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Automated Report

Technical Report for

Absaroka Solutions

SDE_Buffalo_Ditch_1_32H

FID:759989 Reg:COGCC609 Freq.:IN

SGS Job Number: DA10133

Sampling Date: 10/11/18

Report to:

Absaroka Solutions
112 High Street
Buffalo, WY 82834
joel.mason@absarokasolutions.com; tanya.cude@absarokasolutions.com

ATTN: Tanya Cude

Total number of pages in report: 53

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

Scott Heideman
Laboratory Director

Client Service contact: Carissa Cumine 303-425-6021

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

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Test results relate only to samples analyzed.

January 22, 2019

Tanya Cude
Kerr-McGee Oil & Gas Onshore LP
112 High Street
Buffalo, WY 82834

Subject: Report Reissue for SGS Job: DA10133

Dear Tanya:

Per your request, we have changed the Sample ID for DA10133-1 from “BW_HAYWORTH_273561 SENE_32_7N_80W” to “BW_HAWORTH_273561 SENE_32_7N_80W”.

Any questions or concerns should be directed to the undersigned at 303-425-6021.

Sincerely,

Scott Heideman
Laboratory Director

SGS IS THE WORLD’S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

November 7, 2018

Tanya Cude
Absaroka Solutions
112 High Street
Buffalo, WY 82834

Subject: Report Reissue for SGS Job: DA10133

Dear Ms. Cude:

Per your request, we have changed the reporting for metals from PPB to PPM and are reissuing the report for this job.

Any questions or concerns should be directed to the undersigned at 303-425-6021.

Sincerely,

Scott Heideman
Laboratory Director

SGS IS THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

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SGS North America Inc.

Sample Summary

Absaroka Solutions

Job No: DA10133

SDE_Buffalo_Ditch_1_32H
Project No: FID:759989 Reg:COGCC609 Freq.:IN

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA10133-1	10/11/18	12:02	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_273561 SENE_32_7N_80W
DA10133-1A	10/11/18	12:02	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_273561 SENE_32_7N_80W
DA10133-1B	10/11/18	12:02	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_273561 SENE_32_7N_80W
DA10133-1F	10/11/18	12:02	JB	10/12/18	AQ	Groundwater Filtered	BW_HAWORTH_273561 SENE_32_7N_80W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Absaroka Solutions	**Job No**	DA10133
Site:	SDE_Buffalo_Ditch_1_32H	**Report Date**	11/20/2018 12:58:12 P

On 10/12/2018, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 1.2 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA10133 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:** V7V2875

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA10126-14MS, DA10126-14MSD 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:** GFB1023

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA10131-1AMS, DA10131-1AMSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA10133-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2253

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9516-27MS, DA9516-27MSD were used as the QC samples indicated.

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

Matrix: AQ **Batch ID:** OP17040

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9796-2MS, DA9796-2MSD were used as the QC samples indicated.

Metals Analysis By Method EPA 200.7

Matrix: AQ **Batch ID:** MP26509

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10115-5MS, DA10115-5MSD were used as the QC samples for the metals analysis.

Metals Analysis By Method EPA 200.8

Matrix: AQ	Batch ID: MP26503

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10093-1FAMS, DA10093-1FAMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ	Batch ID: R45224

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA10133-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ	Batch ID: GP23865

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9929-3MS, DA10135-1DUP were used as the QC samples for the Phosphorus, Total analysis.
- The duplicate RPD(s) for Phosphorus, Total are outside control limits for sample GP23865-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ	Batch ID: GP23828

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9970-8MS, DA9970-8MSD were used as the QC samples for the Bromide, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide, Chloride analysis.
- The matrix spike (MS) recovery(s) of Chloride are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

General Chemistry By Method HACH IRB-BART

Matrix: AQ	Batch ID: MB1093

- 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: MB1094

- 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: MB1095

- 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: GN44849

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10131-1DUP, DA10133-1MS were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

Matrix: AQ	Batch ID: GN44850

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

Matrix: AQ	Batch ID: GN44851

- 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: GP23852

- Sample(s) DA10131-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ	Batch ID: GN44832

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10060-2DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ	Batch ID: GN44881

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

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ	Batch ID: GN44853

- Sample(s) DA10131-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA10133-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ	Batch ID: R45247

- 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: DA10133
Account: Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H
Collected: 10/11/18

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Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA10133-1	**BW_HAWORTH_273561 SENE_32_7N_80W**					
Alkalinity, Bicarbonate as CaCO3		186	5.0		mg/l	SM 2320B-2011
Alkalinity, Carbonate		32.0	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		218	5.0		mg/l	SM 2320B-2011
Bromide		0.070	0.050		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance		3.3			%	SM1030E-2011
Chloride		6.0	0.50		mg/l	EPA300.0/SW846 9056A
Fluoride		0.32	0.10		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total		0.043	0.010		mg/l	EPA 365.1
Solids, Total Dissolved		332	10		mg/l	SM 2540C-2011
Specific Conductivity		478	1.0		umhos/cm	SM 2510B-2011
Sulfate		53.7	5.0		mg/l	EPA300.0/SW846 9056A
pH [a]		9.13			su	SM4500HB+ -2011/9040C
pH (Field)		9.19			su	FIELD
Temperature (Field)		8.35			Deg. C	FIELD
Oxygen, Dissolved (Field)		0.03			mg/l	FIELD
Redox Potential Vs H2		8.1			mv	FIELD
Specific Conductivity (Field)		545.7	0.50		umhos/cm	FIELD
DA10133-1A	**BW_HAWORTH_273561 SENE_32_7N_80W**					
Methane [b]		0.0142	0.00080	0.00040	mg/l	RSK175 MOD
DA10133-1B	**BW_HAWORTH_273561 SENE_32_7N_80W**					
Iron-Related Bacteria		35000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		2500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		27000	200		CFU/ml	HACH SRB-BART
DA10133-1F	**BW_HAWORTH_273561 SENE_32_7N_80W**					
Barium		0.0151	0.0040		mg/l	EPA 200.8
Calcium		1.54	0.40		mg/l	EPA 200.7
Sodium		119	0.40		mg/l	EPA 200.7
Strontium		0.0485	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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V56185.D	1	10/17/18 18:21	MB	n/a	n/a	V7V2875
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	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		70-130%
17060-07-0	1,2-Dichloroethane-D4	103%		70-130%
2037-26-5	Toluene-D8	107%		70-130%
460-00-4	4-Bromofluorobenzene	109%		70-130%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB47551.D	1	10/19/18 20:35	BB	n/a	n/a	GGB2253
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	98%		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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE63748.D	1	10/18/18 22:39	RB	10/18/18	OP17040	GFE2806
Run #2							

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

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	61%		11-142%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	186	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Alkalinity, Carbonate	32.0	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Alkalinity, Total as CaCO3	218	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Bromide	0.070	0.050	mg/l	1	10/12/18 16:37	JB	EPA300.0/SW846 9056A
Cation Anion Balance	3.3		%	1	10/19/18	KM	SM1030E-2011
Chloride	6.0	0.50	mg/l	1	10/12/18 16:37	JB	EPA300.0/SW846 9056A
Fluoride	0.32	0.10	mg/l	1	10/12/18 16:37	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate	< 0.010	0.010	mg/l	1	10/12/18 16:37	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [a]	< 0.014	0.014	mg/l	1	10/12/18 16:37	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	10/12/18 16:37	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.043	0.010	mg/l	1	10/17/18 16:34	AM	EPA 365.1
Solids, Total Dissolved	332	10	mg/l	1	10/16/18	SK	SM 2540C-2011
Specific Conductivity	478	1.0	umhos/cm	1	10/16/18 12:00	MA	SM 2510B-2011
Sulfate	53.7	5.0	mg/l	10	10/12/18 16:50	JB	EPA300.0/SW846 9056A
pH [b]	9.13		su	1	10/16/18 12:00	MA	SM4500HB+ -2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0.03		mg/l	1	10/16/18	SUB	FIELD
Redox Potential Vs H2	8.1		mv	1	10/16/18	SUB	FIELD
Specific Conductivity (Field)	545.7	0.50	umhos/cm	1	10/16/18	SUB	FIELD
Temperature (Field)	8.35		Deg. C	1	10/16/18	SUB	FIELD
pH (Field)	9.19		su	1	10/16/18	SUB	FIELD

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Analysis performed past recommended hold time.

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1A	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB22546.D	1	10/18/18 12:29	BB	n/a	n/a	GFB1023
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.9 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0142	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	

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

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1B	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	35000	25	CFU/ml	1	10/15/18 16:00	SK	HACH IRB-BART
Slime Forming Bacteria	2500	500	CFU/ml	1	10/15/18 16:00	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	27000	200	CFU/ml	1	10/15/18 16:00	SK	HACH SRB-BART

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_273561 SENE_32_7N_80W		
Lab Sample ID:	DA10133-1F	**Date Sampled:**	10/11/18
Matrix:	AQ - Groundwater Filtered	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.0151	0.0040	mg/l	2	10/15/18	10/16/18	EP	EPA 200.8 [3]	EPA 200.8 [4]
Boron	< 0.050	0.050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Calcium	1.54	0.40	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Iron	< 0.010	0.010	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Magnesium	< 0.20	0.20	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Manganese	< 0.0050	0.0050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Potassium	< 1.0	1.0	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Selenium	< 0.00080	0.00080	mg/l	2	10/15/18	10/16/18	JM	EPA 200.8 [1]	EPA 200.8 [4]
Sodium	119	0.40	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Strontium	0.0485	0.0050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]

(1) Instrument QC Batch: MA10571
(2) Instrument QC Batch: MA10572
(3) Instrument QC Batch: MA10579
(4) Prep QC Batch: MP26503
(5) Prep QC Batch: MP26509

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 #: DA10133

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: Tanya.Cude@Absarokasolutions.com
Sampler(s) Name(s): John Brouwer

Project Information

Project Name: SDE_Buffalo_Ditch_1_32H
Frequency: IN
Regulation: COGCC 609
Facility ID: 759989
EQuIS Facility Code:
Client Purchase Order #: SDE.CO.0212.03
Project Manager: Joel Mason

Billing Information (if different from Report to):
Company:
Street Address:
City, State ZIP:
Attention:

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; Oil - 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	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_Hayworth_273561	10/11/18	1202	JB	GW	17	9	6			1					1	X	X	X	X	X	X	X	X	X	X	X	01
SENE_32_7N_80W																											OB 10.12.18
Temperature, field	8.35	°C																									
pH, field	9.19	s.u.																									
Specific Conductivity, field	545.7	uS/cm																									
Oxidation Reduction Potential, field	8.1	mV																									
Dissolved Oxygen, field	0.03	mg/L																									
Turbidity, field		NTU																									

Turnaround Time (Business days)

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

Emergency & Rush TAT 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
Diss Metals unfiltered/unpreserved
Please also send reports to Joel.Mason@Absarokasolutions.com and Tanya.Cude@Absarokasolutions.com

NOTE - THIS IS NOT AN APC GWA SAMPLE

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	10/11/18 1800	1 10/12/18	2 10/12/18 1100	1100	2 10/12/18 1100
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: [x]
Cooler Temp. °C: 1.2 Therm. ID: 1100
On Ice: [x]

Form MSQA 064-01, RV 6/19/17
http://www.sgs.com/terms-and-conditions

DA10133: Chain of Custody
Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: DA10133 **Client:** ABSAROKA SOLUTIONS **Project:** SDE_BUFFALO_DITCH_1_32H

Date / Time Received: 10/12/2018 11:00:00 AM **Delivery Method:** **Airbill #'s:** CO

Cooler Temps (Initial/Adjusted): #1: (1.2/1.2);

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

5.1

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DA10133: Chain of Custody
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MS 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: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2875-MB	7V56165.D	1	10/17/18	MB	n/a	n/a	V7V2875

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

DA10133-1

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	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	102%	70-130%
17060-07-0	1,2-Dichloroethane-D4	99%	70-130%
2037-26-5	Toluene-D8	106%	70-130%
460-00-4	4-Bromofluorobenzene	108%	70-130%

Blank Spike Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2875-BS	7V56163.D	1	10/17/18	MB	n/a	n/a	V7V2875

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

DA10133-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	52.7	105	70-130
100-41-4	Ethylbenzene	50	57.3	115	69-130
108-88-3	Toluene	50	54.5	109	70-130
1330-20-7	Xylene (total)	150	173	115	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	70-130%
17060-07-0	1,2-Dichloroethane-D4	102%	70-130%
2037-26-5	Toluene-D8	105%	70-130%
460-00-4	4-Bromofluorobenzene	108%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA10126-14MS	7V56167.D	50	10/17/18	MB	n/a	n/a	V7V2875
DA10126-14MSD	7V56168.D	50	10/17/18	MB	n/a	n/a	V7V2875
DA10126-14	7V56166.D	50	10/17/18	MB	n/a	n/a	V7V2875

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

DA10133-1

CAS No.	Compound	DA10126-14 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	2180		2500	5120	118	2500	5170	120	1	67-130/30
100-41-4	Ethylbenzene	955		2500	3930	119	2500	4030	123	3	69-130/30
108-88-3	Toluene	132		2500	2840	108	2500	2920	112	3	70-130/30
1330-20-7	Xylene (total)	3100		7500	12300	123	7500	12600	127	2	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA10126-14	Limits
1868-53-7	Dibromofluoromethane	105%	102%	104%	70-130%
17060-07-0	1,2-Dichloroethane-D4	101%	103%	100%	70-130%
2037-26-5	Toluene-D8	105%	105%	106%	70-130%
460-00-4	4-Bromofluorobenzene	105%	106%	108%	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: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2253-MB	GB47531.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10133-1

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	98%	60-140%

Method Blank Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1023-MB	FB22541.D	1	10/18/18	BB	n/a	n/a	GFB1023

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

DA10133-1A

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: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2253-BS	GB47532.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10133-1

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

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	97%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1023-BS	FB22542.D	10	10/18/18	BB	n/a	n/a	GFB1023

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

DA10133-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.549	107	70-133
74-84-0	Ethane	0.923	1.14	124	70-137
74-98-6	Propane	1.38	1.69	123	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA9516-27MS	GB47533.D	1	10/19/18	BB	n/a	n/a	GGB2253
DA9516-27MSD	GB47534.D	1	10/19/18	BB	n/a	n/a	GGB2253
DA9516-27	GB47535.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10133-1

CAS No.	Compound	DA9516-27 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	1.85	84	2.2	1.92	87	4	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA9516-27	Limits
120-82-1	1,2,4-Trichlorobenzene	94%	104%	102%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA10131-1AMS [a]	FB22544.D	10	10/18/18	BB	n/a	n/a	GFB1023
DA10131-1AMSD [a]	FB22545.D	10	10/18/18	BB	n/a	n/a	GFB1023
DA10131-1A [a]	FB22543.D	1	10/18/18	BB	n/a	n/a	GFB1023

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

DA10133-1A

CAS No.	Compound	DA10131-1A 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	0.0128		0.512	0.540	103	0.512	0.543	104	1	15-196/30
74-84-0	Ethane	ND		0.923	1.10	119	0.923	1.10	119	0	53-144/30
74-98-6	Propane	ND		1.38	1.64	119	1.38	1.64	119	0	54-144/30

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

* = 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: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-MB	FE63739.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10133-1

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	48%	11-142%

Blank Spike Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-BS	FE63740.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10133-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.43	69	22-130

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

8.2.1

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* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10133
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-MS	FE63741.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806
OP17040-MSD	FE63742.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806
DA9796-2	FE63743.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10133-1

CAS No.	Compound	DA9796-2 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND		5	4.11	82	5	4.31	86	5	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA9796-2	Limits
84-15-1	o-Terphenyl	82%	89%	87%	11-142%

* = Outside of Control Limits.

8.3.1

8

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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

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	0.048	<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	0.033	<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 MP26503: DA10133-1F

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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	DA10093-1FA Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	42.1	424	400	92.3	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lead	anr				
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	2.4	188	200	92.8	70-130
Silver	anr				
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Uranium	anr				
Vanadium					
Zinc	anr				

Associated samples MP26503: DA10133-1F

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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	DA10093-1FA Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	42.1	413	400	89.5	4.3	20
Beryllium						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	2.4	177	200	87.3	6.0	20
Silver	anr					
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium	anr					
Vanadium						
Zinc	anr					

Associated samples MP26503: DA10133-1F

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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	362	400	90.5	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	185	200	92.5	85-115
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc	anr			

Associated samples MP26503: DA10133-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	46	46		
Antimony	30	14	8.7		
Arsenic	25	22	12		
Barium	10	.3	.2		
Beryllium	10	1	1.6		
Boron	50	3.3	3.7	0.90	<50
Cadmium	10	1.9	.6		
Calcium	400	6.6	22	24.2	<400
Chromium	10	1.1	1		
Cobalt	5.0	2.7	1.2		
Copper	10	4.6	2.9		
Iron	10	8.9	6.9	3.1	<10
Lead	50	13	9.1		
Lithium	5.0	.6	1		
Magnesium	200	50	39	11.9	<200
Manganese	5.0	.5	.4	-0.10	<5.0
Molybdenum	10	8.5	3.6		
Nickel	30	6.2	2.1		
Phosphorus	100	91	47		
Potassium	1000	84	61	41.3	<1000
Selenium	50	30	15		
Silicon	50	41	6.2		
Silver	30	.6	.9		
Sodium	400	13	14	7.8	<400
Strontium	5.0	.1	.3	0.10	<5.0
Thallium	10	17	9.1		
Tin	50	41	25		
Titanium	10	.5	2.5		
Uranium	50	3.9	4.4		
Vanadium	10	.9	.6		
Zinc	30	9	3.5		

Associated samples MP26509: DA10133-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr				
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron	36.4	1080	1000	104.7	70-130
Cadmium	anr				
Calcium	71200	102000	25000	123.2	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	46.9	5020	5000	99.5	70-130
Lead	anr				
Lithium					
Magnesium	13600	39300	25000	96.4	70-130
Manganese	8.5	513	500	100.9	70-130
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	4470	31100	25000	106.5	70-130
Selenium	anr				
Silicon					
Silver	anr				
Sodium	133000	166000	25000	76.0	70-130
Strontium	682	1140	500	91.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP26509: DA10133-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron	36.4	973	1000	94.0	10.4	20
Cadmium	anr					
Calcium	71200	90500	25000	77.2	11.9	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	46.9	4910	5000	97.3	2.2	20
Lead	anr					
Lithium						
Magnesium	13600	38000	25000	91.2	3.4	20
Manganese	8.5	465	500	91.3	9.8	20
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	4470	30100	25000	102.5	3.3	20
Selenium	anr					
Silicon						
Silver	anr					
Sodium	133000	160000	25000	52.0 (a)	3.7	20
Strontium	682	1100	500	83.6	3.6	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP26509: DA10133-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original MSD	Spikelot ICPALL2 % Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron	977	1000	97.7	85-115
Cadmium	anr			
Calcium	24700	25000	98.8	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	4890	5000	97.8	85-115
Lead	anr			
Lithium				
Magnesium	24200	25000	96.8	85-115
Manganese	484	500	96.8	85-115
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	24800	25000	99.2	85-115
Selenium	anr			
Silicon				
Silver	anr			
Sodium	24500	25000	98.0	85-115
Strontium	477	500	95.4	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP26509: DA10133-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	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: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN44850	5.0	2.0	mg/l	50	54.8	109.6	90-110%
Alkalinity, Carbonate	GN44851	5.0	2.0	mg/l	50	54.8	109.6	80-120%
Alkalinity, Total as CaCO3	GN44849	5.0	2.0	mg/l	50	54.8	109.6	90-110%
Bromide	GP23828/GN44796	0.050	0.0	mg/l	0.5	0.509	101.8	90-110%
Chloride	GP23828/GN44796	0.50	0.0	mg/l	5	5.30	106.0	90-110%
Fluoride	GP23828/GN44796	0.10	0.0	mg/l	1	1.05	105.0	90-110%
Iron-Related Bacteria	MB1093	25	<25	CFU/ml				
Nitrogen, Nitrate	GP23828/GN44796	0.010	0.0	mg/l	0.1	0.104	104.0	90-110%
Nitrogen, Nitrite	GP23828/GN44796	0.0040	0.0	mg/l	0.05	0.0524	104.8	90-110%
Phosphorus, Total	GP23865/GN44872	0.010	0.00	mg/l	0.2	0.196	98.0	90-110%
Phosphorus, Total	GP23865/GN44872	0.010	0.00	mg/l	0.2	0.195	97.5	90-110%
Slime Forming Bacteria	MB1094	500	<500	CFU/ml				
Solids, Total Dissolved	GN44832	10	0.0	mg/l	400	392	98.0	90-110%
Specific Conductivity	GP23852/GN44852			umhos/cm	98.3	96.5	98.2	90-110%
Specific Conductivity	GP23852/GN44852			umhos/cm	997	1000	100.3	90-110%
Sulfate	GP23828/GN44796	0.50	0.0	mg/l	5	5.04	100.8	90-110%
Sulfate Reducing Bacteria	MB1095	200	<200	CFU/ml				
pH	GN44853			su	8.00	7.99	99.9	99.1-100.9%
pH	GN44853			su	6.00	5.99	99.8	99.1-100.9%

Associated Samples:
Batch MB1093: DA10133-1B
Batch MB1094: DA10133-1B
Batch MB1095: DA10133-1B
Batch GN44832: DA10133-1
Batch GN44849: DA10133-1
Batch GN44850: DA10133-1
Batch GN44851: DA10133-1
Batch GN44853: DA10133-1
Batch GP23828: DA10133-1
Batch GP23852: DA10133-1
Batch GP23865: DA10133-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN44849	DA10131-1	mg/l	200	199	0.3	0-20%
Phosphorus, Total	GP23865/GN44872	DA10135-1	mg/l	0.019	0.0140	30.3(a)	0-20%
Solids, Total Dissolved	GN44832	DA10060-2	mg/l	749	750	0.1	0-5%
Specific Conductivity	GP23852/GN44852	DA10131-1	umhos/cm	538	549	2.0	0-20%
pH	GN44853	DA10131-1	su	8.98	8.98	0.0	0-5%

Associated Samples:
Batch GN44832: DA10133-1
Batch GN44849: DA10133-1
Batch GN44853: DA10133-1
Batch GP23852: DA10133-1
Batch GP23865: DA10133-1
(*) Outside of QC limits
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN44849	DA10133-1	mg/l	218	100	270	105.2	80-120%
Bromide	GP23828/GN44796	DA9970-8	mg/l	11.6	50	63.2	103.2	80-120%
Chloride	GP23828/GN44796	DA9970-8	mg/l	2620	500	3010	78.0(a)	80-120%
Fluoride	GP23828/GN44796	DA9970-8	mg/l	0.0	100	104	104.0	80-120%
Nitrogen, Nitrate	GP23828/GN44796	DA9970-8	mg/l	8.2	10	18.3	101.0	80-120%
Nitrogen, Nitrite	GP23828/GN44796	DA9970-8	mg/l	0.0	5	4.5	90.0	80-120%
Phosphorus, Total	GP23865/GN44872	DA9929-3	mg/l	0.0070 U	0.2	0.212	104.0	90-110%
Sulfate	GP23828/GN44796	DA9970-8	mg/l	1450	500	1940	98.0	80-120%

Associated Samples:
Batch GN44849: DA10133-1
Batch GP23828: DA10133-1
Batch GP23865: DA10133-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10133
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP23828/GN44796	DA9970-8	mg/l	11.6	50	63.5	0.5	20%
Chloride	GP23828/GN44796	DA9970-8	mg/l	2620	500	3020	0.3	20%
Fluoride	GP23828/GN44796	DA9970-8	mg/l	0.0	100	105	1.0	20%
Nitrogen, Nitrate	GP23828/GN44796	DA9970-8	mg/l	8.2	10	18.3	0.0	20%
Nitrogen, Nitrite	GP23828/GN44796	DA9970-8	mg/l	0.0	5	4.6	2.2	20%
Sulfate	GP23828/GN44796	DA9970-8	mg/l	1450	500	1940	0.0	20%

Associated Samples:
Batch GP23828: DA10133-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Absaroka Solutions

SDE_Buffalo_Ditch_1_32H

FID:759990 Reg:COGCC609 Freq.:IN

SGS Job Number: DA10131

Sampling Date: 10/11/18

Report to:

Absaroka Solutions
112 High Street
Buffalo, WY 82834
joel.mason@absarokasolutions.com; tanya.cude@absarokasolutions.com

ATTN: Tanya Cude

Total number of pages in report: 53

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

Scott Heideman
Laboratory Director

Client Service contact: Carissa Cumine 303-425-6021

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

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how we can serve you better at:
EHS.US.CustomerCare@sgs.com

January 22, 2019

Tanya Cude
Kerr-McGee Oil & Gas Onshore LP
112 High Street
Buffalo, WY 82834

Subject: Report Reissue for SGS Job: DA10131

Dear Tanya:

Per your request, we have changed the Sample ID for DA10131-1 from “BW_HAYWORTH_299984 NENE_32_7N_80W” to “BW_HAWORTH_299984 NENE_32_7N_80W”.

Any questions or concerns should be directed to the undersigned at 303-425-6021.

Sincerely,

Scott Heideman
Laboratory Director

SGS IS THE WORLD’S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

November 7, 2018

Tanya Cude
Absaroka Solutions
112 High Street
Buffalo, WY 82834

Subject: Report Reissue for SGS Job: DA10131

Dear Ms. Cude:

Per your request, we have changed the reporting for metals from PPB to PPM and are reissuing the report for this job.

Any questions or concerns should be directed to the undersigned at 303-425-6021.

Sincerely,

Scott Heideman
Laboratory Director

SGS IS THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.

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SGS North America Inc.

Sample Summary

Absaroka Solutions

Job No: DA10131

SDE_Buffalo_Ditch_1_32H
Project No: FID:759990 Reg:COGCC609 Freq.:IN

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA10131-1	10/11/18	13:57	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_299984 NENE_32_7N_80W
DA10131-1A	10/11/18	13:57	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_299984 NENE_32_7N_80W
DA10131-1B	10/11/18	13:57	JB	10/12/18	AQ	Ground Water	BW_HAWORTH_299984 NENE_32_7N_80W
DA10131-1F	10/11/18	13:57	JB	10/12/18	AQ	Groundwater Filtered	BW_HAWORTH_299984 NENE_32_7N_80W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Absaroka Solutions	**Job No**	DA10131
Site:	SDE_Buffalo_Ditch_1_32H	**Report Date**	11/20/2018 12:55:58 P

On 10/12/2018, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 1.7 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA10131 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:** V7V2875

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA10126-14MS, DA10126-14MSD 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:** GFB1023

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA10131-1AMS, DA10131-1AMSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA10131-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2253

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9516-27MS, DA9516-27MSD were used as the QC samples indicated.

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

Matrix: AQ **Batch ID:** OP17040

- All samples were extracted and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9796-2MS, DA9796-2MSD were used as the QC samples indicated.

Metals Analysis By Method EPA 200.7

Matrix: AQ **Batch ID:** MP26509

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10115-5MS, DA10115-5MSD were used as the QC samples for the metals analysis.

Metals Analysis By Method EPA 200.8

Matrix: AQ	Batch ID: MP26503

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10093-1FAMS, DA10093-1FAMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ	Batch ID: R45223

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA10131-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ	Batch ID: GP23865

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9929-3MS, DA10135-1DUP were used as the QC samples for the Phosphorus, Total analysis.
- The duplicate RPD(s) for Phosphorus, Total are outside control limits for sample GP23865-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ	Batch ID: GP23828

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA9970-8MS, DA9970-8MSD were used as the QC samples for the Bromide, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide, Chloride analysis.
- The matrix spike (MS) recovery(s) of Chloride are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

General Chemistry By Method HACH IRB-BART

Matrix: AQ	Batch ID: MB1093

- 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: MB1094

- 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: MB1095

- 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: GN44849

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10131-1DUP, DA10133-1MS were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

Matrix: AQ	Batch ID: GN44850

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

Matrix: AQ	Batch ID: GN44851

- 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: GP23852

- Sample(s) DA10131-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ	Batch ID: GN44832

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA10060-2DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ	Batch ID: GN44881

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

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ	Batch ID: GN44853

- Sample(s) DA10131-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA10131-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ	Batch ID: R45247

- 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: DA10131
Account: Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H
Collected: 10/11/18

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA10131-1	**BW_HAWORTH_299984 NENE_32_7N_80W**					
Alkalinity, Bicarbonate as CaCO3		179	5.0		mg/l	SM 2320B-2011
Alkalinity, Carbonate		21.3	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		200	5.0		mg/l	SM 2320B-2011
Bromide		0.079	0.050		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance		0.59			%	SM1030E-2011
Chloride		8.3	0.50		mg/l	EPA300.0/SW846 9056A
Fluoride		0.25	0.10		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total		0.025	0.010		mg/l	EPA 365.1
Solids, Total Dissolved		386	10		mg/l	SM 2540C-2011
Specific Conductivity		538	1.0		umhos/cm	SM 2510B-2011
Sulfate		105	5.0		mg/l	EPA300.0/SW846 9056A
pH [a]		8.98			su	SM4500HB+ -2011/9040C
pH (Field)		9			su	FIELD
Temperature (Field)		9.63			Deg. C	FIELD
Oxygen, Dissolved (Field)		0.06			mg/l	FIELD
Redox Potential Vs H2		10.5			mv	FIELD
Specific Conductivity (Field)		631.7	0.50		umhos/cm	FIELD
DA10131-1A	**BW_HAWORTH_299984 NENE_32_7N_80W**					
Methane [b]		0.0128	0.00080	0.00040	mg/l	RSK175 MOD
DA10131-1B	**BW_HAWORTH_299984 NENE_32_7N_80W**					
Iron-Related Bacteria		35000	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		2500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		27000	200		CFU/ml	HACH SRB-BART
DA10131-1F	**BW_HAWORTH_299984 NENE_32_7N_80W**					
Barium		0.0222	0.0040		mg/l	EPA 200.8
Calcium		2.37	0.40		mg/l	EPA 200.7
Magnesium		0.317	0.20		mg/l	EPA 200.7
Manganese		0.0123	0.0050		mg/l	EPA 200.7
Sodium		142	0.40		mg/l	EPA 200.7
Strontium		0.0760	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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V56184.D	1	10/17/18 17:57	MB	n/a	n/a	V7V2875
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	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%
2037-26-5	Toluene-D8	105%		70-130%
460-00-4	4-Bromofluorobenzene	108%		70-130%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB47550.D	1	10/19/18 20:00	BB	n/a	n/a	GGB2253
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	97%		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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE63747.D	1	10/18/18 21:58	RB	10/18/18	OP17040	GFE2806
Run #2							

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

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	71%		11-142%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	179	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Alkalinity, Carbonate	21.3	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Alkalinity, Total as CaCO3	200	5.0	mg/l	1	10/16/18 12:00	MA	SM 2320B-2011
Bromide	0.079	0.050	mg/l	1	10/12/18 16:11	JB	EPA300.0/SW846 9056A
Cation Anion Balance	0.59		%	1	10/19/18	KM	SM1030E-2011
Chloride	8.3	0.50	mg/l	1	10/12/18 16:11	JB	EPA300.0/SW846 9056A
Fluoride	0.25	0.10	mg/l	1	10/12/18 16:11	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate	< 0.010	0.010	mg/l	1	10/12/18 16:11	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [a]	< 0.014	0.014	mg/l	1	10/12/18 16:11	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	10/12/18 16:11	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.025	0.010	mg/l	1	10/17/18 16:32	AM	EPA 365.1
Solids, Total Dissolved	386	10	mg/l	1	10/16/18	SK	SM 2540C-2011
Specific Conductivity	538	1.0	umhos/cm	1	10/16/18 12:00	MA	SM 2510B-2011
Sulfate	105	5.0	mg/l	10	10/12/18 16:24	JB	EPA300.0/SW846 9056A
pH [b]	8.98		su	1	10/16/18 12:00	MA	SM4500HB+ -2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0.06		mg/l	1	10/16/18	SUB	FIELD
Redox Potential Vs H2	10.5		mv	1	10/16/18	SUB	FIELD
Specific Conductivity (Field)	631.7	0.50	umhos/cm	1	10/16/18	SUB	FIELD
Temperature (Field)	9.63		Deg. C	1	10/16/18	SUB	FIELD
pH (Field)	9		su	1	10/16/18	SUB	FIELD

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Analysis performed past recommended hold time.

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1A	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB22543.D	1	10/18/18 12:04	BB	n/a	n/a	GFB1023
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.9 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0128	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	

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

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1B	**Date Sampled:**	10/11/18
Matrix:	AQ - Ground Water	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	35000	25	CFU/ml	1	10/15/18 16:00	SK	HACH IRB-BART
Slime Forming Bacteria	2500	500	CFU/ml	1	10/15/18 16:00	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	27000	200	CFU/ml	1	10/15/18 16:00	SK	HACH SRB-BART

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_HAWORTH_299984 NENE_32_7N_80W		
Lab Sample ID:	DA10131-1F	**Date Sampled:**	10/11/18
Matrix:	AQ - Groundwater Filtered	**Date Received:**	10/12/18
		Percent Solids:	n/a
Project:	SDE_Buffalo_Ditch_1_32H		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.0222	0.0040	mg/l	2	10/15/18	10/16/18	EP	EPA 200.8 [3]	EPA 200.8 [4]
Boron	< 0.050	0.050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Calcium	2.37	0.40	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Iron	< 0.010	0.010	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Magnesium	0.317	0.20	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Manganese	0.0123	0.0050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Potassium	< 1.0	1.0	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Selenium	< 0.00080	0.00080	mg/l	2	10/15/18	10/16/18	JM	EPA 200.8 [1]	EPA 200.8 [4]
Sodium	142	0.40	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]
Strontium	0.0760	0.0050	mg/l	1	10/15/18	10/16/18	JM	EPA 200.7 [2]	EPA 200.7 [5]

(1) Instrument QC Batch: MA10571
(2) Instrument QC Batch: MA10572
(3) Instrument QC Batch: MA10579
(4) Prep QC Batch: MP26503
(5) Prep QC Batch: MP26509

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 #: DA10131

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: Tanya.Cude@Absarokasolutions.com
Sampler(s) Name(s): John Brouwer

Project Information

Project Name: SDE_Buffalo_Ditch_1_32H
Frequency: IN
Regulation: COGCC 609
Facility ID: 759990
EQuIS Facility Code:
Client Purchase Order #: SDE.CO.0212.03
Project Manager: Joel Mason

Billing Information (if different from Report to)
Company:
Street Address:
City, State ZIP:
Attention:

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	Collection Time	Sampled by	Matrix	# of bottles	NONE	HCl	NaOH	HNO3	H2SO4	DI Water	MEOH	ENCORE	Na2S2O3	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_Hayworth_299984	6/11/18	1357	JB	GW	17	9	6			1					1	X	X	X	X	X	X	X	X	X	X	X	01
NENE_32_7N_80W																											03
																											10-12-18
Temperature, field	9.63	°C																									
pH, field	9.00	s.u.																									
Specific Conductivity, field	631.7	uS/cm																									
Oxidation Reduction Potential, field	10.5	mV																									
Dissolved Oxygen, field	0.06	mg/L																									
Turbidity, field		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
Diss Metals on Filtered/Un Preserved
Please also send reports to Joel.Mason@Absarokasolutions.com and Tanya.Cude@Absarokasolutions.com
NOTE - THIS IS NOT AN APC GWA SAMPLE

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	6/11/18 1800	1 10/12/18	2 10/12/18	1100	2 10/12/18 1100
Relinquished by Sampler:	Date/Time:	Received By:	Relinquished By:	Date/Time:	Received By:
3		3	4		4

Custody Seal # Intact [x] Not intact [ ] Absent [ ] | Preserved where applicable [x] | Cooler Temp. °C: 1.7 TOD | Therm. ID: ___ | On Ice [x]

Form MSQA 064-01, RV 6/19/17
http://www.sgs.com/terms-and-conditions

5.1
5

DA10131: Chain of Custody
Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: DA10131 **Client:** ABSAROKA SOLUTIONS **Project:** SDE_BUFFALO_DITCH_1_32H

Date / Time Received: 10/12/2018 11:00:00 AM **Delivery Method:** **Airbill #'s:** CO

Cooler Temps (Initial/Adjusted): #1: (1.7/1.7);

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

5.1

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DA10131: Chain of Custody
Page 2 of 2

MS 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: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2875-MB	7V56165.D	1	10/17/18	MB	n/a	n/a	V7V2875

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

DA10131-1

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	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	102%	70-130%
17060-07-0	1,2-Dichloroethane-D4	99%	70-130%
2037-26-5	Toluene-D8	106%	70-130%
460-00-4	4-Bromofluorobenzene	108%	70-130%

Blank Spike Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2875-BS	7V56163.D	1	10/17/18	MB	n/a	n/a	V7V2875

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

DA10131-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	52.7	105	70-130
100-41-4	Ethylbenzene	50	57.3	115	69-130
108-88-3	Toluene	50	54.5	109	70-130
1330-20-7	Xylene (total)	150	173	115	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	70-130%
17060-07-0	1,2-Dichloroethane-D4	102%	70-130%
2037-26-5	Toluene-D8	105%	70-130%
460-00-4	4-Bromofluorobenzene	108%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA10126-14MS	7V56167.D	50	10/17/18	MB	n/a	n/a	V7V2875
DA10126-14MSD	7V56168.D	50	10/17/18	MB	n/a	n/a	V7V2875
DA10126-14	7V56166.D	50	10/17/18	MB	n/a	n/a	V7V2875

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

DA10131-1

CAS No.	Compound	DA10126-14 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	2180		2500	5120	118	2500	5170	120	1	67-130/30
100-41-4	Ethylbenzene	955		2500	3930	119	2500	4030	123	3	69-130/30
108-88-3	Toluene	132		2500	2840	108	2500	2920	112	3	70-130/30
1330-20-7	Xylene (total)	3100		7500	12300	123	7500	12600	127	2	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA10126-14	Limits
1868-53-7	Dibromofluoromethane	105%	102%	104%	70-130%
17060-07-0	1,2-Dichloroethane-D4	101%	103%	100%	70-130%
2037-26-5	Toluene-D8	105%	105%	106%	70-130%
460-00-4	4-Bromofluorobenzene	105%	106%	108%	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: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2253-MB	GB47531.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10131-1

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	98%	60-140%

Method Blank Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1023-MB	FB22541.D	1	10/18/18	BB	n/a	n/a	GFB1023

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

DA10131-1A

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: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2253-BS	GB47532.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10131-1

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

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	97%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1023-BS	FB22542.D	10	10/18/18	BB	n/a	n/a	GFB1023

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

DA10131-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.549	107	70-133
74-84-0	Ethane	0.923	1.14	124	70-137
74-98-6	Propane	1.38	1.69	123	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA9516-27MS	GB47533.D	1	10/19/18	BB	n/a	n/a	GGB2253
DA9516-27MSD	GB47534.D	1	10/19/18	BB	n/a	n/a	GGB2253
DA9516-27	GB47535.D	1	10/19/18	BB	n/a	n/a	GGB2253

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

DA10131-1

CAS No.	Compound	DA9516-27 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	1.85	84	2.2	1.92	87	4	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA9516-27	Limits
120-82-1	1,2,4-Trichlorobenzene	94%	104%	102%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA10131-1AMS [a]	FB22544.D	10	10/18/18	BB	n/a	n/a	GFB1023
DA10131-1AMSD [a]	FB22545.D	10	10/18/18	BB	n/a	n/a	GFB1023
DA10131-1A [a]	FB22543.D	1	10/18/18	BB	n/a	n/a	GFB1023

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

DA10131-1A

CAS No.	Compound	DA10131-1A 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	0.0128		0.512	0.540	103	0.512	0.543	104	1	15-196/30
74-84-0	Ethane	ND		0.923	1.10	119	0.923	1.10	119	0	53-144/30
74-98-6	Propane	ND		1.38	1.64	119	1.38	1.64	119	0	54-144/30

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

* = 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: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-MB	FE63739.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10131-1

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	48%	11-142%

Blank Spike Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-BS	FE63740.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10131-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	3.43	69	22-130

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

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA10131
Account: ABSSWYB Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17040-MS	FE63741.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806
OP17040-MSD	FE63742.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806
DA9796-2	FE63743.D	1	10/18/18	RB	10/18/18	OP17040	GFE2806

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

DA10131-1

CAS No.	Compound	DA9796-2 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND		5	4.11	82	5	4.31	86	5	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA9796-2	Limits
84-15-1	o-Terphenyl	82%	89%	87%	11-142%

* = Outside of Control Limits.

8.3.1

8

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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

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	0.048	<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	0.033	<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 MP26503: DA10131-1F

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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	DA10093-1FA Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	42.1	424	400	92.3	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium	anr				
Cobalt					
Copper	anr				
Iron	anr				
Lead	anr				
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Phosphorus					
Potassium					
Selenium	2.4	188	200	92.8	70-130
Silver	anr				
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Uranium	anr				
Vanadium					
Zinc	anr				

Associated samples MP26503: DA10131-1F

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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	DA10093-1FA Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	42.1	413	400	89.5	4.3	20
Beryllium						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium	anr					
Cobalt						
Copper	anr					
Iron	anr					
Lead	anr					
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Phosphorus						
Potassium						
Selenium	2.4	177	200	87.3	6.0	20
Silver	anr					
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium	anr					
Vanadium						
Zinc	anr					

Associated samples MP26503: DA10131-1F

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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26503
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	362	400	90.5	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium	anr			
Cobalt				
Copper	anr			
Iron	anr			
Lead	anr			
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Phosphorus				
Potassium				
Selenium	185	200	92.5	85-115
Silver	anr			
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium	anr			
Vanadium				
Zinc	anr			

Associated samples MP26503: DA10131-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	46	46		
Antimony	30	14	8.7		
Arsenic	25	22	12		
Barium	10	.3	.2		
Beryllium	10	1	1.6		
Boron	50	3.3	3.7	0.90	<50
Cadmium	10	1.9	.6		
Calcium	400	6.6	22	24.2	<400
Chromium	10	1.1	1		
Cobalt	5.0	2.7	1.2		
Copper	10	4.6	2.9		
Iron	10	8.9	6.9	3.1	<10
Lead	50	13	9.1		
Lithium	5.0	.6	1		
Magnesium	200	50	39	11.9	<200
Manganese	5.0	.5	.4	-0.10	<5.0
Molybdenum	10	8.5	3.6		
Nickel	30	6.2	2.1		
Phosphorus	100	91	47		
Potassium	1000	84	61	41.3	<1000
Selenium	50	30	15		
Silicon	50	41	6.2		
Silver	30	.6	.9		
Sodium	400	13	14	7.8	<400
Strontium	5.0	.1	.3	0.10	<5.0
Thallium	10	17	9.1		
Tin	50	41	25		
Titanium	10	.5	2.5		
Uranium	50	3.9	4.4		
Vanadium	10	.9	.6		
Zinc	30	9	3.5		

Associated samples MP26509: DA10131-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr				
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron	36.4	1080	1000	104.7	70-130
Cadmium	anr				
Calcium	71200	102000	25000	123.2	70-130
Chromium	anr				
Cobalt					
Copper	anr				
Iron	46.9	5020	5000	99.5	70-130
Lead	anr				
Lithium					
Magnesium	13600	39300	25000	96.4	70-130
Manganese	8.5	513	500	100.9	70-130
Molybdenum	anr				
Nickel	anr				
Phosphorus					
Potassium	4470	31100	25000	106.5	70-130
Selenium	anr				
Silicon					
Silver	anr				
Sodium	133000	166000	25000	76.0	70-130
Strontium	682	1140	500	91.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP26509: DA10131-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron	36.4	973	1000	94.0	10.4	20
Cadmium	anr					
Calcium	71200	90500	25000	77.2	11.9	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	46.9	4910	5000	97.3	2.2	20
Lead	anr					
Lithium						
Magnesium	13600	38000	25000	91.2	3.4	20
Manganese	8.5	465	500	91.3	9.8	20
Molybdenum	anr					
Nickel	anr					
Phosphorus						
Potassium	4470	30100	25000	102.5	3.3	20
Selenium	anr					
Silicon						
Silver	anr					
Sodium	133000	160000	25000	52.0 (a)	3.7	20
Strontium	682	1100	500	83.6	3.6	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP26509: DA10131-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	DA10115-5 Original MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron	977	1000	97.7	85-115
Cadmium	anr			
Calcium	24700	25000	98.8	85-115
Chromium	anr			
Cobalt				
Copper	anr			
Iron	4890	5000	97.8	85-115
Lead	anr			
Lithium				
Magnesium	24200	25000	96.8	85-115
Manganese	484	500	96.8	85-115
Molybdenum	anr			
Nickel	anr			
Phosphorus				
Potassium	24800	25000	99.2	85-115
Selenium	anr			
Silicon				
Silver	anr			
Sodium	24500	25000	98.0	85-115
Strontium	477	500	95.4	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP26509: DA10131-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

QC Batch ID: MP26509
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 10/15/18

Metal	BSP Result	Spikelot ICPALL2	% Rec	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: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN44850	5.0	2.0	mg/l	50	54.8	109.6	90-110%
Alkalinity, Carbonate	GN44851	5.0	2.0	mg/l	50	54.8	109.6	80-120%
Alkalinity, Total as CaCO3	GN44849	5.0	2.0	mg/l	50	54.8	109.6	90-110%
Bromide	GP23828/GN44796	0.050	0.0	mg/l	0.5	0.509	101.8	90-110%
Chloride	GP23828/GN44796	0.50	0.0	mg/l	5	5.30	106.0	90-110%
Fluoride	GP23828/GN44796	0.10	0.0	mg/l	1	1.05	105.0	90-110%
Iron-Related Bacteria	MB1093	25	<25	CFU/ml				
Nitrogen, Nitrate	GP23828/GN44796	0.010	0.0	mg/l	0.1	0.104	104.0	90-110%
Nitrogen, Nitrite	GP23828/GN44796	0.0040	0.0	mg/l	0.05	0.0524	104.8	90-110%
Phosphorus, Total	GP23865/GN44872	0.010	0.00	mg/l	0.2	0.196	98.0	90-110%
Phosphorus, Total	GP23865/GN44872	0.010	0.00	mg/l	0.2	0.195	97.5	90-110%
Slime Forming Bacteria	MB1094	500	<500	CFU/ml				
Solids, Total Dissolved	GN44832	10	0.0	mg/l	400	392	98.0	90-110%
Specific Conductivity	GP23852/GN44852			umhos/cm	98.3	96.5	98.2	90-110%
Specific Conductivity	GP23852/GN44852			umhos/cm	997	1000	100.3	90-110%
Sulfate	GP23828/GN44796	0.50	0.0	mg/l	5	5.04	100.8	90-110%
Sulfate Reducing Bacteria	MB1095	200	<200	CFU/ml				
pH	GN44853			su	8.00	7.99	99.9	99.1-100.9%
pH	GN44853			su	6.00	5.99	99.8	99.1-100.9%

Associated Samples:
Batch MB1093: DA10131-1B
Batch MB1094: DA10131-1B
Batch MB1095: DA10131-1B
Batch GN44832: DA10131-1
Batch GN44849: DA10131-1
Batch GN44850: DA10131-1
Batch GN44851: DA10131-1
Batch GN44853: DA10131-1
Batch GP23828: DA10131-1
Batch GP23852: DA10131-1
Batch GP23865: DA10131-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN44849	DA10131-1	mg/l	200	199	0.3	0-20%
Phosphorus, Total	GP23865/GN44872	DA10135-1	mg/l	0.019	0.0140	30.3(a)	0-20%
Solids, Total Dissolved	GN44832	DA10060-2	mg/l	749	750	0.1	0-5%
Specific Conductivity	GP23852/GN44852	DA10131-1	umhos/cm	538	549	2.0	0-20%
pH	GN44853	DA10131-1	su	8.98	8.98	0.0	0-5%

Associated Samples:
Batch GN44832: DA10131-1
Batch GN44849: DA10131-1
Batch GN44853: DA10131-1
Batch GP23852: DA10131-1
Batch GP23865: DA10131-1
(*) Outside of QC limits
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN44849	DA10133-1	mg/l	218	100	270	105.2	80-120%
Bromide	GP23828/GN44796	DA9970-8	mg/l	11.6	50	63.2	103.2	80-120%
Chloride	GP23828/GN44796	DA9970-8	mg/l	2620	500	3010	78.0(a)	80-120%
Fluoride	GP23828/GN44796	DA9970-8	mg/l	0.0	100	104	104.0	80-120%
Nitrogen, Nitrate	GP23828/GN44796	DA9970-8	mg/l	8.2	10	18.3	101.0	80-120%
Nitrogen, Nitrite	GP23828/GN44796	DA9970-8	mg/l	0.0	5	4.5	90.0	80-120%
Phosphorus, Total	GP23865/GN44872	DA9929-3	mg/l	0.0070 U	0.2	0.212	104.0	90-110%
Sulfate	GP23828/GN44796	DA9970-8	mg/l	1450	500	1940	98.0	80-120%

Associated Samples:
Batch GN44849: DA10131-1
Batch GP23828: DA10131-1
Batch GP23865: DA10131-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA10131
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Buffalo_Ditch_1_32H

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP23828/GN44796	DA9970-8	mg/l	11.6	50	63.5	0.5	20%
Chloride	GP23828/GN44796	DA9970-8	mg/l	2620	500	3020	0.3	20%
Fluoride	GP23828/GN44796	DA9970-8	mg/l	0.0	100	105	1.0	20%
Nitrogen, Nitrate	GP23828/GN44796	DA9970-8	mg/l	8.2	10	18.3	0.0	20%
Nitrogen, Nitrite	GP23828/GN44796	DA9970-8	mg/l	0.0	5	4.6	2.2	20%
Sulfate	GP23828/GN44796	DA9970-8	mg/l	1450	500	1940	0.0	20%

Associated Samples:
Batch GP23828: DA10131-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Absaroka Solutions

SDE_Vaneta_DAF_Permitting

FID:760365 Reg:COGCC 609 Freq.:IN

SGS Job Number: DA12700

Sampling Date: 01/09/19

Report to:

Absaroka Solutions
112 High Street
Buffalo, WY 82834
joel.mason@absarokasolutions.com; tanya.cude@absarokasolutions.com

ATTN: Tanya Cude

Total number of pages in report: 52

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

Scott Heideman
Laboratory Director

Client Service contact: Carissa Cumine 303-425-6021

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

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how we can serve you better at:
EHS.US.CustomerCare@sgs.com

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SGS North America Inc.

Sample Summary

Absaroka Solutions

Job No: DA12700

SDE_Vaneta_DAF_Permitting
Project No: FID:760365 Reg:COGCC 609 Freq.:IN

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA12700-1	01/09/19	12:52	JB	01/10/19	AQ	Ground Water	BW_EVANS_112473 NENE_29_7N_80W
DA12700-1A	01/09/19	12:52	JB	01/10/19	AQ	Ground Water	BW_EVANS_112473 NENE_29_7N_80W
DA12700-1B	01/09/19	12:52	JB	01/10/19	AQ	Ground Water	BW_EVANS_112473 NENE_29_7N_80W
DA12700-1F	01/09/19	12:52	JB	01/10/19	AQ	Groundwater Filtered	BW_EVANS_112473 NENE_29_7N_80W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Absaroka Solutions	**Job No**	DA12700
Site:	SDE_Vaneta_DAF_Permitting	**Report Date**	1/22/2019 7:25:05 PM

On 01/10/2019, 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 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA12700 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:** V7V2960

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12330-30MS, DA12330-30MSD 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:** GFB1044

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12335-14MS, DA12335-14MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA12700-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2295

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12335-17MS, DA12335-17MSD 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:** OP17326

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) DA12330-18MS, DA12330-18MSD 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:** MP27151

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12696-1FMS, DA12696-1FMSD were used as the QC samples for the metals analysis.
- MP27151-MB1 for Iron: All sample results < RL or > 10x MB1 concentration.

Metals Analysis By Method EPA 200.8

Matrix: AQ	**Batch ID:** MP27146

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12707-1AMS, DA12707-1AMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ	**Batch ID:** R46309

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA12700-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ	**Batch ID:** GP24404

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12649-1DUP, DA12698-1MS were used as the QC samples for the Phosphorus, Total analysis.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ	**Batch ID:** GP24379

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12647-5MS, DA12647-5MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.

General Chemistry By Method HACH IRB-BART

Matrix: AQ	**Batch ID:** MB1131

- 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:** MB1132

- 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:** MB1133

- 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: GN45771

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

Matrix: AQ	Batch ID: GN45772

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

Matrix: AQ	Batch ID: GN45773

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12630-1DUP, DA12669-1MS, DA12669-1MSD were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

General Chemistry By Method SM 2510B-2011

Matrix: AQ	Batch ID: GP24388

- Sample(s) DA12630-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ	Batch ID: GN45779

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12694-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ	Batch ID: GN45827

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

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ	Batch ID: GN45774

- Sample(s) DA12630-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA12700-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ	Batch ID: R46246

- 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: DA12700
Account: Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting
Collected: 01/09/19

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA12700-1	**BW_EVANS_112473 NENE_29_7N_80W**					
Alkalinity, Bicarbonate as CaCO3		283	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		283	5.0		mg/l	SM 2320B-2011
Bromide		0.13	0.10		mg/l	EPA300.0/SW846 9056A
Cation Anion Balance		1.9			%	SM1030E-2011
Chloride		19.9	1.0		mg/l	EPA300.0/SW846 9056A
Fluoride		0.17	0.10		mg/l	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [a]		0.054	0.050		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrite		0.054	0.040		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total		0.12	0.010		mg/l	EPA 365.1
Solids, Total Dissolved		499	10		mg/l	SM 2540C-2011
Specific Conductivity		747	1.0		umhos/cm	SM 2510B-2011
Sulfate		113	5.0		mg/l	EPA300.0/SW846 9056A
pH [b]		7.80			su	SM4500HB+ -2011/9040C
pH (Field)		7.05			su	FIELD
Temperature (Field)		7.51			Deg. C	FIELD
Oxygen, Dissolved (Field)		0.08			mg/l	FIELD
Turbidity		0.02			NTU	FIELD
Specific Conductivity (Field)		797.5	0.50		umhos/cm	FIELD
DA12700-1A	**BW_EVANS_112473 NENE_29_7N_80W**					
Methane [c]		0.0095	0.00080	0.00040	mg/l	RSK175 MOD
DA12700-1B	**BW_EVANS_112473 NENE_29_7N_80W**					
Iron-Related Bacteria		2200	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		2500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		6000	200		CFU/ml	HACH SRB-BART
DA12700-1F	**BW_EVANS_112473 NENE_29_7N_80W**					
Barium		0.235	0.0040		mg/l	EPA 200.8
Calcium		85.9	0.40		mg/l	EPA 200.7
Iron		2.63	0.010		mg/l	EPA 200.7
Magnesium		20.4	0.20		mg/l	EPA 200.7
Manganese		1.12	0.0050		mg/l	EPA 200.7
Potassium		3.25	1.0		mg/l	EPA 200.7
Sodium		65.4	0.40		mg/l	EPA 200.7
Strontium		1.95	0.0050		mg/l	EPA 200.7

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

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V58063.D	1	01/11/19 13:55	MB	n/a	n/a	V7V2960
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	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		70-130%
17060-07-0	1,2-Dichloroethane-D4	98%		70-130%
2037-26-5	Toluene-D8	93%		70-130%
460-00-4	4-Bromofluorobenzene	97%		70-130%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB48737.D	1	01/14/19 19:54	BB	n/a	n/a	GGB2295
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	107%		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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FN2970.D	1	01/11/19 18:10	RB	01/10/19	OP17326	GFN105
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

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

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	91%		11-142%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	283	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Alkalinity, Total as CaCO3	283	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Bromide	0.13	0.10	mg/l	2	01/10/19 17:19	JB	EPA300.0/SW846 9056A
Cation Anion Balance	1.9		%	1	01/17/19	KM	SM1030E-2011
Chloride	19.9	1.0	mg/l	2	01/10/19 17:19	JB	EPA300.0/SW846 9056A
Fluoride	0.17	0.10	mg/l	1	01/10/19 13:11	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate	< 0.010	0.010	mg/l	1	01/10/19 13:11	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [a]	0.054	0.050	mg/l	1	01/10/19 16:40	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.054	0.040	mg/l	10	01/10/19 16:40	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.12	0.010	mg/l	1	01/16/19 13:45	AM	EPA 365.1
Solids, Total Dissolved	499	10	mg/l	1	01/14/19	SK	SM 2540C-2011
Specific Conductivity	747	1.0	umhos/cm	1	01/11/19 09:30	PV	SM 2510B-2011
Sulfate	113	5.0	mg/l	10	01/10/19 16:40	JB	EPA300.0/SW846 9056A
pH [b]	7.80		su	1	01/11/19 09:30	PV	SM4500HB+ -2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	0.08		mg/l	1	01/14/19	SUB	FIELD
Redox Potential Vs H2	-22.7		mv	1	01/14/19	SUB	FIELD
Specific Conductivity (Field)	797.5	0.50	umhos/cm	1	01/14/19	SUB	FIELD
Temperature (Field)	7.51		Deg. C	1	01/14/19	SUB	FIELD
Turbidity	0.02		NTU	1	01/14/19	SUB	FIELD
pH (Field)	7.05		su	1	01/14/19	SUB	FIELD

(a) Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)
(b) Analysis performed past recommended hold time.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1A	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB23011.D	1	01/15/19 14:18	BB	n/a	n/a	GFB1044
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.4 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0095	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	

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

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1B	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	2200	25	CFU/ml	1	01/14/19 13:00	SK	HACH IRB-BART
Slime Forming Bacteria	2500	500	CFU/ml	1	01/14/19 13:00	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	6000	200	CFU/ml	1	01/14/19 13:00	SK	HACH SRB-BART

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_112473 NENE_29_7N_80W		
Lab Sample ID:	DA12700-1F	**Date Sampled:**	01/09/19
Matrix:	AQ - Groundwater Filtered	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.235	0.0040	mg/l	2	01/11/19	01/14/19	EP	EPA 200.8 [1]	EPA 200.8 [4]
Boron	< 0.050	0.050	mg/l	1	01/11/19	01/16/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Calcium	85.9	0.40	mg/l	1	01/11/19	01/16/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Iron	2.63	0.010	mg/l	1	01/11/19	01/16/19	JR	EPA 200.7 [3]	EPA 200.7 [5]
Magnesium	20.4	0.20	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [5]
Manganese	1.12	0.0050	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [5]
Potassium	3.25	1.0	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [5]
Selenium	< 0.00080	0.00080	mg/l	2	01/11/19	01/14/19	EP	EPA 200.8 [1]	EPA 200.8 [4]
Sodium	65.4	0.40	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [5]
Strontium	1.95	0.0050	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [5]

(1) Instrument QC Batch: MA10911
(2) Instrument QC Batch: MA10913
(3) Instrument QC Batch: MA10918
(4) Prep QC Batch: MP27146
(5) Prep QC Batch: MP27151

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS

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

Page _1_ of _1_

Bottle Order Control #:
FED-EX Tracking #:
SGS Quote #:
SGS Job #: DA12700

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: Tanya.Cude@Absarokasolutions.com
Sampler(s) Name(s):

Project Information

Project Name: SDE_Veneta_DAF_Permitting
Frequency: IN
Regulation: COGCC 609
Facility ID: 760366
EQuIS Facility Code:
Client Purchase Order #: SDE.CO.0247.01
Project Manager: Joel Mason

Billing Information (if different from Report to)

Company:
Street Address:
City, State ZIP:
Attention:

Requested Analysis (see TEST CODE sheet)

Field ID / Point of Collection	Collection Date	Time	Sampled by	Matrix	# of bottles	NONE	HCl	NaOH	HNO3	H2SO4	DI Water	MEOH	ENCORE	Na2S2O4	Other	PH, SCON, TDS	XCARBICALK	BRO, CHL, F, NO2, XNO3O, NO32, SO4	TPO4	Dissolved Metals - Lab Filtered*	VRSK175DGMEP	V8260BTX	B8015DRO	V8015GRO	IRBAC, SFBAC, SO4RBAC	CABAL	LAB USE ONLY
BW_Evans_112473	1/9/19	1252		GW	17	9	6			1					1	X	X	X	X	X	X	X	X	X	X	X	01
NENE_29_7N_80W																											
Temperature, field	7.51	°C																									
pH, field	7.05	s.u.																									
Specific Conductivity, field	397.5	uS/cm																									
Oxidation Reduction Potential, field	-22.7	mV																									
Dissolved Oxygen, field	0.08	mg/L																									
Turbidity, field	0.02	NTU																									

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

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 Tanya.Cude@Absarokasolutions.com

NOTE - THIS IS NOT AN APC GWA SAMPLE

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	1/9/19 1600	1 1-10-19 10:0	2		2
Relinquished by Sampler:	Date/Time:	Received By:	Relinquished By:	Date/Time:	Received By:
3		3	4		4

Custody Seal # Intact [x] Not Intact [ ] Absent [ ] Preserved where applicable [x] Cooler Temp. °C: 3.0 Therm. ID: 7/16 On Ice [x]

Form MSQA 084-01, RV 6/19/17

5.1

5

DA12700: Chain of Custody
Page 1 of 3

dig
Dolan Integration Group
Geochemistry for Energy
1317 West 121st Ave
Westminster, CO 80234
p 303.531.2030

Send Data to:	
Name: Tanya Cude	
Company: Absaroka Solutions	
Address: 112 High Street	
City, State, Zip: Buffalo, WY 82834	
Phone: 352-318-4034	
Email: Tanya.Cude@Absarokasolutions.com	

Addition Information:	
AFE#	SDE.CO.0247.01
Project:	SDE_Veneta_DAF_Permitting
WO#	
Location:	NENE_29_7N_80W
Sampled by:	John Brouner
Facility ID:	760365
Notes.	

Turnaround Time: ☑ Standard (≤ 10 business days) ☐ Rush (≤ 5 business days) ☐ Expedited Rush (≤ 3 business days)

Sample Description				Analysis Requested						
Container Number	Sample Identification	Date Sampled	Time	Gas Composition* N_2, O_2+Ar, CO_2, He, H_2, C_1-C_6+	RSK-175: N_2, O_2+Ar, CO_2, He, H_2, C_1-C_6+ with dissolved C_1, C_2, & C_3 (water samples only)	$\delta^{13}C$ Methane (Carbon)	δD Methane (Hydrogen)	$\delta^{13}C$ Ethane-Pentane (C_2-C_5 if present)	$\delta^{13}C$ CO_2 (if present)	Comments
	BW_Evans_112473	1/9/19	1252	X		X	X	X	X	

Chain-of-Custody Record

Signature	Company	Date	Time
Relinquished by	Absaroka Sol	1/9/19	1600
Received by			
Relinquished by			
Received by			
Relinquished by			
Received by			

*Gas composition vs. RSK-175:. Gas composition is a basic analysis of the concentration (ppm) of gases within the headspace of the sample (headspace is created at the lab). RSK-175 is a specific analysis technique combined with calculations to give the total dissolved gas of each species in the water sample (mg/L). Why one or the other? Gas composition gives us a quick, general look at relative concentrations and ratios (e.g., gas wetness). RSK-175 gives us an exact total of gas present in the sample (headspace and dissolved in the water). Questions? Give us a call at 303-531-2030.

DA12700: Chain of Custody
Page 2 of 3

SGS Accutest Sample Receipt Summary

Job Number: DA12700 **Client:** ABSAROKA **Project:** SDE

Date / Time Received: 1/10/2019 10:00:00 AM **Delivery Method:** **Airbill #'s:** FX

Cooler Temps (Initial/Adjusted): #1: (3/3);

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:	Bar Therm;
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

5.1

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DA12700: Chain of Custody
Page 3 of 3

MS 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: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2960-MB	7V58054.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12700-1

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	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	106%	70-130%
17060-07-0	1,2-Dichloroethane-D4	97%	70-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%

Blank Spike Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2960-BS	7V58052.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12700-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	52.9	106	70-130
100-41-4	Ethylbenzene	50	48.9	98	69-130
108-88-3	Toluene	50	49.9	100	70-130
1330-20-7	Xylene (total)	150	149	99	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	70-130%
17060-07-0	1,2-Dichloroethane-D4	100%	70-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12330-30MS	7V58055.D	1	01/11/19	MB	n/a	n/a	V7V2960
DA12330-30MSD	7V58056.D	1	01/11/19	MB	n/a	n/a	V7V2960
DA12330-30	7V58057.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12700-1

CAS No.	Compound	DA12330-30 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	52.3	105	50	51.6	103	1	67-130/30
100-41-4	Ethylbenzene	ND		50	47.7	95	50	47.1	94	1	69-130/30
108-88-3	Toluene	ND		50	48.9	98	50	48.6	97	1	70-130/30
1330-20-7	Xylene (total)	ND		150	146	97	150	144	96	1	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12330-30	Limits
1868-53-7	Dibromofluoromethane	107%	107%	106%	70-130%
17060-07-0	1,2-Dichloroethane-D4	101%	98%	98%	70-130%
2037-26-5	Toluene-D8	94%	94%	95%	70-130%
460-00-4	4-Bromofluorobenzene	95%	95%	97%	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: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2295-MB	GB48726.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12700-1

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	100%	60-140%

Method Blank Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1044-MB	FB23000.D	1	01/15/19	BB	n/a	n/a	GFB1044

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

DA12700-1A

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: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2295-BS	GB48727.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12700-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	1.79	81	51-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	104%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1044-BS	FB23001.D	10	01/15/19	BB	n/a	n/a	GFB1044

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

DA12700-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.542	106	70-133
74-84-0	Ethane	0.923	1.13	122	70-137
74-98-6	Propane	1.38	1.69	123	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12335-17MS	GB48728.D	1	01/14/19	BB	n/a	n/a	GGB2295
DA12335-17MSD	GB48729.D	1	01/14/19	BB	n/a	n/a	GGB2295
DA12335-17	GB48730.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12700-1

CAS No.	Compound	DA12335-17 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	1.81	82	2.2	1.84	84	2	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12335-17	Limits
120-82-1	1,2,4-Trichlorobenzene	103%	107%	104%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12335-14MS	FB23003.D	10	01/15/19	BB	n/a	n/a	GFB1044
DA12335-14MSD	FB23004.D	10	01/15/19	BB	n/a	n/a	GFB1044
DA12335-14	FB23002.D	1	01/15/19	BB	n/a	n/a	GFB1044

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

DA12700-1A

CAS No.	Compound	DA12335-14 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	0.0018		0.512	0.511	99	0.512	0.525	102	3	15-196/30
74-84-0	Ethane	ND		0.923	1.06	115	0.923	1.08	117	2	53-144/30
74-98-6	Propane	ND		1.38	1.58	115	1.38	1.62	118	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: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-MB	FM2957.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12700-1

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	45%	11-142%

Blank Spike Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-BS	FM2959.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12700-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.97	59	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	62%	11-142%

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12700
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-MS	FM2961.D	1	01/11/19	RB	01/10/19	OP17326	GFM106
OP17326-MSD	FM2963.D	1	01/11/19	RB	01/10/19	OP17326	GFM106
DA12330-18	FM2965.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12700-1

CAS No.	Compound	DA12330-18 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	2.80	56	5	3.37	67	18	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12330-18	Limits
84-15-1	o-Terphenyl	64%	73%	78%	11-142%

8.3.1

8

* = 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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

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	0.19	<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	-0.024	<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 MP27146: DA12700-1F

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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	DA12707-1A Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	4.7	407	400	100.7	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium					
Cobalt					
Copper					
Iron	anr				
Lead					
Magnesium					
Manganese					
Molybdenum	anr				
Nickel					
Phosphorus					
Potassium					
Selenium	0.36	181	200	90.3	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP27146: DA12700-1F

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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	DA12707-1A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	4.2	407	400	100.7	0.0	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium						
Cobalt						
Copper						
Iron	anr					
Lead						
Magnesium						
Manganese						
Molybdenum	anr					
Nickel						
Phosphorus						
Potassium						
Selenium	0.39	178	200	88.8	1.7	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP27146: DA12700-1F

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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	398	400	99.5	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese				
Molybdenum	anr			
Nickel				
Phosphorus				
Potassium				
Selenium	190	200	95.0	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP27146: DA12700-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	46	30		
Antimony	30	14	10		
Arsenic	25	22	7		
Barium	10	.3	2		
Beryllium	10	1	1.3		
Boron	50	3.3	7.4	1.7	<50
Cadmium	10	1.9	1.6		
Calcium	400	6.6	53	38.9	<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	24.8	* (a)
Lead	50	13	6.3		
Lithium	5.0	.6	4		
Magnesium	200	50	31	5.9	<200
Manganese	5.0	.5	1.1	0.30	<5.0
Molybdenum	10	8.5	4.3		
Nickel	30	6.2	6.1		
Phosphorus	100	91	24		
Potassium	1000	84	250	25.2	<1000
Selenium	50	30	21		
Silicon	50	41	45		
Silver	30	.6	4		
Sodium	400	13	51	52.3	<400
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 MP27151: DA12700-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested
(a) All sample results < RL or > 10x MB1 concentration.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron	337	1450	1000	112.2	70-130
Cadmium	anr				
Calcium	186000	215000	25000	116.0	70-130
Chromium					
Cobalt					
Copper					
Iron	0.0	5310	5000	105.2	70-130
Lead					
Lithium					
Magnesium	23600	51900	25000	105.2	70-130
Manganese	18.0	541	500	104.6	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	5970	35000	25000	114.2	70-130
Selenium					
Silicon					
Silver					
Sodium	508000	530000	25000	88.0	70-130
Strontium	570	1120	500	102.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP27151: DA12700-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F 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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron	337	1420	1000	109.2	2.1	20
Cadmium	anr					
Calcium	186000	210000	25000	96.0	2.4	20
Chromium						
Cobalt						
Copper						
Iron	0.0	5140	5000	101.8	3.3	20
Lead						
Lithium						
Magnesium	23600	50000	25000	97.6	3.7	20
Manganese	18.0	531	500	102.6	1.9	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	5970	34200	25000	111.0	2.3	20
Selenium						
Silicon						
Silver						
Sodium	508000	519000	25000	44.0 (a)	2.1	20
Strontium	570	1100	500	98.6	1.8	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP27151: DA12700-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	1070	1000	107.0	85-115
Cadmium	anr			
Calcium	27600	25000	110.4	85-115
Chromium				
Cobalt				
Copper				
Iron	5510	5000	110.2	85-115
Lead				
Lithium				
Magnesium	25600	25000	102.4	85-115
Manganese	511	500	102.2	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	27300	25000	109.2	85-115
Selenium				
Silicon				
Silver				
Sodium	26600	25000	106.4	85-115
Strontium	518	500	103.6	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP27151: DA12700-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	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: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN45771	5.0	2.4	mg/l	100	97.5	97.5	90-110%
Alkalinity, Carbonate	GN45772	5.0	2.4	mg/l	100	97.5	97.5	80-120%
Alkalinity, Total as CaCO3	GN45773	5.0	2.4	mg/l	100	97.5	97.5	90-110%
Bromide	GP24379/GN45759	0.050	0.0	mg/l	0.5	0.506	101.2	90-110%
Chloride	GP24379/GN45759	0.50	0.0	mg/l	5	5.01	100.2	90-110%
Fluoride	GP24379/GN45759	0.10	0.0	mg/l	1	0.986	98.6	90-110%
Iron-Related Bacteria	MB1131	25	<25	CFU/ml				
Nitrogen, Nitrate	GP24379/GN45759	0.010	0.0	mg/l	0.1	0.104	104.0	90-110%
Nitrogen, Nitrite	GP24379/GN45759	0.0040	0.0	mg/l	0.05	0.0498	99.6	90-110%
Phosphorus, Total	GP24404/GN45811	0.010	0.00	mg/l	0.2	0.193	96.5	90-110%
Phosphorus, Total	GP24404/GN45811	0.010	0.00	mg/l	0.2	0.199	99.5	90-110%
Slime Forming Bacteria	MB1132	500	<500	CFU/ml				
Solids, Total Dissolved	GN45779	10	0.0	mg/l	400	398	99.5	90-110%
Solids, Total Dissolved	GN45779	10	0.0	mg/l				
Specific Conductivity	GP24388/GN45775			umhos/cm	998	1010	100.7	90-110%
Specific Conductivity	GP24388/GN45775			umhos/cm	98.8	97.1	98.3	90-110%
Sulfate	GP24379/GN45759	0.50	0.0	mg/l	5	4.92	98.4	90-110%
Sulfate Reducing Bacteria	MB1133	200	<200	CFU/ml				
pH	GN45774			su	6.00	6.00	100.0	99.1-100.9%
pH	GN45774			su	6.00	6.00	100.0	99.1-100.9%
pH	GN45774			su	8.00	7.96	99.5	99.1-100.9%
pH	GN45774			su	8.00	7.96	99.5	99.1-100.9%

Associated Samples:
Batch MB1131: DA12700-1B
Batch MB1132: DA12700-1B
Batch MB1133: DA12700-1B
Batch GN45771: DA12700-1
Batch GN45772: DA12700-1
Batch GN45773: DA12700-1
Batch GN45774: DA12700-1
Batch GN45779: DA12700-1
Batch GP24379: DA12700-1
Batch GP24388: DA12700-1
Batch GP24404: DA12700-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN45773	DA12630-1	mg/l	477	477	0.2	0-20%
Phosphorus, Total	GP24404/GN45811	DA12649-1	mg/l	0.024	0.0240	0.0	0-20%
Solids, Total Dissolved	GN45779	DA12694-1	mg/l	516	516	0.0	0-5%
Specific Conductivity	GP24388/GN45775	DA12630-1	umhos/cm	821	847	3.1	0-20%
pH	GN45774	DA12630-1	su	9.25	9.24	0.1	0-5%
pH	GN45774	DA12630-1	su	9.25	9.24	0.1	0-5%

Associated Samples:
Batch GN45773: DA12700-1
Batch GN45774: DA12700-1
Batch GN45779: DA12700-1
Batch GP24388: DA12700-1
Batch GP24404: DA12700-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN45773	DA12669-1	mg/l	221	100	319	98.2	80-120%
Bromide	GP24379/GN45759	DA12647-5	mg/l	0.13 U	2.5	2.6	104.0	80-120%
Chloride	GP24379/GN45759	DA12647-5	mg/l	40.2	25	66.0	103.2	80-120%
Fluoride	GP24379/GN45759	DA12647-5	mg/l	0.55	5	5.6	101.0	80-120%
Nitrogen, Nitrate	GP24379/GN45759	DA12647-5	mg/l	0.54	0.5	1.1	112.0	80-120%
Nitrogen, Nitrite	GP24379/GN45759	DA12647-5	mg/l	0.036	0.25	0.29	101.6	80-120%
Phosphorus, Total	GP24404/GN45811	DA12698-1	mg/l	0.027	0.2	0.231	102.0	90-110%
Sulfate	GP24379/GN45759	DA12647-5	mg/l	87.9	25	111	92.4	80-120%

Associated Samples:
Batch GN45773: DA12700-1
Batch GP24379: DA12700-1
Batch GP24404: DA12700-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12700
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN45773	DA12669-1	mg/l	221	100	319	0.1	20%
Bromide	GP24379/GN45759	DA12647-5	mg/l	0.13 U	2.5	2.6	0.0	20%
Chloride	GP24379/GN45759	DA12647-5	mg/l	40.2	25	65.8	0.3	20%
Fluoride	GP24379/GN45759	DA12647-5	mg/l	0.55	5	5.6	0.0	20%
Nitrogen, Nitrate	GP24379/GN45759	DA12647-5	mg/l	0.54	0.5	1.0	9.5	20%
Nitrogen, Nitrite	GP24379/GN45759	DA12647-5	mg/l	0.036	0.25	0.30	3.4	20%
Sulfate	GP24379/GN45759	DA12647-5	mg/l	87.9	25	111	0.0	20%

Associated Samples:
Batch GN45773: DA12700-1
Batch GP24379: DA12700-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Absaroka Solutions

SDE_Vaneta_DAF_Permitting

FID:760366 Reg:COGCC 609 Freq.:in

SGS Job Number: DA12698

Sampling Date: 01/09/19

Report to:

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Total number of pages in report: 51

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

Scott Heideman
Laboratory Director

Client Service contact: Carissa Cumine 303-425-6021

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

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SGS North America Inc.

Sample Summary

Absaroka Solutions

Job No: DA12698

SDE_Vaneta_DAF_Permitting
Project No: FID:760366 Reg:COGCC 609 Freq.:in

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
DA12698-1	01/09/19	12:27	HH	01/10/19	AQ	Ground Water	BW_EVANS_204347 NWNW_28_7N_80W
DA12698-1A	01/09/19	12:27	HH	01/10/19	AQ	Ground Water	BW_EVANS_204347 NWNW_28_7N_80W
DA12698-1B	01/09/19	12:27	HH	01/10/19	AQ	Ground Water	BW_EVANS_204347 NWNW_28_7N_80W
DA12698-1F	01/09/19	12:27	HH	01/10/19	AQ	Groundwater Filtered	BW_EVANS_204347 NWNW_28_7N_80W

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Absaroka Solutions	**Job No**	DA12698
Site:	SDE_Vaneta_DAF_Permitting	**Report Date**	1/22/2019 7:10:31 PM

On 01/10/2019, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 2.6 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA12698 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:** V7V2960

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12330-30MS, DA12330-30MSD 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:** GFB1044

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA12335-14MS, DA12335-14MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- DA12698-1A: The pH of the sample was >2 at time of analysis.

GC Volatiles By Method SW846 8015B

Matrix: AQ **Batch ID:** GGB2295

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12335-17MS, DA12335-17MSD were used as the QC samples indicated.

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

Matrix: AQ **Batch ID:** OP17326

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) DA12330-18MS, DA12330-18MSD 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:** MP27151

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12696-1FMS, DA12696-1FMSD were used as the QC samples for the metals analysis.
- MP27151-MB1 for Iron: All sample results < RL or > 10x MB1 concentration.

Metals Analysis By Method EPA 200.8

Matrix: AQ	Batch ID: MP27146

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12707-1AMS, DA12707-1AMSD were used as the QC samples for the metals analysis.

General Chemistry By Method EPA 300.0/SW846 9056

Matrix: AQ	Batch ID: R46308

- The data for EPA 300.0/SW846 9056 meets quality control requirements.
- DA12698-1 for Nitrogen, Nitrate + Nitrite: Calculated as: (Nitrogen, Nitrate) + (Nitrogen, Nitrite)

General Chemistry By Method EPA 365.1

Matrix: AQ	Batch ID: GP24404

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12649-1DUP, DA12698-1MS were used as the QC samples for the Phosphorus, Total analysis.

General Chemistry By Method EPA300.0/SW846 9056A

Matrix: AQ	Batch ID: GP24379

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12647-5MS, DA12647-5MSD were used as the QC samples for the Bromide, Chloride, Fluoride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate, Bromide analysis.

General Chemistry By Method HACH IRB-BART

Matrix: AQ	Batch ID: MB1131

- 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: MB1132

- 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: MB1133

- 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: GN45771

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

Matrix: AQ	Batch ID: GN45772

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

Matrix: AQ	Batch ID: GN45773

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12630-1DUP, DA12669-1MS, DA12669-1MSD were used as the QC samples for the Alkalinity, Total as CaCO3 analysis.

General Chemistry By Method SM 2510B-2011

Matrix: AQ	Batch ID: GP24388

- Sample(s) DA12630-1DUP were used as the QC samples for the Specific Conductivity analysis.

General Chemistry By Method SM 2540C-2011

Matrix: AQ	Batch ID: GN45779

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA12694-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

General Chemistry By Method SM1030E-2011

Matrix: AQ	Batch ID: GN45827

- The data for SM1030E-2011 meets quality control requirements.
- DA12698-1 for Cation Anion Balance: Poor balance due to possible matrix interference.

General Chemistry By Method SM4500HB+-2011/9040C

Matrix: AQ	Batch ID: GN45774

- Sample(s) DA12630-1DUP were used as the QC samples for the pH analysis.
- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: DA12698-1 Analysis performed past recommended hold time.

Field Data By Method FIELD

Matrix: AQ	Batch ID: R46246

- 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: DA12698
Account: Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting
Collected: 01/09/19

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA12698-1	**BW_EVANS_204347 NWNW_28_7N_80W**					
Alkalinity, Bicarbonate as CaCO3		140	5.0		mg/l	SM 2320B-2011
Alkalinity, Carbonate		30.1	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		170	5.0		mg/l	SM 2320B-2011
Cation Anion Balance [a]		3.6 *			%	SM1030E-2011
Chloride		3.6	0.50		mg/l	EPA300.0/SW846 9056A
Fluoride		0.14	0.10		mg/l	EPA300.0/SW846 9056A
Phosphorus, Total		0.027	0.010		mg/l	EPA 365.1
Solids, Total Dissolved		286	10		mg/l	SM 2540C-2011
Specific Conductivity		428	1.0		umhos/cm	SM 2510B-2011
Sulfate		57.6	2.5		mg/l	EPA300.0/SW846 9056A
pH [b]		9.28			su	SM4500HB+ -2011/9040C
pH (Field)		9.25			su	FIELD
Temperature (Field)		7.1			Deg. C	FIELD
Oxygen, Dissolved (Field)		4.77			mg/l	FIELD
Turbidity		0.73			NTU	FIELD
Redox Potential Vs H2		43.6			mv	FIELD
Specific Conductivity (Field)		449.4	0.50		umhos/cm	FIELD
DA12698-1A	**BW_EVANS_204347 NWNW_28_7N_80W**					
Methane [c]		0.0046	0.00080	0.00040	mg/l	RSK175 MOD
DA12698-1B	**BW_EVANS_204347 NWNW_28_7N_80W**					
Iron-Related Bacteria		< 25	25		CFU/ml	HACH IRB-BART
Slime Forming Bacteria		< 500	500		CFU/ml	HACH SLYM-BART
Sulfate Reducing Bacteria		1400	200		CFU/ml	HACH SRB-BART
DA12698-1F	**BW_EVANS_204347 NWNW_28_7N_80W**					
Barium		0.0110	0.0040		mg/l	EPA 200.8
Calcium		1.16	0.40		mg/l	EPA 200.7
Sodium		114	0.40		mg/l	EPA 200.7
Strontium		0.0398	0.0050		mg/l	EPA 200.7

(a) Poor balance due to possible matrix interference.
(b) Analysis performed past recommended hold time.
(c) The pH of the sample was > 2 at time of analysis.

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V58062.D	1	01/11/19 13:31	MB	n/a	n/a	V7V2960
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	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-130%
17060-07-0	1,2-Dichloroethane-D4	97%		70-130%
2037-26-5	Toluene-D8	95%		70-130%
460-00-4	4-Bromofluorobenzene	96%		70-130%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB48735.D	1	01/14/19 18:44	BB	n/a	n/a	GGB2295
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	103%		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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FN2968.D	1	01/11/19 17:32	RB	01/10/19	OP17326	GFN105
Run #2							

	Initial Volume	Final Volume
Run #1	1060 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	29%		11-142%

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

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	140	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Alkalinity, Carbonate	30.1	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Alkalinity, Total as CaCO3	170	5.0	mg/l	1	01/11/19 09:30	PV	SM 2320B-2011
Bromide	< 0.050	0.050	mg/l	1	01/10/19 12:58	JB	EPA300.0/SW846 9056A
Cation Anion Balance [a]	3.6 *		%	1	01/17/19	KM	SM1030E-2011
Chloride	3.6	0.50	mg/l	1	01/10/19 12:58	JB	EPA300.0/SW846 9056A
Fluoride	0.14	0.10	mg/l	1	01/10/19 12:58	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate	< 0.010	0.010	mg/l	1	01/10/19 12:58	JB	EPA300.0/SW846 9056A
Nitrogen, Nitrate + Nitrite [b]	< 0.014	0.014	mg/l	1	01/10/19 12:58	JB	EPA 300.0/SW846 9056
Nitrogen, Nitrite	< 0.0040	0.0040	mg/l	1	01/10/19 12:58	JB	EPA300.0/SW846 9056A
Phosphorus, Total	0.027	0.010	mg/l	1	01/16/19 13:42	AM	EPA 365.1
Solids, Total Dissolved	286	10	mg/l	1	01/14/19	SK	SM 2540C-2011
Specific Conductivity	428	1.0	umhos/cm	1	01/11/19 09:30	PV	SM 2510B-2011
Sulfate	57.6	2.5	mg/l	5	01/10/19 16:27	JB	EPA300.0/SW846 9056A
pH [c]	9.28		su	1	01/11/19 09:30	PV	SM4500HB+ -2011/9040C

Field Parameters

Oxygen, Dissolved (Field)	4.77		mg/l	1	01/14/19	SUB	FIELD
Redox Potential Vs H2	43.6		mv	1	01/14/19	SUB	FIELD
Specific Conductivity (Field)	449.4	0.50	umhos/cm	1	01/14/19	SUB	FIELD
Temperature (Field)	7.1		Deg. C	1	01/14/19	SUB	FIELD
Turbidity	0.73		NTU	1	01/14/19	SUB	FIELD
pH (Field)	9.25		su	1	01/14/19	SUB	FIELD

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1A	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	SDE_Vaneta_DAF_Permitting		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB23009.D	1	01/15/19 14:01	BB	n/a	n/a	GFB1044
Run #2							

	Initial Volume	Headspace Volume	Volume Injected	Temperature
Run #1	39.0 ml	4.0 ml	500 ul	19.4 Deg. C
Run #2				

Methane, Ethane and Propane

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0046	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	

(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_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1B	**Date Sampled:**	01/09/19
Matrix:	AQ - Ground Water	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Iron-Related Bacteria	< 25	25	CFU/ml	1	01/14/19 13:00	SK	HACH IRB-BART
Slime Forming Bacteria	< 500	500	CFU/ml	1	01/14/19 13:00	SK	HACH SLYM-BART
Sulfate Reducing Bacteria	1400	200	CFU/ml	1	01/14/19 13:00	SK	HACH SRB-BART

RL = Reporting Limit

SGS North America Inc.

Report of Analysis

Client Sample ID:	BW_EVANS_204347 NWNW_28_7N_80W		
Lab Sample ID:	DA12698-1F	**Date Sampled:**	01/09/19
Matrix:	AQ - Groundwater Filtered	**Date Received:**	01/10/19
		Percent Solids:	n/a
Project:	SDE_Vaneta_DAF_Permitting		

Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Barium	0.0110	0.0040	mg/l	2	01/11/19	01/14/19	EP	EPA 200.8 [1]	EPA 200.8 [5]
Boron	< 0.050	0.050	mg/l	1	01/11/19	01/16/19	JR	EPA 200.7 [3]	EPA 200.7 [6]
Calcium	1.16	0.40	mg/l	1	01/11/19	01/16/19	JR	EPA 200.7 [3]	EPA 200.7 [6]
Iron	< 0.010	0.010	mg/l	1	01/17/19	01/17/19	JM	EPA 200.7 [4]	EPA 200.7 [6]
Magnesium	< 0.20	0.20	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [6]
Manganese	< 0.0050	0.0050	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [6]
Potassium	< 1.0	1.0	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [6]
Selenium	< 0.00080	0.00080	mg/l	2	01/11/19	01/14/19	EP	EPA 200.8 [1]	EPA 200.8 [5]
Sodium	114	0.40	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [6]
Strontium	0.0398	0.0050	mg/l	1	01/11/19	01/15/19	JR	EPA 200.7 [2]	EPA 200.7 [6]

(1) Instrument QC Batch: MA10911
(2) Instrument QC Batch: MA10913
(3) Instrument QC Batch: MA10918
(4) Instrument QC Batch: MA10927
(5) Prep QC Batch: MP27146
(6) Prep QC Batch: MP27151

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

SGS

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

Page _1_ of _1_

Bottle Order Control #:
FED-EX Tracking #:
SGS Quote #:
SGS Job #: DA 12698

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: Tanya.Cude@Absarokasolutions.com
Sampler(s) Name(s): Hannah Howard

Project Information

Project Name: SDE_Veneta_DAF_Permitting
Frequency: IN
Regulation: COGCC 609
Facility ID: 760366
EQuIS Facility Code:
Client Purchase Order #: SDE.CO.0247.01
Project Manager: Joel Mason

Billing Information (if different from Report to)

Company:
Street Address:
City, State ZIP:
Attention:

Requested Analysis (see TEST CODE sheet)

Field ID / Point of Collection	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	NONE	HCl	NaOH	HNO3	H2SO4	DI Water	MEOH	ENCORE	Na2S2O4	Other	PH, SCON, TDS	XCARBICALK	BRO, CHL, F, NO2, XNO3O, NO32, SO4	TPO4	Dissolved Metals - Lab Filtered*	VRSK175DGMEP	V8260BTX	B8015DRO	V8015GRO	IRBAC, SFBAC, SO4RBAC	CABAL	LAB USE ONLY
BW_Evans_204347	01/09/19	1227	HH	GW	17	9	6			1					1	X	X	X	X	X	X	X	X	X	X	X	01
NWNW_28_7N_80W																											
Temperature, field	7.1	°C																									
pH, field	9.25	s.u.																									
Specific Conductivity, field	449.4	uS/cm																									
Oxidation Reduction Potential, field	43.6	mV																									
Dissolved Oxygen, field	4.77	mg/L																									
Turbidity, field	0.73	NTU																									

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

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 Tanya.Cude@Absarokasolutions.com

NOTE - THIS IS NOT AN APC GWA SAMPLE

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:
Hannah Howard	1/9/19 1600	1 [signature] 1-10-19 1000	2		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: 2.6
Therm. ID: T1 06
On Ice [✓]

Form MSQA 064-01, RV 5/19/17

5.1 5

DA12698: Chain of Custody
Page 1 of 2

SGS Accutest Sample Receipt Summary

Job Number: DA12698 **Client:** ABSAROKA **Project:** SDE

Date / Time Received: 1/10/2019 10:00:00 AM **Delivery Method:** **Airbill #'s:** FX

Cooler Temps (Initial/Adjusted): #1: (2.6/2.6);

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:	Bar Therm;
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

DA12698: Chain of Custody
Page 2 of 2

MS 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: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2960-MB	7V58054.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12698-1

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	
1330-20-7	Xylene (total)	ND	1.0	1.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	106%	70-130%
17060-07-0	1,2-Dichloroethane-D4	97%	70-130%
2037-26-5	Toluene-D8	93%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%

Blank Spike Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V7V2960-BS	7V58052.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12698-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	52.9	106	70-130
100-41-4	Ethylbenzene	50	48.9	98	69-130
108-88-3	Toluene	50	49.9	100	70-130
1330-20-7	Xylene (total)	150	149	99	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	70-130%
17060-07-0	1,2-Dichloroethane-D4	100%	70-130%
2037-26-5	Toluene-D8	94%	70-130%
460-00-4	4-Bromofluorobenzene	96%	70-130%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12330-30MS	7V58055.D	1	01/11/19	MB	n/a	n/a	V7V2960
DA12330-30MSD	7V58056.D	1	01/11/19	MB	n/a	n/a	V7V2960
DA12330-30	7V58057.D	1	01/11/19	MB	n/a	n/a	V7V2960

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

DA12698-1

CAS No.	Compound	DA12330-30 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	52.3	105	50	51.6	103	1	67-130/30
100-41-4	Ethylbenzene	ND		50	47.7	95	50	47.1	94	1	69-130/30
108-88-3	Toluene	ND		50	48.9	98	50	48.6	97	1	70-130/30
1330-20-7	Xylene (total)	ND		150	146	97	150	144	96	1	67-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12330-30	Limits
1868-53-7	Dibromofluoromethane	107%	107%	106%	70-130%
17060-07-0	1,2-Dichloroethane-D4	101%	98%	98%	70-130%
2037-26-5	Toluene-D8	94%	94%	95%	70-130%
460-00-4	4-Bromofluorobenzene	95%	95%	97%	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: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2295-MB	GB48726.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12698-1

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	100%	60-140%

Method Blank Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1044-MB	FB23000.D	1	01/15/19	BB	n/a	n/a	GFB1044

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

DA12698-1A

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: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB2295-BS	GB48727.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12698-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	1.79	81	51-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	104%	60-140%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB1044-BS	FB23001.D	10	01/15/19	BB	n/a	n/a	GFB1044

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

DA12698-1A

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.512	0.542	106	70-133
74-84-0	Ethane	0.923	1.13	122	70-137
74-98-6	Propane	1.38	1.69	123	70-137

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12335-17MS	GB48728.D	1	01/14/19	BB	n/a	n/a	GGB2295
DA12335-17MSD	GB48729.D	1	01/14/19	BB	n/a	n/a	GGB2295
DA12335-17	GB48730.D	1	01/14/19	BB	n/a	n/a	GGB2295

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

DA12698-1

CAS No.	Compound	DA12335-17 mg/l	Q	Spike mg/l	MS mg/l	MS %	Spike mg/l	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	1.81	82	2.2	1.84	84	2	40-132/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12335-17	Limits
120-82-1	1,2,4-Trichlorobenzene	103%	107%	104%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA12335-14MS	FB23003.D	10	01/15/19	BB	n/a	n/a	GFB1044
DA12335-14MSD	FB23004.D	10	01/15/19	BB	n/a	n/a	GFB1044
DA12335-14	FB23002.D	1	01/15/19	BB	n/a	n/a	GFB1044

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

DA12698-1A

CAS No.	Compound	DA12335-14 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	0.0018		0.512	0.511	99	0.512	0.525	102	3	15-196/30
74-84-0	Ethane	ND		0.923	1.06	115	0.923	1.08	117	2	53-144/30
74-98-6	Propane	ND		1.38	1.58	115	1.38	1.62	118	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: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-MB	FM2957.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12698-1

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	45%	11-142%

Blank Spike Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-BS	FM2959.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12698-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	5	2.97	59	22-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	62%	11-142%

8.2.1

8

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA12698
Account: ABSSWYB Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP17326-MS	FM2961.D	1	01/11/19	RB	01/10/19	OP17326	GFM106
OP17326-MSD	FM2963.D	1	01/11/19	RB	01/10/19	OP17326	GFM106
DA12330-18	FM2965.D	1	01/11/19	RB	01/10/19	OP17326	GFM106

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

DA12698-1

CAS No.	Compound	DA12330-18 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	2.80	56	5	3.37	67	18	22-130/30

CAS No.	Surrogate Recoveries	MS	MSD	DA12330-18	Limits
84-15-1	o-Terphenyl	64%	73%	78%	11-142%

* = Outside of Control Limits.

8.3.1

8

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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

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	0.19	<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	-0.024	<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 MP27146: DA12698-1F

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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	DA12707-1A Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	4.7	407	400	100.7	70-130
Beryllium					
Boron					
Cadmium	anr				
Calcium					
Chromium					
Cobalt					
Copper					
Iron	anr				
Lead					
Magnesium					
Manganese					
Molybdenum	anr				
Nickel					
Phosphorus					
Potassium					
Selenium	0.36	181	200	90.3	70-130
Silver					
Sodium					
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP27146: DA12698-1F

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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	DA12707-1A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	4.2	407	400	100.7	0.0	20
Beryllium						
Boron						
Cadmium	anr					
Calcium						
Chromium						
Cobalt						
Copper						
Iron	anr					
Lead						
Magnesium						
Manganese						
Molybdenum	anr					
Nickel						
Phosphorus						
Potassium						
Selenium	0.39	178	200	88.8	1.7	20
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP27146: DA12698-1F

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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27146
Matrix Type: AQUEOUS

Methods: EPA 200.8
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	398	400	99.5	85-115
Beryllium				
Boron				
Cadmium	anr			
Calcium				
Chromium				
Cobalt				
Copper				
Iron	anr			
Lead				
Magnesium				
Manganese				
Molybdenum	anr			
Nickel				
Phosphorus				
Potassium				
Selenium	190	200	95.0	85-115
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP27146: DA12698-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	46	30		
Antimony	30	14	10		
Arsenic	25	22	7		
Barium	10	.3	2		
Beryllium	10	1	1.3		
Boron	50	3.3	7.4	1.7	<50
Cadmium	10	1.9	1.6		
Calcium	400	6.6	53	38.9	<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	24.8	* (a)
Lead	50	13	6.3		
Lithium	5.0	.6	4		
Magnesium	200	50	31	5.9	<200
Manganese	5.0	.5	1.1	0.30	<5.0
Molybdenum	10	8.5	4.3		
Nickel	30	6.2	6.1		
Phosphorus	100	91	24		
Potassium	1000	84	250	25.2	<1000
Selenium	50	30	21		
Silicon	50	41	45		
Silver	30	.6	4		
Sodium	400	13	51	52.3	<400
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 MP27151: DA12698-1F

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	RL	IDL	MDL	MB raw	final

(anr) Analyte not requested
(a) All sample results < RL or > 10x MB1 concentration.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original	MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron	337	1450	1000	112.2	70-130
Cadmium	anr				
Calcium	186000	215000	25000	116.0	70-130
Chromium					
Cobalt					
Copper					
Iron	0.0	5310	5000	105.2	70-130
Lead					
Lithium					
Magnesium	23600	51900	25000	105.2	70-130
Manganese	18.0	541	500	104.6	70-130
Molybdenum					
Nickel					
Phosphorus					
Potassium	5970	35000	25000	114.2	70-130
Selenium					
Silicon					
Silver					
Sodium	508000	530000	25000	88.0	70-130
Strontium	570	1120	500	102.6	70-130
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP27151: DA12698-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F 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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron	337	1420	1000	109.2	2.1	20
Cadmium	anr					
Calcium	186000	210000	25000	96.0	2.4	20
Chromium						
Cobalt						
Copper						
Iron	0.0	5140	5000	101.8	3.3	20
Lead						
Lithium						
Magnesium	23600	50000	25000	97.6	3.7	20
Manganese	18.0	531	500	102.6	1.9	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	5970	34200	25000	111.0	2.3	20
Selenium						
Silicon						
Silver						
Sodium	508000	519000	25000	44.0 (a)	2.1	20
Strontium	570	1100	500	98.6	1.8	20
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP27151: DA12698-1F

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	DA12696-1F Original MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron	1070	1000	107.0	85-115
Cadmium	anr			
Calcium	27600	25000	110.4	85-115
Chromium				
Cobalt				
Copper				
Iron	5510	5000	110.2	85-115
Lead				
Lithium				
Magnesium	25600	25000	102.4	85-115
Manganese	511	500	102.2	85-115
Molybdenum				
Nickel				
Phosphorus				
Potassium	27300	25000	109.2	85-115
Selenium				
Silicon				
Silver				
Sodium	26600	25000	106.4	85-115
Strontium	518	500	103.6	85-115
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP27151: DA12698-1F

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

QC Batch ID: MP27151
Matrix Type: AQUEOUS

Methods: EPA 200.7
Units: ug/l

Prep Date: 01/11/19

Metal	BSP Result	Spikelot ICPALL2	% Rec	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: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN45771	5.0	2.4	mg/l	100	97.5	97.5	90-110%
Alkalinity, Carbonate	GN45772	5.0	2.4	mg/l	100	97.5	97.5	80-120%
Alkalinity, Total as CaCO3	GN45773	5.0	2.4	mg/l	100	97.5	97.5	90-110%
Bromide	GP24379/GN45759	0.050	0.0	mg/l	0.5	0.506	101.2	90-110%
Chloride	GP24379/GN45759	0.50	0.0	mg/l	5	5.01	100.2	90-110%
Fluoride	GP24379/GN45759	0.10	0.0	mg/l	1	0.986	98.6	90-110%
Iron-Related Bacteria	MB1131	25	<25	CFU/ml				
Nitrogen, Nitrate	GP24379/GN45759	0.010	0.0	mg/l	0.1	0.104	104.0	90-110%
Nitrogen, Nitrite	GP24379/GN45759	0.0040	0.0	mg/l	0.05	0.0498	99.6	90-110%
Phosphorus, Total	GP24404/GN45811	0.010	0.00	mg/l	0.2	0.193	96.5	90-110%
Phosphorus, Total	GP24404/GN45811	0.010	0.00	mg/l	0.2	0.199	99.5	90-110%
Slime Forming Bacteria	MB1132	500	<500	CFU/ml				
Solids, Total Dissolved	GN45779	10	0.0	mg/l	400	398	99.5	90-110%
Solids, Total Dissolved	GN45779	10	0.0	mg/l				
Specific Conductivity	GP24388/GN45775			umhos/cm	998	1010	100.7	90-110%
Specific Conductivity	GP24388/GN45775			umhos/cm	98.8	97.1	98.3	90-110%
Sulfate	GP24379/GN45759	0.50	0.0	mg/l	5	4.92	98.4	90-110%
Sulfate Reducing Bacteria	MB1133	200	<200	CFU/ml				
pH	GN45774			su	6.00	6.00	100.0	99.1-100.9%
pH	GN45774			su	6.00	6.00	100.0	99.1-100.9%
pH	GN45774			su	8.00	7.96	99.5	99.1-100.9%
pH	GN45774			su	8.00	7.96	99.5	99.1-100.9%

Associated Samples:
Batch MB1131: DA12698-1B
Batch MB1132: DA12698-1B
Batch MB1133: DA12698-1B
Batch GN45771: DA12698-1
Batch GN45772: DA12698-1
Batch GN45773: DA12698-1
Batch GN45774: DA12698-1
Batch GN45779: DA12698-1
Batch GP24379: DA12698-1
Batch GP24388: DA12698-1
Batch GP24404: DA12698-1
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN45773	DA12630-1	mg/l	477	477	0.2	0-20%
Phosphorus, Total	GP24404/GN45811	DA12649-1	mg/l	0.024	0.0240	0.0	0-20%
Solids, Total Dissolved	GN45779	DA12694-1	mg/l	516	516	0.0	0-5%
Specific Conductivity	GP24388/GN45775	DA12630-1	umhos/cm	821	847	3.1	0-20%
pH	GN45774	DA12630-1	su	9.25	9.24	0.1	0-5%
pH	GN45774	DA12630-1	su	9.25	9.24	0.1	0-5%

Associated Samples:
Batch GN45773: DA12698-1
Batch GN45774: DA12698-1
Batch GN45779: DA12698-1
Batch GP24388: DA12698-1
Batch GP24404: DA12698-1
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN45773	DA12669-1	mg/l	221	100	319	98.2	80-120%
Bromide	GP24379/GN45759	DA12647-5	mg/l	0.13 U	2.5	2.6	104.0	80-120%
Chloride	GP24379/GN45759	DA12647-5	mg/l	40.2	25	66.0	103.2	80-120%
Fluoride	GP24379/GN45759	DA12647-5	mg/l	0.55	5	5.6	101.0	80-120%
Nitrogen, Nitrate	GP24379/GN45759	DA12647-5	mg/l	0.54	0.5	1.1	112.0	80-120%
Nitrogen, Nitrite	GP24379/GN45759	DA12647-5	mg/l	0.036	0.25	0.29	101.6	80-120%
Phosphorus, Total	GP24404/GN45811	DA12698-1	mg/l	0.027	0.2	0.231	102.0	90-110%
Sulfate	GP24379/GN45759	DA12647-5	mg/l	87.9	25	111	92.4	80-120%

Associated Samples:
Batch GN45773: DA12698-1
Batch GP24379: DA12698-1
Batch GP24404: DA12698-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: DA12698
Account: ABSSWYB - Absaroka Solutions
Project: SDE_Vaneta_DAF_Permitting

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN45773	DA12669-1	mg/l	221	100	319	0.1	20%
Bromide	GP24379/GN45759	DA12647-5	mg/l	0.13 U	2.5	2.6	0.0	20%
Chloride	GP24379/GN45759	DA12647-5	mg/l	40.2	25	65.8	0.3	20%
Fluoride	GP24379/GN45759	DA12647-5	mg/l	0.55	5	5.6	0.0	20%
Nitrogen, Nitrate	GP24379/GN45759	DA12647-5	mg/l	0.54	0.5	1.0	9.5	20%
Nitrogen, Nitrite	GP24379/GN45759	DA12647-5	mg/l	0.036	0.25	0.30	3.4	20%
Sulfate	GP24379/GN45759	DA12647-5	mg/l	87.9	25	111	0.0	20%

Associated Samples:
Batch GN45773: DA12698-1
Batch GP24379: DA12698-1
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits