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Automated Report

Technical Report for

Kerr-McGee Oil & Gas Onshore LP

GWA_Henrickson_Water_Well

FID:752520 Reg:Vol. Freq.:Q3

SGS Job Number: DA18031

Sampling Date: 07/25/19



Report to:

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Total number of pages in report: 55



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.

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Laboratory Director

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

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Test results relate only to samples analyzed.

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Sample Summary

Kerr-McGee Oil & Gas Onshore LP

Job No: DA18031

GWA_Henrickson_Water_Well
Project No: FID:752520 Reg:Vol. Freq.:Q3

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
DA18031-1	07/25/19	12:42 JB	07/26/19	AQ	Ground Water	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W
DA18031-1A	07/25/19	12:42 JB	07/26/19	AQ	Ground Water	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W
DA18031-1B	07/25/19	12:42 JB	07/26/19	AQ	Ground Water	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W
DA18031-1F	07/25/19	12:42 JB	07/26/19	AQ	Groundwater Filtered	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W

CASE NARRATIVE / CONFORMANCE SUMMARY

2

Client: Kerr-McGee Oil & Gas Onshore LP

Job No DA18031

Site: GWA_Henrickson_Water_Well

Report Date 8/8/2019 3:35:05 PM

On 07/26/2019, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 1.1 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA18031 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: V7V3149

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12216-39MS, DA12216-39MSD 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: GFB1089

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA17835-1MS, DA17835-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA18031-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ

Batch ID: GGA2261

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA17835-8MS, DA17835-8MSD 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: OP18087

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) DA12216-35MS, DA12216-35MSD 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: MP28555

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA17619-1FMS, DA17619-1FMSD were used as the QC samples for the metals analysis.
- MP28555-MB1 for Sodium: All sample results < RL or > 10x MB concentration.

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Metals Analysis By Method EPA 200.8

Matrix: AQ

Batch ID: MP28567

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA18072-2AMS, DA18072-2AMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 365.1

Matrix: AQ

Batch ID: GP25633

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA18004-2MS, DA18026-1DUP were used as the QC samples for the Phosphorus, Total analysis.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ

Batch ID: GP25584

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA18017-5MS, DA18017-5MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.
- DA18031-1 for Sulfate; Nitrogen, Nitrate; Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

Matrix: AQ

Batch ID: R48601

- The data for EPA300.0/SW846 9056A meets quality control requirements.
- DA18031-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method HACH IRB-BART

Matrix: AQ

Batch ID: MB1209

- 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: MB1210

- 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: MB1211

- 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: GN47770

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA18026-1DUP, LA56518-1MS, LA56518-1MSD were used as the QC samples for the Alkalinity, Total as CaCO₃ analysis.

Matrix: AQ

Batch ID: GN47771

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

Matrix: AQ

Batch ID: GN47773

- 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: GP25620

- Sample(s) DA18026-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ

Batch ID: GN47705

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA17955-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ

Batch ID: GN47788

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

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ

Batch ID: GN47768

- Sample(s) DA18026-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA18031-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ

Batch ID: R48550

- 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.

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Summary of Hits

Job Number: DA18031
 Account: Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well
 Collected: 07/25/19

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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DA18031-1 BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W

TPH-GRO (C6-C10)	0.105	0.050	0.050	mg/l	SW846 8015B
Alkalinity, Bicarbonate as CaCO3	422	5.0		mg/l	SM 2320B-2011
Alkalinity, Carbonate	5.1	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	427	5.0		mg/l	SM 2320B-2011
Bromide	0.50	0.10		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance	4.8			%	SM1030E-2011
Chloride	48.2	5.0		mg/l	EPA300.0/SW846 9056A
Fluoride	1.8	0.20		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total	0.027	0.010		mg/l	EPA 365.1
Solids, Total Dissolved	564	10		mg/l	SM 2540C-2011
Specific Conductivity	906	1.0		umhos/cm	SM 2510B-2011
pH ^a	8.41			su	SM4500HB+ -2011/9040C
pH (Field)	8.44			su	FIELD
Temperature (Field)	17.82			Deg. C	FIELD
Oxygen, Dissolved (Field)	0.11			mg/l	FIELD
Turbidity	0.02			NTU	FIELD
Specific Conductivity (Field)	965.6	0.50		umhos/cm	FIELD

DA18031-1A BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W

Methane ^b	4.81	0.040	0.020	mg/l	RSK175 MOD
Ethane ^b	0.501	0.080	0.040	mg/l	RSK175 MOD
Propane ^b	0.165	0.11	0.055	mg/l	RSK175 MOD

DA18031-1B BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W

Iron-Related Bacteria	35000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria	440000	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria	27000	200		CFU/ml	HACH SRB-BART

DA18031-1F BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W

Barium	0.0629	0.0040		mg/l	EPA 200.8
Boron	0.107	0.050		mg/l	EPA 200.7
Calcium	2.99	0.40		mg/l	EPA 200.7
Iron	0.0616	0.010		mg/l	EPA 200.7
Magnesium	0.698	0.20		mg/l	EPA 200.7
Manganese	0.0075	0.0050		mg/l	EPA 200.7
Potassium	1.44	1.0		mg/l	EPA 200.7
Selenium	0.0015	0.00080		mg/l	EPA 200.8
Sodium	201	0.40		mg/l	EPA 200.7
Strontium	0.0954	0.0050		mg/l	EPA 200.7

Summary of Hits

Job Number: DA18031
Account: Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well
Collected: 07/25/19



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

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



Wheat Ridge, CO

Section 4

4

Sample Results

Report of Analysis

Report of Analysis

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Client Sample ID:	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W					Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1					Date Received:	07/26/19
Matrix:	AQ - Ground Water					Percent Solids:	n/a
Method:	SW846 8260B						
Project:	GWA_Henrickson_Water_Well						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V62128.D	1	07/30/19 16:38	MB	n/a	n/a	V7V3149
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	95%		70-130%
17060-07-0	1,2-Dichloroethane-D4	97%		70-130%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	97%		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_7_3N_66W_HENRICKSON SWSE_7_3N_66W					Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1					Date Received:	07/26/19
Matrix:	AQ - Ground Water					Percent Solids:	n/a
Method:	SW846 8015B						
Project:	GWA_Henrickson_Water_Well						

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA49384.D	1	08/01/19 20:36	BB	n/a	n/a	GGA2261
Run #2							

Run #	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	0.105	0.050	0.050	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	86%		60-140%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W					Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1					Date Received:	07/26/19
Matrix:	AQ - Ground Water					Percent Solids:	n/a
Method:	SW846-8015B SW846 3510C						
Project:	GWA_Henrickson_Water_Well						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD64221.D	1	07/31/19 14:57	RB	07/30/19	OP18087	GFD2643
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	0.18	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	69%		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_7_3N_66W_HENRICKSON SWSE_7_3N_66W
 Lab Sample ID: DA18031-1
 Matrix: AQ - Ground Water
 Project: GWA_Henrickson_Water_Well

Date Sampled: 07/25/19
 Date Received: 07/26/19
 Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	422	5.0	mg/l	1	08/01/19	PV	SM 2320B-2011
Alkalinity, Carbonate	5.1	5.0	mg/l	1	08/01/19	PV	SM 2320B-2011
Alkalinity, Total as CaCO ₃	427	5.0	mg/l	1	08/01/19	PV	SM 2320B-2011
Bromide	0.50	0.10	mg/l	2	07/26/19 19:12	JB	EPA300.0/SW846 9056A
Cation Anion Balance	4.8		%	1	08/02/19	KM	SM1030E-2011
Chloride	48.2	5.0	mg/l	10	07/26/19 19:26	JB	EPA300.0/SW846 9056A
Fluoride	1.8	0.20	mg/l	2	07/26/19 19:12	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate ^a	< 0.020	0.020	mg/l	2	07/26/19 19:12	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite ^b	< 0.028	0.028	mg/l	1	07/26/19 19:12	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrite ^a	< 0.0080	0.0080	mg/l	2	07/26/19 19:12	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.027	0.010	mg/l	1	08/03/19 13:37	AM	EPA 365.1
Solids, Total Dissolved	564	10	mg/l	1	07/29/19	AK	SM 2540C-2011
Specific Conductivity	906	1.0	umhos/cm	1	08/01/19 14:00	PV	SM 2510B-2011
Sulfate ^a	< 1.0	1.0	mg/l	2	07/26/19 19:12	JB	EPA300.0/SW846 9056A
pH ^c	8.41		su	1	08/01/19 14:15	PV	SM4500HB+ -2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0.11		mg/l	1	07/30/19	SUB	FIELD
Redox Potential Vs H ₂	-100.9		mv	1	07/30/19	SUB	FIELD
Specific Conductivity (Field)	965.6	0.50	umhos/cm	1	07/30/19	SUB	FIELD
Temperature (Field)	17.82		Deg. C	1	07/30/19	SUB	FIELD
Turbidity	0.02		NTU	1	07/30/19	SUB	FIELD
pH (Field)	8.44		su	1	07/30/19	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

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Client Sample ID:	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W					Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1A					Date Received:	07/26/19
Matrix:	AQ - Ground Water					Percent Solids:	n/a
Method:	RSK175 MOD						
Project:	GWA_Henrickson_Water_Well						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	FB23846.D	50	07/31/19 17:05	BB	n/a	n/a	GFB1089
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	21.6 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	4.81	0.040	0.020	mg/l	
74-84-0	Ethane	0.501	0.080	0.040	mg/l	
74-98-6	Propane	0.165	0.11	0.055	mg/l	

(a) The pH of the sample was > 2 at time of analysis.

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_7_3N_66W_HENRICKSON SWSE_7_3N_66W	Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1B	Date Received:	07/26/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Project:	GWA_Henrickson_Water_Well		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	35000	25	CFU/ml	1	07/29/19 15:00	SK	HACH IRB-BART
Slime Forming Bacteria	440000	500	CFU/ml	1	07/29/19 15:00	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	27000	200	CFU/ml	1	07/29/19 15:00	SK	HACH SRB-BART

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_7_3N_66W_HENRICKSON SWSE_7_3N_66W	Date Sampled:	07/25/19
Lab Sample ID:	DA18031-1F	Date Received:	07/26/19
Matrix:	AQ - Groundwater Filtered	Percent Solids:	n/a
Project:	GWA_Henrickson_Water_Well		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium	0.0629	0.0040	mg/l	2	07/31/19	07/31/19 JM	EPA 200.8 ²	EPA 200.8 ⁴
Boron	0.107	0.050	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Calcium	2.99	0.40	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Iron	0.0616	0.010	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Magnesium	0.698	0.20	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Manganese	0.0075	0.0050	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Potassium	1.44	1.0	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Selenium	0.0015	0.00080	mg/l	2	07/31/19	07/31/19 JM	EPA 200.8 ²	EPA 200.8 ⁴
Sodium	201	0.40	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³
Strontium	0.0954	0.0050	mg/l	1	07/29/19	07/30/19 JM	EPA 200.7 ¹	EPA 200.7 ³

- (1) Instrument QC Batch: MA11618
- (2) Instrument QC Batch: MA11626
- (3) Prep QC Batch: MP28555
- (4) Prep QC Batch: MP28567

RL = Reporting Limit

Misc. Forms

5

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody



CHAIN OF CUSTODY

Page 1 of 1

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

Bottle Order Control #	FED-EX Tracking #
SGS Quote #	SGS Job #
Client / Reporting Information	
Company: (Report to) Absaroka Solutions	
Project Name: GWA_Henrickson_Water_Well Frequency: SP	
Street: 112 High Street	
Regulation: Voluntary	
City, State: Buffalo, WY 82834	
Facility ID: 752520	
Company: Anadarko Petroleum Corporation (APC)	
Project Contact: Tanya Cude	
EQUS Facility Code: 0089019-AN-GWABWQ	
Street Address: 1099 18th Street, Suite 1800	
Phone: 352-318-4034	
Client Purchase Order #: WO#88363888	
City, State ZIP: Denver, CO 80202-1918	
Email: Tanya.Cude@Absarokasolutions.com	
Sampler(s) Name(s): John Brouwer	
Project Manager: Joel Mason	
Attention: Erik Mickelson User ID: fvv451	
Requested Analysis (see TEST CODE sheet)	
Matrix Codes	
LAB USE ONLY	
PH, SCOR, TDS	
XCARBICALK	
BRO, CHL, F, NO2, XNO3O, NO32, SO4	
TPO4	
Dissolved Metals - Lab Filtered	
VRSK175DGMPEP	
V8260BTX	
B8015DRO	
V8015GRO	
IRBAC, SFBAC, SOARBAC	
CABAL	
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	
LAB USE ONLY	
Turnaround Time (Business days)	
Data Deliverable Information	
Comments / Special Instructions	
Sample Custody must be documented below each time samples change possession, including courier delivery.	
Relinquished by Sampler:	
Received By:	
Relinquished by Sampler:	
Received By:	
Custody Seal #	
Preserved where applicable	
Cooler Temp. °C:	
Therm. ID:	
On Ice	
Form MSQA 064-01, RV 6/19/17	
http://www.sgs.com/terms-and-conditions	

DA18031: Chain of Custody

Page 1 of 4



Cumine, Carissa (Wheat Ridge)

From: Tanya Cude <tanya.cude@absarokasolutions.com>
Sent: Tuesday, July 30, 2019 9:39 AM
To: Cumine, Carissa (Wheat Ridge)
Cc: Sutcliffe, Elizabeth (Wheat Ridge)
Subject: [EXTERNAL] FW: LabLink distribution sample receipt DA18031: GWA_Henrickson_Water_Well, sampled on 07/25/2019
Attachments: DA18031--receipt.pdf; DA18031--receipt-detail.pdf; DA18031--chain.PDF

Hi Carissa,

Could you please change the frequency on this sample and its associated trip blank, DA18032? It should be Q3.

Thank you!
Tanya

From: SGS LabLink Wheat Ridge CO <ehs.lablink@sgs.com>
Sent: Monday, July 29, 2019 3:58 PM
To: Tanya Cude <tanya.cude@absarokasolutions.com>; Joel Mason <jel.mason@absarokasolutions.com>; Max Moran <max.moran@absarokasolutions.com>; AnadarkoDataMngt@ghd.com
Subject: LabLink distribution sample receipt DA18031: GWA_Henrickson_Water_Well, sampled on 07/25/2019

The following job has been received by SGS:

DA18031: GWA_Henrickson_Water_Well
Received: 07/26/2019 7-14 day TAT
Kerr-McGee Oil & Gas Onshore LP

The attached PDF file contains your sample receipt confirmation; 1 page.
The attached **detail** receipt contains complete job / project setup information for review.
A scanned copy of the chain of custody is also attached; 122469 bytes.

Please review this summary to make sure that we have correctly interpreted the chain of custody and have assigned the correct matrices and products for each sample.
Please also confirm that the sampling information, including sample names and sampling dates and times, are correct.
This login is undergoing a full review process at SGS, but your review will help us ensure that your final data package includes all of the correct information.
Please let us know as soon as possible if any changes are necessary. Thank you for this opportunity to work with you.

Address questions/changes to your project manager at the link below:

Carissa Cumine
Carissa.Cumine@sgs.com

This E-mail was sent automatically from server accuco.acctest.com as per LabLink Auto-Email settings (Distribution2). If you have received this in error, please contact your client service representative.

SGS LabLink®

Celebrating 20 Years On-Line - 1996-2016

This message is confidential and intended solely for the use of the addressee and may contain material protected by law.

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DA18031: Chain of Custody
Page 2 of 4

Cumine, Carissa (Wheat Ridge)

From: Tanya Cude <tanya.cude@absarokasolutions.com>
Sent: Friday, August 02, 2019 1:13 PM
To: Cumine, Carissa (Wheat Ridge)
Cc: Sutcliffe, Elizabeth (Wheat Ridge)
Subject: [EXTERNAL] Field Data Edit

Hi Carissa,

Could you please edit the field DO for DA18031? It should be 0.11 mg/L.

Thanks!

Tanya Cude
Environmental Scientist
C: 352.318.4034

Tanya.Cude@Absarokasolutions.com
Absaroka Energy and Environmental Solutions, LLC.
112 High Street, Buffalo, WY 82834
(855) 684-5891



DA18031: Chain of Custody
Page 3 of 4

SGS Accutest Sample Receipt Summary

Job Number: DA18031

Client: ABSAROKA SOLUTIONS

Project: GWA_MAE_J_8_1HZ

Date / Time Received: 7/26/2019 2:00:00 PM

Delivery Method:

Airbill #'s: co

Cooler Temps (Initial/Adjusted): 0

Cooler Security

Y or N

Y or N

- | | | | | | |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Cooler Temperature

Y or N

- | | | |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | ; | |
| 3. Cooler media: | Ice (Bag) | |
| 4. No. Coolers: | 1 | |

Quality Control Preservation

Y or N

N/A

- | | | | |
|---------------------------------|-------------------------------------|--------------------------|--------------------------|
| 1. Trip Blank present / cooler: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Trip Blank listed on COC: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Samples preserved properly: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. VOCs headspace free: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Documentation

Y or N

- | | | |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Sample Integrity - Condition

Y or N

- | | | |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample: | Intact | |

Sample Integrity - Instructions

Y or N N/A

- | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 2. Bottles received for unspecified tests | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| 3. Sufficient volume recvd for analysis: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| 4. Compositing instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear: | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Comments

DA18031: Chain of Custody

Page 4 of 4

MS Volatiles**QC Data Summaries**

Includes the following where applicable:

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

Method Blank Summary

Page 1 of 1

Job Number: DA18031

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3149-MB	7V62107.D	1	07/30/19	MB	n/a	n/a	V7V3149

The QC reported here applies to the following samples:

Method: SW846 8260B

DA18031-1

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	87% 70-130%
17060-07-0	1,2-Dichloroethane-D4	95% 70-130%
2037-26-5	Toluene-D8	99% 70-130%
460-00-4	4-Bromofluorobenzene	96% 70-130%

Blank Spike Summary

Page 1 of 1

Job Number: DA18031

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V3149-BS	7V62105.D	1	07/30/19	MB	n/a	n/a	V7V3149

The QC reported here applies to the following samples:

Method: SW846 8260B

DA18031-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	50.0	100	70-130
100-41-4	Ethylbenzene	50	50.9	102	69-130
108-88-3	Toluene	50	50.4	101	70-130
	m,p-Xylene	100	104	104	70-130
95-47-6	o-Xylene	50	51.2	102	70-130
1330-20-7	Xylene (total)	150	156	104	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	91%	70-130%
17060-07-0	1,2-Dichloroethane-D4	98%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	100%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: DA18031

Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP

Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12216-39MS	7V62108.D	1	07/30/19	MB	n/a	n/a	V7V3149
DA12216-39MSD	7V62109.D	1	07/30/19	MB	n/a	n/a	V7V3149
DA12216-39	7V62110.D	1	07/30/19	MB	n/a	n/a	V7V3149

The QC reported here applies to the following samples:

Method: SW846 8260B

DA18031-1

CAS No.	Compound	DA12216-39 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	50	49.7	99	50	47.5	95	5	67-130/30
100-41-4	Ethylbenzene	ND	50	51.4	103	50	47.9	96	7	69-130/30
108-88-3	Toluene	ND	50	50.8	102	50	48.0	96	6	70-130/30
	m,p-Xylene	ND	100	104	104	100	98.1	98	6	70-130/30
95-47-6	o-Xylene	ND	50	51.1	102	50	47.9	96	6	70-130/30
1330-20-7	Xylene (total)	ND	150	155	103	150	146	97	6	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12216-39 Limits
1868-53-7	Dibromofluoromethane	89%	94%	89% 70-130%
17060-07-0	1,2-Dichloroethane-D4	97%	102%	98% 70-130%
2037-26-5	Toluene-D8	99%	98%	98% 70-130%
460-00-4	4-Bromofluorobenzene	102%	102%	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: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2261-MB	GA49372.D	1	08/01/19	BB	n/a	n/a	GGA2261

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

DA18031-1

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	80% 60-140%

Method Blank Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1089-MB	FB23832.D	1	07/31/19	BB	n/a	n/a	GFB1089

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

DA18031-1A

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	

7.1.2
7

Blank Spike Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2261-BS	GA49374.D	1	08/01/19	BB	n/a	n/a	GGA2261

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

DA18031-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	2.58	117	51-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	132%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1089-BS	FB23833.D	10	07/31/19	BB	n/a	n/a	GFB1089

The QC reported here applies to the following samples:

Method: RSK175 MOD

DA18031-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.518	101	70-133
74-84-0	Ethane	0.923	1.07	116	70-137
74-98-6	Propane	1.38	1.60	116	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA17835-8MS	GA49375.D	1	08/01/19	BB	n/a	n/a	GGA2261
DA17835-8MSD	GA49376.D	1	08/01/19	BB	n/a	n/a	GGA2261
DA17835-8	GA49377.D	1	08/01/19	BB	n/a	n/a	GGA2261

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

DA18031-1

CAS No.	Compound	DA17835-8 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	2.2	2.22	101	2.2	2.28	104	3	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA17835-8	Limits
120-82-1	1,2,4-Trichlorobenzene	81%	82%	85%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA17835-1MS	FB23834.D	10	07/31/19	BB	n/a	n/a	GFB1089
DA17835-1MSD	FB23835.D	10	07/31/19	BB	n/a	n/a	GFB1089
DA17835-1	FB23836.D	1	07/31/19	BB	n/a	n/a	GFB1089

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

DA18031-1A

CAS No.	Compound	DA17835-1 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.00079	J 0.512	0.521	102	0.512	0.517	101	1	15-196/30
74-84-0	Ethane	ND	0.923	1.08	117	0.923	1.07	116	1	53-144/30
74-98-6	Propane	ND	1.38	1.61	117	1.38	1.60	116	1	54-144/30

* = Outside of Control Limits.

GC/LC Semi-volatiles**QC Data Summaries**

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Includes the following where applicable:

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

Method Blank Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP18087-MB	FD64200.D	1	07/30/19	RB	07/30/19	OP18087	GFD2643

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

DA18031-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	0.20	0.19	mg/l	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	56% 11-142%

Blank Spike Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP18087-BS	FD64201.D	1	07/30/19	RB	07/30/19	OP18087	GFD2643

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

DA18031-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.49	50	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	56%	11-142%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA18031
Account: ANADACOD Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP18087-MS	FD64202.D	1	07/30/19	RB	07/30/19	OP18087	GFD2643
OP18087-MSD	FD64203.D	1	07/30/19	RB	07/30/19	OP18087	GFD2643
DA12216-35	FD64204.D	1	07/30/19	RB	07/30/19	OP18087	GFD2643

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

DA18031-1

CAS No.	Compound	DA12216-35 mg/l	Spike Q mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	5	2.83	57	5	2.95	59	4	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12216-35	Limits
84-15-1	o-Terphenyl	61%	62%	66%	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: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/29/19

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	3.3	<50
Cadmium	10	1.9	1.6		
Calcium	400	6.6	53	40.6	<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	3.1	<10
Lead	50	13	6.3		
Lithium	5.0	.6	4		
Magnesium	200	50	31	3.6	<200
Manganese	5.0	.5	1.1	0.20	<5.0
Molybdenum	10	8.5	4.3		
Nickel	30	6.2	6.1		
Phosphorus	100	91	24		
Potassium	1000	84	250	-14	<1000
Selenium	50	30	21		
Silicon	50	41	45		
Silver	30	.6	4		
Sodium	400	13	51	332	* (a)
Strontium	5.0	.1	.6	0.20	<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 MP28555: DA18031-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/29/19

Metal	RL	IDL	MDL	MB raw	final
-------	----	-----	-----	-----------	-------

(anr) Analyte not requested

(a) All sample results < RL or > 10x MB concentration.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/29/19

Metal	DA17619-1F Original MS	Spikelot ICPAL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	259	1350	1000	109.1 70-130
Cadmium	anr			
Calcium	107000	129000	25000	88.0 70-130
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	69.0	5140	5000	101.4 70-130
Lead	anr			
Lithium				
Magnesium	35600	56600	25000	90.0 70-130
Manganese	10.3	511	500	100.1 70-130
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	12400	40200	25000	110.4 70-130
Selenium	anr			
Silicon				
Silver	anr			
Sodium	104000	133000	25000	100.0 70-130
Strontium	1040	1530	500	98.0 70-130
Thallium	anr			
Tin				
Titanium	anr			
Uranium				
Vanadium	anr			
Zinc	anr			

Associated samples MP28555: DA18031-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/29/19

Metal	DA17619-1F Original MS	SpikeLot ICPALL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/29/19

	DA17619-1F		Spikelot		MSD	QC
Metal	Original	MSD	ICPALL2	% Rec	RPD	Limit
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Boron	259	1360	1000	110.1	0.7	20
Cadmium	anr					
Calcium	107000	133000	25000	104.0	3.1	20
Chromium	anr					
Cobalt	anr					
Copper	anr					
Iron	69.0	5300	5000	104.6	3.1	20
Lead	anr					
Lithium						
Magnesium	35600	56500	25000	89.6	0.2	20
Manganese	10.3	513	500	100.5	0.4	20
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	12400	40300	25000	110.8	0.2	20
Selenium	anr					
Silicon						
Silver	anr					
Sodium	104000	135000	25000	108.0	1.5	20
Strontium	1040	1550	500	102.0	1.3	20
Thallium	anr					
Tin						
Titanium	anr					
Uranium						
Vanadium	anr					
Zinc	anr					

Associated samples MP28555: DA18031-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

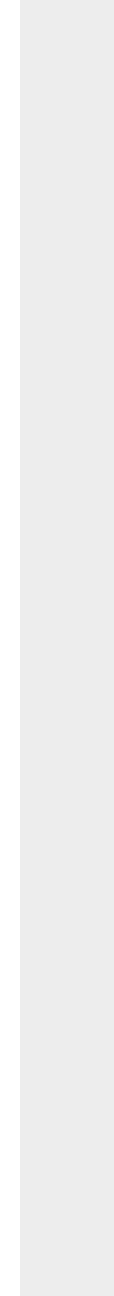
QC Batch ID: MP28555
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/29/19

Metal	DA17619-1F Original MSD	Spielot ICPALL2 % Rec	MSD RPD	QC Limit
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(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested



SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28555
 Matrix Type: AQUEOUS

Methods: EPA 200.7
 Units: ug/l

Prep Date: 07/29/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	anr			
Beryllium	anr			
Boron	1120	1000	112.0	85-115
Cadmium	anr			
Calcium	26300	25000	105.2	85-115
Chromium	anr			
Cobalt	anr			
Copper	anr			
Iron	5090	5000	101.8	85-115
Lead	anr			
Lithium				
Magnesium	23400	25000	93.6	85-115
Manganese	520	500	104.0	85-115
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	26000	25000	104.0	85-115
Selenium	anr			
Silicon				
Silver	anr			
Sodium	25300	25000	101.2	85-115
Strontium	498	500	99.6	85-115
Thallium	anr			
Tin				
Titanium	anr			
Uranium				
Vanadium	anr			
Zinc	anr			

Associated samples MP28555: DA18031-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

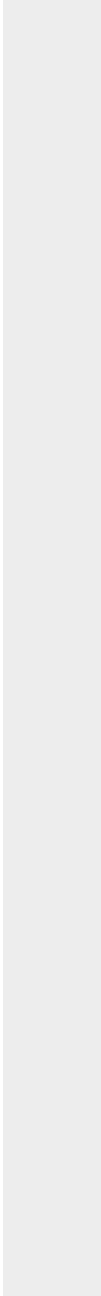
QC Batch ID: MP28555
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 07/29/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
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(anr) Analyte not requested



BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28567
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 07/31/19

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	0.036	<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	.071	.21	-0.079	<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 MP28567: DA18031-1F

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: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28567
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 07/31/19

Metal	DA18072-2A Original MS		SpikeLot ICPAL2 % Rec		QC Limits
Aluminum					
Antimony					
Arsenic					
Barium	20.4	327	300	102.2	70-130
Beryllium					
Boron					
Cadmium					
Calcium					
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	0.0	148	150	98.2	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP28567: DA18031-1F

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: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28567
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 07/31/19

Metal	DA18072-2A Original	MSD	SpikeLot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium	20.4	321	300	100.2	1.9	20
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium	0.0	149	150	98.9	0.7	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP28567: DA18031-1F

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: DA18031
 Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
 Project: GWA_Henrickson_Water_Well

QC Batch ID: MP28567
 Matrix Type: AQUEOUS

Methods: EPA 200.8
 Units: ug/l

Prep Date: 07/31/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium	302	300	100.7	85-115
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	148	150	98.7	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP28567: DA18031-1F

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: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN47771	5.0	0.0	mg/l	100	99.6	99.5	90-110%
Alkalinity, Carbonate	GN47773	5.0	0.0	mg/l	100	99.6	99.5	80-120%
Alkalinity, Total as CaCO3	GN47770	5.0	0.0	mg/l	100	99.6	99.5	90-110%
Bromide	GP25584/GN47698	0.050	0.0	mg/l	0.5	0.510	102.0	90-110%
Chloride	GP25584/GN47698	0.50	0.0	mg/l	5	5.17	103.4	90-110%
Fluoride	GP25584/GN47698	0.10	0.0	mg/l	1	1.02	102.0	90-110%
Iron-Related Bacteria	MB1209	25	<25	CFU/ml				
Nitrogen, Nitrate	GP25584/GN47698	0.010	0.0	mg/l	0.1	0.0989	98.9	90-110%
Nitrogen, Nitrite	GP25584/GN47698	0.0040	0.0	mg/l	0.05	0.0520	104.0	90-110%
Phosphorus, Total	GP25633/GN47792	0.010	0.00	mg/l	0.2	0.198	99.0	90-110%
Slime Forming Bacteria	MB1210	500	<500	CFU/ml				
Solids, Total Dissolved	GN47705	10	0.0	mg/l	250	258	103.2	90-110%
Specific Conductivity	GP25620/GN47769			umhos/cm	998	976	97.8	90-110%
Specific Conductivity	GP25620/GN47769			umhos/cm	98.6	94.7	96.0	90-110%
Specific Conductivity	GP25620/GN47769			umhos/cm	1413	1420	100.2	90-110%
Specific Conductivity	GP25620/GN47769			umhos/cm	1413	1400	98.9	90-110%
Sulfate	GP25584/GN47698	0.50	0.0	mg/l	5	5.13	102.6	90-110%
Sulfate Reducing Bacteria	MB1211	200	<200	CFU/ml				
pH	GN47768			su	8.00	7.96	99.5	99.1-100.9%
pH	GN47768			su	8.00	7.99	99.9	99.1-100.9%
pH	GN47768			su	6.00	5.98	99.7	99.1-100.9%

Associated Samples:

Batch MB1209: DA18031-1B
Batch MB1210: DA18031-1B
Batch MB1211: DA18031-1B
Batch GN47705: DA18031-1
Batch GN47768: DA18031-1
Batch GN47770: DA18031-1
Batch GN47771: DA18031-1
Batch GN47773: DA18031-1
Batch GP25584: DA18031-1
Batch GP25620: DA18031-1
Batch GP25633: DA18031-1
(*) Outside of QC limits

BLANK SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Analyte	Batch ID	Units	Spike Amount	BSD Result	RPD	QC Limit
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Associated Samples:
Batch GN47705: DA18031-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN47770	DA18026-1	mg/l	504	509	1.1	0-20%
Phosphorus, Total	GP25633/GN47792	DA18026-1	mg/l	0.043	0.0410	4.8	0-20%
Solids, Total Dissolved	GN47705	DA17955-1	mg/l	2050	1990	3.0	0-5%
Specific Conductivity	GP25620/GN47769	DA18026-1	umhos/cm	1880	1900	1.1	0-20%
pH	GN47768	DA18026-1	su	8.25	8.33	1.0	0-5%

Associated Samples:

Batch GN47705: DA18031-1
Batch GN47768: DA18031-1
Batch GN47770: DA18031-1
Batch GP25620: DA18031-1
Batch GP25633: DA18031-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO ₃	GN47770	LA56518-1	mg/l	191	100	286	95.2	80-120%
Bromide	GP25584/GN47698	DA18017-5	mg/l	0.0	5	4.9	98.0	80-120%
Chloride	GP25584/GN47698	DA18017-5	mg/l	39.4	50	91.2	103.6	80-120%
Fluoride	GP25584/GN47698	DA18017-5	mg/l	0.56	10	10.4	98.4	80-120%
Nitrogen, Nitrate	GP25584/GN47698	DA18017-5	mg/l	0.45	1	1.4	95.0	80-120%
Nitrogen, Nitrite	GP25584/GN47698	DA18017-5	mg/l	0.048	0.5	0.54	98.4	80-120%
Phosphorus, Total	GP25633/GN47792	DA18004-2	mg/l	0.0	0.2	0.205	101.5	90-110%
Sulfate	GP25584/GN47698	DA18017-5	mg/l	61.6	50	112	100.8	80-120%

Associated Samples:

Batch GN47770: DA18031-1

Batch GP25584: DA18031-1

Batch GP25633: DA18031-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

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MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA18031
Account: ANADACOD - Kerr-McGee Oil & Gas Onshore LP
Project: GWA_Henrickson_Water_Well

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN47770	LA56518-1	mg/l	191	100	287	0.2	20%
Bromide	GP25584/GN47698	DA18017-5	mg/l	0.0	5	4.9	0.0	20%
Chloride	GP25584/GN47698	DA18017-5	mg/l	39.4	50	91.4	0.2	20%
Fluoride	GP25584/GN47698	DA18017-5	mg/l	0.56	10	10.5	1.0	20%
Nitrogen, Nitrate	GP25584/GN47698	DA18017-5	mg/l	0.45	1	1.4	0.0	20%
Nitrogen, Nitrite	GP25584/GN47698	DA18017-5	mg/l	0.048	0.5	0.55	1.8	20%
Sulfate	GP25584/GN47698	DA18017-5	mg/l	61.6	50	112	0.0	20%

Associated Samples:

Batch GN47770: DA18031-1

Batch GP25584: DA18031-1

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits