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Automated Report

Technical Report for

Kerr-McGee Oil & Gas Onshore LP

GWA_Barclay_68535_Well

FID:753245 Reg:Vol. Freq.:Q2

SGS Job Number: DA15825

Sampling Date: 05/13/19

Report to:

Kerr-McGee Oil & Gas Onshore LP
112 High Street
Buffalo, WY 82834
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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), 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: DA15825

GWA_Barclay_68535_Well
Project No: FID:753245 Reg:Vol. Freq.:Q2

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA15825-1	05/13/19	14:50	TS	05/14/19	AQ	Ground Water	BW_BARCLAY_68535 SWSW_20_3N_66W
DA15825-1A	05/13/19	14:50	TS	05/14/19	AQ	Ground Water	BW_BARCLAY_68535 SWSW_20_3N_66W
DA15825-1B	05/13/19	14:50	TS	05/14/19	AQ	Ground Water	BW_BARCLAY_68535 SWSW_20_3N_66W
DA15825-1F	05/13/19	14:50	TS	05/14/19	AQ	Groundwater Filtered	BW_BARCLAY_68535 SWSW_20_3N_66W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Kerr-McGee Oil & Gas Onshore LP	**Job No**	DA15825
Site:	GWA_Barclay_68535_Well	**Report Date**	6/7/2019 11:18:55 AM

On 05/14/2019, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 3.9 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA15825 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:** V7V3076

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12210-11MS, DA12210-11MSD were used as the QC samples indicated.

GC Volatiles By Method RSK175 MOD

Matrix: AQ **Batch ID:** GFB1073

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12210-39MS, DA12210-39MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA15825-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2352

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12210-36MS, DA12210-36MSD 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:** OP17809

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12210-3MS, DA12210-3MSD were used as the QC samples indicated.

Metals Analysis By Method EPA 200.7

Matrix: AQ **Batch ID:** MP28028

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA15836-1MS, DA15836-1MSD were used as the QC samples for the metals analysis.

Metals Analysis By Method EPA 200.8

Matrix: AQ **Batch ID:** MP28030

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA15820-1FAMS, DA15820-1FAMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ **Batch ID:** R47711

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA15825-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ **Batch ID:** GP25161

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA15854-2MS, DA15906-3DUP were used as the QC samples for the Phosphorus, Total analysis.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ **Batch ID:** GP25118

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA15856-3MS, DA15856-3MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- DA15825-1 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.Associated CCV outside control limits high, sample was ND
- DA15825-1 for Sulfate; Nitrogen, Nitrate: Elevated detection limit due to matrix interference.
- DA15825-1 for Sulfate: Elevated detection limit due to matrix interference.

General Chemistry By Method HACH IRB-BART

Matrix: AQ **Batch ID:** MB1191

- 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:** MB1186

- 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:** MB1187

- 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:** GN46974

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

Matrix: AQ **Batch ID:** GN46975

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

Matrix: AQ **Batch ID:** GN46976

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12210-23MS, DA12210-23MSD, DA15771-1DUP were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

General Chemistry By Method SM 2510B-2011

Matrix: AQ **Batch ID:** GP25124

- Sample(s) DA15771-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ **Batch ID:** GN46967

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA15829-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ **Batch ID:** GN47018

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

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ **Batch ID:** GN46971

- Sample(s) DA15771-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA15825-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ **Batch ID:** R47637

- 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: DA15825
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well
Collected: 05/13/19

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA15825-1	**BW_BARCLAY_68535 SWSW_20_3N_66W**					
Toluene		0.80 J	1.0	0.50	ug/l	SW846 8260B
Alkalinity, Bicarbonate as CaCO3		443	5.0		mg/l	SM 2320B-2011
Alkalinity, Carbonate		19.1	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		462	5.0		mg/l	SM 2320B-2011
Bromide		0.56	0.10		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance		0.71			%	SM1030E-2011
Chloride		56.1	2.5		mg/l	EPA300.0/SW846 9056A
Fluoride		1.9	0.20		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total		0.035	0.010		mg/l	EPA 365.1
Solids, Total Dissolved		611	10		mg/l	SM 2540C-2011
Specific Conductivity		945	1.0		umhos/cm	SM 2510B-2011
pH [a]		8.68			su	SM4500HB + -2011/9040C
Temperature (Field)		16.8			Deg. C	FIELD
pH (Field)		8.48			su	FIELD
Oxygen, Dissolved (Field)		0.08			mg/l	FIELD
Specific Conductivity (Field)		966	0.50		umhos/cm	FIELD
Turbidity		0.02			NTU	FIELD
DA15825-1A	**BW_BARCLAY_68535 SWSW_20_3N_66W**					
Methane [b]		5.80	0.020	0.010	mg/l	RSK175 MOD
Ethane [b]		0.0026	0.0016	0.00080	mg/l	RSK175 MOD
DA15825-1B	**BW_BARCLAY_68535 SWSW_20_3N_66W**					
Iron-Related Bacteria		9000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		2500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		115000	200		CFU/ml	HACH SRB-BART
DA15825-1F	**BW_BARCLAY_68535 SWSW_20_3N_66W**					
Barium		0.0365	0.0040		mg/l	EPA 200.8
Boron		0.185	0.050		mg/l	EPA 200.7
Calcium		2.28	0.40		mg/l	EPA 200.7
Iron		0.0243	0.010		mg/l	EPA 200.7
Magnesium		0.461	0.20		mg/l	EPA 200.7
Manganese		0.0070	0.0050		mg/l	EPA 200.7
Potassium		1.26	1.0		mg/l	EPA 200.7
Sodium		241	0.40		mg/l	EPA 200.7
Strontium		0.0675	0.0050		mg/l	EPA 200.7

(a) Analysis performed past recommended hold time.
(b) The pH of the sample was > 2 at time of analysis.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BW_BARCLAY_68535 SWSW_20_3N_66W		
Lab Sample ID:	DA15825-1	**Date Sampled:**	05/13/19
Matrix:	AQ - Ground Water	**Date Received:**	05/14/19
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	GWA_Barclay_68535_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V60564.D	1	05/15/19 18:47	MB	n/a	n/a	V7V3076
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	0.80	1.0	0.50	ug/l	J
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	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	99%		70-130%
2037-26-5	Toluene-D8	96%		70-130%
460-00-4	4-Bromofluorobenzene	95%		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_BARCLAY_68535 SWSW_20_3N_66W		
Lab Sample ID:	DA15825-1	**Date Sampled:**	05/13/19
Matrix:	AQ - Ground Water	**Date Received:**	05/14/19
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	GWA_Barclay_68535_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB50234.D	1	05/17/19 23:57	BB	n/a	n/a	GGB2352
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	106%		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_BARCLAY_68535 SWSW_20_3N_66W
Lab Sample ID: DA15825-1
Matrix: AQ - Ground Water
Method: SW846-8015B SW846 3510C
Project: GWA_Barclay_68535_Well

Date Sampled: 05/13/19
Date Received: 05/14/19
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD63496.D	1	05/16/19 18:11	RB	05/15/19	OP17809	GFD2603
Run #2							

	Initial Volume	Final Volume
Run #1	1040 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	67%		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_BARCLAY_68535 SWSW_20_3N_66W
Lab Sample ID: DA15825-1
Matrix: AQ - Ground Water
Project: GWA_Barclay_68535_Well

Date Sampled: 05/13/19
Date Received: 05/14/19
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	443	5.0	mg/l	1	05/16/19 09:00	PV	SM 2320B-2011
Alkalinity, Carbonate	19.1	5.0	mg/l	1	05/16/19 09:00	PV	SM 2320B-2011
Alkalinity, Total as CaCO3	462	5.0	mg/l	1	05/16/19 09:00	PV	SM 2320B-2011
Bromide	0.56	0.10	mg/l	2	05/15/19 10:51	JB	EPA300.0/SW846 9056A
Cation Anion Balance	0.71		%	1	05/21/19	KM	SM1030E-2011
Chloride	56.1	2.5	mg/l	5	05/15/19 11:06	JB	EPA300.0/SW846 9056A
Fluoride	1.9	0.20	mg/l	2	05/15/19 10:51	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate [a]	< 0.020	0.020	mg/l	2	05/15/19 10:51	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [b]	< 0.040	0.040	mg/l	1	05/15/19 11:06	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite [c]	< 0.020	0.020	mg/l	5	05/15/19 11:06	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.035	0.010	mg/l	1	05/21/19 13:45	AM	EPA 365.1
Solids, Total Dissolved	611	10	mg/l	1	05/16/19	SK	SM 2540C-2011
Specific Conductivity	945	1.0	umhos/cm	1	05/16/19 08:00	PV	SM 2510B-2011
Sulfate [a]	< 1.0	1.0	mg/l	2	05/15/19 10:51	JB	EPA300.0/SW846 9056A
pH [d]	8.68		su	1	05/16/19 09:00	PV	SM4500HB+-2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0.08		mg/l	1	05/15/19	SH	FIELD
Redox Potential Vs H2	-80.7		mv	1	05/15/19	SH	FIELD
Specific Conductivity (Field)	966	0.50	umhos/cm	1	05/15/19	SH	FIELD
Temperature (Field)	16.8		Deg. C	1	05/15/19	SH	FIELD
Turbidity	0.02		NTU	1	05/15/19	SH	FIELD
pH (Field)	8.48		su	1	05/15/19	SH	FIELD

(a) Elevated detection limit due to matrix interference.
(b) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(c) Elevated detection limit due to matrix interference. Associated CCV outside control limits high, sample was ND
(d) Analysis performed past recommended hold time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_BARCLAY_68535 SWSW_20_3N_66W		
Lab Sample ID:	DA15825-1A	**Date Sampled:**	05/13/19
Matrix:	AQ - Ground Water	**Date Received:**	05/14/19
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	GWA_Barclay_68535_Well		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB23565.D	1	05/20/19 15:46	BB	n/a	n/a	GFB1073
Run #2 [a]	FB23566.D	25	05/20/19 15:54	BB	n/a	n/a	GFB1073

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.7 Deg. C
Run #2	39.0 ml	4.0 ml	500 ul	19.7 Deg. C

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	5.80 [b]	0.020	0.010	mg/l	
74-84-0	Ethane	0.0026	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_BARCLAY_68535 SWSW_20_3N_66W		
Lab Sample ID:	DA15825-1B	**Date Sampled:**	05/13/19
Matrix:	AQ - Ground Water	**Date Received:**	05/14/19
		Percent Solids:	n/a
Project:	GWA_Barclay_68535_Well		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	9000	25	CFU/ml	1	06/03/19 16:00	SK	HACH IRB-BART
Slime Forming Bacteria	2500	500	CFU/ml	1	05/20/19 15:45	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	115000	200	CFU/ml	1	05/20/19 15:45	SK	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_BARCLAY_68535 SWSW_20_3N_66W		
Lab Sample ID:	DA15825-1F	**Date Sampled:**	05/13/19
Matrix:	AQ - Groundwater Filtered	**Date Received:**	05/14/19
		Percent Solids:	n/a
Project:	GWA_Barclay_68535_Well		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.0365	0.0040	mg/l	2	05/16/19	05/16/19	EP	EPA 200.8 [1]	EPA 200.8 [6]
Boron	0.185	0.050	mg/l	1	05/16/19	05/17/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Calcium	2.28	0.40	mg/l	1	05/16/19	05/16/19	JR	EPA 200.7 [2]	EPA 200.7 [5]
Iron	0.0243	0.010	mg/l	1	05/16/19	05/20/19	JR	EPA 200.7 [4]	EPA 200.7 [5]
Magnesium	0.461	0.20	mg/l	1	05/16/19	05/17/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Manganese	0.0070	0.0050	mg/l	1	05/16/19	05/17/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Potassium	1.26	1.0	mg/l	1	05/16/19	05/17/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Selenium	< 0.00080	0.00080	mg/l	2	05/16/19	05/16/19	EP	EPA 200.8 [1]	EPA 200.8 [6]
Sodium	241	0.40	mg/l	1	05/16/19	05/17/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Strontium	0.0675	0.0050	mg/l	1	05/16/19	05/16/19	JR	EPA 200.7 [2]	EPA 200.7 [5]

(1) Instrument QC Batch: MA11394
(2) Instrument QC Batch: MA11395
(3) Instrument QC Batch: MA11404
(4) Instrument QC Batch: MA11410
(5) Prep QC Batch: MP28028
(6) Prep QC Batch: MP28030

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 # VA 15825

Client / Reporting Information

Company: (Report to) **Absaroka Solutions**
Street: 112 High Street
City, State: Buffalo, WY 82834
Project Contact: Tanya Cude
Phone: 352-318-4034
Email:
Sampler(s) Name(s): Tyler Scherden

Project Information

Project Name: GWA_Barclay_68535_Well
Frequency: Q2
Regulation: Voluntary
Facility ID: 753245
EQuIS Facility Code: 0089019-AN-GWABWQ
Client Purchase Order #: WO #88561343
Project Manager: Joel Mason

Billing Information (if different from Report to)

Company: Anadarko Petroleum Corporation (APC)
Street Address: 1099 18th Street, Suite 1800
City, State ZIP: Denver, CO 80202-1918
Attention: Erik Mickelson User ID: fvv451

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Field ID / Point of Collection	Collection Date	Time	Sampled by	Matrix	# of bottles	Number of preserved 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_Barclay_68535	5/13/2019	1450	TS	GW	17	9	6			1					1	X	X	X	X	X	X	X	X	X	X	X	01
SWSW_20_3N_66W																											
Temperature, field	16.8	°C																									
pH, field	8.48	s.u.																									5/14/19
Specific Conductivity, field	966	uS/cm																									
Oxidation Reduction Potential, field	-80.7	mV																									
Dissolved Oxygen, field	0.08	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

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

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

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

Bubbles/ISHuseman

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	5/13/19 1700	1	2 5/14/19 13:10		2
Relinquished by Sampler:	Date/Time:	Received By:	Relinquished By:	Date/Time:	Received By:
3		3	4		4

Custody Seal # Intact ☐ Not Intact ☐ Absent ☐ | Preserved where applicable ☐ | Cooler Temp. °C: 3.9 | Therm. ID: T088 | On Ice ☑

Form MSQA 064-01, RV 6/19/17

5.1 5

DA15825: Chain of Custody
Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: DA15825 **Client:** ABSAROKA SOLUTIONS **Project:** GWA

Date / Time Received: 5/14/2019 1:10:00 PM **Delivery Method:** **Airbill #'s:** CO

Cooler Temps (Initial/Adjusted): #1: (3.9/3.9);

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: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3076-MB	7V60550.D	1	05/15/19	MB	n/a	n/a	V7V3076

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

DA15825-1

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	99%	70-130%
17060-07-0	1,2-Dichloroethane-D4	99%	70-130%
2037-26-5	Toluene-D8	96%	70-130%
460-00-4	4-Bromofluorobenzene	97%	70-130%

Blank Spike Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3076-BS	7V60548A.D	1	05/15/19	MB	n/a	n/a	V7V3076

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

DA15825-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	51.0	102	70-130
100-41-4	Ethylbenzene	50	48.6	97	69-130
108-88-3	Toluene	50	49.0	98	70-130
	m,p-Xylene	100	99.4	99	70-130
95-47-6	o-Xylene	50	48.7	97	70-130
1330-20-7	Xylene (total)	150	148	99	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	70-130%
17060-07-0	1,2-Dichloroethane-D4	97%	70-130%
2037-26-5	Toluene-D8	96%	70-130%
460-00-4	4-Bromofluorobenzene	101%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12210-11MS	7V60552.D	1	05/15/19	MB	n/a	n/a	V7V3076
DA12210-11MSD	7V60553.D	1	05/15/19	MB	n/a	n/a	V7V3076
DA12210-11	7V60554.D	1	05/15/19	MB	n/a	n/a	V7V3076

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

DA15825-1

CAS No.	Compound	DA12210-11 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	48.3	97	50	50.1	100	4	67-130/30
100-41-4	Ethylbenzene	ND		50	46.9	94	50	48.6	97	4	69-130/30
108-88-3	Toluene	ND		50	46.7	93	50	48.5	97	4	70-130/30
	m,p-Xylene	ND		100	94.7	95	100	98.4	98	4	70-130/30
95-47-6	o-Xylene	ND		50	47.2	94	50	48.8	98	3	70-130/30
1330-20-7	Xylene (total)	ND		150	142	95	150	147	98	3	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12210-11	Limits
1868-53-7	Dibromofluoromethane	100%	102%	99%	70-130%
17060-07-0	1,2-Dichloroethane-D4	98%	100%	97%	70-130%
2037-26-5	Toluene-D8	98%	98%	97%	70-130%
460-00-4	4-Bromofluorobenzene	100%	101%	94%	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: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2352-MB	GB50218.D	1	05/17/19	BB	n/a	n/a	GGB2352

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

DA15825-1

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	104%	60-140%

Method Blank Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1073-MB	FB23554.D	1	05/20/19	BB	n/a	n/a	GFB1073

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

DA15825-1A

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: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2352-BS	GB50219.D	1	05/17/19	BB	n/a	n/a	GGB2352

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

DA15825-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	2.00	91	51-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	108%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1073-BS	FB23555.D	10	05/20/19	BB	n/a	n/a	GFB1073

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

DA15825-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.512	100	70-133
74-84-0	Ethane	0.923	1.06	115	70-137
74-98-6	Propane	1.38	1.58	115	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12210-36MS	GB50220.D	1	05/17/19	BB	n/a	n/a	GGB2352
DA12210-36MSD	GB50221.D	1	05/17/19	BB	n/a	n/a	GGB2352
DA12210-36	GB50222.D	1	05/17/19	BB	n/a	n/a	GGB2352

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

DA15825-1

CAS No.	Compound	DA12210-36 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)	0.0526		2.2	2.06	91	2.2	2.08	92	1	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12210-36	Limits
120-82-1	1,2,4-Trichlorobenzene	108%	106%	106%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12210-39MS	FB23556.D	10	05/20/19	BB	n/a	n/a	GFB1073
DA12210-39MSD	FB23557.D	10	05/20/19	BB	n/a	n/a	GFB1073
DA12210-39	FB23558.D	1	05/20/19	BB	n/a	n/a	GFB1073

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

DA15825-1A

CAS No.	Compound	DA12210-39 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	0.0012		0.512	0.509	99	0.512	0.491	96	4	15-196/30
74-84-0	Ethane	ND		0.923	1.05	114	0.923	1.02	111	3	53-144/30
74-98-6	Propane	ND		1.38	1.57	114	1.38	1.52	110	3	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: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17809-MB	FD63483.D	1	05/16/19	RB	05/15/19	OP17809	GFD2603

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

DA15825-1

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	55%	11-142%

Blank Spike Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17809-BS	FD63484.D	1	05/16/19	RB	05/15/19	OP17809	GFD2603

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

DA15825-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.30	66	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	70%	11-142%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA15825
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17809-MS	FD63485.D	1	05/16/19	RB	05/15/19	OP17809	GFD2603
OP17809-MSD	FD63486.D	1	05/16/19	RB	05/15/19	OP17809	GFD2603
DA12210-3	FD63487.D	1	05/16/19	RB	05/15/19	OP17809	GFD2603

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

DA15825-1

CAS No.	Compound	DA12210-3 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	3.09	62	5	3.86	77	22	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12210-3	Limits
84-15-1	o-Terphenyl	69%	82%	78%	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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

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	0.80	<50
Cadmium	10	1.9	1.6		
Calcium	400	6.6	53	18.6	<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	2.2	<10
Lead	50	13	6.3		
Lithium	5.0	.6	4		
Magnesium	200	50	31	10.4	<200
Manganese	5.0	.5	1.1	1.1	<5.0
Molybdenum	10	8.5	4.3		
Nickel	30	6.2	6.1		
Phosphorus	100	91	24		
Potassium	1000	84	250	161	<1000
Selenium	50	30	21		
Silicon	50	41	45		
Silver	30	.6	4		
Sodium	400	13	51	89.5	<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 MP28028: DA15825-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/16/19

Metal	DA15836-1 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron	46.3	1150	1000	110.6	70-130
Cadmium					
Calcium	123000	154000	25000	104.0	70-130
Chromium					
Cobalt					
Copper					
Iron	795	5750	5000	99.1	70-130
Lead					
Lithium					
Magnesium	29900	56900	25000	98.8	70-130
Manganese	51.7	544	500	98.5	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	1780	28000	25000	104.4	70-130
Selenium					
Silicon					
Silver					
Sodium	25500	50400	25000	99.6	70-130
Strontium	866	1470	500	104.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP28028: DA15825-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

Metal	DA15836-1 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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

Metal	DA15836-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron	46.3	1170	1000	112.6	1.7	20
Cadmium						
Calcium	123000	153000	25000	100.0	0.7	20
Chromium						
Cobalt						
Copper						
Iron	795	5850	5000	101.1	1.7	20
Lead						
Lithium						
Magnesium	29900	58200	25000	104.0	2.3	20
Manganese	51.7	556	500	100.9	2.2	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	1780	28700	25000	107.2	2.5	20
Selenium						
Silicon						
Silver						
Sodium	25500	51700	25000	104.8	2.5	20
Strontium	866	1470	500	104.6	0.0	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP28028: DA15825-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028 Methods: EPA 200.7
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

Metal	DA15836-1 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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/16/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	1070	1000	107.0	85-115
Cadmium				
Calcium	25400	25000	101.6	85-115
Chromium				
Cobalt				
Copper				
Iron	4960	5000	99.2	85-115
Lead				
Lithium				
Magnesium	25200	25000	100.8	85-115
Manganese	500	500	100.0	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	26000	25000	104.0	85-115
Selenium				
Silicon				
Silver				
Sodium	25000	25000	100.0	85-115
Strontium	538	500	107.6	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP28028: DA15825-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28028
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 05/16/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits

(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28030
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/16/19

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	0.071	<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	-0.030	<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 MP28030: DA15825-1F

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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28030
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/16/19

Metal	DA15820-1FA Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	77.3	443	400	91.4	70-130
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum	anr				
Nickel					
Phosphorus					
Potassium					
Selenium	1.0	185	200	92.0	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP28030: DA15825-1F

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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28030 Methods: EPA 200.8
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 05/16/19

Metal	DA15820-1FA Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	77.3	445	400	91.9	0.5	20
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum	anr					
Nickel						
Phosphorus						
Potassium						
Selenium	1.0	188	200	93.5	1.6	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP28030: DA15825-1F

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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

QC Batch ID: MP28030
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 05/16/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	396	400	99.0	85-115
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum	anr			
Nickel				
Phosphorus				
Potassium				
Selenium	201	200	100.5	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP28030: DA15825-1F

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: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN46974	5.0	2.2	mg/l	100	99.7	99.7	90-110%
Alkalinity, Carbonate	GN46975	5.0	2.2	mg/l	100	99.7	99.7	80-120%
Alkalinity, Total as CaCO3	GN46976	5.0	2.2	mg/l	100	99.7	99.7	90-110%
Bromide	GP25118/GN46966	0.050	0.0	mg/l	0.5	0.516	103.2	90-110%
Chloride	GP25118/GN46966	0.50	0.0	mg/l	5	5.29	105.8	90-110%
Fluoride	GP25118/GN46966	0.10	0.0	mg/l	1	1.05	105.0	90-110%
Iron-Related Bacteria	MB1191	25	<25	CFU/ml				
Nitrogen, Nitrate	GP25118/GN46966	0.010	0.0	mg/l	0.1	0.102	102.0	90-110%
Nitrogen, Nitrite	GP25118/GN46966	0.0040	0.0	mg/l	0.05	0.0505	101.0	90-110%
Phosphorus, Total	GP25161/GN47038	0.010	0.00	mg/l	0.2	0.208	104.0	90-110%
Phosphorus, Total	GP25161/GN47038	0.010	0.00	mg/l	0.2	0.202	101.0	90-110%
Slime Forming Bacteria	MB1186	500	<500	CFU/ml				
Solids, Total Dissolved	GN46967	10	0.0	mg/l	400	401	100.3	90-110%
Specific Conductivity	GP25124/GN46972			umhos/cm	1413	1390	98.1	90-110%
Specific Conductivity	GP25124/GN46972			umhos/cm	98.8	98.4	99.6	90-110%
Specific Conductivity	GP25124/GN46972			umhos/cm	1004	953	94.9	90-110%
Sulfate	GP25118/GN46966	0.50	0.0	mg/l	5	5.13	102.6	90-110%
Sulfate Reducing Bacteria	MB1187	200	<200	CFU/ml				
pH	GN46971			su	8.00	7.98	99.8	99.1-100.9%
pH	GN46971			su	8.00	7.96	99.5	99.1-100.9%
pH	GN46971			su	6.00	5.99	99.8	99.1-100.9%

Associated Samples:
Batch MB1186: DA15825-1B
Batch MB1187: DA15825-1B
Batch MB1191: DA15825-1B
Batch GN46967: DA15825-1
Batch GN46971: DA15825-1
Batch GN46974: DA15825-1
Batch GN46975: DA15825-1
Batch GN46976: DA15825-1
Batch GP25118: DA15825-1
Batch GP25124: DA15825-1
Batch GP25161: DA15825-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN46976	DA15771-1	mg/l	377	380	1.0	0-20%
Phosphorus, Total	GP25161/GN47038	DA15906-3	mg/l	1.1	1.11	0.0	0-20%
Solids, Total Dissolved	GN46967	DA15829-1	mg/l	1950	1940	0.5	0-5%
Specific Conductivity	GP25124/GN46972	DA15771-1	umhos/cm	3610	3590	0.6	0-20%
pH	GN46971	DA15771-1	su	8.21	8.22	0.1	0-5%

Associated Samples:
Batch GN46967: DA15825-1
Batch GN46971: DA15825-1
Batch GN46976: DA15825-1
Batch GP25124: DA15825-1
Batch GP25161: DA15825-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN46976	DA12210-23	mg/l	7.7	100	103	95.3	80-120%
Bromide	GP25118/GN46966	DA15856-3	mg/l	0.0	0.5	0.51	102.0	80-120%
Chloride	GP25118/GN46966	DA15856-3	mg/l	0.58	5	5.7	102.4	80-120%
Fluoride	GP25118/GN46966	DA15856-3	mg/l	0.074	1	1.1	102.6	80-120%
Nitrogen, Nitrate	GP25118/GN46966	DA15856-3	mg/l	0.028	0.1	0.13	102.0	80-120%
Nitrogen, Nitrite	GP25118/GN46966	DA15856-3	mg/l	0.0	0.05	0.051	102.0	80-120%
Phosphorus, Total	GP25161/GN47038	DA15854-2	mg/l	0.0070 U	0.2	0.208	102.0	90-110%
Sulfate	GP25118/GN46966	DA15856-3	mg/l	1.8	5	6.8	100.0	80-120%

Associated Samples:
Batch GN46976: DA15825-1
Batch GP25118: DA15825-1
Batch GP25161: DA15825-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA15825
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Barclay_68535_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN46976	DA12210-23	mg/l	7.7	100	105	1.6	20%
Bromide	GP25118/GN46966	DA15856-3	mg/l	0.0	0.5	0.51	0.0	20%
Chloride	GP25118/GN46966	DA15856-3	mg/l	0.58	5	5.7	0.0	20%
Fluoride	GP25118/GN46966	DA15856-3	mg/l	0.074	1	1.1	0.0	20%
Nitrogen, Nitrate	GP25118/GN46966	DA15856-3	mg/l	0.028	0.1	0.13	0.0	20%
Nitrogen, Nitrite	GP25118/GN46966	DA15856-3	mg/l	0.0	0.05	0.051	0.0	20%
Sulfate	GP25118/GN46966	DA15856-3	mg/l	1.8	5	6.8	0.0	20%

Associated Samples:
Batch GN46976: DA15825-1
Batch GP25118: DA15825-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits