/a	n/a	GFB1050

The QC reported here applies to the following samples: **Method:** RSK175 MOD

DA13311-1A

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	
74-84-0	Ethane	ND	0.0016	0.00080	mg/l	
74-98-6	Propane	ND	0.0022	0.0011	mg/l	

Blank Spike Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2305-BS	GB48963.D	1	02/06/19	BB	n/a	n/a	GGB2305

The QC reported here applies to the following samples: **Method:** SW846 8015B

DA13311-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	1.89	86	51-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	94%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1050-BS	FB23132.D	10	02/11/19	BB	n/a	n/a	GFB1050

The QC reported here applies to the following samples: **Method:** RSK175 MOD

DA13311-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.528	103	70-133
74-84-0	Ethane	0.923	1.09	118	70-137
74-98-6	Propane	1.38	1.62	118	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12301-7MS	GB48964.D	1	02/06/19	BB	n/a	n/a	GGB2305
DA12301-7MSD	GB48965.D	1	02/06/19	BB	n/a	n/a	GGB2305
DA12301-7	GB48966.D	1	02/06/19	BB	n/a	n/a	GGB2305

The QC reported here applies to the following samples: **Method:** SW846 8015B

DA13311-1

CAS No.	Compound	DA12301-7 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	1.56	71	2.2	1.57	71	1	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12301-7	Limits
120-82-1	1,2,4-Trichlorobenzene	97%	97%	92%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12301-24MS	FB23134.D	10	02/11/19	BB	n/a	n/a	GFB1050
DA12301-24MSD	FB23135.D	10	02/11/19	BB	n/a	n/a	GFB1050
DA12301-24	FB23133.D	1	02/11/19	BB	n/a	n/a	GFB1050

The QC reported here applies to the following samples: **Method:** RSK175 MOD

DA13311-1A

CAS No.	Compound	DA12301-24 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.00047	J	0.512	0.501	98	0.512	0.497	97	1	15-196/30
74-84-0	Ethane	ND		0.923	1.02	111	0.923	1.01	109	1	53-144/30
74-98-6	Propane	ND		1.38	1.53	111	1.38	1.51	110	1	54-144/30

* = Outside of Control Limits.

GC/LC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17434-MB	FC62524.D	1	02/08/19	RB	02/07/19	OP17434	GFC2558

The QC reported here applies to the following samples: **Method:** SW846-8015B

DA13311-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.18	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	42%	11-142%

Blank Spike Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17434-BS	FC62525.D	1	02/08/19	RB	02/07/19	OP17434	GFC2558

The QC reported here applies to the following samples: **Method:** SW846-8015B

DA13311-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.42	68	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	38%	11-142%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA13311
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17434-MS	FC62526.D	1	02/08/19	RB	02/07/19	OP17434	GFC2558
OP17434-MSD	FC62527.D	1	02/08/19	RB	02/07/19	OP17434	GFC2558
DA12301-2	FC62528.D	1	02/08/19	RB	02/07/19	OP17434	GFC2558

The QC reported here applies to the following samples: **Method:** SW846-8015B

DA13311-1

CAS No.	Compound	DA12301-2 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND		5	4.69	94	5	3.92	78	18	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12301-2	Limits
84-15-1	o-Terphenyl	90%	70%	96%	11-142%

* = Outside of Control Limits.

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	46	30		
Antimony	30	14	10		
Arsenic	25	22	7		
Barium	10	.3	2		
Beryllium	10	1	1.3		
Boron	50	3.3	7.4	1.8	<50
Cadmium	10	1.9	1.6		
Calcium	400	6.6	53	19.7	<400
Chromium	10	1.1	1.7		
Cobalt	5.0	2.7	2.3		
Copper	10	4.6	2.3		
Iron	10	8.9	3.1	2.8	<10
Lead	50	13	6.3		
Lithium	5.0	.6	4		
Magnesium	200	50	31	9.2	<200
Manganese	5.0	.5	1.1	2.3	<5.0
Molybdenum	10	8.5	4.3		
Nickel	30	6.2	6.1		
Phosphorus	100	91	24		
Potassium	1000	84	250	-5.2	<1000
Selenium	50	30	21		
Silicon	50	41	45		
Silver	30	.6	4		
Sodium	400	13	51	17.6	<400
Strontium	5.0	.1	.6	0.0	<5.0
Thallium	10	17	7.5		
Tin	60	41	51		
Titanium	10	.5	1.9		
Uranium	50	3.9	8.5		
Vanadium	10	.9	.7		
Zinc	30	9	3.8		

Associated samples MP27288: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 02/06/19

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	DA13316-1A Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron	86.7	1140	1000	105.1	70-130
Cadmium					
Calcium	96700	118000	25000	82.4	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	273	5640	5000	107.3	70-130
Lead	anr				
Lithium					
Magnesium	25400	51300	25000	102.0	70-130
Manganese	453	940	500	96.6	70-130
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	4960	32900	25000	111.8	70-130
Selenium					
Silicon					
Silver					
Sodium	102000	131000	25000	116.0	70-130
Strontium	584	1070	500	95.2	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP27288: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	DA13316-1A Original MS	Spikelot ICPALL2	% Rec	QC Limits

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	DA13316-1A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron	86.7	1160	1000	107.1	1.7	20
Cadmium						
Calcium	96700	119000	25000	86.4	0.8	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	273	5650	5000	107.5	0.2	20
Lead	anr					
Lithium						
Magnesium	25400	51500	25000	102.8	0.4	20
Manganese	453	948	500	98.2	0.8	20
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	4960	33000	25000	112.2	0.3	20
Selenium						
Silicon						
Silver						
Sodium	102000	132000	25000	120.0	0.8	20
Strontium	584	1090	500	99.2	1.9	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP27288: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 02/06/19

Metal	DA13316-1A Original MSD	Spikelot ICPALL2 % Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	1030	1000	103.0	85-115
Cadmium				
Calcium	24500	25000	98.0	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	5250	5000	105.0	85-115
Lead	anr			
Lithium				
Magnesium	24700	25000	98.8	85-115
Manganese	482	500	96.4	85-115
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	27000	25000	108.0	85-115
Selenium				
Silicon				
Silver				
Sodium	25900	25000	103.6	85-115
Strontium	485	500	97.0	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP27288: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27288
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 02/06/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27300
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 02/06/19

Metal	RL	IDL	MDL	MB raw	final
Aluminum	50	1.1	2		
Antimony	0.40	.0022	.011		
Arsenic	0.20	.017	.044		
Barium	2.0	.016	.079	0.11	<2.0
Beryllium	0.20	.016	.069		
Boron	40	.49	2.1		
Cadmium	0.10	.036	.042		
Calcium	400	5.6	12		
Chromium	2.0	.053	.053		
Cobalt	0.20	.0049	.015		
Copper	2.0	.06	.13		
Iron	10	3.5	4.6		
Lead	0.50	.0079	.008		
Magnesium	100	1.3	1.3		
Manganese	1.0	.12	.13		
Molybdenum	1.0	.049	.029		
Nickel	2.0	.0088	.027		
Phosphorus	60	2.6	4.3		
Potassium	200	2.9	2.9		
Selenium	0.40	.06	.21	0.020	<0.40
Silver	0.10	.0019	.008		
Sodium	500	4.9	4.9		
Strontium	20	.01	.015		
Thallium	0.20	.0024	.005		
Tin	10	.063	1.3		
Titanium	2.0	.059	.092		
Uranium	0.20	.0017	.002		
Vanadium	1.0	.037	.2		
Zinc	10	.21	.96		

Associated samples MP27300: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27300
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 02/06/19

Metal	DA13293-2A Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	17.8	418	400	100.1	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lead	anr				
Magnesium					
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	0.80	194	200	96.6	70-130
Silver	anr				
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP27300: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27300
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 02/06/19

Metal	DA13293-2A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	17.8	425	400	101.8	1.7	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	0.80	197	200	98.1	1.5	20
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP27300: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

QC Batch ID: MP27300
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 02/06/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	388	400	97.0	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	192	200	96.0	85-115
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP27300: DA13311-1F

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN46041	5.0	2.8	mg/l	100	97.4	97.4	90-110%
Alkalinity, Carbonate	GN46043	5.0	2.8	mg/l	100	97.4	97.4	80-120%
Alkalinity, Total as CaCO3	GN46040	5.0	2.8	mg/l	100	97.4	97.4	90-110%
Bromide	GP24531/GN46021	0.050	0.0	mg/l	0.5	0.500	100.0	90-110%
Chloride	GP24531/GN46021	0.50	0.0	mg/l	5	4.91	98.2	90-110%
Chloride	GP24536/GN46029	0.50	0.0	mg/l	5	5.04	100.8	90-110%
Fluoride	GP24531/GN46021	0.10	0.0	mg/l	1	0.969	96.9	90-110%
Iron-Related Bacteria	MB1143	25	<25	CFU/ml				
Nitrogen, Nitrate	GP24531/GN46021	0.010	0.0	mg/l	0.1	0.101	101.0	90-110%
Nitrogen, Nitrate	GP24536/GN46029	0.010	0.0	mg/l	0.1	0.103	103.0	90-110%
Nitrogen, Nitrite	GP24531/GN46021	0.0040	0.0	mg/l	0.05	0.0495	99.0	90-110%
Nitrogen, Nitrite	GP24536/GN46029	0.0040	0.0	mg/l	0.05	0.0508	101.6	90-110%
Phosphorus, Total	GP24561/GN46060	0.010	0.00	mg/l	0.2	0.193	96.5	90-110%
Phosphorus, Total	GP24561/GN46060	0.010	0.00	mg/l	0.2	0.198	99.0	90-110%
Slime Forming Bacteria	MB1144	500	<500	CFU/ml				
Solids, Total Dissolved	GN46030	10	0.0	mg/l	400	402	100.5	90-110%
Specific Conductivity	GP24542/GN46039			umhos/cm	1413	1430	101.2	90-110%
Specific Conductivity	GP24542/GN46039			umhos/cm	98.8	101	101.9	90-110%
Specific Conductivity	GP24542/GN46039			umhos/cm	998	986	98.8	90-110%
Sulfate	GP24531/GN46021	0.50	0.0	mg/l	5	4.87	97.4	90-110%
Sulfate	GP24536/GN46029	0.50	0.0	mg/l	5	5.04	100.8	90-110%
Sulfate Reducing Bacteria	MB1145	200	<200	CFU/ml				
pH	GN46038			su	8.00	8.01	100.1	99.1-100.9%
pH	GN46038			su	8.00	7.98	99.8	99.1-100
pH	GN46038			su	8.00	7.98	99.8	99.1-100
pH	GN46038			su	6.00	6.00	100.0	99.1-100
pH	GN46038			su	6.00	6.00	100.0	99.1-100
pH	GN46038			su	8.00	8.01	100.1	99.1-100.9%

Associated Samples:
Batch MB1143: DA13311-1B
Batch MB1144: DA13311-1B
Batch MB1145: DA13311-1B
Batch GN46030: DA13311-1
Batch GN46038: DA13311-1
Batch GN46040: DA13311-1
Batch GN46041: DA13311-1
Batch GN46043: DA13311-1
Batch GP24531: DA13311-1
Batch GP24536: DA13311-1
Batch GP24542: DA13311-1
Batch GP24561: DA13311-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN46040	DA13259-1	mg/l	522	531	1.6	0-20%
Phosphorus, Total	GP24561/GN46060	DA13388-1	mg/l	0.077	0.0760	1.3	0-20%
Solids, Total Dissolved	GN46030	DA13369-1	mg/l	608	616	1.3	0-5%
Specific Conductivity	GP24542/GN46039	DA13259-1	umhos/cm	1200	1250	3.7	0-20%
pH	GN46038	DA13259-1	su	8.96	8.95	0.1	0-5%
pH	GN46038	DA13259-1	su	8.96	8.95	0.1	0-5%

Associated Samples:
Batch GN46030: DA13311-1
Batch GN46038: DA13311-1
Batch GN46040: DA13311-1
Batch GP24542: DA13311-1
Batch GP24561: DA13311-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN46040	DA13256-1A	mg/l	77.3	100	177	100.0	80-120%
Bromide	GP24531/GN46021	DA12301-8	mg/l	0.0	5	5.1	102.0	80-120%
Chloride	GP24531/GN46021	DA12301-8	mg/l	11.2	50	61.4	100.4	80-120%
Chloride	GP24536/GN46029	DA13311-1	mg/l	191	500	683	98.4	80-120%
Fluoride	GP24531/GN46021	DA12301-8	mg/l	0.0	10	10.2	102.0	80-120%
Nitrogen, Nitrate	GP24531/GN46021	DA12301-8	mg/l	0.89	1	1.9	101.0	80-120%
Nitrogen, Nitrate	GP24536/GN46029	DA13311-1	mg/l	0.0	10	10.4	104.0	80-120%
Nitrogen, Nitrite	GP24531/GN46021	DA12301-8	mg/l	0.0	0.5	0.49	98.0	80-120%
Nitrogen, Nitrite	GP24536/GN46029	DA13311-1	mg/l	0.0	5	5.1	102.0	80-120%
Phosphorus, Total	GP24561/GN46060	DA13311-1	mg/l	0.0	0.2	0.194	95.0	90-110%
Sulfate	GP24531/GN46021	DA12301-8	mg/l	234	50	281	94.0	80-120%
Sulfate	GP24536/GN46029	DA13311-1	mg/l	1520	500	2000	96.0	80-120%

Associated Samples:
Batch GN46040: DA13311-1
Batch GP24531: DA13311-1
Batch GP24536: DA13311-1
Batch GP24561: DA13311-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA13311
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_High_Sierra_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN46040	DA13256-1A	mg/l	77.3	100	174	2.1	20%
Bromide	GP24531/GN46021	DA12301-8	mg/l	0.0	5	5.1	0.0	20%
Chloride	GP24531/GN46021	DA12301-8	mg/l	11.2	50	61.0	0.7	20%
Chloride	GP24536/GN46029	DA13311-1	mg/l	191	500	686	0.4	20%
Fluoride	GP24531/GN46021	DA12301-8	mg/l	0.0	10	10.1	1.0	20%
Nitrogen, Nitrate	GP24531/GN46021	DA12301-8	mg/l	0.89	1	1.9	0.0	20%
Nitrogen, Nitrate	GP24536/GN46029	DA13311-1	mg/l	0.0	10	10.5	1.0	20%
Nitrogen, Nitrite	GP24531/GN46021	DA12301-8	mg/l	0.0	0.5	0.49	0.0	20%
Nitrogen, Nitrite	GP24536/GN46029	DA13311-1	mg/l	0.0	5	5.2	1.9	20%
Sulfate	GP24531/GN46021	DA12301-8	mg/l	234	50	283	0.7	20%
Sulfate	GP24536/GN46029	DA13311-1	mg/l	1520	500	2010	0.5	20%

Associated Samples:
Batch GN46040: DA13311-1
Batch GP24531: DA13311-1
Batch GP24536: DA13311-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits