

Rule 908.b(9-10) Groundwater and Surface Water Monitoring

**LINN Operating Inc.
O-29 Centralized E&P Waste
Management Facility**

OA Project No. 014-1565

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Nicholson GeoSolutions, LLC

3433 East Lake Drive

Centennial, CO 80121

Groundwater Monitoring for the 29-17 Injection Well Site

Nicholson GeoSolutions LLC conducted groundwater monitoring near the 29-17 injection well site (the O-29 well pad) on September 27, 2012. A walking survey of Little Creek was performed below Garden Gulch Road to look for groundwater springs that could be used to monitor shallow groundwater below the injection well site.

Two springs (29-1 and 29-2) were located below Garden Gulch Road. Field parameters were measured and a water quality sample was collected at one of these springs (Spring 29-1). In addition, one surface water sample was collected on Little Creek above Garden Gulch Road at existing monitoring site LC-1. This monitoring station is downgradient of the injection well site and the pipeline right-of-way that is located just north of the well pad. Previous sampling has shown that this location is in communication with groundwater that flows down the pipeline trench into Little Creek, and thus is an appropriate groundwater monitoring location for the 29-17 injection well. These two locations will be sampled semi-annually to provide groundwater monitoring for the 29-17 injection well permit.

Table 1 summarizes the field parameters and laboratory analytical results for the samples collected. The laboratory analytical reports are attached. All results for the Little Creek sample are below the associated Federal and Colorado aquatic life standards; however, the detection limit for ammonia is higher than the associated standard. All results for Spring 29-1 are below the associated standards except for TSS (490 mg/l), ammonia (0.14 mg/l), iron (830 µg/l), and manganese (890 µg/l). No petroleum constituents were detected in either sample.

Table 1 29-17 Groundwater Monitoring Results for Fall 2012

Parameter	Standards		Sample ID and Date	
	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (Sept 24, 2012)	Spring 29-1 (Sept 27, 2012)
Field Parameters				
sp. conductance (µS/cm)			714	741
pH (standard units)	6.5-9.0	6.5-8.5 ²	7.45	6.80
temperature (°C)			10.7	9.3
estimated flow			0.25 cfs	0.25 gpm
General Water Quality Parameters				
total alkalinity (mg/L)			300	320
total hardness (mg/l)			280 J	340 J
TDS (mg/l)		500 ²	480	480
TSS (mg/l)	90		54	490
Organic Constituents				
benzene (µg/l)	5,300	5 ¹	<0.5	<0.5

Parameter	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (Sept 24, 2012)	Spring 29-1 (Sept 27, 2012)
toluene (µg/l)	17,500	1000 ¹	<5	<5
ethylbenzene (µg/l)	32,000	700 ¹	<0.5	<0.5
xylene (µg/l)	C ⁴	10,000 ¹	<1.5	<1.5
methane (µg/l)			<10	<10
ethane (µg/l)			<13	<13
ethene (µg/l)			<13	<13
Major Cations and Anions				
calcium (mg/l)			64	70
magnesium (mg/l)			30	33
potassium (mg/l)			1.5	3.7
sodium (mg/l)			51	51
chloride (mg/l)		250 ²	32	24
fluoride (mg/l)		4 ¹ , 2 ²	0.17	0.17
nitrate (mg/l)		10 ¹	0.34	<0.1
nitrite (mg/l)		1 ¹	<0.1	<0.1
sulfate (mg/l)		250 ²	67	72
ammonia (mg/l)	0.02 ⁵		<0.1 UJ	0.14
Trace Metals				
aluminum (µg/l)	750		<100	<100
arsenic (µg/l)	340	10 ¹	3.1	1.6
barium (µg/l)		2000 ¹	110	280
boron (µg/l)			<200	<200
chromium (µg/l)	1,773 ⁶	100 ¹	<2	<2
copper (µg/l)	50 ⁶	1300 ¹ , 1000 ²	<2	<2
iron (µg/l)		300 ²	<100	830
lead (µg/l)	281 ⁶	15 ¹	<1	<1
manganese (µg/l)	4,738 ⁶	50 ²	<10 UJ	890 J
nickel (µg/l)	1,513 ⁶		3.1	4.1
selenium (µg/l)	18.4	50 ¹	<1	<1
zinc (µg/l)	379 ⁶	5000 ²	<10	<10

Values in bold type exceed standards J = Estimated concentration UJ = Estimated detection limit

mg/l = milligrams per liter; ug/l = micrograms per liter; cfs = cubic feet per minute; gpm = gallons per minute;

uS/cm = microSiemens per centimeter

¹Federal Drinking Water Maximum Contaminant Level (MCL)

²Federal Drinking Water Secondary Standard

³Chronic aquatic life standard (Colorado Water Quality Standards, 5 CCR 1002-31).

⁴Carcinogenic compounds as classified by the EPA

⁵Chronic. Acute ammonia standard calculated based on 0.43/FT/FPH/2, where FT = acute temperature adjustment and FPH = acute pH adjustment. ⁶Aquatic standard is hardness dependent. Values shown are for a hardness of 400 mg/L

A data review was conducted using the quality assurance reports supplied by the laboratory and standard EPA data validation guidelines. For laboratory report L597006 (LC-1), all analyses were conducted within the recommended holding times and all method blank results were reported as not detected. The RPD for the laboratory duplicate sample for ammonia was above the laboratory control limit of 20%. Ammonia was reported as not detected and qualified as not detected at an estimated detection limit "UJ". All laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for hardness (MS = 42.7%, MSD = 42.7%). The hardness result was qualified as estimated "J".

For laboratory report L598165 (Spring 29-1), all analyses were conducted within the recommended holding times and all method blank results were reported as not detected. All laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for hardness (MS = 52.0%, MSD =

56.0%). The hardness result was qualified as estimated "J". Arsenic was originally reported at an estimated concentration of 13 µg/l for Spring 29-1, above the federal primary drinking water standard of 10 µg/l. However, this result was not confirmed by the laboratory. The sample was re-extracted and re-analyzed for arsenic and the result was 1.6 µg/l as reported in laboratory report L600899.

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Laboratory Reports

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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Sunday October 07, 2012

Report Number: L597006

Samples Received: 09/25/12

Client Project:

Description: Garden Gulch

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

This report may not be reproduced, except in full, without written approval from ESC Lab Sciences. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

October 07, 2012

Date Received : September 25, 2012
Description : Garden Gulch
Sample ID : LC-1
Collected By :
Collection Date : 09/24/12 10:10

ESC Sample # : L597006-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	32.	1.0	mg/l	9056	09/29/12	1
Fluoride	0.17	0.10	mg/l	9056	09/29/12	1
Nitrate	0.34	0.10	mg/l	9056	09/26/12	1
Nitrite	BDL	0.10	mg/l	9056	09/26/12	1
Sulfate	67.	5.0	mg/l	9056	09/29/12	1
Alkalinity	300	20.	mg/l	2320B	09/28/12	1
Methane	BDL	0.010	mg/l	RSK175	09/27/12	1
Ethane	BDL	0.013	mg/l	RSK175	09/27/12	1
Ethene	BDL	0.013	mg/l	RSK175	09/27/12	1
Hardness, Total (mg/L as CaCO3)	280	30.	mg/l	130.1	10/01/12	1
Ammonia Nitrogen	BDL	0.10	mg/l	350.1	10/02/12	1
Dissolved Solids	480	10.	mg/l	2540C	10/01/12	1
Suspended Solids	54.	1.0	mg/l	2540D	10/01/12	1
Arsenic,Dissolved	0.0031	0.0010	mg/l	6020	10/02/12	1
Chromium,Dissolved	BDL	0.0020	mg/l	6020	10/02/12	1
Copper,Dissolved	BDL	0.0020	mg/l	6020	10/02/12	1
Lead,Dissolved	BDL	0.0010	mg/l	6020	10/02/12	1
Nickel,Dissolved	0.0031	0.0010	mg/l	6020	10/02/12	1
Selenium,Dissolved	BDL	0.0010	mg/l	6020	10/02/12	1
Zinc,Dissolved	BDL	0.010	mg/l	6020	10/02/12	1
Aluminum,Dissolved	BDL	0.10	mg/l	6010B	10/01/12	1
Barium,Dissolved	0.11	0.0050	mg/l	6010B	10/01/12	1
Boron,Dissolved	BDL	0.20	mg/l	6010B	10/01/12	1
Calcium,Dissolved	64.	0.50	mg/l	6010B	10/01/12	1
Iron,Dissolved	BDL	0.10	mg/l	6010B	10/01/12	1
Magnesium,Dissolved	30.	0.10	mg/l	6010B	10/01/12	1
Manganese,Dissolved	BDL	0.010	mg/l	6010B	10/01/12	1
Potassium,Dissolved	1.5	0.50	mg/l	6010B	10/01/12	1
Sodium,Dissolved	51.	0.50	mg/l	6010B	10/01/12	1
Benzene	BDL	0.00050	mg/l	8021B	09/26/12	1
Toluene	BDL	0.0050	mg/l	8021B	09/26/12	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	09/26/12	1
Total Xylene	BDL	0.0015	mg/l	8021B	09/28/12	1
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	85.9		% Rec.	8021B	09/26/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/05/12 17:17 Revised: 10/07/12 17:10

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L597006-01	WG615509	SAMP	Hardness, Total (mg/L as CaCO3)	R2371776	J6
L597006-04	WG615012	SAMP	Ammonia Nitrogen	R2372754	P1
	WG615773	SAMP	Fluoride	R2373967	P1
L597006-08	WG615701	SAMP	Nitrate	R2372253	Q
	WG615701	SAMP	Nitrite	R2372253	Q
L597006-09	WG615631	SAMP	Selenium,Dissolved	R2373653	P1

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
Q	(ESC) Sample held beyond the accepted holding time.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.



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October 07, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Benzene	< .0005	mg/l			WG614597	09/26/12 06:10
Ethylbenzene	< .0005	mg/l			WG614597	09/26/12 06:10
Toluene	< .005	mg/l			WG614597	09/26/12 06:10
Total Xylene	< .0015	mg/l			WG614597	09/26/12 06:10
a,a,a-Trifluorotoluene(PID)		% Rec.	104.4	55-122	WG614597	09/26/12 06:10
Benzene	< .0005	mg/l			WG614550	09/26/12 05:23
Ethylbenzene	< .0005	mg/l			WG614550	09/26/12 05:23
Toluene	< .005	mg/l			WG614550	09/26/12 05:23
a,a,a-Trifluorotoluene(PID)		% Rec.	99.33	55-122	WG614550	09/26/12 05:23
Benzene	< .0005	mg/l			WG614801	09/26/12 23:08
Ethylbenzene	< .0005	mg/l			WG614801	09/26/12 23:08
Toluene	< .005	mg/l			WG614801	09/26/12 23:08
Total Xylene	< .0015	mg/l			WG614801	09/26/12 23:08
a,a,a-Trifluorotoluene(PID)		% Rec.	104.4	55-122	WG614801	09/26/12 23:08
Ethane	< .013	mg/l			WG614947	09/27/12 11:10
Ethene	< .013	mg/l			WG614947	09/27/12 11:10
Methane	< .01	mg/l			WG614947	09/27/12 11:10
Nitrate	< .1	mg/l			WG614644	09/25/12 21:46
Nitrite	< .1	mg/l			WG614644	09/25/12 21:46
Alkalinity	< 20	mg/l			WG614981	09/28/12 10:36
Total Xylene	< .0015	mg/l			WG614873	09/28/12 13:35
a,a,a-Trifluorotoluene(PID)		% Rec.	103.8	55-122	WG614873	09/28/12 13:35
Alkalinity	< 20	mg/l			WG615194	09/29/12 06:28
Chloride	< 1	mg/l			WG615277	09/28/12 13:45
Fluoride	< .1	mg/l			WG615277	09/28/12 13:45
Sulfate	< 5	mg/l			WG615277	09/28/12 13:45
Suspended Solids	< 1	mg/l			WG615010	10/01/12 11:15
Dissolved Solids	< 10	mg/l			WG615006	10/01/12 13:40
Chloride	< 1	mg/l			WG614487	09/25/12 08:28
Fluoride	< .1	mg/l			WG614487	09/25/12 08:28
Nitrate	< .1	mg/l			WG614487	09/25/12 08:28
Nitrite	< .1	mg/l			WG614487	09/25/12 08:28
Sulfate	< 5	mg/l			WG614487	09/25/12 08:28
Chloride	< 1	mg/l			WG615337	09/29/12 10:07
Fluoride	< .1	mg/l			WG615337	09/29/12 10:07

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Sulfate	< 5	mg/l			WG615337	09/29/12 10:07
Hardness, Total (mg/L as CaCO ₃)	< 30	mg/l			WG615509	10/01/12 15:09
Chloride	< 1	mg/l			WG615701	10/01/12 21:02
Fluoride	< .1	mg/l			WG615701	10/01/12 21:02
Nitrate	< .1	mg/l			WG615701	10/01/12 21:02
Nitrite	< .1	mg/l			WG615701	10/01/12 21:02
Sulfate	< 5	mg/l			WG615701	10/01/12 21:02
Aluminum,Dissolved	< .1	mg/l			WG615608	10/01/12 16:16
Barium,Dissolved	< .005	mg/l			WG615608	10/01/12 16:16
Boron,Dissolved	< .2	mg/l			WG615608	10/01/12 16:16
Calcium,Dissolved	< .5	mg/l			WG615608	10/01/12 16:16
Iron,Dissolved	< .1	mg/l			WG615608	10/01/12 16:16
Magnesium,Dissolved	< .1	mg/l			WG615608	10/01/12 16:16
Manganese,Dissolved	< .01	mg/l			WG615608	10/01/12 16:16
Potassium,Dissolved	< .5	mg/l			WG615608	10/01/12 16:16
Sodium,Dissolved	< .5	mg/l			WG615608	10/01/12 16:16
Dissolved Solids	< 10	mg/l			WG615238	10/02/12 12:42
Ammonia Nitrogen	< .1	mg/l			WG615012	10/02/12 10:10
Ammonia Nitrogen	< .1	mg/l			WG615348	10/02/12 15:19
Arsenic,Dissolved	< .001	mg/l			WG615631	10/02/12 17:21
Chromium,Dissolved	< .002	mg/l			WG615631	10/02/12 17:21
Copper,Dissolved	< .002	mg/l			WG615631	10/02/12 17:21
Lead,Dissolved	< .001	mg/l			WG615631	10/02/12 17:21
Nickel,Dissolved	< .001	mg/l			WG615631	10/02/12 17:21
Selenium,Dissolved	< .001	mg/l			WG615631	10/02/12 17:21
Zinc,Dissolved	< .01	mg/l			WG615631	10/02/12 17:21
Ammonia Nitrogen	< .1	mg/l			WG615253	10/03/12 09:16
Aluminum,Dissolved	< .1	mg/l			WG615768	10/02/12 21:41
Barium,Dissolved	< .005	mg/l			WG615768	10/02/12 21:41
Boron,Dissolved	< .2	mg/l			WG615768	10/02/12 21:41
Calcium,Dissolved	< .5	mg/l			WG615768	10/02/12 21:41
Iron,Dissolved	< .1	mg/l			WG615768	10/02/12 21:41
Magnesium,Dissolved	< .1	mg/l			WG615768	10/02/12 21:41
Manganese,Dissolved	< .01	mg/l			WG615768	10/02/12 21:41
Potassium,Dissolved	< .5	mg/l			WG615768	10/02/12 21:41
Sodium,Dissolved	< .5	mg/l			WG615768	10/02/12 21:41
Fluoride	< .1	mg/l			WG615773	10/02/12 08:13
Sulfate	< 5	mg/l			WG615773	10/02/12 08:13

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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October 07, 2012

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG616205	10/04/12 08:58
Ammonia Nitrogen	< .1	mg/l			WG615684	10/04/12 16:59
Analyte	Units	Duplicate		Limit	Ref Samp	Batch
		Result	Duplicate			
Nitrate	mg/l	0	0	0	L597004-09	WG614644
Nitrate	mg/l	0.110	0.170	45.5*	L597004-07	WG614644
Alkalinity	mg/l	24.0	24.0	1.26	L597004-03	WG614981
Alkalinity	mg/l	54.0	53.0	1.13	L597004-14	WG614981
Alkalinity	mg/l	260.	260.	1.53	L597006-07	WG615194
Alkalinity	mg/l	49.0	51.0	4.61	L597133-01	WG615194
Sulfate	mg/l	1.90	1.90	0	L596264-04	WG615277
Sulfate	mg/l	1700	1600	4.28	L596856-21	WG615277
Sulfate	mg/l	5000	4800	4.28	L597048-01	WG615277
Suspended Solids	mg/l	30.0	29.0	3.39	L597006-09	WG615010
Suspended Solids	mg/l	4.00	4.00	0	L597395-02	WG615010
Dissolved Solids	mg/l	430.	427.	0.467	L597006-07	WG615006
Chloride	mg/l	0	0	0	L596981-04	WG614487
Nitrate	mg/l	0	0	0	L596981-04	WG614487
Nitrate	mg/l	0	0	0	L597004-15	WG614487
Sulfate	mg/l	29.0	39.0	28.4*	L596866-01	WG615337
Chloride	mg/l	17.0	17.0	0.590	L598137-01	WG615337
Fluoride	mg/l	1.60	1.60	1.26	L598137-01	WG615337
Sulfate	mg/l	48.0	48.0	0.837	L598137-01	WG615337
Hardness, Total (mg/L as CaCO3)	mg/l	280.	280.	0.358	L597299-07	WG615509
Hardness, Total (mg/L as CaCO3)	mg/l	200.	200.	0.501	L595511-01	WG615509
Chloride	mg/l	78.0	77.0	1.29	L597006-08	WG615701
Fluoride	mg/l	0.150	0.140	6.90	L597006-08	WG615701
Nitrate	mg/l	0	0	0	L597006-08	WG615701
Nitrite	mg/l	0	0	0	L597006-08	WG615701
Sulfate	mg/l	42.0	42.0	0.238	L597006-08	WG615701
Sulfate	mg/l	70.0	70.0	0.717	L597087-04	WG615701
Fluoride	mg/l	0.210	0.190	10.5	L597184-01	WG615701
Aluminum, Dissolved	mg/l	0	0.0918	NA	L596590-11	WG615608
Barium, Dissolved	mg/l	0.0550	0.0540	1.65	L596590-11	WG615608

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YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L597006

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

October 07, 2012

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
			Duplicate				
Boron,Dissolved	mg/l	0.630	0.627	0.794*	0	L596590-11	WG615608
Calcium,Dissolved	mg/l	110.	110.	0.905	20	L596590-11	WG615608
Iron,Dissolved	mg/l	0	0	0	20	L596590-11	WG615608
Magnesium,Dissolved	mg/l	81.0	80.1	0.994	20	L596590-11	WG615608
Manganese,Dissolved	mg/l	0.430	0.427	0.467	20	L596590-11	WG615608
Potassium,Dissolved	mg/l	34.0	33.1	1.20	20	L596590-11	WG615608
Sodium,Dissolved	mg/l	210.	211.	0.475	20	L596590-11	WG615608
Dissolved Solids	mg/l	200.	195.	3.03	5	L597754-01	WG615238
Ammonia Nitrogen	mg/l	0.130	0.220	51.4*	20	L597006-04	WG615012
Ammonia Nitrogen	mg/l	0	0	0	20	L596446-01	WG615012
Ammonia Nitrogen	mg/l	4.60	5.30	15.0	20	L597193-01	WG615348
Ammonia Nitrogen	mg/l	0	0	0	20	L595877-01	WG615348
Arsenic,Dissolved	mg/l	0.00710	0.00680	3.89	20	L597006-09	WG615631
Chromium,Dissolved	mg/l	0	0	0	20	L597006-09	WG615631
Copper,Dissolved	mg/l	0	0	0	20	L597006-09	WG615631
Lead,Dissolved	mg/l	0	0	0	20	L597006-09	WG615631
Nickel,Dissolved	mg/l	0.00420	0.00450	6.19	20	L597006-09	WG615631
Selenium,Dissolved	mg/l	0.00100	0	NA	20	L597006-09	WG615631
Zinc,Dissolved	mg/l	0	0	0	20	L597006-09	WG615631
Ammonia Nitrogen	mg/l	0	0	0	20	L597004-03	WG615253
Aluminum,Dissolved	mg/l	0	0.0882	NA	20	L597001-03	WG615768
Barium,Dissolved	mg/l	0.0800	0.0794	0.377	20	L597001-03	WG615768
Boron,Dissolved	mg/l	0	0.00680	NA	0	L597001-03	WG615768
Calcium,Dissolved	mg/l	16.0	15.8	1.88	20	L597001-03	WG615768
Iron,Dissolved	mg/l	0	0	0	20	L597001-03	WG615768
Magnesium,Dissolved	mg/l	4.40	4.38	0.228	20	L597001-03	WG615768
Manganese,Dissolved	mg/l	0	0.00660	NA	20	L597001-03	WG615768
Potassium,Dissolved	mg/l	2.30	2.47	5.41	20	L597001-03	WG615768
Sodium,Dissolved	mg/l	9.30	9.14	2.06	20	L597001-03	WG615768
Fluoride	mg/l	0.120	0	NA	20	L597006-04	WG615773
Sulfate	mg/l	44.0	44.0	0.228	20	L597006-04	WG615773
Sulfate	mg/l	600.	600.	0.333	20	L597315-01	WG615773
Chloride	mg/l	2.20	2.70	18.2	20	L597006-04	WG616205
Ammonia Nitrogen	mg/l	0	0	0	20	L597006-07	WG615684
Ammonia Nitrogen	mg/l	0.380	0.300	22.5*	20	L597004-18	WG615684
Chloride	mg/l	2.20	2.70	18.2	20	L597006-04	WG616205
Chloride	mg/l	75.0	74.1	1.34	20	L597782-01	WG616205

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Benzene	mg/l	.05	0.0536	107.	79-114	WG614597
Ethylbenzene	mg/l	.05	0.0534	107.	80-116	WG614597
Toluene	mg/l	.05	0.0525	105.	79-112	WG614597
Total Xylene	mg/l	.15	0.157	105.	84-118	WG614597
a,a,a-Trifluorotoluene(PID)				103.3	55-122	WG614597
Benzene	mg/l	.05	0.0528	106.	79-114	WG614550
Ethylbenzene	mg/l	.05	0.0539	108.	80-116	WG614550
Toluene	mg/l	.05	0.0537	107.	79-112	WG614550
a,a,a-Trifluorotoluene(PID)				99.85	55-122	WG614550
Benzene	mg/l	.05	0.0563	113.	79-114	WG614801
Ethylbenzene	mg/l	.05	0.0558	112.	80-116	WG614801
Toluene	mg/l	.05	0.0556	111.	79-112	WG614801
Total Xylene	mg/l	.15	0.172	115.	84-118	WG614801
a,a,a-Trifluorotoluene(PID)				103.2	55-122	WG614801
Ethane	mg/l	.645	0.709	110.	70-130	WG614947
Ethene	mg/l	.635	0.683	108.	70-130	WG614947
Methane	mg/l	.339	0.359	106.	70-130	WG614947
Nitrate	mg/l	8	8.36	105.	90-110	WG614644
Nitrite	mg/l	8	8.12	102.	90-110	WG614644
Alkalinity	mg/l	100	109.	109.	85-115	WG614981
Total Xylene	mg/l	.15	0.155	103.	84-118	WG614873
a,a,a-Trifluorotoluene(PID)				103.5	55-122	WG614873
Alkalinity	mg/l	100	93.9	93.9	85-115	WG615194
Chloride	mg/l	40	39.9	99.8	90-110	WG615277
Fluoride	mg/l	8	8.06	101.	90-110	WG615277
Sulfate	mg/l	40	39.5	98.8	90-110	WG615277
Suspended Solids	mg/l	773	752.	97.3	85-115	WG615010
Dissolved Solids	mg/l	8800	8720	99.0	85-115	WG615006
Chloride	mg/l	40	40.4	101.	90-110	WG614487
Fluoride	mg/l	8	8.17	102.	90-110	WG614487
Nitrate	mg/l	8	8.39	105.	90-110	WG614487
Nitrite	mg/l	8	8.19	102.	90-110	WG614487
Sulfate	mg/l	40	40.1	100.	90-110	WG614487
Chloride	mg/l	40	40.1	100.	90-110	WG615337
Fluoride	mg/l	8	8.10	101.	90-110	WG615337
Sulfate	mg/l	40	39.5	98.8	90-110	WG615337

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Hardness, Total (mg/L as CaCO ₃)	mg/l	200	204.	102.	85-115	WG615509
Chloride	mg/l	40	39.8	99.5	90-110	WG615701
Fluoride	mg/l	8	8.03	100.	90-110	WG615701
Nitrate	mg/l	8	8.22	103.	90-110	WG615701
Nitrite	mg/l	8	8.01	100.	90-110	WG615701
Sulfate	mg/l	40	39.4	98.5	90-110	WG615701
Aluminum, Dissolved	mg/l	1.13	1.17	104.	85-115	WG615608
Barium, Dissolved	mg/l	1.13	1.19	105.	85-115	WG615608
Boron, Dissolved	mg/l	1.13	1.10	97.3	85-115	WG615608
Calcium, Dissolved	mg/l	11.3	11.4	101.	85-115	WG615608
Iron, Dissolved	mg/l	1.13	1.12	99.1	85-115	WG615608
Magnesium, Dissolved	mg/l	11.3	11.6	103.	85-115	WG615608
Manganese, Dissolved	mg/l	1.13	1.16	103.	85-115	WG615608
Potassium, Dissolved	mg/l	11.3	11.3	100.	85-115	WG615608
Sodium, Dissolved	mg/l	11.3	11.7	104.	85-115	WG615608
Dissolved Solids	mg/l	8800	8570	97.4	85-115	WG615238
Ammonia Nitrogen	mg/l	7.5	7.47	99.6	90-110	WG615012
Ammonia Nitrogen	mg/l	7.5	7.55	101.	90-110	WG615348
Arsenic, Dissolved	mg/l	.0567	0.0541	95.4	85-115	WG615631
Chromium, Dissolved	mg/l	.0567	0.0606	107.	85-115	WG615631
Copper, Dissolved	mg/l	.0567	0.0600	106.	85-115	WG615631
Lead, Dissolved	mg/l	.0567	0.0598	105.	85-115	WG615631
Nickel, Dissolved	mg/l	.0567	0.0595	105.	85-115	WG615631
Selenium, Dissolved	mg/l	.0567	0.0491	86.6	85-115	WG615631
Zinc, Dissolved	mg/l	.0567	0.0610	108.	85-115	WG615631
Ammonia Nitrogen	mg/l	7.5	8.15	109.	90-110	WG615253
Aluminum, Dissolved	mg/l	1.13	1.08	95.6	85-115	WG615768
Barium, Dissolved	mg/l	1.13	1.14	101.	85-115	WG615768
Boron, Dissolved	mg/l	1.13	1.03	91.2	85-115	WG615768
Calcium, Dissolved	mg/l	11.3	11.4	101.	85-115	WG615768
Iron, Dissolved	mg/l	1.13	1.15	102.	85-115	WG615768
Magnesium, Dissolved	mg/l	11.3	11.2	99.1	85-115	WG615768
Manganese, Dissolved	mg/l	1.13	1.14	101.	85-115	WG615768
Potassium, Dissolved	mg/l	11.3	10.9	96.5	85-115	WG615768
Sodium, Dissolved	mg/l	11.3	11.4	101.	85-115	WG615768
Fluoride	mg/l	8	7.96	99.5	90-110	WG615773
Sulfate	mg/l	40	39.6	99.0	90-110	WG615773
Chloride	mg/l	40	40.1	100.	90-110	WG616205

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Analyte	Units	Laboratory Control		Sample	% Rec	Limit	Batch	
		Known Val	Result	Result				
Ammonia Nitrogen	mg/l	7.5		8.15	109.	90-110	WG615684	
Chloride	mg/l	40		40.1	100.	90-110	WG616205	
Analyte	Units	Laboratory Control		Sample Duplicate	Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Benzene	mg/l	0.0543	0.0536	108.	79-114	1.29	20	WG614597
Ethylbenzene	mg/l	0.0538	0.0534	108.	80-116	0.800	20	WG614597
Toluene	mg/l	0.0529	0.0525	106.	79-112	0.880	20	WG614597
Total Xylene	mg/l	0.159	0.157	106.	84-118	0.820	20	WG614597
a,a,a-Trifluorotoluene(PID)				103.7	55-122			WG614597
Benzene	mg/l	0.0506	0.0528	101.	79-114	4.26	20	WG614550
Ethylbenzene	mg/l	0.0512	0.0539	102.	80-116	5.25	20	WG614550
Toluene	mg/l	0.0507	0.0537	101.	79-112	5.67	20	WG614550
a,a,a-Trifluorotoluene(PID)				99.34	55-122			WG614550
Benzene	mg/l	0.0515	0.0563	103.	79-114	8.86	20	WG614801
Ethylbenzene	mg/l	0.0510	0.0558	102.	80-116	9.01	20	WG614801
Toluene	mg/l	0.0512	0.0556	102.	79-112	8.15	20	WG614801
Total Xylene	mg/l	0.160	0.172	106.	84-118	7.53	20	WG614801
a,a,a-Trifluorotoluene(PID)				103.3	55-122			WG614801
Ethane	mg/l	0.698	0.709	108.	70-130	1.57	25	WG614947
Ethene	mg/l	0.670	0.683	105.	70-130	2.00	25	WG614947
Methane	mg/l	0.353	0.359	104.	70-130	1.70	25	WG614947
Nitrate	mg/l	8.34	8.36	104.	90-110	0.240	20	WG614644
Nitrite	mg/l	8.14	8.12	102.	90-110	0.246	20	WG614644
Alkalinity	mg/l	103.	109.	103.	85-115	5.66	20	WG614981
Total Xylene	mg/l	0.159	0.155	106.	84-118	2.26	20	WG614873
a,a,a-Trifluorotoluene(PID)				103.0	55-122			WG614873
Alkalinity	mg/l	95.1	93.9	95.0	85-115	1.27	20	WG615194
Chloride	mg/l	39.9	39.9	100.	90-110	0	20	WG615277
Fluoride	mg/l	8.10	8.06	101.	90-110	0.495	20	WG615277
Sulfate	mg/l	39.5	39.5	99.0	90-110	0	20	WG615277
Suspended Solids	mg/l	760.	752.	98.0	85-115	1.06	5	WG615010
Dissolved Solids	mg/l	8720	8720	99.0	85-115	0	5	WG615006

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chloride	mg/l	40.5	40.4	101.	90-110	0.247	20	WG614487
Fluoride	mg/l	8.26	8.17	103.	90-110	1.10	20	WG614487
Nitrate	mg/l	8.38	8.39	105.	90-110	0.119	20	WG614487
Nitrite	mg/l	8.19	8.19	102.	90-110	0	20	WG614487
Sulfate	mg/l	40.4	40.1	101.	90-110	0.745	20	WG614487
Chloride	mg/l	40.2	40.1	100.	90-110	0.249	20	WG615337
Fluoride	mg/l	8.15	8.10	102.	90-110	0.615	20	WG615337
Sulfate	mg/l	39.6	39.5	99.0	90-110	0.253	20	WG615337
Hardness, Total (mg/L as CaCO3)	mg/l	205.	204.	102.	85-115	0.489	20	WG615509
Chloride	mg/l	39.5	39.8	99.0	90-110	0.757	20	WG615701
Fluoride	mg/l	8.02	8.03	100.	90-110	0.125	20	WG615701
Nitrate	mg/l	8.15	8.22	102.	90-110	0.855	20	WG615701
Nitrite	mg/l	7.96	8.01	100.	90-110	0.626	20	WG615701
Sulfate	mg/l	39.2	39.4	98.0	90-110	0.509	20	WG615701
Dissolved Solids	mg/l	8540	8570	97.0	85-115	0.374	5	WG615238
Ammonia Nitrogen	mg/l	8.25	7.47	110.	90-110	9.92	20	WG615012
Ammonia Nitrogen	mg/l	8.02	7.55	107.	90-110	6.04	20	WG615348
Ammonia Nitrogen	mg/l	7.97	8.15	106.	90-110	2.23	20	WG615253
Fluoride	mg/l	8.09	7.96	101.	90-110	1.62	20	WG615773
Sulfate	mg/l	39.9	39.6	100.	90-110	0.755	20	WG615773
Chloride	mg/l	40.3	40.1	101.	90-110	0.498	20	WG616205
Ammonia Nitrogen	mg/l	7.84	8.15	104.	90-110	3.88	20	WG615684
Chloride	mg/l	40.3	40.1	101.	90-110	0.498	20	WG616205

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Benzene	mg/l	0.0616	0.0110	.05	101.	35-147	L596379-02	WG614597
Ethylbenzene	mg/l	0.114	0.0770	.05	74.3	39-141	L596379-02	WG614597
Toluene	mg/l	0.0523	0	.05	104.	35-148	L596379-02	WG614597
Total Xylene	mg/l	0.190	0.0500	.15	93.4	33-151	L596379-02	WG614597
a,a,a-Trifluorotoluene(PID)					112.5	55-122		WG614597
Benzene	mg/l	0.0518	0	.05	104.	35-147	L597006-01	WG614550
Ethylbenzene	mg/l	0.0520	0	.05	104.	39-141	L597006-01	WG614550
Toluene	mg/l	0.0532	0	.05	106.	35-148	L597006-01	WG614550

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
a,a,a-Trifluorotoluene(PID)					97.67	55-122		
Benzene	mg/l	0.0576	0	.05	115.	35-147	L596623-04	WG614801
Ethylbenzene	mg/l	0.0574	0	.05	115.	39-141	L596623-04	WG614801
Toluene	mg/l	0.0571	0	.05	114.	35-148	L596623-04	WG614801
Total Xylene	mg/l	0.179	0	.15	119.	33-151	L596623-04	WG614801
a,a,a-Trifluorotoluene(PID)					104.8	55-122		WG614801
Nitrate	mg/l	5.15	0	5	103.	80-120	L597005-01	WG614644
Nitrite	mg/l	5.14	0	5	103.	80-120	L597005-01	WG614644
Alkalinity	mg/l	124.	24.0	100	100.	80-120	L597004-06	WG614981
Total Xylene	mg/l	0.153	0	.15	102.	33-151	L597299-05	WG614873
a,a,a-Trifluorotoluene(PID)					102.1	55-122		WG614873
Alkalinity	mg/l	859.	390.	100	93.8	80-120	L597190-01	WG615194
Sulfate	mg/l	74.9	27.8	50	94.2	80-120	L597945-09	WG615277
Chloride	mg/l	50.6	0	50	101.	80-120	L596981-02	WG614487
Nitrate	mg/l	5.30	0.440	5	97.2	80-120	L596981-02	WG614487
Chloride	mg/l	46.1	5.90	50	80.4	80-120	L598192-04	WG615337
Sulfate	mg/l	45.8	0	50	91.6	80-120	L598192-04	WG615337
Hardness, Total (mg/L as CaCO3)	mg/l	344.	280.	150	42.7*	80-120	L597006-01	WG615509
Sulfate	mg/l	62.9	17.0	50	91.8	80-120	L596888-01	WG615701
Aluminum,Dissolved	mg/l	1.37	0.0918	1.13	113.	75-125	L596590-11	WG615608
Barium,Dissolved	mg/l	1.18	0.0540	1.13	99.6	75-125	L596590-11	WG615608
Boron,Dissolved	mg/l	1.71	0.627	1.13	95.8	75-125	L596590-11	WG615608
Calcium,Dissolved	mg/l	122.	110.	11.3	106.	75-125	L596590-11	WG615608
Iron,Dissolved	mg/l	1.10	0	1.13	97.3	75-125	L596590-11	WG615608
Magnesium,Dissolved	mg/l	94.5	80.1	11.3	127.*	75-125	L596590-11	WG615608
Manganese,Dissolved	mg/l	1.58	0.427	1.13	102.	75-125	L596590-11	WG615608
Potassium,Dissolved	mg/l	44.6	33.1	11.3	102.	75-125	L596590-11	WG615608
Sodium,Dissolved	mg/l	221.	211.	11.3	88.5	75-125	L596590-11	WG615608
Ammonia Nitrogen	mg/l	5.78	0.140	5	113.*	90-110	L596449-01	WG615012
Ammonia Nitrogen	mg/l	5.88	0.170	5	114.*	90-110	L597011-01	WG615348
Arsenic,Dissolved	mg/l	0.0619	0.00680	.0567	97.2	75-125	L597006-09	WG615631
Chromium,Dissolved	mg/l	0.0595	0	.0567	105.	75-125	L597006-09	WG615631
Copper,Dissolved	mg/l	0.0576	0	.0567	102.	75-125	L597006-09	WG615631

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L597006

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(615) 758-5858
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Tax I.D. 62-0814289

Est. 1970

October 07, 2012

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Lead,Dissolved	mg/l	0.0578	0	.0567	102.	75-125	L597006-09	WG615631
Nickel,Dissolved	mg/l	0.0611	0.00450	.0567	99.8	75-125	L597006-09	WG615631
Selenium,Dissolved	mg/l	0.0544	0	.0567	95.9	75-125	L597006-09	WG615631
Zinc,Dissolved	mg/l	0.0618	0	.0567	109.	75-125	L597006-09	WG615631
Ammonia Nitrogen	mg/l	5.50	0	5	110.	90-110	L597004-11	WG615253
Aluminum,Dissolved	mg/l	1.09	0.0882	1.13	88.6	75-125	L597001-03	WG615768
Barium,Dissolved	mg/l	1.23	0.0794	1.13	102.	75-125	L597001-03	WG615768
Boron,Dissolved	mg/l	1.05	0.00680	1.13	92.3	75-125	L597001-03	WG615768
Calcium,Dissolved	mg/l	27.3	15.8	11.3	102.	75-125	L597001-03	WG615768
Iron,Dissolved	mg/l	1.15	0	1.13	102.	75-125	L597001-03	WG615768
Magnesium,Dissolved	mg/l	15.6	4.38	11.3	99.3	75-125	L597001-03	WG615768
Manganese,Dissolved	mg/l	1.16	0.00660	1.13	102.	75-125	L597001-03	WG615768
Potassium,Dissolved	mg/l	13.5	2.47	11.3	97.6	75-125	L597001-03	WG615768
Sodium,Dissolved	mg/l	20.5	9.14	11.3	100.	75-125	L597001-03	WG615768
Ammonia Nitrogen	mg/l	5.80	0.210	5	112.*	90-110	L597251-07	WG615684

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/l	0.0593	0.0616	96.5	35-147	3.90	20	L596379-02	WG614597
Ethylbenzene	mg/l	0.111	0.114	67.4	39-141	3.05	20	L596379-02	WG614597
Toluene	mg/l	0.0504	0.0523	101.	35-148	3.62	20	L596379-02	WG614597
Total Xylene	mg/l	0.187	0.190	91.1	33-151	1.82	20	L596379-02	WG614597
a,a,a-Trifluorotoluene(PID)				112.8	55-122				WG614597
Benzene	mg/l	0.0499	0.0518	99.7	35-147	3.82	20	L597006-01	WG614550
Ethylbenzene	mg/l	0.0498	0.0520	99.7	39-141	4.18	20	L597006-01	WG614550
Toluene	mg/l	0.0492	0.0532	98.5	35-148	7.76	20	L597006-01	WG614550
a,a,a-Trifluorotoluene(PID)				97.44	55-122				WG614550
Benzene	mg/l	0.0556	0.0576	111.	35-147	3.59	20	L596623-04	WG614801
Ethylbenzene	mg/l	0.0549	0.0574	110.	39-141	4.43	20	L596623-04	WG614801
Toluene	mg/l	0.0551	0.0571	110.	35-148	3.63	20	L596623-04	WG614801
Total Xylene	mg/l	0.171	0.179	114.	33-151	4.29	20	L596623-04	WG614801
a,a,a-Trifluorotoluene(PID)				104.0	55-122				WG614801
Nitrate	mg/l	4.93	5.15	98.6	80-120	4.37	20	L597005-01	WG614644
Nitrite	mg/l	4.93	5.14	98.6	80-120	4.17	20	L597005-01	WG614644
Alkalinity	mg/l	128.	124.	104.	80-120	3.17	20	L597004-06	WG614981
Total Xylene	mg/l	0.156	0.153	104.	33-151	1.82	20	L597299-05	WG614873
a,a,a-Trifluorotoluene(PID)				102.5	55-122				WG614873
Alkalinity	mg/l	868.	859.	95.6	80-120	1.04	20	L597190-01	WG615194

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chloride	mg/l	50.0	50.6	100.	80-120	1.19	20	L596981-02	WG614487
Nitrate	mg/l	5.24	5.30	96.0	80-120	1.14	20	L596981-02	WG614487
Chloride	mg/l	47.3	46.1	82.8	80-120	2.57	20	L598192-04	WG615337
Sulfate	mg/l	47.3	45.8	94.6	80-120	3.22	20	L598192-04	WG615337
Hardness, Total (mg/L as CaCO3)	mg/l	344.	344.	42.7*	80-120	0	20	L597006-01	WG615509
Sulfate	mg/l	63.2	62.9	92.4	80-120	0.476	20	L596888-01	WG615701
Aluminum,Dissolved	mg/l	1.38	1.37	114.	75-125	0.727	20	L596590-11	WG615608
Barium,Dissolved	mg/l	1.20	1.18	101.	75-125	1.68	20	L596590-11	WG615608
Boron,Dissolved	mg/l	1.75	1.71	99.4	75-125	2.31	20	L596590-11	WG615608
Calcium,Dissolved	mg/l	124.	122.	124.	75-125	1.63	20	L596590-11	WG615608
Iron,Dissolved	mg/l	1.09	1.10	96.5	75-125	0.913	20	L596590-11	WG615608
Magnesium,Dissolved	mg/l	96.2	94.5	142.*	75-125	1.78	20	L596590-11	WG615608
Manganese,Dissolved	mg/l	1.61	1.58	105.	75-125	1.88	20	L596590-11	WG615608
Potassium,Dissolved	mg/l	45.9	44.6	113.	75-125	2.87	20	L596590-11	WG615608
Sodium,Dissolved	mg/l	223.	221.	106.	75-125	0.901	20	L596590-11	WG615608
Ammonia Nitrogen	mg/l	5.78	5.78	113.*	90-110	0	20	L596449-01	WG615012
Ammonia Nitrogen	mg/l	5.10	5.88	98.6	90-110	14.2	20	L597011-01	WG615348
Arsenic,Dissolved	mg/l	0.0619	0.0619	97.2	75-125	0	20	L597006-09	WG615631
Chromium,Dissolved	mg/l	0.0592	0.0595	104.	75-125	0.505	20	L597006-09	WG615631
Copper,Dissolved	mg/l	0.0592	0.0576	104.	75-125	2.74	20	L597006-09	WG615631
Lead,Dissolved	mg/l	0.0574	0.0578	101.	75-125	0.694	20	L597006-09	WG615631
Nickel,Dissolved	mg/l	0.0614	0.0611	100.	75-125	0.490	20	L597006-09	WG615631
Selenium,Dissolved	mg/l	0.0527	0.0544	92.9	75-125	3.17	20	L597006-09	WG615631
Zinc,Dissolved	mg/l	0.0623	0.0618	110.	75-125	0.806	20	L597006-09	WG615631
Ammonia Nitrogen	mg/l	5.73	5.50	115.*	90-110	4.10	20	L597004-11	WG615253
Aluminum,Dissolved	mg/l	1.11	1.09	90.4	75-125	1.82	20	L597001-03	WG615768
Barium,Dissolved	mg/l	1.28	1.23	106.	75-125	3.98	20	L597001-03	WG615768
Boron,Dissolved	mg/l	1.09	1.05	95.8	75-125	3.74	20	L597001-03	WG615768
Calcium,Dissolved	mg/l	27.8	27.3	106.	75-125	1.81	20	L597001-03	WG615768
Iron,Dissolved	mg/l	1.19	1.15	105.	75-125	3.42	20	L597001-03	WG615768
Magnesium,Dissolved	mg/l	16.1	15.6	104.	75-125	3.15	20	L597001-03	WG615768
Manganese,Dissolved	mg/l	1.20	1.16	106.	75-125	3.39	20	L597001-03	WG615768
Potassium,Dissolved	mg/l	13.8	13.5	100.	75-125	2.20	20	L597001-03	WG615768
Sodium,Dissolved	mg/l	21.0	20.5	105.	75-125	2.41	20	L597001-03	WG615768
Ammonia Nitrogen	mg/l	5.19	5.80	99.6	90-110	11.1	20	L597251-07	WG615684

Batch number /Run number / Sample number cross reference

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WG614597: R2365734: L597006-06 07 08 09
WG614550: R2365858: L597006-01
WG614801: R2367553: L597006-02 03 04 05
WG614947: R2367773: L597006-01 02 03 04 05 06 07 08 09
WG614644: R2368821: L597006-01 02 03 04
WG614981: R2369674: L597006-01 02 03 04
WG614873: R2370193: L597006-01
WG615194: R2370961: L597006-05 06 07 08 09
WG615277: R2371015: L597006-01 02
WG615010: R2371175: L597006-01 02 03 04 05 06 07 08 09
WG615006: R2371474: L597006-01 02 03 04 05 06 07
WG614487: R2371553: L597006-05 06 07 09
WG615337: R2371716: L597006-03
WG615509: R2371776: L597006-01 02 03 04 05 06 07 08 09
WG615701: R2372253: L597006-08
WG615608: R2372374: L597006-01 02 03 04 05 06 07 08
WG615238: R2372673: L597006-08 09
WG615012: R2372754: L597006-01 02 03 04 05
WG615348: R2373257: L597006-08 09
WG615631: R2373653: L597006-01 02 03 04 05 06 07 08 09
WG615253: R2373733: L597006-06
WG615768: R2373774: L597006-09
WG615773: R2373967: L597006-04
WG615340: R2374694: L597006-04
WG616205: R2376233: L597006-04
WG615684: R2376533: L597006-07

* * Calculations are performed prior to rounding of reported values.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Tuesday October 09, 2012

Report Number: L598165

Samples Received: 09/29/12

Client Project:

Description: Garden Gulch

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

October 09, 2012

Date Received : September 29, 2012
Description : Garden Gulch
Sample ID : 29-1
Collected By : D. Nicholson
Collection Date : 09/27/12 12:00

ESC Sample # : L598165-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	24.	1.0	mg/l	9056	09/29/12	1
Fluoride	0.17	0.10	mg/l	9056	09/29/12	1
Nitrate	BDL	0.10	mg/l	9056	09/29/12	1
Nitrite	BDL	0.10	mg/l	9056	09/29/12	1
Sulfate	72.	5.0	mg/l	9056	09/29/12	1
Alkalinity	320	100	mg/l	2320B	10/04/12	5
Methane	BDL	0.010	mg/l	RSK175	10/05/12	1
Ethane	BDL	0.013	mg/l	RSK175	10/05/12	1
Ethene	BDL	0.013	mg/l	RSK175	10/05/12	1
Hardness, Total (mg/L as CaCO3)	340	120	mg/l	130.1	10/04/12	2
Ammonia Nitrogen	0.14	0.10	mg/l	350.1	10/09/12	1
Dissolved Solids	480	10.	mg/l	2540C	10/06/12	1
Suspended Solids	490	1.0	mg/l	2540D	10/05/12	1
Arsenic, Dissolved	0.013	0.0010	mg/l	6020	10/04/12	1
Barium, Dissolved	0.28	0.010	mg/l	6020	10/04/12	5
Chromium, Dissolved	BDL	0.0020	mg/l	6020	10/04/12	1
Copper, Dissolved	BDL	0.0020	mg/l	6020	10/04/12	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	10/04/12	1
Manganese, Dissolved	0.89	0.040	mg/l	6020	10/04/12	20
Nickel, Dissolved	0.0041	0.0010	mg/l	6020	10/04/12	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	10/04/12	1
Zinc, Dissolved	BDL	0.010	mg/l	6020	10/04/12	1
Aluminum, Dissolved	BDL	0.10	mg/l	6010B	10/05/12	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	10/05/12	1
Calcium, Dissolved	70.	0.50	mg/l	6010B	10/05/12	1
Iron, Dissolved	0.83	0.10	mg/l	6010B	10/05/12	1
Magnesium, Dissolved	33.	0.10	mg/l	6010B	10/05/12	1
Potassium, Dissolved	3.7	0.50	mg/l	6010B	10/05/12	1
Sodium, Dissolved	51.	0.50	mg/l	6010B	10/05/12	1
Benzene	BDL	0.00050	mg/l	8021B	10/02/12	1
Toluene	BDL	0.0050	mg/l	8021B	10/02/12	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	10/02/12	1
Total Xylene	BDL	0.0015	mg/l	8021B	10/02/12	1
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	99.9		% Rec.	8021B	10/02/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/09/12 17:11 Printed: 10/09/12 17:16



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG615337	09/29/12 10:07
Fluoride	< .1	mg/l			WG615337	09/29/12 10:07
Nitrate	< .1	mg/l			WG615337	09/29/12 10:07
Nitrite	< .1	mg/l			WG615337	09/29/12 10:07
Sulfate	< 5	mg/l			WG615337	09/29/12 10:07
Benzene	< .0005	mg/l			WG615718	10/02/12 11:07
Ethylbenzene	< .0005	mg/l			WG615718	10/02/12 11:07
Toluene	< .005	mg/l			WG615718	10/02/12 11:07
Total Xylene	< .0015	mg/l			WG615718	10/02/12 11:07
a,a,a-Trifluorotoluene(PID)		% Rec.	101.0	55-122	WG615718	10/02/12 11:07
Alkalinity	< 20	mg/l			WG616085	10/04/12 09:32
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG616095	10/04/12 15:57
Arsenic,Dissolved	< .001	mg/l			WG616275	10/04/12 19:48
Barium,Dissolved	< .002	mg/l			WG616275	10/04/12 19:48
Chromium,Dissolved	< .002	mg/l			WG616275	10/04/12 19:48
Copper,Dissolved	< .002	mg/l			WG616275	10/04/12 19:48
Lead,Dissolved	< .001	mg/l			WG616275	10/04/12 19:48
Manganese,Dissolved	< .002	mg/l			WG616275	10/04/12 19:48
Nickel,Dissolved	< .001	mg/l			WG616275	10/04/12 19:48
Selenium,Dissolved	< .001	mg/l			WG616275	10/04/12 19:48
Zinc,Dissolved	< .01	mg/l			WG616275	10/04/12 19:48
Ethane	< .013	mg/l			WG616466	10/05/12 13:30
Ethene	< .013	mg/l			WG616466	10/05/12 13:30
Methane	< .01	mg/l			WG616466	10/05/12 13:30
Suspended Solids	< 1	mg/l			WG616097	10/05/12 18:52
Dissolved Solids	< 10	mg/l			WG616098	10/06/12 13:46
Boron,Dissolved	< .2	mg/l			WG616162	10/05/12 20:16
Ammonia Nitrogen	< .1	mg/l			WG616328	10/09/12 14:56

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Sulfate	mg/l	29.0	39.0	28.4*	20		L596866-01	WG615337
Chloride	mg/l	17.0	17.0	0.590	20		L598137-01	WG615337
Fluoride	mg/l	1.60	1.60	1.26	20		L598137-01	WG615337
Nitrate	mg/l	6.30	6.30	0.317	20		L598137-01	WG615337
Nitrite	mg/l	0	0	0	20		L598137-01	WG615337
Sulfate	mg/l	48.0	48.0	0.837	20		L598137-01	WG615337
Alkalinity	mg/l	250.	250.	0.797	20		L597824-03	WG616085

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October 09, 2012

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Alkalinity	mg/l	210.	210.	0.475	20	L598155-05	WG616085
Hardness, Total (mg/L as CaCO3)	mg/l	270.	260.	2.66	20	L597591-01	WG616095
Arsenic, Dissolved	mg/l	0.00120	0.00120	1.68	20	L598263-09	WG616275
Barium, Dissolved	mg/l	0.190	0.189	1.05	20	L598263-09	WG616275
Chromium, Dissolved	mg/l	0	0.000140	NA	20	L598263-09	WG616275
Copper, Dissolved	mg/l	0	0.00113	NA	20	L598263-09	WG616275
Lead, Dissolved	mg/l	0	0.000200	NA	20	L598263-09	WG616275
Manganese, Dissolved	mg/l	0.0420	0.0417	0.481	20	L598263-09	WG616275
Nickel, Dissolved	mg/l	0.00200	0.00219	9.57	20	L598263-09	WG616275
Selenium, Dissolved	mg/l	0	0.000130	NA	20	L598263-09	WG616275
Zinc, Dissolved	mg/l	0.0130	0.0143	7.25	20	L598263-09	WG616275
Suspended Solids	mg/l	5.30	4.89	8.70*	5	L597947-01	WG616097
Suspended Solids	mg/l	44.0	42.7	2.06	5	L598227-20	WG616097
Dissolved Solids	mg/l	8300	8480	1.64	5	L598357-01	WG616098
Aluminum, Dissolved	mg/l	0	0.0432	NA	20	L598705-12	WG616162
Calcium, Dissolved	mg/l	140.	151.	5.44	20	L598705-12	WG616162
Iron, Dissolved	mg/l	8.20	8.26	0.121	20	L598705-12	WG616162
Magnesium, Dissolved	mg/l	25.0	25.0	0	20	L598705-12	WG616162
Potassium, Dissolved	mg/l	10.0	10.2	0.985	20	L598705-12	WG616162
Sodium, Dissolved	mg/l	41.0	42.3	2.39	20	L598705-12	WG616162
Boron, Dissolved	mg/l	1.20	0	NA	0	L598705-12	WG616162
Ammonia Nitrogen	mg/l	11.0	11.0	3.57	20	L598136-02	WG616328
Ammonia Nitrogen	mg/l	0.270	0.310	13.8	20	L597888-01	WG616328

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chloride	mg/l	40	40.1	100.	90-110	WG615337
Fluoride	mg/l	8	8.10	101.	90-110	WG615337
Nitrate	mg/l	8	8.23	103.	90-110	WG615337
Nitrite	mg/l	8	7.95	99.4	90-110	WG615337
Sulfate	mg/l	40	39.5	98.8	90-110	WG615337
Benzene	mg/l	.05	0.0489	97.8	79-114	WG615718
Ethylbenzene	mg/l	.05	0.0508	102.	80-116	WG615718
Toluene	mg/l	.05	0.0500	99.9	79-112	WG615718
Total Xylene	mg/l	.15	0.158	105.	84-118	WG615718
a,a,a-Trifluorotoluene(PID)				102.5	55-122	WG615718
Alkalinity	mg/l	100	96.9	96.9	85-115	WG616085
Hardness, Total (mg/L as CaCO3)	mg/l	200	205.	103.	85-115	WG616095

* Performance of this Analyte is outside of established criteria.
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Quality Assurance Report
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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Arsenic, Dissolved	mg/l	.0567	0.0498	87.8	85-115	WG616275
Barium, Dissolved	mg/l	.0567	0.0525	92.6	85-115	WG616275
Chromium, Dissolved	mg/l	.0567	0.0540	95.2	85-115	WG616275
Copper, Dissolved	mg/l	.0567	0.0554	97.7	85-115	WG616275
Lead, Dissolved	mg/l	.0567	0.0509	89.8	85-115	WG616275
Manganese, Dissolved	mg/l	.0567	0.0541	95.4	85-115	WG616275
Nickel, Dissolved	mg/l	.0567	0.0544	95.9	85-115	WG616275
Selenium, Dissolved	mg/l	.0567	0.0491	86.6	85-115	WG616275
Zinc, Dissolved	mg/l	.0567	0.0556	98.1	85-115	WG616275
Ethane	mg/l	.645	0.734	114.	70-130	WG616466
Ethene	mg/l	.635	0.702	110.	70-130	WG616466
Methane	mg/l	.339	0.393	116.	70-130	WG616466
Suspended Solids	mg/l	773	812.	105.	85-115	WG616097
Dissolved Solids	mg/l	8800	8580	97.5	85-115	WG616098
Aluminum, Dissolved	mg/l	1.13	1.15	102.	85-115	WG616162
Calcium, Dissolved	mg/l	11.3	11.3	100.	85-115	WG616162
Iron, Dissolved	mg/l	1.13	1.08	95.6	85-115	WG616162
Magnesium, Dissolved	mg/l	11.3	11.7	104.	85-115	WG616162
Potassium, Dissolved	mg/l	11.3	11.4	101.	85-115	WG616162
Sodium, Dissolved	mg/l	11.3	11.4	101.	85-115	WG616162
Boron, Dissolved	mg/l	1.13	0.992	87.8	85-115	WG616162
Ammonia Nitrogen	mg/l	7.5	7.82	104.	90-110	WG616328

Analyte	Units	Laboratory Control Sample Duplicate		%Rec	Limit	RPD	Limit	Batch
		Result	Ref					
Chloride	mg/l	40.2	40.1	100.	90-110	0.249	20	WG615337
Fluoride	mg/l	8.15	8.10	102.	90-110	0.615	20	WG615337
Nitrate	mg/l	8.26	8.23	103.	90-110	0.364	20	WG615337
Nitrite	mg/l	7.98	7.95	100.	90-110	0.377	20	WG615337
Sulfate	mg/l	39.6	39.5	99.0	90-110	0.253	20	WG615337
Benzene	mg/l	0.0498	0.0489	100.	79-114	1.80	20	WG615718
Ethylbenzene	mg/l	0.0519	0.0508	104.	80-116	2.24	20	WG615718
Toluene	mg/l	0.0508	0.0500	102.	79-112	1.64	20	WG615718
Total Xylene	mg/l	0.161	0.158	108.	84-118	2.02	20	WG615718
a,a,a-Trifluorotoluene(PID)				102.0	55-122			WG615718
Alkalinity	mg/l	95.2	96.9	95.0	85-115	1.77	20	WG616085
Hardness, Total (mg/L as CaCO3)	mg/l	205.	205.	102.	85-115	0	20	WG616095
Ethane	mg/l	0.733	0.734	114.	70-130	0.0800	25	WG616466
Ethene	mg/l	0.699	0.702	110.	70-130	0.340	25	WG616466
Methane	mg/l	0.380	0.393	112.	70-130	3.58	25	WG616466

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Suspended Solids	mg/l	796.	812.	103.	85-115	1.99	5	WG616097
Dissolved Solids	mg/l	8540	8580	97.0	85-115	0.561	5	WG616098
Ammonia Nitrogen	mg/l	7.41	7.82	99.0	90-110	5.38	20	WG616328

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Chloride	mg/l	46.1	5.90	50	80.4	80-120	L598192-04	WG615337
Nitrate	mg/l	4.47	0	5	89.4	80-120	L598192-04	WG615337
Nitrite	mg/l	4.56	0	5	91.2	80-120	L598192-04	WG615337
Sulfate	mg/l	45.8	0	50	91.6	80-120	L598192-04	WG615337
Benzene	mg/l	0.0495	0.000790	.05	97.5	35-147	L598278-10	WG615718
Ethylbenzene	mg/l	0.0508	0	.05	102.	39-141	L598278-10	WG615718
Toluene	mg/l	0.0500	0	.05	100.	35-148	L598278-10	WG615718
Total Xylene	mg/l	0.158	0	.15	105.	33-151	L598278-10	WG615718
a,a,a-Trifluorotoluene(PID)					101.5	55-122		WG615718
Alkalinity	mg/l	906.	470.	100	87.2	80-120	L598270-02	WG616085
Hardness, Total (mg/L as CaCO3)	mg/l	468.	390.	150	52.0*	80-120	L597591-02	WG616095
Arsenic,Dissolved	mg/l	0.0538	0.00120	.0567	92.8	75-125	L598263-09	WG616275
Barium,Dissolved	mg/l	0.249	0.189	.0567	106.	75-125	L598263-09	WG616275
Chromium,Dissolved	mg/l	0.0528	0.000140	.0567	92.9	75-125	L598263-09	WG616275
Copper,Dissolved	mg/l	0.0534	0.00113	.0567	92.2	75-125	L598263-09	WG616275
Lead,Dissolved	mg/l	0.0521	0.000200	.0567	91.5	75-125	L598263-09	WG616275
Manganese,Dissolved	mg/l	0.0941	0.0417	.0567	92.4	75-125	L598263-09	WG616275
Nickel,Dissolved	mg/l	0.0536	0.00219	.0567	90.7	75-125	L598263-09	WG616275
Selenium,Dissolved	mg/l	0.0519	0.000130	.0567	91.3	75-125	L598263-09	WG616275
Zinc,Dissolved	mg/l	0.0694	0.0143	.0567	97.2	75-125	L598263-09	WG616275
Aluminum,Dissolved	mg/l	1.13	0.0432	1.13	96.2	75-125	L598705-12	WG616162
Calcium,Dissolved	mg/l	156.	151.	11.3	44.2*	75-125	L598705-12	WG616162
Iron,Dissolved	mg/l	9.33	8.26	1.13	94.7	75-125	L598705-12	WG616162
Magnesium,Dissolved	mg/l	35.8	25.0	11.3	95.6	75-125	L598705-12	WG616162
Potassium,Dissolved	mg/l	21.4	10.2	11.3	99.1	75-125	L598705-12	WG616162
Sodium,Dissolved	mg/l	53.5	42.3	11.3	99.1	75-125	L598705-12	WG616162
Boron,Dissolved	mg/l	2.36	0	1.13	209.*	75-125	L598705-12	WG616162
Ammonia Nitrogen	mg/l	4.16	0.350	5	76.2*	90-110	L597967-01	WG616328

Analyte	Units	Matrix Spike Duplicate			Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref	%Rec					
Chloride	mg/l	47.3	46.1	82.8	80-120	2.57	20	L598192-04	WG615337
Nitrate	mg/l	4.73	4.47	94.6	80-120	5.65	20	L598192-04	WG615337
Nitrite	mg/l	4.74	4.56	94.8	80-120	3.87	20	L598192-04	WG615337
Sulfate	mg/l	47.3	45.8	94.6	80-120	3.22	20	L598192-04	WG615337

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Benzene	mg/l	0.0488	0.0495	95.9	35-147	1.60	20	L598278-10	WG615718
Ethylbenzene	mg/l	0.0502	0.0508	100.	39-141	1.30	20	L598278-10	WG615718
Toluene	mg/l	0.0490	0.0500	98.0	35-148	2.02	20	L598278-10	WG615718
Total Xylene	mg/l	0.155	0.158	103.	33-151	1.92	20	L598278-10	WG615718
a,a,a-Trifluorotoluene(PID)				101.3	55-122				WG615718
Alkalinity	mg/l	918.	906.	89.6	80-120	1.32	20	L598270-02	WG616085
Hardness, Total (mg/L as CaCO3)	mg/l	474.	468.	56.0*	80-120	1.27	20	L597591-02	WG616095
Arsenic,Dissolved	mg/l	0.0544	0.0538	93.8	75-125	1.11	20	L598263-09	WG616275
Barium,Dissolved	mg/l	0.247	0.249	102.	75-125	0.806	20	L598263-09	WG616275
Chromium,Dissolved	mg/l	0.0535	0.0528	94.1	75-125	1.32	20	L598263-09	WG616275
Copper,Dissolved	mg/l	0.0540	0.0534	93.2	75-125	1.12	20	L598263-09	WG616275
Lead,Dissolved	mg/l	0.0506	0.0521	88.9	75-125	2.92	20	L598263-09	WG616275
Manganese,Dissolved	mg/l	0.0954	0.0941	94.7	75-125	1.37	20	L598263-09	WG616275
Nickel,Dissolved	mg/l	0.0545	0.0536	92.2	75-125	1.67	20	L598263-09	WG616275
Selenium,Dissolved	mg/l	0.0529	0.0519	93.1	75-125	1.91	20	L598263-09	WG616275
Zinc,Dissolved	mg/l	0.0692	0.0694	96.8	75-125	0.289	20	L598263-09	WG616275
Aluminum,Dissolved	mg/l	1.16	1.13	98.8	75-125	2.62	20	L598705-12	WG616162
Calcium,Dissolved	mg/l	162.	156.	97.3	75-125	3.77	20	L598705-12	WG616162
Iron,Dissolved	mg/l	9.52	9.33	112.	75-125	2.02	20	L598705-12	WG616162
Magnesium,Dissolved	mg/l	36.7	35.8	104.	75-125	2.48	20	L598705-12	WG616162
Potassium,Dissolved	mg/l	21.7	21.4	102.	75-125	1.39	20	L598705-12	WG616162
Sodium,Dissolved	mg/l	54.0	53.5	104.	75-125	0.930	20	L598705-12	WG616162
Boron,Dissolved	mg/l	2.32	2.36	205.*	75-125	1.71	20	L598705-12	WG616162
Ammonia Nitrogen	mg/l	5.40	4.16	101.	90-110	25.9*	20	L597967-01	WG616328

Batch number /Run number / Sample number cross reference

WG615337: R2371716: L598165-01
WG615718: R2373966: L598165-01
WG616085: R2375973: L598165-01
WG616095: R2376373: L598165-01
WG616275: R2376620: L598165-01
WG616466: R2377393: L598165-01
WG616097: R2377933: L598165-01
WG616098: R2378093: L598165-01
WG616162: R2378173: L598165-01
WG616328: R2382117: L598165-01

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

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October 09, 2012

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Sunday October 21, 2012

Report Number: L600899

Samples Received: 09/29/12

Client Project:

Description: Garden Gulch

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

October 21, 2012

Date Received : September 29, 2012
Description : Garden Gulch
Sample ID : 29-1
Collected By : D. Nicholson
Collection Date : 09/27/12 12:00

ESC Sample # : L600899-01

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Arsenic,Dissolved	0.0016	0.0010	mg/l	6020	10/18/12	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/21/12 11:30 Printed: 10/21/12 11:31

Summary of Remarks For Samples Printed
10/21/12 at 11:31:19

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L600899-01 Account: BERPETDCO Received: 09/29/12 07:45 Due Date: 10/22/12 00:00 RPT Date: 10/21/12 11:30
Relogged from L598165-01
Sample: L600899-02 Account: BERPETDCO Received: 09/25/12 09:00 Due Date: 10/22/12 00:00 RPT Date: 10/21/12 11:30
Relogged from L597006-08
Sample: L600899-03 Account: BERPETDCO Received: 09/27/12 09:00 Due Date: 10/22/12 00:00 RPT Date: 10/21/12 11:30
Relogged from L597591-03



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Arsenic,Dissolved	< .001	mg/l			WG618533	10/18/12 17:23
Aluminum,Dissolved	< .1	mg/l			WG619012	10/21/12 01:04
Iron,Dissolved	< .1	mg/l			WG619012	10/21/12 01:04

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Arsenic,Dissolved	mg/l	0.00480	0.00470	2.11	20	L600899-03	WG618533
Aluminum,Dissolved	mg/l	0	0.0383	NA	20	L600381-01	WG619012
Iron,Dissolved	mg/l	0	0	0	20	L600381-01	WG619012

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Sample Result			
Arsenic,Dissolved	mg/l	.0567	0.0560	98.8	85-115	WG618533
Aluminum,Dissolved	mg/l	1.13	1.05	92.9	85-115	WG619012
Iron,Dissolved	mg/l	1.13	1.07	94.7	85-115	WG619012

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Arsenic,Dissolved	mg/l	0.0650	0.00470	.0567	106.	75-125	L600899-03	WG618533
Aluminum,Dissolved	mg/l	1.20	0.0383	1.13	103.	75-125	L600381-01	WG619012
Iron,Dissolved	mg/l	1.04	0	1.13	92.0	75-125	L600381-01	WG619012

Analyte	Units	Matrix Spike Duplicate			Limit	RPD	Limit	Ref Samp	Batch
		MSD	Ref	%Rec					
Arsenic,Dissolved	mg/l	0.0628	0.0650	102.	75-125	3.44	20	L600899-03	WG618533
Aluminum,Dissolved	mg/l	1.21	1.20	104.	75-125	0.830	20	L600381-01	WG619012
Iron,Dissolved	mg/l	1.07	1.04	94.7	75-125	2.84	20	L600381-01	WG619012

Batch number /Run number / Sample number cross reference

WG618533: R2398397: L600899-01 02 03
WG619012: R2400780: L600899-03

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



Berry Petroleum Company - Denver, CO
Dave Nicholson
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Denver, CO 80202

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L600899

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Est. 1970

October 21, 2012

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



Nicholson GeoSolutions, LLC

3433 East Lake Drive

Centennial, CO 80121

Groundwater Monitoring Report for the 29-17 Injection Well Site, Spring 2013

Nicholson GeoSolutions LLC conducted groundwater monitoring near the 29-17 injection well site (the O-29 well pad) on May 23rd and 28th, 2013. A walking survey of Little Creek was previously performed below Garden Gulch Road to look for groundwater springs that could be used to monitor shallow groundwater below the injection well site. Two springs (29-1 and 29-2) were located below Garden Gulch Road. Spring 29-1 was sampled in the fall of 2013 and again in the spring of 2013. Spring 29-2 provides insufficient flow for sampling.

Field parameters were measured and a water quality sample was collected at Spring 29-1 on May 28th, 2013. In addition, one surface water sample was collected on Little Creek above Garden Gulch Road at existing monitoring site LC-1 on May 23rd, 2013. This monitoring station is downgradient of the injection well site and the pipeline right-of-way that is located just north of the well pad. Previous sampling has shown that this location is in communication with groundwater that flows down the pipeline trench into Little Creek, and thus is an appropriate groundwater monitoring location for the 29-17 injection well. These two locations will be sampled semi-annually to provide groundwater monitoring for the 29-17 injection well permit.

Table 1 summarizes the field parameters and laboratory analytical results for the samples collected. The laboratory analytical reports are attached. All results for the Little Creek sample are below the associated Federal and Colorado aquatic life standards except for ammonia (0.16 mg/l). All results for Spring 29-1 are below the associated standards except for ammonia (1.6 mg/l) and manganese (170 µg/l). No petroleum constituents were detected in either sample.

Table 1 29-17 Groundwater Monitoring Results for Spring 2013

Parameter	Standards		Sample ID and Date	
	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (May 23, 2013)	Spring 29-1 (May 28, 2013)
Field Parameters				
sp. conductance (µS/cm)			671	698
pH (standard units)	6.5-9.0	6.5-8.5 ²	8.02	7.71
temperature (°C)			10.6	12.1
estimated flow			0.3 cfs	0.2 gpm
General Water Quality Parameters				
total alkalinity (mg/L)			260	300 J
total hardness (mg/l)			260	1,100 J
TDS (mg/l)		500 ²	420	460
TSS (mg/l)	90		<2.5	85
Organic Constituents				
benzene (µg/l)	5,300	5 ¹	<0.5	<0.5

Parameter	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (May 23, 2013)	Spring 29-1 (May 28, 2013)
toluene (µg/l)	17,500	1000 ¹	<5	<5
ethylbenzene (µg/l)	32,000	700 ¹	<0.5	<0.5
xylenes (µg/l)	C ⁴	10,000 ¹	<1.5	<1.5
methane (µg/l)			<10	<10
ethane (µg/l)			<13	<13
ethene (µg/l)			<13	<13
Major Cations and Anions				
calcium (mg/l)			66	70
magnesium (mg/l)			27	31
potassium (mg/l)			0.59	0.70 J
sodium (mg/l)			44	43
chloride (mg/l)		250 ²	23	27
fluoride (mg/l)		4 ¹ , 2 ²	0.12 J	0.15
nitrate (mg/l)		10 ¹	0.14	0.16
nitrite (mg/l)		1 ¹	<0.1	<0.1
sulfate (mg/l)		250 ²	59	78
ammonia (mg/l)	0.02 ⁵		0.16	1.6 J
Trace Metals				
aluminum (µg/l)	750		<100	<100
arsenic (µg/l)	340	10 ¹	2.5	6.4
barium (µg/l)		2000 ¹	72	130
boron (µg/l)			<200	<200
chromium (µg/l)	1,773 ⁶	100 ¹	<2	<2
copper (µg/l)	50 ⁶	1300 ¹ , 1000 ²	<2	<2
iron (µg/l)		300 ²	<100	<100
lead (µg/l)	281 ⁶	15 ¹	<1	<1
manganese (µg/l)	4,738 ⁶	50 ²	5.1	170
nickel (µg/l)	1,513 ⁶		1.5	2.6
selenium (µg/l)	18.4	50 ¹	<1	<1
zinc (µg/l)	379 ⁶	5000 ²	<10	<10

Values in bold type exceed standards J = Estimated concentration

mg/l = milligrams per liter; ug/l = micrograms per liter; cfs = cubic feet per minute; gpm = gallons per minute;

uS/cm = microSiemens per centimeter

¹Federal Drinking Water Maximum Contaminant Level (MCL)

²Federal Drinking Water Secondary Standard

³Chronic aquatic life standard (Colorado Water Quality Standards, 5 CCR 1002-31).

⁴Carcinogenic compounds as classified by the EPA

⁵Chronic. Acute ammonia standard calculated based on 0.43/FT/FPH/2, where FT = acute temperature adjustment and FPH = acute pH adjustment. ⁶Aquatic standard is hardness dependent. Values shown are for a hardness of 400 mg/L

A data review was conducted using the quality assurance reports supplied by the laboratory and standard EPA data validation guidelines. For laboratory report L637585, all analyses were conducted within the recommended holding times. All method blank results were reported as not detected. All laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for the laboratory duplicate for fluoride (RPD = 22.2%). The fluoride result was qualified as estimated “J”.

For laboratory report L638102, all analyses were conducted within the recommended holding times. All method blank results were reported as not detected. The RPDs for the laboratory duplicate sample for potassium (24.8%) and ammonia (30.8%) were above the laboratory control limit of 20%. Potassium and ammonia results were qualified as estimated “J”. All laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for alkalinity (MS = 60.0%; MSD = 70.0%) and

hardness (MS = 146%, MSD = 150%). Alkalinity and hardness results were qualified as estimated "J".

All results are usable for all intended purposes (i.e., no results were rejected during data review).

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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Thursday June 06, 2013

Report Number: L637585

Samples Received: 05/24/13

Client Project:

Description: Garden Gultch

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

June 06, 2013

Date Received : May 24, 2013
Description : Garden Gultch
Sample ID : LC-1
Collected By : DK Nicholson
Collection Date : 05/23/13 10:00

ESC Sample # : L637585-03

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	23.	1.0	mg/l	9056	06/06/13	1
Fluoride	0.12	0.10	mg/l	9056	06/06/13	1
Nitrate	0.14	0.10	mg/l	9056	06/06/13	1
Nitrite	BDL	0.10	mg/l	9056	06/06/13	1
Sulfate	59.	5.0	mg/l	9056	06/06/13	1
Alkalinity	260	20.	mg/l	2320 B-2011	05/29/13	1
Methane	BDL	0.010	mg/l	RSK175	05/30/13	1
Ethane	BDL	0.013	mg/l	RSK175	05/30/13	1
Ethene	BDL	0.013	mg/l	RSK175	05/30/13	1
Hardness, Total (mg/L as CaCO3)	260	30.	mg/l	130.1	06/02/13	1
Ammonia Nitrogen	0.16	0.10	mg/l	350.1	06/02/13	1
Dissolved Solids	420	10.	mg/l	2540 C-2011	05/29/13	1
Suspended Solids	BDL	2.5	mg/l	2540 D-2011	05/29/13	1
Arsenic,Dissolved	0.0025	0.0010	mg/l	6020	06/03/13	1
Barium,Dissolved	0.072	0.0020	mg/l	6020	06/03/13	1
Chromium,Dissolved	BDL	0.0020	mg/l	6020	06/03/13	1
Copper,Dissolved	BDL	0.0020	mg/l	6020	06/03/13	1
Lead,Dissolved	BDL	0.0010	mg/l	6020	06/03/13	1
Manganese,Dissolved	0.0051	0.0020	mg/l	6020	06/03/13	1
Nickel,Dissolved	0.0015	0.0010	mg/l	6020	06/03/13	1
Selenium,Dissolved	BDL	0.0010	mg/l	6020	06/03/13	1
Zinc,Dissolved	BDL	0.010	mg/l	6020	06/03/13	1
Aluminum,Dissolved	BDL	0.10	mg/l	6010B	06/02/13	1
Boron,Dissolved	BDL	0.20	mg/l	6010B	06/04/13	1
Calcium,Dissolved	66.	0.50	mg/l	6010B	06/02/13	1
Iron,Dissolved	BDL	0.10	mg/l	6010B	06/02/13	1
Magnesium,Dissolved	27.	0.10	mg/l	6010B	06/02/13	1
Potassium,Dissolved	0.59	0.50	mg/l	6010B	06/02/13	1
Sodium,Dissolved	44.	0.50	mg/l	6010B	06/02/13	1
Benzene	BDL	0.00050	mg/l	8021B	05/25/13	1
Toluene	BDL	0.0050	mg/l	8021B	05/25/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	05/25/13	1
Total Xylene	BDL	0.0015	mg/l	8021B	05/25/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	106.		% Rec.	8021B	05/25/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/05/13 16:17 Revised: 06/06/13 14:43

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L637585-03	WG664889	SAMP	Fluoride	R2697067	J3

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J3	The associated batch QC was outside the established quality control range for precision.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
06/06/13 at 14:43:49

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L637585-01 Account: BERPETDCO Received: 05/24/13 09:00 Due Date: 06/03/13 00:00 RPT Date: 06/05/13 16:17

Sample: L637585-02 Account: BERPETDCO Received: 05/24/13 09:00 Due Date: 06/03/13 00:00 RPT Date: 06/05/13 16:17

Sample: L637585-03 Account: BERPETDCO Received: 05/24/13 09:00 Due Date: 06/03/13 00:00 RPT Date: 06/05/13 16:17

Sample: L637585-04 Account: BERPETDCO Received: 05/24/13 09:00 Due Date: 06/03/13 00:00 RPT Date: 06/05/13 16:17

Sample: L637585-05 Account: BERPETDCO Received: 05/24/13 09:00 Due Date: 06/03/13 00:00 RPT Date: 06/05/13 16:17



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June 06, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG663122	05/24/13 07:34
Fluoride	< .1	mg/l			WG663122	05/24/13 07:34
Nitrate	< .1	mg/l			WG663122	05/24/13 07:34
Nitrite	< .1	mg/l			WG663122	05/24/13 07:34
Sulfate	< 5	mg/l			WG663122	05/24/13 07:34
Benzene	< .0005	mg/l			WG663226	05/25/13 01:20
Ethylbenzene	< .0005	mg/l			WG663226	05/25/13 01:20
Toluene	< .005	mg/l			WG663226	05/25/13 01:20
Total Xylene	< .0015	mg/l			WG663226	05/25/13 01:20
a,a,a-Trifluorotoluene(PID)		% Rec.	105.2	55-122	WG663226	05/25/13 01:20
Suspended Solids	< 2.5	mg/l			WG663189	05/29/13 13:33
Dissolved Solids	< 10	mg/l			WG663446	05/29/13 15:15
Dissolved Solids	< 10	mg/l			WG663196	05/29/13 15:46
Ethane	< .013	mg/l			WG663910	05/30/13 11:05
Ethene	< .013	mg/l			WG663910	05/30/13 11:05
Methane	< .01	mg/l			WG663910	05/30/13 11:05
Alkalinity	< 20	mg/l			WG663577	05/29/13 15:23
Ammonia Nitrogen	< .1	mg/l			WG664190	06/02/13 09:32
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG664247	06/02/13 11:53
Aluminum,Dissolved	< .1	mg/l			WG664297	06/02/13 11:18
Calcium,Dissolved	< .5	mg/l			WG664297	06/02/13 11:18
Iron,Dissolved	< .1	mg/l			WG664297	06/02/13 11:18
Magnesium,Dissolved	< .1	mg/l			WG664297	06/02/13 11:18
Potassium,Dissolved	< .5	mg/l			WG664297	06/02/13 11:18
Sodium,Dissolved	< .5	mg/l			WG664297	06/02/13 11:18
Barium,Dissolved	< .002	mg/l			WG664299	06/03/13 01:10
Chromium,Dissolved	< .002	mg/l			WG664299	06/03/13 01:10
Copper,Dissolved	< .002	mg/l			WG664299	06/03/13 01:10
Lead,Dissolved	< .001	mg/l			WG664299	06/03/13 01:10
Manganese,Dissolved	< .002	mg/l			WG664299	06/03/13 01:10
Nickel,Dissolved	< .001	mg/l			WG664299	06/03/13 01:10
Zinc,Dissolved	< .01	mg/l			WG664299	06/03/13 01:10
Arsenic,Dissolved	< .001	mg/l			WG664299	06/03/13 09:31
Selenium,Dissolved	< .001	mg/l			WG664299	06/03/13 09:31
Boron,Dissolved	< .2	mg/l			WG664575	06/04/13 12:29

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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June 06, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Ammonia Nitrogen	< .1	mg/l			WG664252	06/04/13 17:18
Chloride	< 1	mg/l			WG664889	06/06/13 05:39
Fluoride	< .1	mg/l			WG664889	06/06/13 05:39
Nitrate	< .1	mg/l			WG664889	06/06/13 05:39
Nitrite	< .1	mg/l			WG664889	06/06/13 05:39
Sulfate	< 5	mg/l			WG664889	06/06/13 05:39

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Chloride	mg/l	23.0	24.0	4.26	20	L637585-04	WG663122
Fluoride	mg/l	0.170	0.140	19.4	20	L637585-04	WG663122
Nitrate	mg/l	0.140	0.140	0	20	L637585-04	WG663122
Nitrite	mg/l	0	0	0	20	L637585-04	WG663122
Sulfate	mg/l	61.0	61.0	0	20	L637585-04	WG663122
Nitrate	mg/l	1.40	1.40	0	20	L637634-01	WG663122
Suspended Solids	mg/l	29.0	30.4	5.41*	5	L637522-02	WG663189
Suspended Solids	mg/l	28.0	27.0	3.64	5	L637614-01	WG663189
Dissolved Solids	mg/l	3900	4040	3.53	5	L637962-06	WG663446
Dissolved Solids	mg/l	300.	296.	1.01	5	L637502-05	WG663196
Alkalinity	mg/l	180.	170.	3.47	20	L637361-03	WG663577
Alkalinity	mg/l	230.	220.	2.69	20	L637502-02	WG663577
Ammonia Nitrogen	mg/l	0.240	0.160	40.0*	20	L637616-02	WG664190
Ammonia Nitrogen	mg/l	5.40	5.20	3.77	20	L636356-01	WG664190
Hardness, Total (mg/L as CaCO3)	mg/l	2800	2400	15.4	20	L638165-02	WG664247
Hardness, Total (mg/L as CaCO3)	mg/l	860.	910.	5.65	20	L638165-04	WG664247
Barium, Dissolved	mg/l	0.0560	0.0542	3.27	20	L637502-01	WG664299
Chromium, Dissolved	mg/l	0	0.000510	NA	20	L637502-01	WG664299
Copper, Dissolved	mg/l	0	0.000960	NA	20	L637502-01	WG664299
Lead, Dissolved	mg/l	0	0.000280	NA	20	L637502-01	WG664299
Manganese, Dissolved	mg/l	0.00330	0.00327	0.913	20	L637502-01	WG664299
Nickel, Dissolved	mg/l	0.00110	0.00111	0.905	20	L637502-01	WG664299
Zinc, Dissolved	mg/l	0	0.000970	NA	20	L637502-01	WG664299
Arsenic, Dissolved	mg/l	0.00240	0.00223	7.34	20	L637502-01	WG664299
Selenium, Dissolved	mg/l	0	0	0	20	L637502-01	WG664299
Boron, Dissolved	mg/l	0	0	0	0	L637417-02	WG664575
Ammonia Nitrogen	mg/l	0.110	0.100	9.52	20	L637576-01	WG664252

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Tax I.D. 62-0814289

Est. 1970

June 06, 2013

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Chloride	mg/l	2100	2100	0	20	L638957-02	WG664889
Chloride	mg/l	23.0	23.0	0	20	L637585-03	WG664889
Fluoride	mg/l	0.150	0.120	22.2*	20	L637585-03	WG664889
Nitrate	mg/l	0.140	0.140	0	20	L637585-03	WG664889
Nitrite	mg/l	0	0	0	20	L637585-03	WG664889
Sulfate	mg/l	59.0	59.0	0	20	L637585-03	WG664889
Chloride	mg/l	1.50	1.70	12.5	20	L637585-04	WG664889
Fluoride	mg/l	0.110	0.120	8.70	20	L637585-04	WG664889
Nitrate	mg/l	0.230	0.230	0	20	L637585-04	WG664889
Nitrite	mg/l	0	0	0	20	L637585-04	WG664889
Sulfate	mg/l	37.0	37.0	0	20	L637585-04	WG664889

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chloride	mg/l	40	40.7	102.	90-110	WG663122
Fluoride	mg/l	8	8.51	106.	90-110	WG663122
Nitrate	mg/l	8	8.46	106.	90-110	WG663122
Nitrite	mg/l	8	8.28	104.	90-110	WG663122
Sulfate	mg/l	40	41.2	103.	90-110	WG663122
Benzene	mg/l	.05	0.0507	101.	79-114	WG663226
Ethylbenzene	mg/l	.05	0.0533	107.	80-116	WG663226
Toluene	mg/l	.05	0.0524	105.	79-112	WG663226
Total Xylene	mg/l	.15	0.157	104.	84-118	WG663226
a,a,a-Trifluorotoluene(PID)				104.6	55-122	WG663226
Suspended Solids	mg/l	773	812.	105.	85-115	WG663189
Dissolved Solids	mg/l	8800	8690	98.8	85-115	WG663446
Dissolved Solids	mg/l	8800	8840	100.	85-115	WG663196
Ethane	mg/l	.645	0.672	104.	70-130	WG663910
Ethene	mg/l	.635	0.644	101.	70-130	WG663910
Methane	mg/l	.339	0.345	102.	70-130	WG663910
Alkalinity	mg/l	100	100.	100.	85-115	WG663577
Ammonia Nitrogen	mg/l	7.5	7.69	103.	90-110	WG664190
Hardness, Total (mg/L as CaCO3)	mg/l	200	196.	98.0	85-115	WG664247
Aluminum,Dissolved	mg/l	1.11	1.21	109.	85-115	WG664297
Calcium,Dissolved	mg/l	11.1	11.8	106.	85-115	WG664297
Iron,Dissolved	mg/l	1.11	1.15	104.	85-115	WG664297
Magnesium,Dissolved	mg/l	11.1	12.0	108.	85-115	WG664297
Potassium,Dissolved	mg/l	11.1	12.3	111.	85-115	WG664297
Sodium,Dissolved	mg/l	11.1	12.7	114.	85-115	WG664297

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Quality Assurance Report
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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Barium,Dissolved	mg/l	.0556	0.0476	85.6	85-115	WG664299
Chromium,Dissolved	mg/l	.0556	0.0492	88.5	85-115	WG664299
Copper,Dissolved	mg/l	.0556	0.0494	88.8	85-115	WG664299
Lead,Dissolved	mg/l	.0556	0.0485	87.2	85-115	WG664299
Manganese,Dissolved	mg/l	.0556	0.0497	89.4	85-115	WG664299
Nickel,Dissolved	mg/l	.0556	0.0495	89.0	85-115	WG664299
Zinc,Dissolved	mg/l	.0556	0.0520	93.5	85-115	WG664299
Arsenic,Dissolved	mg/l	.0556	0.0540	97.1	85-115	WG664299
Selenium,Dissolved	mg/l	.0556	0.0538	96.8	85-115	WG664299
Boron,Dissolved	mg/l	1.67	1.54	92.2	85-115	WG664575
Ammonia Nitrogen	mg/l	7.5	7.80	104.	85-115	WG664252
Chloride	mg/l	40	40.3	101.	90-110	WG664889
Fluoride	mg/l	8	8.41	105.	90-110	WG664889
Nitrate	mg/l	8	8.44	106.	90-110	WG664889
Nitrite	mg/l	8	8.20	103.	90-110	WG664889
Sulfate	mg/l	40	40.3	101.	90-110	WG664889

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chloride	mg/l	40.8	40.7	102.	90-110	0.245	20	WG663122
Fluoride	mg/l	8.53	8.51	107.	90-110	0.235	20	WG663122
Nitrate	mg/l	8.51	8.46	106.	90-110	0.589	20	WG663122
Nitrite	mg/l	8.31	8.28	104.	90-110	0.362	20	WG663122
Sulfate	mg/l	41.5	41.2	104.	90-110	0.726	20	WG663122
Benzene	mg/l	0.0500	0.0507	100.	79-114	1.45	20	WG663226
Ethylbenzene	mg/l	0.0525	0.0533	105.	80-116	1.58	20	WG663226
Toluene	mg/l	0.0514	0.0524	103.	79-112	1.90	20	WG663226
Total Xylene	mg/l	0.154	0.157	102.	84-118	1.88	20	WG663226
a,a,a-Trifluorotoluene(PID)				104.8	55-122			WG663226
Suspended Solids	mg/l	796.	812.	103.	85-115	1.99	5	WG663189
Dissolved Solids	mg/l	8700	8690	99.0	85-115	0.115	5	WG663446
Dissolved Solids	mg/l	8900	8840	101.	85-115	0.676	5	WG663196
Ethane	mg/l	0.685	0.672	106.	70-130	1.95	25	WG663910
Ethene	mg/l	0.656	0.644	103.	70-130	1.89	25	WG663910
Methane	mg/l	0.355	0.345	105.	70-130	2.90	25	WG663910
Alkalinity	mg/l	100.	100.	100.	85-115	0	20	WG663577
Ammonia Nitrogen	mg/l	7.65	7.69	102.	90-110	0.522	20	WG664190

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Hardness, Total (mg/L as CaCO ₃)	mg/l	194.	196.	97.0	85-115	1.03	20	WG664247
Ammonia Nitrogen	mg/l	7.60	7.80	101.	85-115	2.60	20	WG664252
Chloride	mg/l	39.8	40.3	100.	90-110	1.25	20	WG664889
Fluoride	mg/l	8.35	8.41	104.	90-110	0.716	20	WG664889
Nitrate	mg/l	8.36	8.44	104.	90-110	0.952	20	WG664889
Nitrite	mg/l	8.09	8.20	101.	90-110	1.35	20	WG664889
Sulfate	mg/l	40.0	40.3	100.	90-110	0.747	20	WG664889

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Chloride	mg/l	53.6	3.20	50	101.	80-120	L637585-01	WG663122
Fluoride	mg/l	5.20	0	5	104.	80-120	L637585-01	WG663122
Nitrate	mg/l	6.05	0.920	5	103.	80-120	L637585-01	WG663122
Nitrite	mg/l	5.08	0	5	102.	80-120	L637585-01	WG663122
Sulfate	mg/l	86.0	36.0	50	100.	80-120	L637585-01	WG663122
Benzene	mg/l	0.0511	0	.05	102.	35-147	L637585-01	WG663226
Ethylbenzene	mg/l	0.0539	0	.05	108.	39-141	L637585-01	WG663226
Toluene	mg/l	0.0531	0	.05	106.	35-148	L637585-01	WG663226
Total Xylene	mg/l	0.158	0	.15	105.	33-151	L637585-01	WG663226
a,a,a-Trifluorotoluene(PID)					104.7	55-122		WG663226
Alkalinity	mg/l	370.	320.	100	50.0*	80-120	L637413-02	WG663577
Ammonia Nitrogen	mg/l	4.67	0.160	5	90.2	90-110	L637585-03	WG664190
Hardness, Total (mg/L as CaCO ₃)	mg/l	475.	340.	150	90.0	80-120	L638165-01	WG664247
Barium,Dissolved	mg/l	0.103	0.0542	.0556	87.8	75-125	L637502-01	WG664299
Chromium,Dissolved	mg/l	0.0482	0.000510	.0556	85.8	75-125	L637502-01	WG664299
Copper,Dissolved	mg/l	0.0484	0.000960	.0556	85.3	75-125	L637502-01	WG664299
Lead,Dissolved	mg/l	0.0462	0.000280	.0556	82.6	75-125	L637502-01	WG664299
Manganese,Dissolved	mg/l	0.0518	0.00327	.0556	87.3	75-125	L637502-01	WG664299
Nickel,Dissolved	mg/l	0.0496	0.00111	.0556	87.2	75-125	L637502-01	WG664299
Zinc,Dissolved	mg/l	0.0499	0.000970	.0556	88.0	75-125	L637502-01	WG664299
Arsenic,Dissolved	mg/l	0.0590	0.00223	.0556	102.	75-125	L637502-01	WG664299
Selenium,Dissolved	mg/l	0.0554	0	.0556	99.6	75-125	L637502-01	WG664299
Boron,Dissolved	mg/l	1.61	0	1.11	145.*	75-125	L637417-02	WG664575
Ammonia Nitrogen	mg/l	10.0	0	10	100.	80-120	L637576-02	WG664252
Sulfate	mg/l	1220	790.	50	86.0	80-120	L638802-03	WG664889

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Chloride	mg/l	52.2	53.6	98.0	80-120	2.65	20	L637585-01	WG663122	
Fluoride	mg/l	5.07	5.20	101.	80-120	2.53	20	L637585-01	WG663122	
Nitrate	mg/l	5.91	6.05	99.8	80-120	2.34	20	L637585-01	WG663122	
Nitrite	mg/l	4.96	5.08	99.2	80-120	2.39	20	L637585-01	WG663122	
Sulfate	mg/l	84.5	86.0	97.0	80-120	1.76	20	L637585-01	WG663122	
Benzene	mg/l	0.0492	0.0511	98.4	35-147	3.81	20	L637585-01	WG663226	
Ethylbenzene	mg/l	0.0517	0.0539	103.	39-141	4.17	20	L637585-01	WG663226	
Toluene	mg/l	0.0508	0.0531	102.	35-148	4.44	20	L637585-01	WG663226	
Total Xylene	mg/l	0.152	0.158	101.	33-151	3.75	20	L637585-01	WG663226	
a,a,a-Trifluorotoluene(PID)				104.8	55-122				WG663226	
Alkalinity	mg/l	360.	370.	40.0*	80-120	2.74	20	L637413-02	WG663577	
Ammonia Nitrogen	mg/l	5.02	4.67	97.2	90-110	7.22	20	L637585-03	WG664190	
Hardness, Total (mg/L as CaCO3)	mg/l	505.	475.	110.	80-120	6.12	20	L638165-01	WG664247	
Barium,Dissolved	mg/l	0.103	0.103	87.8	75-125	0	20	L637502-01	WG664299	
Chromium,Dissolved	mg/l	0.0475	0.0482	84.5	75-125	1.46	20	L637502-01	WG664299	
Copper,Dissolved	mg/l	0.0480	0.0484	84.6	75-125	0.830	20	L637502-01	WG664299	
Lead,Dissolved	mg/l	0.0461	0.0462	82.4	75-125	0.217	20	L637502-01	WG664299	
Manganese,Dissolved	mg/l	0.0514	0.0518	86.6	75-125	0.775	20	L637502-01	WG664299	
Nickel,Dissolved	mg/l	0.0476	0.0496	83.6	75-125	4.12	20	L637502-01	WG664299	
Zinc,Dissolved	mg/l	0.0499	0.0499	88.0	75-125	0	20	L637502-01	WG664299	
Arsenic,Dissolved	mg/l	0.0598	0.0590	104.	75-125	1.35	20	L637502-01	WG664299	
Selenium,Dissolved	mg/l	0.0587	0.0554	106.	75-125	5.78	20	L637502-01	WG664299	
Boron,Dissolved	mg/l	1.60	1.61	144.*	75-125	0.623	20	L637417-02	WG664575	
Ammonia Nitrogen	mg/l	10.0	10.0	100.	80-120	0	20	L637576-02	WG664252	
Sulfate	mg/l	1210	1220	84.0	80-120	0.823	20	L638802-03	WG664889	

Batch number /Run number / Sample number cross reference

WG663122: R2684020: L637585-01 02 03 04 05
WG663226: R2685624: L637585-01 02 03 04 05
WG663189: R2686821: L637585-01 02 03 04 05
WG663446: R2687220: L637585-05
WG663196: R2687321: L637585-01 02 03 04
WG663910: R2688541: L637585-01 02 03 04 05
WG663577: R2689260: L637585-01 02 03 04 05
WG664190: R2691483: L637585-02 03 04 05
WG664247: R2691521: L637585-01 02 03 04 05
WG664297: R2692022 R2692023: L637585-01 03 02 04 05
WG664299: R2692620: L637585-01 02 03 04 05
WG664575: R2695441: L637585-01 02 03 04 05
WG664252: R2695880: L637585-01
WG664889: R2697067: L637585-03 04

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Tuesday June 18, 2013

Report Number: L638102

Samples Received: 05/29/13

Client Project:

Description: Garden Gulch

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

June 18, 2013

Date Received : May 29, 2013
Description : Garden Gulch
Sample ID : 29-1
Collected By :
Collection Date : 05/28/13 11:20

ESC Sample # : L638102-09

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	27.	1.0	mg/l	9056	05/29/13	1
Fluoride	0.15	0.10	mg/l	9056	05/29/13	1
Nitrate	0.16	0.10	mg/l	9056	05/29/13	1
Nitrite	BDL	0.10	mg/l	9056	05/29/13	1
Sulfate	78.	5.0	mg/l	9056	05/29/13	1
Alkalinity	300	20.	mg/l	2320 B-2011	06/03/13	1
Methane	BDL	0.010	mg/l	RSK175	05/31/13	1
Ethane	BDL	0.013	mg/l	RSK175	05/31/13	1
Ethene	BDL	0.013	mg/l	RSK175	05/31/13	1
Hardness, Total (mg/L as CaCO3)	1100	300	mg/l	130.1	06/07/13	10
Ammonia Nitrogen	1.6	0.10	mg/l	350.1	06/06/13	1
Nitrate-Nitrite	0.32	0.10	mg/l	353.2	06/06/13	1
Dissolved Solids	460	10.	mg/l	2540 C-2011	06/03/13	1
Suspended Solids	85.	2.5	mg/l	2540 D-2011	06/03/13	1
Arsenic, Dissolved	0.0064	0.0010	mg/l	6020	06/17/13	1
Chromium, Dissolved	BDL	0.0020	mg/l	6020	06/17/13	1
Copper, Dissolved	BDL	0.0020	mg/l	6020	06/17/13	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	06/17/13	1
Nickel, Dissolved	0.0026	0.0010	mg/l	6020	06/17/13	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	06/17/13	1
Zinc, Dissolved	BDL	0.010	mg/l	6020	06/17/13	1
Aluminum, Dissolved	BDL	0.10	mg/l	6010B	06/07/13	1
Barium, Dissolved	0.13	0.0050	mg/l	6010B	06/07/13	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	06/07/13	1
Calcium, Dissolved	70.	0.50	mg/l	6010B	06/07/13	1
Iron, Dissolved	BDL	0.10	mg/l	6010B	06/07/13	1
Magnesium, Dissolved	31.	0.10	mg/l	6010B	06/07/13	1
Manganese, Dissolved	0.17	0.010	mg/l	6010B	06/07/13	1
Potassium, Dissolved	0.70	0.50	mg/l	6010B	06/07/13	1
Sodium, Dissolved	43.	0.50	mg/l	6010B	06/07/13	1
Benzene	BDL	0.00050	mg/l	8021B	06/05/13	1
Toluene	BDL	0.0050	mg/l	8021B	06/05/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/05/13	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/05/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

June 18, 2013

Date Received : May 29, 2013
Description : Garden Gulch

Sample ID : 29-1

Collected By :
Collection Date : 05/28/13 11:20

ESC Sample # : L638102-09

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021B	06/05/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

This report shall not be reproduced, except in full, without the written approval from ESC.

Reported: 06/18/13 07:51 Printed: 06/18/13 07:52

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L638102-01	WG663715	SAMP	Nitrate	R2687981	T8
	WG663715	SAMP	Nitrite	R2687981	T8
	WG664953	SAMP	Potassium,Dissolved	R2696881	P1
L638102-02	WG663715	SAMP	Nitrate	R2687981	T8
	WG663715	SAMP	Nitrite	R2687981	T8
L638102-03	WG663715	SAMP	Nitrate	R2687981	T8
	WG663715	SAMP	Nitrite	R2687981	T8
	WG664415	SAMP	Alkalinity	R2693960	J6
L638102-08	WG665280	SAMP	Hardness, Total (mg/L as CaCO3)	R2699541	J5
L638102-09	WG664781	SAMP	Ammonia Nitrogen	R2697280	T2
L638102-11	WG664781	SAMP	Ammonia Nitrogen	R2697280	T2
L638102-13	WG665130	SAMP	Lead,Dissolved	R2711080	O

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
O	(ESC) Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
T2	(ESC) - Additional method/sample information: The laboratory analysis was from an unpreserved or improperly preserved sample.
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
06/18/13 at 07:52:40

TSR Signing Reports: 134
RX - Priority Rush

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L638102-01 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-02 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-03 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-04 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-05 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-06 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-07 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-08 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-09 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-10 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-11 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-12 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51
Sample: L638102-13 Account: BERPETDCO Received: 05/29/13 09:30 Due Date: 06/18/13 00:00 RPT Date: 06/18/13 07:51



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Quality Assurance Report
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Tax I.D. 62-0814289

Est. 1970

June 18, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG663715	05/29/13 08:51
Fluoride	< .1	mg/l			WG663715	05/29/13 08:51
Nitrate	< .1	mg/l			WG663715	05/29/13 08:51
Nitrite	< .1	mg/l			WG663715	05/29/13 08:51
Sulfate	< 5	mg/l			WG663715	05/29/13 08:51
Suspended Solids	< 2.5	mg/l			WG663775	05/31/13 10:35
Dissolved Solids	< 10	mg/l			WG663933	05/31/13 13:52
Ethane	< .013	mg/l			WG664157	05/31/13 13:06
Ethene	< .013	mg/l			WG664157	05/31/13 13:06
Methane	< .01	mg/l			WG664157	05/31/13 13:06
Suspended Solids	< 2.5	mg/l			WG663991	06/03/13 09:36
Dissolved Solids	< 10	mg/l			WG663984	06/03/13 16:34
Dissolved Solids	< 10	mg/l			WG663982	06/03/13 16:57
Alkalinity	< 20	mg/l			WG664415	06/03/13 15:18
Benzene	< .0005	mg/l			WG663816	06/05/13 01:10
Ethylbenzene	< .0005	mg/l			WG663816	06/05/13 01:10
Toluene	< .005	mg/l			WG663816	06/05/13 01:10
Total Xylene	< .0015	mg/l			WG663816	06/05/13 01:10
a,a,a-Trifluorotoluene(PID)		% Rec.	101.6	55-122	WG663816	06/05/13 01:10
Aluminum,Dissolved	< .1	mg/l			WG664953	06/06/13 08:45
Barium,Dissolved	< .005	mg/l			WG664953	06/06/13 08:45
Boron,Dissolved	< .2	mg/l			WG664953	06/06/13 08:45
Calcium,Dissolved	< .5	mg/l			WG664953	06/06/13 08:45
Iron,Dissolved	< .1	mg/l			WG664953	06/06/13 08:45
Magnesium,Dissolved	< .1	mg/l			WG664953	06/06/13 08:45
Manganese,Dissolved	< .01	mg/l			WG664953	06/06/13 08:45
Potassium,Dissolved	< .5	mg/l			WG664953	06/06/13 08:45
Sodium,Dissolved	< .5	mg/l			WG664953	06/06/13 08:45
Ammonia Nitrogen	< .1	mg/l			WG664949	06/06/13 10:59
Ammonia Nitrogen	< .1	mg/l			WG664781	06/06/13 13:30
Benzene	< .0005	mg/l			WG664814	06/05/13 20:02
Ethylbenzene	< .0005	mg/l			WG664814	06/05/13 20:02
Toluene	< .005	mg/l			WG664814	06/05/13 20:02
Total Xylene	< .0015	mg/l			WG664814	06/05/13 20:02
a,a,a-Trifluorotoluene(PID)		% Rec.	100.0	55-122	WG664814	06/05/13 20:02

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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Nitrate-Nitrite	< .1	mg/l			WG665112	06/06/13 18:00
Aluminum,Dissolved	< .1	mg/l			WG665047	06/07/13 15:04
Barium,Dissolved	< .005	mg/l			WG665047	06/07/13 15:04
Boron,Dissolved	< .2	mg/l			WG665047	06/07/13 15:04
Calcium,Dissolved	< .5	mg/l			WG665047	06/07/13 15:04
Iron,Dissolved	< .1	mg/l			WG665047	06/07/13 15:04
Magnesium,Dissolved	< .1	mg/l			WG665047	06/07/13 15:04
Manganese,Dissolved	< .01	mg/l			WG665047	06/07/13 15:04
Potassium,Dissolved	< .5	mg/l			WG665047	06/07/13 15:04
Sodium,Dissolved	< .5	mg/l			WG665047	06/07/13 15:04
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG665280	06/07/13 14:39
Aluminum,Dissolved	< .1	mg/l			WG665445	06/09/13 19:09
Barium,Dissolved	< .005	mg/l			WG665445	06/09/13 19:09
Boron,Dissolved	< .2	mg/l			WG665445	06/09/13 19:09
Calcium,Dissolved	< .5	mg/l			WG665445	06/09/13 19:09
Iron,Dissolved	< .1	mg/l			WG665445	06/09/13 19:09
Magnesium,Dissolved	< .1	mg/l			WG665445	06/09/13 19:09
Manganese,Dissolved	< .01	mg/l			WG665445	06/09/13 19:09
Potassium,Dissolved	< .5	mg/l			WG665445	06/09/13 19:09
Sodium,Dissolved	< .5	mg/l			WG665445	06/09/13 19:09
Arsenic,Dissolved	< .001	mg/l			WG665130	06/17/13 18:04
Chromium,Dissolved	< .002	mg/l			WG665130	06/17/13 18:04
Copper,Dissolved	< .002	mg/l			WG665130	06/17/13 18:04
Lead,Dissolved	< .001	mg/l			WG665130	06/17/13 18:04
Nickel,Dissolved	< .001	mg/l			WG665130	06/17/13 18:04
Selenium,Dissolved	< .001	mg/l			WG665130	06/17/13 18:04
Zinc,Dissolved	< .01	mg/l			WG665130	06/17/13 18:04

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Fluoride	mg/l	0.480	0.480		0	20	L637243-01	WG663715
Chloride	mg/l	72.0	72.0		0	20	L638102-05	WG663715
Fluoride	mg/l	0	0		0	20	L638102-05	WG663715
Nitrate	mg/l	1.00	1.00		0	20	L638102-05	WG663715
Nitrite	mg/l	0	0		0	20	L638102-05	WG663715
Sulfate	mg/l	66.0	66.0		0	20	L638102-05	WG663715
Sulfate	mg/l	230.	240.		4.26	20	L637472-08	WG663715
Suspended Solids	mg/l	110.	110.		3.08	5	L638045-01	WG663775
Suspended Solids	mg/l	2600	2560		1.55	5	L638097-03	WG663775
Dissolved Solids	mg/l	500.	512.		1.77	5	L638102-01	WG663933
Suspended Solids	mg/l	110.	112.		2.71	5	L638103-01	WG663991
Suspended Solids	mg/l	10.0	10.4		3.92	5	L638111-03	WG663991

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Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Dissolved Solids	mg/l	2900	2960	0.850	5		L638135-04	WG663984
Dissolved Solids	mg/l	470.	456.	2.17	5		L638102-08	WG663982
Alkalinity	mg/l	300.	300.	0.995	20		L638102-01	WG664415
Alkalinity	mg/l	240.	240.	1.26	20		L638102-12	WG664415
Aluminum, Dissolved	mg/l	0	0	0	20		L638102-01	WG664953
Barium, Dissolved	mg/l	0.110	0.100	9.52	20		L638102-01	WG664953
Boron, Dissolved	mg/l	0	0	0	0		L638102-01	WG664953
Calcium, Dissolved	mg/l	82.0	80.0	2.47	20		L638102-01	WG664953
Iron, Dissolved	mg/l	0	0	0	20		L638102-01	WG664953
Magnesium, Dissolved	mg/l	35.0	34.0	2.90	20		L638102-01	WG664953
Manganese, Dissolved	mg/l	0	0	0	20		L638102-01	WG664953
Potassium, Dissolved	mg/l	0.680	0.530	24.8*	20		L638102-01	WG664953
Sodium, Dissolved	mg/l	57.0	57.0	0	20		L638102-01	WG664953
Ammonia Nitrogen	mg/l	0	0	0	20		L638287-01	WG664949
Ammonia Nitrogen	mg/l	0.190	0.190	0	20		L638287-08	WG664949
Ammonia Nitrogen	mg/l	0.150	0.110	30.8*	20		L638534-01	WG664781
Ammonia Nitrogen	mg/l	0	0	0	20		L638102-03	WG664781
Nitrate-Nitrite	mg/l	0.540	0.570	5.41	20		L638102-04	WG665112
Nitrate-Nitrite	mg/l	0.800	0.810	1.24	20		L638527-01	WG665112
Aluminum, Dissolved	mg/l	0	0	0	20		L638841-02	WG665047
Barium, Dissolved	mg/l	0.100	0.100	0	20		L638841-02	WG665047
Boron, Dissolved	mg/l	0	0.0266	NA	0		L638841-02	WG665047
Calcium, Dissolved	mg/l	40.0	40.0	0	20		L638841-02	WG665047
Iron, Dissolved	mg/l	0	0	0	20		L638841-02	WG665047
Magnesium, Dissolved	mg/l	7.70	0	NA	20		L638841-02	WG665047
Manganese, Dissolved	mg/l	0.190	0.188	1.06	20		L638841-02	WG665047
Potassium, Dissolved	mg/l	5.00	4.97	0.602	20		L638841-02	WG665047
Sodium, Dissolved	mg/l	9.40	9.39	0.106	20		L638841-02	WG665047
Hardness, Total (mg/L as CaCO3)	mg/l	87.0	86.0	1.16	20		L639020-02	WG665280
Aluminum, Dissolved	mg/l	0.120	0.133	10.3	20		L638653-07	WG665445
Barium, Dissolved	mg/l	0.0130	0.0130	0	20		L638653-07	WG665445
Boron, Dissolved	mg/l	0.890	0.894	0.448*	0		L638653-07	WG665445
Calcium, Dissolved	mg/l	54.0	53.0	1.87	20		L638653-07	WG665445
Iron, Dissolved	mg/l	0	0.00370	NA	20		L638653-07	WG665445
Magnesium, Dissolved	mg/l	1.30	1.34	3.03	20		L638653-07	WG665445
Manganese, Dissolved	mg/l	0.0670	0.0745	10.6	20		L638653-07	WG665445
Potassium, Dissolved	mg/l	12.0	11.8	1.68	20		L638653-07	WG665445
Sodium, Dissolved	mg/l	18.0	18.6	3.28	20		L638653-07	WG665445
Hardness, Total (mg/L as CaCO3)	mg/l	400.	370.	7.79	20		L638102-01	WG665280

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Est. 1970

June 18, 2013

Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate					
Arsenic, Dissolved	mg/l	0.00620	0.00590	4.96	20		L638102-02	WG665130
Chromium, Dissolved	mg/l	0	0	0	20		L638102-02	WG665130
Copper, Dissolved	mg/l	0	0	0	20		L638102-02	WG665130
Lead, Dissolved	mg/l	0	0	0	20		L638102-02	WG665130
Nickel, Dissolved	mg/l	0.00230	0.00260	12.2	20		L638102-02	WG665130
Selenium, Dissolved	mg/l	0	0	0	20		L638102-02	WG665130
Zinc, Dissolved	mg/l	0	0	0	20		L638102-02	WG665130

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chloride	mg/l	40	41.8	105.	90-110	WG663715
Fluoride	mg/l	8	8.46	106.	90-110	WG663715
Nitrate	mg/l	8	8.30	104.	90-110	WG663715
Nitrite	mg/l	8	8.11	101.	90-110	WG663715
Sulfate	mg/l	40	40.8	102.	90-110	WG663715
Suspended Solids	mg/l	773	884.	114.	85-115	WG663775
Dissolved Solids	mg/l	8800	8660	98.4	85-115	WG663933
Ethane	mg/l	.645	0.687	106.	70-130	WG664157
Ethene	mg/l	.635	0.657	103.	70-130	WG664157
Methane	mg/l	.339	0.362	107.	70-130	WG664157
Suspended Solids	mg/l	773	840.	109.	85-115	WG663991
Dissolved Solids	mg/l	8800	8610	97.8	85-115	WG663984
Dissolved Solids	mg/l	8800	8630	98.1	85-115	WG663982
Alkalinity	mg/l	100	100.	100.	85-115	WG664415
Benzene	mg/l	.05	0.0516	103.	79-114	WG663816
Ethylbenzene	mg/l	.05	0.0544	109.	80-116	WG663816
Toluene	mg/l	.05	0.0535	107.	79-112	WG663816
Total Xylene	mg/l	.15	0.158	106.	84-118	WG663816
a,a,a-Trifluorotoluene(PID)				101.8	55-122	WG663816
Aluminum, Dissolved	mg/l	1.11	1.15	104.	85-115	WG664953
Barium, Dissolved	mg/l	1.11	1.18	106.	85-115	WG664953
Boron, Dissolved	mg/l	1.67	1.63	97.6	85-115	WG664953
Calcium, Dissolved	mg/l	11.1	12.0	108.	85-115	WG664953
Iron, Dissolved	mg/l	1.11	1.17	105.	85-115	WG664953
Magnesium, Dissolved	mg/l	11.1	12.1	109.	85-115	WG664953
Manganese, Dissolved	mg/l	1.11	1.20	108.	85-115	WG664953
Potassium, Dissolved	mg/l	11.1	11.1	100.	85-115	WG664953
Sodium, Dissolved	mg/l	11.1	11.8	106.	85-115	WG664953

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Ammonia Nitrogen	mg/l	7.5	7.55	101.	90-110	WG664949
Ammonia Nitrogen	mg/l	7.5	7.58	101.	90-110	WG664781
Benzene	mg/l	.05	0.0443	88.7	79-114	WG664814
Ethylbenzene	mg/l	.05	0.0439	87.9	80-116	WG664814
Toluene	mg/l	.05	0.0440	87.9	79-112	WG664814
Total Xylene	mg/l	.15	0.134	89.6	84-118	WG664814
a,a,a-Trifluorotoluene(PID)				98.49	55-122	WG664814
Nitrate-Nitrite	mg/l	5	4.76	95.2	90-110	WG665112
Aluminum,Dissolved	mg/l	1.11	1.23	111.	85-115	WG665047
Barium,Dissolved	mg/l	1.11	1.14	103.	85-115	WG665047
Boron,Dissolved	mg/l	1.67	1.57	94.0	85-115	WG665047
Calcium,Dissolved	mg/l	11.1	11.4	103.	85-115	WG665047
Iron,Dissolved	mg/l	1.11	1.20	108.	85-115	WG665047
Magnesium,Dissolved	mg/l	11.1	11.4	103.	85-115	WG665047
Manganese,Dissolved	mg/l	1.11	1.16	105.	85-115	WG665047
Potassium,Dissolved	mg/l	11.1	10.6	95.5	85-115	WG665047
Sodium,Dissolved	mg/l	11.1	10.4	93.7	85-115	WG665047
Hardness, Total (mg/L as CaCO3)	mg/l	200	185.	92.5	85-115	WG665280
Aluminum,Dissolved	mg/l	1.11	1.14	103.	85-115	WG665445
Barium,Dissolved	mg/l	1.11	1.13	102.	85-115	WG665445
Boron,Dissolved	mg/l	1.67	1.55	92.8	85-115	WG665445
Calcium,Dissolved	mg/l	11.1	11.5	104.	85-115	WG665445
Iron,Dissolved	mg/l	1.11	1.10	99.1	85-115	WG665445
Magnesium,Dissolved	mg/l	11.1	11.5	104.	85-115	WG665445
Manganese,Dissolved	mg/l	1.11	1.16	105.	85-115	WG665445
Potassium,Dissolved	mg/l	11.1	10.9	98.2	85-115	WG665445
Sodium,Dissolved	mg/l	11.1	11.2	101.	85-115	WG665445
Arsenic,Dissolved	mg/l	.0556	0.0535	96.2	85-115	WG665130
Chromium,Dissolved	mg/l	.0556	0.0588	106.	85-115	WG665130
Copper,Dissolved	mg/l	.0556	0.0589	106.	85-115	WG665130
Lead,Dissolved	mg/l	.0556	0.0583	105.	85-115	WG665130
Nickel,Dissolved	mg/l	.0556	0.0600	108.	85-115	WG665130
Selenium,Dissolved	mg/l	.0556	0.0548	98.6	85-115	WG665130
Zinc,Dissolved	mg/l	.0556	0.0624	112.	85-115	WG665130

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chloride	mg/l	40.9	41.8	102.	90-110	2.18	20	WG663715
Fluoride	mg/l	8.36	8.46	104.	90-110	1.19	20	WG663715
Nitrate	mg/l	8.29	8.30	104.	90-110	0.121	20	WG663715
Nitrite	mg/l	8.12	8.11	102.	90-110	0.123	20	WG663715
Sulfate	mg/l	40.6	40.8	102.	90-110	0.491	20	WG663715

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Suspended Solids	mg/l	860.	884.	111.	85-115	2.75	5	WG663775
Dissolved Solids	mg/l	8660	8660	98.0	85-115	0	5	WG663933
Ethane	mg/l	0.687	0.687	106.	70-130	0	25	WG664157
Ethene	mg/l	0.656	0.657	103.	70-130	0.0500	25	WG664157
Methane	mg/l	0.363	0.362	107.	70-130	0.300	25	WG664157
Suspended Solids	mg/l	816.	840.	106.	85-115	2.90	5	WG663991
Dissolved Solids	mg/l	8620	8610	98.0	85-115	0.116	5	WG663984
Dissolved Solids	mg/l	8630	8630	98.0	85-115	0	5	WG663982
Alkalinity	mg/l	96.0	100.	96.0	85-115	4.08	20	WG664415
Benzene	mg/l	0.0520	0.0516	104.	79-114	0.920	20	WG663816
Ethylbenzene	mg/l	0.0550	0.0544	110.	80-116	1.09	20	WG663816
Toluene	mg/l	0.0541	0.0535	108.	79-112	1.06	20	WG663816
Total Xylene	mg/l	0.161	0.158	107.	84-118	1.46	20	WG663816
a,a,a-Trifluorotoluene(PID)				101.7	55-122			WG663816
Ammonia Nitrogen	mg/l	7.93	7.55	106.	90-110	4.91	20	WG664949
Ammonia Nitrogen	mg/l	7.69	7.58	102.	90-110	1.44	20	WG664781
Benzene	mg/l	0.0476	0.0443	95.0	79-114	7.10	20	WG664814
Ethylbenzene	mg/l	0.0478	0.0439	96.0	80-116	8.53	20	WG664814
Toluene	mg/l	0.0472	0.0440	94.0	79-112	7.09	20	WG664814
Total Xylene	mg/l	0.147	0.134	98.0	84-118	8.96	20	WG664814
a,a,a-Trifluorotoluene(PID)				99.35	55-122			WG664814
Nitrate-Nitrite	mg/l	4.82	4.76	96.0	90-110	1.25	20	WG665112
Hardness, Total (mg/L as CaCO3)	mg/l	186.	185.	93.0	85-115	0.539	20	WG665280

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Chloride	mg/l	54.4	5.20	50	98.4	80-120	L638102-04	WG663715
Fluoride	mg/l	5.02	0.120	5	98.0	80-120	L638102-04	WG663715
Nitrate	mg/l	5.18	0.430	5	95.0	80-120	L638102-04	WG663715
Nitrite	mg/l	5.01	0	5	100.	80-120	L638102-04	WG663715
Sulfate	mg/l	131.	86.0	50	90.0	80-120	L638102-04	WG663715
Alkalinity	mg/l	330.	270.	100	60.0*	80-120	L638102-03	WG664415

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Benzene	mg/l	0.0542	0.0000514	.05	108.	35-147	L638102-01	WG663816
Ethylbenzene	mg/l	0.0575	0	.05	115.	39-141	L638102-01	WG663816
Toluene	mg/l	0.0565	0.0000626	.05	113.	35-148	L638102-01	WG663816
Total Xylene	mg/l	0.167	0.0000617	.15	111.	33-151	L638102-01	WG663816
a,a,a-Trifluorotoluene(PID)					101.9	55-122		WG663816
Aluminum,Dissolved	mg/l	1.12	0	1.11	101.	75-125	L638102-01	WG664953
Barium,Dissolved	mg/l	1.26	0.100	1.11	104.	75-125	L638102-01	WG664953
Boron,Dissolved	mg/l	1.70	0	1.67	102.	75-125	L638102-01	WG664953
Calcium,Dissolved	mg/l	93.2	80.0	11.1	119.	75-125	L638102-01	WG664953
Iron,Dissolved	mg/l	1.13	0	1.11	102.	75-125	L638102-01	WG664953
Magnesium,Dissolved	mg/l	46.3	34.0	11.1	111.	75-125	L638102-01	WG664953
Manganese,Dissolved	mg/l	1.16	0	1.11	104.	75-125	L638102-01	WG664953
Potassium,Dissolved	mg/l	11.6	0.530	11.1	99.7	75-125	L638102-01	WG664953
Sodium,Dissolved	mg/l	68.6	57.0	11.1	104.	75-125	L638102-01	WG664953
Ammonia Nitrogen	mg/l	4.71	0.120	5	91.8	90-110	L638287-02	WG664949
Ammonia Nitrogen	mg/l	5.17	0	5	103.	90-110	L638102-04	WG664781
Benzene	mg/l	0.0467	0.00746	.05	78.5	35-147	L639114-03	WG664814
Ethylbenzene	mg/l	0.0420	0	.05	84.1	39-141	L639114-03	WG664814
Toluene	mg/l	0.0412	0.000739	.05	80.9	35-148	L639114-03	WG664814
Total Xylene	mg/l	0.131	0.00147	.15	86.3	33-151	L639114-03	WG664814
a,a,a-Trifluorotoluene(PID)					101.1	55-122		WG664814
Nitrate-Nitrite	mg/l	5.37	0.540	5	96.6	90-110	L638102-10	WG665112
Aluminum,Dissolved	mg/l	1.28	0	1.11	115.	75-125	L638841-02	WG665047
Barium,Dissolved	mg/l	1.24	0.100	1.11	103.	75-125	L638841-02	WG665047
Boron,Dissolved	mg/l	1.61	0.0266	1.67	94.8	75-125	L638841-02	WG665047
Calcium,Dissolved	mg/l	51.6	40.0	11.1	104.	75-125	L638841-02	WG665047
Iron,Dissolved	mg/l	1.20	0	1.11	108.	75-125	L638841-02	WG665047
Magnesium,Dissolved	mg/l	19.3	0	11.1	174.*	75-125	L638841-02	WG665047
Manganese,Dissolved	mg/l	1.37	0.188	1.11	106.	75-125	L638841-02	WG665047
Potassium,Dissolved	mg/l	15.9	4.97	11.1	98.5	75-125	L638841-02	WG665047
Sodium,Dissolved	mg/l	20.4	9.39	11.1	99.2	75-125	L638841-02	WG665047
Hardness, Total (mg/L as CaCO3)	mg/l	489.	270.	150	146.*	80-120	L638102-08	WG665280
Aluminum,Dissolved	mg/l	1.22	0.133	1.11	97.9	75-125	L638653-07	WG665445
Barium,Dissolved	mg/l	1.15	0.0130	1.11	102.	75-125	L638653-07	WG665445
Boron,Dissolved	mg/l	2.49	0.894	1.67	95.6	75-125	L638653-07	WG665445
Calcium,Dissolved	mg/l	64.4	53.0	11.1	103.	75-125	L638653-07	WG665445
Iron,Dissolved	mg/l	1.14	0.00370	1.11	102.	75-125	L638653-07	WG665445
Magnesium,Dissolved	mg/l	12.8	1.34	11.1	103.	75-125	L638653-07	WG665445
Manganese,Dissolved	mg/l	1.24	0.0745	1.11	105.	75-125	L638653-07	WG665445
Potassium,Dissolved	mg/l	22.4	11.8	11.1	95.5	75-125	L638653-07	WG665445
Sodium,Dissolved	mg/l	28.9	18.6	11.1	92.8	75-125	L638653-07	WG665445

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Arsenic, Dissolved	mg/l	0.0641	0.00590	.0556	105.	75-125	L638102-02	WG665130
Chromium, Dissolved	mg/l	0.0551	0	.0556	99.1	75-125	L638102-02	WG665130
Copper, Dissolved	mg/l	0.0568	0	.0556	102.	75-125	L638102-02	WG665130
Lead, Dissolved	mg/l	0.0571	0	.0556	103.	75-125	L638102-02	WG665130
Nickel, Dissolved	mg/l	0.0579	0.00260	.0556	99.5	75-125	L638102-02	WG665130
Selenium, Dissolved	mg/l	0.0579	0	.0556	104.	75-125	L638102-02	WG665130
Zinc, Dissolved	mg/l	0.0675	0	.0556	121.	75-125	L638102-02	WG665130

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chloride	mg/l	55.7	54.4	101.	80-120	2.36	20	L638102-04	WG663715
Fluoride	mg/l	5.16	5.02	101.	80-120	2.75	20	L638102-04	WG663715
Nitrate	mg/l	5.31	5.18	97.6	80-120	2.48	20	L638102-04	WG663715
Nitrite	mg/l	5.13	5.01	103.	80-120	2.37	20	L638102-04	WG663715
Sulfate	mg/l	132.	131.	92.0	80-120	0.760	20	L638102-04	WG663715
Alkalinity	mg/l	340.	330.	70.0*	80-120	2.99	20	L638102-03	WG664415
Benzene	mg/l	0.0526	0.0542	105.	35-147	2.92	20	L638102-01	WG663816
Ethylbenzene	mg/l	0.0561	0.0575	112.	39-141	2.38	20	L638102-01	WG663816
Toluene	mg/l	0.0549	0.0565	110.	35-148	2.84	20	L638102-01	WG663816
Total Xylene	mg/l	0.164	0.167	109.	33-151	1.93	20	L638102-01	WG663816
a,a,a-Trifluorotoluene (PID)				102.0	55-122				WG663816
Aluminum, Dissolved	mg/l	1.16	1.12	104.	75-125	3.51	20	L638102-01	WG664953
Barium, Dissolved	mg/l	1.26	1.26	104.	75-125	0	20	L638102-01	WG664953
Boron, Dissolved	mg/l	1.72	1.70	103.	75-125	1.17	20	L638102-01	WG664953
Calcium, Dissolved	mg/l	92.6	93.2	114.	75-125	0.646	20	L638102-01	WG664953
Iron, Dissolved	mg/l	1.14	1.13	103.	75-125	0.881	20	L638102-01	WG664953
Magnesium, Dissolved	mg/l	45.9	46.3	107.	75-125	0.868	20	L638102-01	WG664953
Manganese, Dissolved	mg/l	1.17	1.16	105.	75-125	0.858	20	L638102-01	WG664953
Potassium, Dissolved	mg/l	12.1	11.6	104.	75-125	4.22	20	L638102-01	WG664953
Sodium, Dissolved	mg/l	70.7	68.6	123.	75-125	3.02	20	L638102-01	WG664953
Ammonia Nitrogen	mg/l	4.99	4.71	97.4	90-110	5.77	20	L638287-02	WG664949
Ammonia Nitrogen	mg/l	4.69	5.17	93.8	90-110	9.74	20	L638102-04	WG664781
Benzene	mg/l	0.0542	0.0467	93.5	35-147	14.9	20	L639114-03	WG664814
Ethylbenzene	mg/l	0.0498	0.0420	99.6	39-141	16.9	20	L639114-03	WG664814
Toluene	mg/l	0.0485	0.0412	95.5	35-148	16.3	20	L639114-03	WG664814
Total Xylene	mg/l	0.153	0.131	101.	33-151	15.4	20	L639114-03	WG664814
a,a,a-Trifluorotoluene (PID)				100.9	55-122				WG664814
Nitrate-Nitrite	mg/l	5.35	5.37	96.2	90-110	0.373	20	L638102-10	WG665112
Aluminum, Dissolved	mg/l	1.26	1.28	114.	75-125	1.57	20	L638841-02	WG665047
Barium, Dissolved	mg/l	1.24	1.24	103.	75-125	0	20	L638841-02	WG665047
Boron, Dissolved	mg/l	1.61	1.61	94.8	75-125	0	20	L638841-02	WG665047
Calcium, Dissolved	mg/l	51.3	51.6	102.	75-125	0.583	20	L638841-02	WG665047

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Iron,Dissolved	mg/l	1.20	1.20	108.	75-125	0	20	L638841-02	WG665047
Magnesium,Dissolved	mg/l	19.1	19.3	172.*	75-125	1.04	20	L638841-02	WG665047
Manganese,Dissolved	mg/l	1.36	1.37	106.	75-125	0.733	20	L638841-02	WG665047
Potassium,Dissolved	mg/l	15.9	15.9	98.5	75-125	0	20	L638841-02	WG665047
Sodium,Dissolved	mg/l	20.3	20.4	98.3	75-125	0.491	20	L638841-02	WG665047
Hardness, Total (mg/L as CaCO3)	mg/l	495.	489.	150.*	80-120	1.22	20	L638102-08	WG665280
Aluminum,Dissolved	mg/l	1.27	1.22	102.	75-125	4.02	20	L638653-07	WG665445
Barium,Dissolved	mg/l	1.14	1.15	102.	75-125	0.873	20	L638653-07	WG665445
Boron,Dissolved	mg/l	2.49	2.49	95.6	75-125	0	20	L638653-07	WG665445
Calcium,Dissolved	mg/l	64.2	64.4	101.	75-125	0.311	20	L638653-07	WG665445
Iron,Dissolved	mg/l	1.11	1.14	99.7	75-125	2.67	20	L638653-07	WG665445
Magnesium,Dissolved	mg/l	12.8	12.8	103.	75-125	0	20	L638653-07	WG665445
Manganese,Dissolved	mg/l	1.23	1.24	104.	75-125	0.810	20	L638653-07	WG665445
Potassium,Dissolved	mg/l	22.4	22.4	95.5	75-125	0	20	L638653-07	WG665445
Sodium,Dissolved	mg/l	29.2	28.9	95.5	75-125	1.03	20	L638653-07	WG665445
Arsenic,Dissolved	mg/l	0.0647	0.0641	106.	75-125	0.932	20	L638102-02	WG665130
Chromium,Dissolved	mg/l	0.0578	0.0551	104.	75-125	4.78	20	L638102-02	WG665130
Copper,Dissolved	mg/l	0.0592	0.0568	106.	75-125	4.14	20	L638102-02	WG665130
Lead,Dissolved	mg/l	0.0575	0.0571	103.	75-125	0.698	20	L638102-02	WG665130
Nickel,Dissolved	mg/l	0.0601	0.0579	103.	75-125	3.73	20	L638102-02	WG665130
Selenium,Dissolved	mg/l	0.0593	0.0579	107.	75-125	2.39	20	L638102-02	WG665130
Zinc,Dissolved	mg/l	0.0694	0.0675	125.	75-125	2.78	20	L638102-02	WG665130

Batch number /Run number / Sample number cross reference

WG663715: R2687981: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13
WG663775: R2690082: L638102-01 02 03 04 05 06
WG663933: R2690560: L638102-01 02 03 04 05 06
WG664157: R2690720: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13
WG663991: R2691924: L638102-07 08 09 10 11 12 13
WG663984: R2692808: L638102-09 10 11 12 13
WG663982: R2692880: L638102-07 08
WG664415: R2693960: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13
WG663816: R2694761: L638102-01 02 03 04 05 06 07 09 10 11 12 13
WG664953: R2696881: L638102-01 02 03 04 05 06 07
WG664949: R2696921: L638102-01 02
WG664781: R2697280: L638102-03 04 05 06 07 08 09 10 11 12 13
WG664814: R2697360: L638102-08
WG665112: R2697685: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13
WG665047: R2699000: L638102-08 09 10 11 12
WG665280: R2699541: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13
WG665445: R2700542: L638102-13
WG665130: R2711080: L638102-01 02 03 04 05 06 07 08 09 10 11 12 13

* * Calculations are performed prior to rounding of reported values.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.



Nicholson GeoSolutions, LLC

3433 East Lake Drive

Centennial, CO 80121

Groundwater Monitoring Report for the 29-17 Injection Well Site, Fall 2013

Nicholson GeoSolutions LLC conducted groundwater monitoring near the 29-17 injection well site (the O-29 well pad) on September 15, 2013. A walking survey of Little Creek was previously performed below Garden Gulch Road to look for groundwater springs that could be used to monitor shallow groundwater below the injection well site. Two springs (29-1 and 29-2) were located below Garden Gulch Road. Spring 29-1 was sampled in the fall of 2012, the spring of 2013, and again in the fall of 2013. Spring 29-2 provides insufficient flow for sampling.

For this sample event, field parameters were measured and a water quality sample was collected at Spring 29-1. In addition, one surface water sample was collected on Little Creek above Garden Gulch Road at existing monitoring site LC-1. This monitoring station is downgradient of the injection well site and the pipeline right-of-way that is located just north of the well pad. Previous sampling has shown that this location is in communication with groundwater that flows down the pipeline trench into Little Creek, and thus is an appropriate groundwater monitoring location for the 29-17 injection well. These two locations will be sampled semi-annually to provide groundwater monitoring for the 29-17 injection well permit.

Table 1 summarizes the field parameters and laboratory analytical results for the samples collected. The laboratory analytical report is attached. All results for Little Creek sample LC-1 are below the associated Federal and Colorado aquatic life standards except for manganese (260 ug/l). All results for Spring 29-1 are below the associated standards except for ammonia (0.15 mg/l). No petroleum constituents were detected in either sample.

Table 1 29-17 Groundwater Monitoring Results for Fall 2013

Parameter	Standards		Sample ID and Date	
	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (Sept 15, 2013)	Spring 29-1 (Sept 15, 2013)
Field Parameters				
sp. conductance (µS/cm)			732	710
pH (standard units)	6.5-9.0	6.5-8.5 ²	8.02	7.93
temperature (°C)			15.4	12.6
estimated flow			0.25 cfs	0.2 gpm
General Water Quality Parameters				
total alkalinity (mg/L)			310 J	280 J
total hardness (mg/l)			350	380
TDS (mg/l)		500 ²	460	440 J
TSS (mg/l)	90		5.3 J	NA
Organic Constituents				
benzene (µg/l)	5,300	5 ¹	<0.5	<0.5

Parameter	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (Sept 15, 2013)	Spring 29-1 (Sept 15, 2013)
toluene (µg/l)	17,500	1000 ¹	<5	<5
ethylbenzene (µg/l)	32,000	700 ¹	<0.5	<0.5
xylenes (µg/l)	C ⁴	10,000 ¹	<1.5	<1.5
methane (µg/l)			<10	<10
ethane (µg/l)			<13	<13
ethene (µg/l)			<13	<13
Major Cations and Anions				
calcium (mg/l)			75	67
magnesium (mg/l)			30	28
potassium (mg/l)			1.2	0.59
sodium (mg/l)			51	48
chloride (mg/l)		250 ²	20	21
fluoride (mg/l)		4 ¹ , 2 ²	0.20	0.22
nitrate (mg/l)		10 ¹	<0.1	<0.1
nitrite (mg/l)		1 ¹	<0.1	<0.1
sulfate (mg/l)		250 ²	66	77
ammonia (mg/l)	0.02 ⁵		<0.1	0.15
Trace Metals				
aluminum (µg/l)	750		<100 UJ	<100 UJ
arsenic (µg/l)	340	10 ¹	2.2	2.5
barium (µg/l)		2000 ¹	180	100
boron (µg/l)			<200	<200
chromium (µg/l)	1,773 ⁶	100 ¹	<2	<2
copper (µg/l)	50 ⁶	1300 ¹ , 1000 ²	<2	<2
iron (µg/l)		300 ²	<100 UJ	<100 UJ
lead (µg/l)	281 ⁶	15 ¹	<1	<1
manganese (µg/l)	4,738 ⁶	50 ²	260	36
nickel (µg/l)	1,513 ⁶		2.1	1.8
selenium (µg/l)	18.4	50 ¹	<1	<1
zinc (µg/l)	379 ⁶	5000 ²	<10	<10

Values in bold type exceed standards UJ = Estimated detection limit J = Estimated concentration NA = Not analyzed
mg/l = milligrams per liter; ug/l = micrograms per liter; cfs = cubic feet per minute; gpm = gallons per minute;
uS/cm = microSiemens per centimeter

¹Federal Drinking Water Maximum Contaminant Level (MCL)

²Federal Drinking Water Secondary Standard

³Chronic aquatic life standard (Colorado Water Quality Standards, 5 CCR 1002-31).

⁴Carcinogenic compounds as classified by the EPA

⁵Chronic. Acute ammonia standard calculated based on 0.43/FT/FPH/2, where FT = acute temperature adjustment and FPH = acute pH adjustment. ⁶Aquatic standard is hardness dependent. Values shown are for a hardness of 400 mg/L

A data review was conducted using the quality assurance reports supplied by the laboratory and standard EPA data validation guidelines. All analyses were conducted within the recommended holding times. All method blank results were reported as not detected. The RPDs for the laboratory duplicate sample for aluminum (21.7%) and iron (84.7%) were above the laboratory control limit of 20%. Aluminum and iron results were qualified as estimated “J” for positive results and not detected at an estimated detection limit “UJ” for non-detect results. All laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for TSS (LCS = 115%) and alkalinity (MS = 70%, MSD = 70%). TSS and alkalinity results were qualified as estimated “J”.

All results are usable for all intended purposes (i.e., no results were rejected during data review).

APPENDIX A
Laboratory Report

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Est. 1970

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Monday September 30, 2013

Report Number: L657751

Samples Received: 09/17/13

Client Project:

Description: Berry Garden Gulch Water

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

September 30, 2013

Date Received : September 17, 2013
Description : Berry Garden Gulch Water

ESC Sample # : L657751-05

Sample ID : LC-1

Site ID :

Collected By : DK Nicholson
Collection Date : 09/15/13 12:30

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	20.	1.0	mg/l	9056	09/17/13	1
Fluoride	0.20	0.10	mg/l	9056	09/17/13	1
Nitrate	BDL	0.10	mg/l	9056	09/17/13	1
Nitrite	BDL	0.10	mg/l	9056	09/17/13	1
Sulfate	66.	5.0	mg/l	9056	09/18/13	1
Alkalinity	310	20.	mg/l	2320 B-2011	09/19/13	1
Methane	BDL	0.010	mg/l	RSK175	09/20/13	1
Ethane	BDL	0.013	mg/l	RSK175	09/20/13	1
Ethene	BDL	0.013	mg/l	RSK175	09/20/13	1
Hardness, Total (mg/L as CaCO3)	350	60.	mg/l	130.1	09/23/13	2
Ammonia Nitrogen	BDL	0.10	mg/l	350.1	09/22/13	1
Dissolved Solids	460	10.	mg/l	2540 C-2011	09/18/13	1
Suspended Solids	5.3	2.5	mg/l	2540 D-2011	09/18/13	1
Arsenic,Dissolved	0.0022	0.0010	mg/l	6020	09/24/13	1
Chromium,Dissolved	BDL	0.0020	mg/l	6020	09/24/13	1
Copper,Dissolved	BDL	0.0020	mg/l	6020	09/24/13	1
Lead,Dissolved	BDL	0.0010	mg/l	6020	09/24/13	1
Nickel,Dissolved	0.0021	0.0010	mg/l	6020	09/24/13	1
Selenium,Dissolved	BDL	0.0010	mg/l	6020	09/24/13	1
Zinc,Dissolved	BDL	0.010	mg/l	6020	09/24/13	1
Aluminum,Dissolved	BDL	0.10	mg/l	6010B	09/28/13	1
Barium,Dissolved	0.18	0.0050	mg/l	6010B	09/28/13	1
Boron,Dissolved	BDL	0.20	mg/l	6010B	09/28/13	1
Calcium,Dissolved	75.	0.50	mg/l	6010B	09/28/13	1
Iron,Dissolved	BDL	0.10	mg/l	6010B	09/28/13	1
Magnesium,Dissolved	30.	0.10	mg/l	6010B	09/28/13	1
Manganese,Dissolved	0.26	0.010	mg/l	6010B	09/28/13	1
Potassium,Dissolved	1.2	0.50	mg/l	6010B	09/28/13	1
Sodium,Dissolved	51.	0.50	mg/l	6010B	09/28/13	1
Benzene	BDL	0.00050	mg/l	8021B	09/18/13	1
Toluene	BDL	0.0050	mg/l	8021B	09/18/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	09/18/13	1
Total Xylene	BDL	0.0015	mg/l	8021B	09/18/13	1
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021B	09/18/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 09/30/13 10:56 Printed: 09/30/13 10:57



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

September 30, 2013

Date Received : September 17, 2013
Description : Berry Garden Gulch Water
Sample ID : 29-1
Collected By : DK Nicholson
Collection Date : 09/15/13 13:00

ESC Sample # : L657751-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	21.	1.0	mg/l	9056	09/17/13	1
Fluoride	0.22	0.10	mg/l	9056	09/17/13	1
Nitrate	BDL	0.10	mg/l	9056	09/17/13	1
Nitrite	BDL	0.10	mg/l	9056	09/17/13	1
Sulfate	77.	5.0	mg/l	9056	09/18/13	1
Alkalinity	280	20.	mg/l	2320 B-2011	09/19/13	1
Methane	BDL	0.010	mg/l	RSK175	09/20/13	1
Ethane	BDL	0.013	mg/l	RSK175	09/20/13	1
Ethene	BDL	0.013	mg/l	RSK175	09/20/13	1
Hardness, Total (mg/L as CaCO3)	380	60.	mg/l	130.1	09/23/13	2
Ammonia Nitrogen	0.15	0.10	mg/l	350.1	09/22/13	1
Dissolved Solids	440	10.	mg/l	2540 C-2011	09/18/13	1
Arsenic, Dissolved	0.0025	0.0010	mg/l	6020	09/24/13	1
Chromium, Dissolved	BDL	0.0020	mg/l	6020	09/24/13	1
Copper, Dissolved	BDL	0.0020	mg/l	6020	09/24/13	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	09/24/13	1
Nickel, Dissolved	0.0018	0.0010	mg/l	6020	09/24/13	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	09/24/13	1
Zinc, Dissolved	BDL	0.010	mg/l	6020	09/24/13	1
Aluminum, Dissolved	BDL	0.10	mg/l	6010B	09/28/13	1
Barium, Dissolved	0.10	0.0050	mg/l	6010B	09/28/13	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	09/28/13	1
Calcium, Dissolved	67.	0.50	mg/l	6010B	09/28/13	1
Iron, Dissolved	BDL	0.10	mg/l	6010B	09/28/13	1
Magnesium, Dissolved	28.	0.10	mg/l	6010B	09/28/13	1
Manganese, Dissolved	0.036	0.010	mg/l	6010B	09/28/13	1
Potassium, Dissolved	0.59	0.50	mg/l	6010B	09/28/13	1
Sodium, Dissolved	48.	0.50	mg/l	6010B	09/28/13	1
Benzene	BDL	0.00050	mg/l	8021B	09/18/13	1
Toluene	BDL	0.0050	mg/l	8021B	09/18/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	09/18/13	1
Total Xylene	BDL	0.0015	mg/l	8021B	09/18/13	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021B	09/18/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L657751-02	WG682566	SAMP	Alkalinity	R2820281	J6
L657751-12	WG682582	SAMP	Alkalinity	R2820883	J6
L657751-15	WG683324	SAMP	Calcium,Dissolved	R2830283	V
	WG683324	SAMP	Potassium,Dissolved	R2830283	P1
	WG683324	SAMP	Sodium,Dissolved	R2830283	V

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	(ESC) - Additional QC Info: The sample concentration is too high to evaluate accurate spike recoveries.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
09/30/13 at 10:57:19

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L657751-01 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-02 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-03 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-04 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-05 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-06 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-07 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-08 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-09 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-10 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-11 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-12 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-13 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-14 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17
Sample: L657751-15 Account: BERPETDCO Received: 09/17/13 09:00 Due Date: 09/24/13 00:00 RPT Date: 09/30/13 10:56
Added Sulfate per coc. AV 9/17



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L657751

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

September 30, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Suspended Solids	< 2.5	mg/l			WG682296	09/18/13 09:28
Dissolved Solids	< 10	mg/l			WG682292	09/18/13 15:50
Chloride	< 1	mg/l			WG682279	09/17/13 08:37
Fluoride	< .1	mg/l			WG682279	09/17/13 08:37
Nitrate	< .1	mg/l			WG682279	09/17/13 08:37
Nitrite	< .1	mg/l			WG682279	09/17/13 08:37
Benzene	< .0005	mg/l			WG682385	09/18/13 12:15
Ethylbenzene	< .0005	mg/l			WG682385	09/18/13 12:15
Toluene	< .005	mg/l			WG682385	09/18/13 12:15
Total Xylene	< .0015	mg/l			WG682385	09/18/13 12:15
a,a,a-Trifluorotoluene(PID)		% Rec.	101.0	55-122	WG682385	09/18/13 12:15
Sulfate	< 5	mg/l			WG682556	09/18/13 16:58
Dissolved Solids	< 10	mg/l			WG682294	09/19/13 15:23
Dissolved Solids	< 10	mg/l			WG682503	09/19/13 15:28
Benzene	< .0005	mg/l			WG682629	09/19/13 12:43
Ethylbenzene	< .0005	mg/l			WG682629	09/19/13 12:43
Toluene	< .005	mg/l			WG682629	09/19/13 12:43
Total Xylene	< .0015	mg/l			WG682629	09/19/13 12:43
a,a,a-Trifluorotoluene(PID)		% Rec.	99.30	55-122	WG682629	09/19/13 12:43
Alkalinity	< 20	mg/l			WG682566	09/19/13 08:30
Suspended Solids	< 2.5	mg/l			WG682525	09/20/13 09:42
Alkalinity	< 20	mg/l			WG682582	09/19/13 15:40
Ethane	< .013	mg/l			WG682978	09/20/13 13:54
Ethene	< .013	mg/l			WG682978	09/20/13 13:54
Methane	< .01	mg/l			WG682978	09/20/13 13:54
Ammonia Nitrogen	< .1	mg/l			WG683014	09/22/13 16:21
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG682825	09/23/13 11:37
Benzene	< .0005	mg/l			WG682787	09/23/13 12:25
Ethylbenzene	< .0005	mg/l			WG682787	09/23/13 12:25
Toluene	< .005	mg/l			WG682787	09/23/13 12:25
Total Xylene	< .0015	mg/l			WG682787	09/23/13 12:25

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L657751

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Tax I.D. 62-0814289

Est. 1970

September 30, 2013

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
a,a,a-Trifluorotoluene(PID)		% Rec.	99.10	55-122		09/23/13 12:25
Ammonia Nitrogen	< .1	mg/l			WG683015	09/24/13 11:36
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG683349	09/24/13 15:13
Arsenic,Dissolved	< .001	mg/l			WG682656	09/24/13 03:07
Chromium,Dissolved	< .002	mg/l			WG682656	09/24/13 03:07
Copper,Dissolved	< .002	mg/l			WG682656	09/24/13 03:07
Lead,Dissolved	< .001	mg/l			WG682656	09/24/13 03:07
Nickel,Dissolved	< .001	mg/l			WG682656	09/24/13 03:07
Selenium,Dissolved	< .001	mg/l			WG682656	09/24/13 03:07
Zinc,Dissolved	< .01	mg/l			WG682656	09/24/13 03:07
Arsenic,Dissolved	< .001	mg/l			WG683327	09/24/13 20:21
Chromium,Dissolved	< .002	mg/l			WG683327	09/24/13 20:21
Copper,Dissolved	< .002	mg/l			WG683327	09/24/13 20:21
Lead,Dissolved	< .001	mg/l			WG683327	09/24/13 20:21
Nickel,Dissolved	< .001	mg/l			WG683327	09/24/13 20:21
Selenium,Dissolved	< .001	mg/l			WG683327	09/24/13 20:21
Zinc,Dissolved	< .01	mg/l			WG683327	09/24/13 20:21
Aluminum,Dissolved	< .1	mg/l			WG683324	09/28/13 01:29
Barium,Dissolved	< .005	mg/l			WG683324	09/28/13 01:29
Boron,Dissolved	< .2	mg/l			WG683324	09/28/13 01:29
Calcium,Dissolved	< .5	mg/l			WG683324	09/28/13 01:29
Iron,Dissolved	< .1	mg/l			WG683324	09/28/13 01:29
Magnesium,Dissolved	< .1	mg/l			WG683324	09/28/13 01:29
Manganese,Dissolved	< .01	mg/l			WG683324	09/28/13 01:29
Potassium,Dissolved	< .5	mg/l			WG683324	09/28/13 01:29
Sodium,Dissolved	< .5	mg/l			WG683324	09/28/13 01:29

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Suspended Solids	mg/l	116.	115.	1.57	5	L657661-01	WG682296
Suspended Solids	mg/l	20900	20400	2.50	5	L657751-10	WG682296
Dissolved Solids	mg/l	660.	651.	1.42	5	L657751-10	WG682292
Chloride	mg/l	58.0	58.0	0.0	20	L657751-11	WG682279
Fluoride	mg/l	0.120	0.110	8.70	20	L657751-11	WG682279
Nitrate	mg/l	0.450	0.440	2.25	20	L657751-11	WG682279
Nitrite	mg/l	0.0	0.0	0.0	20	L657751-11	WG682279
Sulfate	mg/l	120.	120.	0.0	20	L657397-23	WG682556
Sulfate	mg/l	77.0	77.0	0.0	20	L657751-11	WG682556
Dissolved Solids	mg/l	123.	124.	0.810	5	L657684-01	WG682294
Dissolved Solids	mg/l	392.	397.	1.17	5	L656998-02	WG682503

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Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
			Duplicate				
Alkalinity	mg/l	370.	370.	0.0	20	L657480-04	WG682566
Alkalinity	mg/l	310.	310.	0.0	20	L657751-05	WG682566
Suspended Solids	mg/l	962.	888.	8.00*	5	L657828-01	WG682525
Suspended Solids	mg/l	39.6	40.4	2.00	5	L657839-01	WG682525
Alkalinity	mg/l	320.	320.	1.55	20	L657751-11	WG682582
Alkalinity	mg/l	71.0	71.0	0.0	20	L657894-02	WG682582
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L657751-09	WG683014
Ammonia Nitrogen	mg/l	2.60	2.70	3.77	20	L656480-01	WG683014
Hardness, Total (mg/L as CaCO3)	mg/l	58.0	59.0	1.71	20	L657521-01	WG682825
Hardness, Total (mg/L as CaCO3)	mg/l	350.	360.	2.82	20	L657751-07	WG682825
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L657946-01	WG683015
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L657751-15	WG683015
Hardness, Total (mg/L as CaCO3)	mg/l	770.	770.	0.0	20	L657052-01	WG683349
Hardness, Total (mg/L as CaCO3)	mg/l	490.	510.	4.00	20	L657751-11	WG683349
Arsenic,Dissolved	mg/l	0.00590	0.00600	1.68	20	L657751-11	WG682656
Chromium,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-11	WG682656
Copper,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-11	WG682656
Lead,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-11	WG682656
Nickel,Dissolved	mg/l	0.00260	0.00260	0.0	20	L657751-11	WG682656
Selenium,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-11	WG682656
Zinc,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-11	WG682656
Arsenic,Dissolved	mg/l	0.00620	0.00590	4.96	20	L657751-12	WG683327
Chromium,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-12	WG683327
Copper,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-12	WG683327
Lead,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-12	WG683327
Nickel,Dissolved	mg/l	0.00210	0.00180	15.4	20	L657751-12	WG683327
Selenium,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-12	WG683327
Zinc,Dissolved	mg/l	0.0	0.0	0.0	20	L657751-12	WG683327
Aluminum,Dissolved	mg/l	0.0	0.0710	21.7*	20	L657751-15	WG683324
Barium,Dissolved	mg/l	0.110	0.113	0.0785	20	L657751-15	WG683324
Boron,Dissolved	mg/l	0.0	0.0597	11.0	20	L657751-15	WG683324
Calcium,Dissolved	mg/l	63.0	63.3	0.251	20	L657751-15	WG683324
Iron,Dissolved	mg/l	0.0	0.0128	84.7*	20	L657751-15	WG683324
Magnesium,Dissolved	mg/l	26.0	25.7	0.782	20	L657751-15	WG683324
Manganese,Dissolved	mg/l	0.0160	0.0163	0.383	20	L657751-15	WG683324
Potassium,Dissolved	mg/l	0.710	0.681	4.36	20	L657751-15	WG683324
Sodium,Dissolved	mg/l	61.0	60.2	1.21	20	L657751-15	WG683324

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Suspended Solids	mg/l	773	832.	108.	85-115	WG682296
Dissolved Solids	mg/l	8800	8550	97.2	85-115	WG682292
Chloride	mg/l	40	40.2	101.	90-110	WG682279
Fluoride	mg/l	8	8.09	101.	90-110	WG682279
Nitrate	mg/l	8	8.31	104.	90-110	WG682279
Nitrite	mg/l	8	8.07	101.	90-110	WG682279
Benzene	mg/l	.05	0.0525	105.	70-130	WG682385
Ethylbenzene	mg/l	.05	0.0539	108.	70-130	WG682385
Toluene	mg/l	.05	0.0524	105.	70-130	WG682385
Total Xylene	mg/l	.15	0.158	105.	70-130	WG682385
a,a,a-Trifluorotoluene(PID)				100.0	55-122	WG682385
Sulfate	mg/l	40	41.7	104.	90-110	WG682556
Dissolved Solids	mg/l	8800	8630	98.1	85-115	WG682294
Dissolved Solids	mg/l	8800	8580	97.5	85-115	WG682503
Benzene	mg/l	.05	0.0541	108.	70-130	WG682629
Ethylbenzene	mg/l	.05	0.0551	110.	70-130	WG682629
Toluene	mg/l	.05	0.0560	112.	70-130	WG682629
Total Xylene	mg/l	.15	0.165	110.	70-130	WG682629
a,a,a-Trifluorotoluene(PID)				98.90	55-122	WG682629
Alkalinity	mg/l	100	98.0	98.0	85-115	WG682566
Suspended Solids	mg/l	773	892.	115.*	85-115	WG682525
Alkalinity	mg/l	100	100.	100.	85-115	WG682582
Ethane	mg/l	.645	0.723	112.	70-130	WG682978
Ethene	mg/l	.635	0.696	110.	70-130	WG682978
Methane	mg/l	.339	0.382	113.	70-130	WG682978
Ammonia Nitrogen	mg/l	7.5	8.04	107.	90-110	WG683014
Hardness, Total (mg/L as CaCO3)	mg/l	200	190.	95.0	85-115	WG682825
Benzene	mg/l	.05	0.0458	91.7	70-130	WG682787
Ethylbenzene	mg/l	.05	0.0480	96.0	70-130	WG682787
Toluene	mg/l	.05	0.0480	96.1	70-130	WG682787
Total Xylene	mg/l	.15	0.144	96.3	70-130	WG682787
a,a,a-Trifluorotoluene(PID)				100.0	55-122	WG682787

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		Known Val	Result			
Ammonia Nitrogen	mg/l	7.5	6.90	92.0	90-110	WG683015
Hardness, Total (mg/L as CaCO3)	mg/l	200	213.	107.	85-115	WG683349
Arsenic, Dissolved	mg/l	.05	0.0458	91.6	85-115	WG682656
Chromium, Dissolved	mg/l	.05	0.0481	96.2	85-115	WG682656
Copper, Dissolved	mg/l	.05	0.0481	96.2	85-115	WG682656
Lead, Dissolved	mg/l	.05	0.0477	95.4	85-115	WG682656
Nickel, Dissolved	mg/l	.05	0.0468	93.6	85-115	WG682656
Selenium, Dissolved	mg/l	.05	0.0469	93.8	85-115	WG682656
Zinc, Dissolved	mg/l	.05	0.0481	96.2	85-115	WG682656
Arsenic, Dissolved	mg/l	.05	0.0509	102.	85-115	WG683327
Chromium, Dissolved	mg/l	.05	0.0541	108.	85-115	WG683327
Copper, Dissolved	mg/l	.05	0.0550	110.	85-115	WG683327
Lead, Dissolved	mg/l	.05	0.0530	106.	85-115	WG683327
Nickel, Dissolved	mg/l	.05	0.0535	107.	85-115	WG683327
Selenium, Dissolved	mg/l	.05	0.0538	108.	85-115	WG683327
Zinc, Dissolved	mg/l	.05	0.0545	109.	85-115	WG683327
Aluminum, Dissolved	mg/l	1	1.05	105.	85-115	WG683324
Barium, Dissolved	mg/l	1	1.05	105.	85-115	WG683324
Boron, Dissolved	mg/l	1	0.966	96.6	85-115	WG683324
Calcium, Dissolved	mg/l	10	10.3	103.	85-115	WG683324
Iron, Dissolved	mg/l	1	1.12	112.	85-115	WG683324
Magnesium, Dissolved	mg/l	10	10.5	105.	85-115	WG683324
Manganese, Dissolved	mg/l	1	1.06	106.	85-115	WG683324
Potassium, Dissolved	mg/l	10	10.4	104.	85-115	WG683324
Sodium, Dissolved	mg/l	10	10.4	104.	85-115	WG683324

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Suspended Solids	mg/l	816.	832.	106.	85-115	1.94	5	WG682296
Dissolved Solids	mg/l	8630	8550	98.0	85-115	0.931	5	WG682292
Chloride	mg/l	40.2	40.2	100.	90-110	0.0	20	WG682279
Fluoride	mg/l	8.13	8.09	102.	90-110	0.493	20	WG682279
Nitrate	mg/l	8.32	8.31	104.	90-110	0.120	20	WG682279
Nitrite	mg/l	8.08	8.07	101.	90-110	0.124	20	WG682279
Benzene	mg/l	0.0497	0.0525	99.0	70-130	5.49	20	WG682385
Ethylbenzene	mg/l	0.0508	0.0539	102.	70-130	5.90	20	WG682385
Toluene	mg/l	0.0494	0.0524	99.0	70-130	5.83	20	WG682385
Total Xylene	mg/l	0.149	0.158	99.0	70-130	5.75	20	WG682385
a,a,a-Trifluorotoluene (PID)				100.0	55-122			WG682385
Sulfate	mg/l	42.0	41.7	105.	90-110	0.717	20	WG682556

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Dissolved Solids	mg/l	8480	8630	96.0	85-115	1.75	5	WG682294
Dissolved Solids	mg/l	8630	8580	98.0	85-115	0.581	5	WG682503
Benzene	mg/l	0.0539	0.0541	108.	70-130	0.490	20	WG682629
Ethylbenzene	mg/l	0.0548	0.0551	110.	70-130	0.520	20	WG682629
Toluene	mg/l	0.0556	0.0560	111.	70-130	0.660	20	WG682629
Total Xylene	mg/l	0.165	0.165	110.	70-130	0.250	20	WG682629
a,a,a-Trifluorotoluene(PID)				98.80	55-122			WG682629
Alkalinity	mg/l	96.0	98.0	96.0	85-115	2.06	20	WG682566
Suspended Solids	mg/l	856.	892.	111.	85-115	4.12	5	WG682525
Alkalinity	mg/l	110.	100.	110.	85-115	9.52	20	WG682582
Ethane	mg/l	0.702	0.723	109.	70-130	2.81	25	WG682978
Ethene	mg/l	0.676	0.696	106.	70-130	3.04	25	WG682978
Methane	mg/l	0.373	0.382	110.	70-130	2.34	25	WG682978
Ammonia Nitrogen	mg/l	8.19	8.04	109.	90-110	1.85	20	WG683014
Hardness, Total (mg/L as CaCO3)	mg/l	187.	190.	94.0	85-115	1.59	20	WG682825
Benzene	mg/l	0.0417	0.0458	83.0	70-130	9.44	20	WG682787
Ethylbenzene	mg/l	0.0440	0.0480	88.0	70-130	8.59	20	WG682787
Toluene	mg/l	0.0441	0.0480	88.0	70-130	8.59	20	WG682787
Total Xylene	mg/l	0.134	0.144	90.0	70-130	7.24	20	WG682787
a,a,a-Trifluorotoluene(PID)				98.40	55-122			WG682787
Ammonia Nitrogen	mg/l	7.09	6.90	94.0	90-110	2.72	20	WG683015
Hardness, Total (mg/L as CaCO3)	mg/l	215.	213.	108.	85-115	0.935	20	WG683349

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Chloride	mg/l	53.2	7.90	50	91.0	80-120	L657751-09	WG682279
Fluoride	mg/l	4.59	0.120	5	89.0	80-120	L657751-09	WG682279
Nitrate	mg/l	4.95	0.560	5	88.0	80-120	L657751-09	WG682279
Nitrite	mg/l	4.59	0.0	5	92.0	80-120	L657751-09	WG682279
Benzene	mg/l	0.0458	0.0	.05	92.0	57.2-131	L657751-01	WG682385
Ethylbenzene	mg/l	0.0480	0.0	.05	96.0	67.5-135	L657751-01	WG682385
Toluene	mg/l	0.0466	0.0	.05	93.0	63.7-134	L657751-01	WG682385
Total Xylene	mg/l	0.141	0.0	.15	94.0	65.9-138	L657751-01	WG682385
a,a,a-Trifluorotoluene(PID)					99.70	55-122		WG682385

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Sulfate	mg/l	103.	58.0	50	90.0	80-120	L657751-01	WG682556
Benzene	mg/l	0.0505	0.0000656	.05	100.	57.2-131	L657751-11	WG682629
Ethylbenzene	mg/l	0.0518	0.0000259	.05	100.	67.5-135	L657751-11	WG682629
Toluene	mg/l	0.0526	0.000242	.05	100.	63.7-134	L657751-11	WG682629
Total Xylene	mg/l	0.156	0.000181	.15	100.	65.9-138	L657751-11	WG682629
a,a,a-Trifluorotoluene(PID)					98.40	55-122		WG682629
Alkalinity	mg/l	310.	240.	100	70.0*	80-120	L657751-02	WG682566
Alkalinity	mg/l	390.	320.	100	70.0*	80-120	L657751-12	WG682582
Ammonia Nitrogen	mg/l	5.36	0.230	5	100.	90-110	L657751-02	WG683014
Hardness, Total (mg/L as CaCO3)	mg/l	248.	111.	150	91.0	80-120	L657663-01	WG682825
Benzene	mg/l	0.0425	0.0000745	.05	85.0	57.2-131	L657751-12	WG682787
Ethylbenzene	mg/l	0.0450	0.0000377	.05	90.0	67.5-135	L657751-12	WG682787
Toluene	mg/l	0.0448	0.0000713	.05	90.0	63.7-134	L657751-12	WG682787
Total Xylene	mg/l	0.136	0.000213	.15	91.0	65.9-138	L657751-12	WG682787
a,a,a-Trifluorotoluene(PID)					98.80	55-122		WG682787
Ammonia Nitrogen	mg/l	4.58	0.0	5	92.0	90-110	L657891-01	WG683015
Hardness, Total (mg/L as CaCO3)	mg/l	264.	90.6	150	120.	80-120	L658049-01	WG683349
Arsenic,Dissolved	mg/l	0.0528	0.00600	.05	94.0	75-125	L657751-11	WG682656
Chromium,Dissolved	mg/l	0.0466	0.0	.05	93.0	75-125	L657751-11	WG682656
Copper,Dissolved	mg/l	0.0461	0.0	.05	92.0	75-125	L657751-11	WG682656
Lead,Dissolved	mg/l	0.0471	0.0	.05	94.0	75-125	L657751-11	WG682656
Nickel,Dissolved	mg/l	0.0459	0.00260	.05	87.0	75-125	L657751-11	WG682656
Selenium,Dissolved	mg/l	0.0510	0.0	.05	100.	75-125	L657751-11	WG682656
Zinc,Dissolved	mg/l	0.0479	0.0	.05	96.0	75-125	L657751-11	WG682656
Arsenic,Dissolved	mg/l	0.0602	0.00590	.05	110.	75-125	L657751-12	WG683327
Chromium,Dissolved	mg/l	0.0535	0.0	.05	110.	75-125	L657751-12	WG683327
Copper,Dissolved	mg/l	0.0532	0.0	.05	110.	75-125	L657751-12	WG683327
Lead,Dissolved	mg/l	0.0519	0.0	.05	100.	75-125	L657751-12	WG683327
Nickel,Dissolved	mg/l	0.0538	0.00180	.05	100.	75-125	L657751-12	WG683327
Selenium,Dissolved	mg/l	0.0552	0.0	.05	110.	75-125	L657751-12	WG683327
Zinc,Dissolved	mg/l	0.0541	0.0	.05	110.	75-125	L657751-12	WG683327
Aluminum,Dissolved	mg/l	1.11	0.0710	1	100.	75-125	L657751-15	WG683324
Barium,Dissolved	mg/l	1.13	0.113	1	100.	75-125	L657751-15	WG683324
Boron,Dissolved	mg/l	0.990	0.0597	1	93.0	75-125	L657751-15	WG683324
Calcium,Dissolved	mg/l	72.7	63.3	10	94.0	75-125	L657751-15	WG683324
Iron,Dissolved	mg/l	1.07	0.0128	1	110.	75-125	L657751-15	WG683324
Magnesium,Dissolved	mg/l	36.0	25.7	10	100.	75-125	L657751-15	WG683324

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



YOUR LAB OF CHOICE

Berry Petroleum Company - Denver, CO
Dave Nicholson
1999 Broadway, Suite 3700

Denver, CO 80202

Quality Assurance Report
Level II

L657751

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(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

September 30, 2013

Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Manganese,Dissolved	mg/l	1.05	0.0163	1	100.	75-125	L657751-15	WG683324
Potassium,Dissolved	mg/l	11.1	0.681	10	100.	75-125	L657751-15	WG683324
Sodium,Dissolved	mg/l	72.0	60.2	10	120.	75-125	L657751-15	WG683324

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Chloride	mg/l	57.2	53.2	98.6	80-120	7.25	20	L657751-09	WG682279
Fluoride	mg/l	5.00	4.59	97.6	80-120	8.55	20	L657751-09	WG682279
Nitrate	mg/l	5.36	4.95	96.0	80-120	7.95	20	L657751-09	WG682279
Nitrite	mg/l	4.99	4.59	99.8	80-120	8.35	20	L657751-09	WG682279
Benzene	mg/l	0.0496	0.0458	99.3	57.2-131	8.07	20	L657751-01	WG682385
Ethylbenzene	mg/l	0.0510	0.0480	102.	67.5-135	6.20	20	L657751-01	WG682385
Toluene	mg/l	0.0496	0.0466	99.2	63.7-134	6.28	20	L657751-01	WG682385
Total Xylene	mg/l	0.150	0.141	99.8	65.9-138	6.07	20	L657751-01	WG682385
a,a,a-Trifluorotoluene(PID)				99.80	55-122				WG682385
Sulfate	mg/l	104.	103.	92.0	80-120	0.966	20	L657751-01	WG682556
Benzene	mg/l	0.0498	0.0505	99.4	57.2-131	1.47	20	L657751-11	WG682629
Ethylbenzene	mg/l	0.0509	0.0518	102.	67.5-135	1.76	20	L657751-11	WG682629
Toluene	mg/l	0.0518	0.0526	103.	63.7-134	1.58	20	L657751-11	WG682629
Total Xylene	mg/l	0.153	0.156	102.	65.9-138	1.66	20	L657751-11	WG682629
a,a,a-Trifluorotoluene(PID)				98.20	55-122				WG682629
Alkalinity	mg/l	310.	310.	70.0*	80-120	0.0	20	L657751-02	WG682566
Alkalinity	mg/l	390.	390.	70.0*	80-120	0.0	20	L657751-12	WG682582
Ammonia Nitrogen	mg/l	5.39	5.36	103.	90-110	0.558	20	L657751-02	WG683014
Hardness, Total (mg/L as CaCO3)	mg/l	245.	248.	89.3	80-120	1.22	20	L657663-01	WG682825
Benzene	mg/l	0.0468	0.0425	93.4	57.2-131	9.49	20	L657751-12	WG682787
Ethylbenzene	mg/l	0.0490	0.0450	97.9	67.5-135	8.44	20	L657751-12	WG682787
Toluene	mg/l	0.0489	0.0448	97.7	63.7-134	8.79	20	L657751-12	WG682787
Total Xylene	mg/l	0.148	0.136	98.7	65.9-138	8.50	20	L657751-12	WG682787
a,a,a-Trifluorotoluene(PID)				98.40	55-122				WG682787
Ammonia Nitrogen	mg/l	4.57	4.58	91.4	90-110	0.219	20	L657891-01	WG683015
Hardness, Total (mg/L as CaCO3)	mg/l	263.	264.	115.	80-120	0.380	20	L658049-01	WG683349
Arsenic,Dissolved	mg/l	0.0537	0.0528	95.4	75-125	1.69	20	L657751-11	WG682656
Chromium,Dissolved	mg/l	0.0481	0.0466	96.2	75-125	3.17	20	L657751-11	WG682656
Copper,Dissolved	mg/l	0.0474	0.0461	94.8	75-125	2.78	20	L657751-11	WG682656
Lead,Dissolved	mg/l	0.0479	0.0471	95.8	75-125	1.68	20	L657751-11	WG682656

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September 30, 2013

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Nickel,Dissolved	mg/l	0.0478	0.0459	90.4	75-125	4.06	20	L657751-11	WG682656
Selenium,Dissolved	mg/l	0.0517	0.0510	103.	75-125	1.36	20	L657751-11	WG682656
Zinc,Dissolved	mg/l	0.0490	0.0479	98.0	75-125	2.27	20	L657751-11	WG682656
Arsenic,Dissolved	mg/l	0.0601	0.0602	108.	75-125	0.166	20	L657751-12	WG683327
Chromium,Dissolved	mg/l	0.0520	0.0535	104.	75-125	2.84	20	L657751-12	WG683327
Copper,Dissolved	mg/l	0.0519	0.0532	104.	75-125	2.47	20	L657751-12	WG683327
Lead,Dissolved	mg/l	0.0516	0.0519	103.	75-125	0.580	20	L657751-12	WG683327
Nickel,Dissolved	mg/l	0.0525	0.0538	101.	75-125	2.45	20	L657751-12	WG683327
Selenium,Dissolved	mg/l	0.0583	0.0552	117.	75-125	5.46	20	L657751-12	WG683327
Zinc,Dissolved	mg/l	0.0537	0.0541	107.	75-125	0.742	20	L657751-12	WG683327
Aluminum,Dissolved	mg/l	1.14	1.11	106.	75-125	2.09	20	L657751-15	WG683324
Barium,Dissolved	mg/l	1.14	1.13	103.	75-125	1.14	20	L657751-15	WG683324
Boron,Dissolved	mg/l	1.01	0.990	95.0	75-125	1.98	20	L657751-15	WG683324
Calcium,Dissolved	mg/l	72.1	72.7	88.2	75-125	0.743	20	L657751-15	WG683324
Iron,Dissolved	mg/l	1.12	1.07	111.	75-125	4.41	20	L657751-15	WG683324
Magnesium,Dissolved	mg/l	36.2	36.0	104.	75-125	0.599	20	L657751-15	WG683324
Manganese,Dissolved	mg/l	1.07	1.05	105.	75-125	1.66	20	L657751-15	WG683324
Potassium,Dissolved	mg/l	11.1	11.1	104.	75-125	0.241	20	L657751-15	WG683324
Sodium,Dissolved	mg/l	70.8	72.0	106.	75-125	1.71	20	L657751-15	WG683324

Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG682296: R2818766: L657751-01 02 03 04 05 07 08 09 10 11 12
WG682292: R2819161: L657751-01 02 03 04 05 06 07 08 09 10
WG682279: R2819162: L657751-01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
WG682385: R2819520: L657751-01 02 03 04 05 06 07 08 09 10
WG682556: R2819542: L657751-01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
WG682294: R2820121: L657751-11

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WG682503: R2820141: L657751-12 13 14 15
WG682629: R2820240: L657751-11 13 14 15
WG682566: R2820281: L657751-01 02 03 04 05 06 07 08 09
WG682525: R2820862: L657751-15
WG682582: R2820883: L657751-10 11 12 13 14 15
WG682978: R2821442: L657751-01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
WG683014: R2822700: L657751-01 02 03 04 05 06 07 08 09 10 11 12
WG682825: R2823384: L657751-01 02 03 04 05 06 07
WG682787: R2823960: L657751-12
WG683015: R2825140: L657751-13 14 15
WG683349: R2825611: L657751-08 09 10 11 12 13 14 15
WG682656: R2825982: L657751-01 02 03 04 05 06 07 08 09 10 11
WG683327: R2826048: L657751-12 13 14 15
WG683324: R2830283: L657751-01 02 03 04 05 06 07 08 09 10 11 12 13 14 15

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Nicholson GeoSolutions, LLC

3433 East Lake Drive

Centennial, CO 80121

Groundwater Monitoring Report for the 29-17 Injection Well Site, Spring 2014

Nicholson GeoSolutions LLC conducted groundwater monitoring near the 29-17 injection well site (the O-29 well pad) on May 18, 2014. A walking survey of Little Creek was previously performed below Garden Gulch Road to look for groundwater springs that could be used to monitor shallow groundwater below the injection well site. Two springs (29-1 and 29-2) were located below Garden Gulch Road. Spring 29-1 was sampled in the fall of 2012, the spring of 2013, in the fall of 2013, and again for this sampling event. Spring 29-2 provides insufficient flow for sampling.

For this sample event, field parameters were measured and a water quality sample was collected at Spring 29-1. In addition, one surface water sample was collected on Little Creek above Garden Gulch Road at existing monitoring site LC-1. This monitoring station is downgradient of the injection well site and the pipeline right-of-way that is located just north of the well pad. Previous sampling has shown that this location is in communication with groundwater that flows down the pipeline trench into Little Creek, and thus is an appropriate groundwater monitoring location for the 29-17 injection well. These two locations will be sampled semi-annually to provide groundwater monitoring for the 29-17 injection well permit.

Table 1 summarizes the field parameters and laboratory analytical results for the samples collected. The laboratory analytical report is attached. All results are below the associated Federal and Colorado aquatic life standards except for the low pH of 6.41 for Spring 29-1. In addition, the detection limit for ammonia is above the standard. No petroleum constituents were detected in either sample.

Table 1 29-17 Groundwater Monitoring Results for Spring 2014

Parameter	Standards		Sample ID and Date	
	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (May 18, 2014)	Spring 29-1 (May 18, 2014)
Field Parameters				
sp. conductance (µS/cm)			591	690
pH (standard units)	6.5-9.0	6.5-8.5 ²	8.45	6.41
temperature (°C)			9.9	12.7
estimated flow			0.5 cfs	0.2 gpm
General Water Quality Parameters				
total alkalinity (mg/L)			200	220
total hardness (mg/l)			240	780
TDS (mg/l)		500 ²	350	380
TSS (mg/l)	90		<2.5	32
Organic Constituents				

benzene (µg/l)	5,300	5 ¹	<0.5	<0.5
toluene (µg/l)	17,500	1000 ¹	<5	<5
ethylbenzene (µg/l)	32,000	700 ¹	<0.5	<0.5
xylenes (µg/l)	C ⁴	10,000 ¹	<1.5	<1.5
methane (µg/l)			<10	<10
ethane (µg/l)			<13	<13
ethene (µg/l)			<13	<13
Major Cations and Anions				
calcium (mg/l)			63	66
magnesium (mg/l)			25	28
potassium (mg/l)			0.56	<0.5
sodium (mg/l)			40	41
chloride (mg/l)		250 ²	16	15
fluoride (mg/l)		4 ¹ , 2 ²	0.11	0.15
nitrate (mg/l)		10 ¹	0.26	1.2
nitrite (mg/l)		1 ¹	<0.1 UJ	<0.1 UJ
sulfate (mg/l)		250 ²	53	68
ammonia (mg/l)	0.02 ³		<0.25	<0.25
Trace Metals				
aluminum (µg/l)	750		<100	<100
arsenic (µg/l)	340	10 ¹	3.1	2.6
barium (µg/l)		2000 ¹	88	76
boron (µg/l)			<200	<200
chromium (µg/l)	1,773 ⁶	100 ¹	<2	<2
copper (µg/l)	50 ⁶	1300 ¹ , 1000 ²	2.3	<2
iron (µg/l)		300 ²	<100	<100
lead (µg/l)	281 ⁶	15 ¹	<1	<1
manganese (µg/l)	4,738 ⁶	50 ²	7.7	<2
nickel (µg/l)	1,513 ⁶		16	1.7
selenium (µg/l)	18.4	50 ¹	<1	<1
zinc (µg/l)	379 ⁶	5000 ²	18	<10

Values in bold type exceed standards UJ = Estimated detection limit

mg/l = milligrams per liter; ug/l = micrograms per liter; cfs = cubic feet per minute; gpm = gallons per minute;

uS/cm = microSiemens per centimeter ¹Federal Drinking Water Maximum Contaminant Level (MCL)

²Federal Drinking Water Secondary Standard

³Chronic aquatic life standard (Colorado Water Quality Standards, 5 CCR 1002-31).

⁴Carcinogenic compounds as classified by the EPA

⁵Chronic. Acute ammonia standard calculated based on 0.43/FT/FPH/2, where FT = acute temperature adjustment and FPH = acute pH adjustment. ⁶Aquatic standard is hardness dependent. Values shown are for a hardness of 400 mg/L

A data review was conducted using the quality assurance reports supplied by the laboratory and standard EPA data validation guidelines. All analyses were conducted within the recommended holding times, except for nitrite. Nitrite was reported as not detected and qualified as estimated "UJ" for both samples. All method blank results were reported as not detected. All laboratory control sample (LCS), laboratory duplicate, surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits. All results are usable for all intended purposes (no results were rejected).

Sincerely,

David K. Nicholson, P.G.
Nicholson GeoSolutions LLC



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Tax I.D. 62-0814289

Est. 1970

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Wednesday May 28, 2014

Report Number: L699985

Samples Received: 05/20/14

Client Project:

Description: Berry Garden Gulch Water

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

May 28, 2014

Date Received : May 20, 2014
Description : Berry Garden Gulch Water
Sample ID : LC-1
Collected By : DK Nicholson
Collection Date : 05/18/14 09:35

ESC Sample # : L699985-04

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	16.	1.0	mg/l	9056	05/21/14	1
Fluoride	0.11	0.10	mg/l	9056	05/21/14	1
Nitrate	0.26	0.10	mg/l	9056	05/21/14	1
Nitrite	BDL	0.10	mg/l	9056	05/21/14	1
Sulfate	53.	5.0	mg/l	9056	05/21/14	1
Alkalinity	200	20.	mg/l	2320 B-2011	05/22/14	1
Methane	BDL	0.010	mg/l	RSK175	05/26/14	1
Ethane	BDL	0.013	mg/l	RSK175	05/26/14	1
Ethene	BDL	0.013	mg/l	RSK175	05/26/14	1
Hardness, Total (mg/L as CaCO3)	240	30.	mg/l	130.1	05/23/14	1
Ammonia Nitrogen	BDL	0.25	mg/l	350.1	05/22/14	1
Nitrate-Nitrite	0.36	0.10	mg/l	353.2	05/28/14	1
Dissolved Solids	350	10.	mg/l	2540 C-2011	05/23/14	1
Suspended Solids	BDL	2.5	mg/l	2540 D-2011	05/22/14	1
Arsenic, Dissolved	0.0031	0.0010	mg/l	6020	05/27/14	1
Barium, Dissolved	0.088	0.0020	mg/l	6020	05/27/14	1
Chromium, Dissolved	BDL	0.0020	mg/l	6020	05/27/14	1
Copper, Dissolved	0.0023	0.0020	mg/l	6020	05/27/14	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	05/27/14	1
Manganese, Dissolved	0.0077	0.0020	mg/l	6020	05/27/14	1
Nickel, Dissolved	0.016	0.0010	mg/l	6020	05/27/14	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	05/27/14	1
Zinc, Dissolved	0.18	0.010	mg/l	6020	05/27/14	1
Aluminum, Dissolved	BDL	0.10	mg/l	6010B	05/23/14	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	05/23/14	1
Calcium, Dissolved	63.	0.50	mg/l	6010B	05/23/14	1
Iron, Dissolved	BDL	0.10	mg/l	6010B	05/23/14	1
Magnesium, Dissolved	25.	0.10	mg/l	6010B	05/23/14	1
Potassium, Dissolved	0.56	0.50	mg/l	6010B	05/23/14	1
Sodium, Dissolved	40.	0.50	mg/l	6010B	05/23/14	1
Benzene	BDL	0.00050	mg/l	8021B	05/23/14	1
Toluene	BDL	0.0050	mg/l	8021B	05/23/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	05/23/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	05/23/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)



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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

May 28, 2014

Date Received : May 20, 2014
Description : Berry Garden Gulch Water
Sample ID : LC-1
Collected By : DK Nicholson
Collection Date : 05/18/14 09:35

ESC Sample # : L699985-04
Site ID :
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021B	05/23/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 05/28/14 13:43 Printed: 05/28/14 13:44



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REPORT OF ANALYSIS

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Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

May 28, 2014

Date Received : May 20, 2014
Description : Berry Garden Gulch Water
Sample ID : 29-1
Collected By : DK Nicholson
Collection Date : 05/18/14 10:00

ESC Sample # : L699985-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	15.	1.0	mg/l	9056	05/21/14	1
Fluoride	0.15	0.10	mg/l	9056	05/21/14	1
Nitrate	1.2	0.10	mg/l	9056	05/21/14	1
Nitrite	BDL	0.10	mg/l	9056	05/21/14	1
Sulfate	68.	5.0	mg/l	9056	05/21/14	1
Alkalinity	220	20.	mg/l	2320 B-2011	05/22/14	1
Methane	BDL	0.010	mg/l	RSK175	05/26/14	1
Ethane	BDL	0.013	mg/l	RSK175	05/26/14	1
Ethene	BDL	0.013	mg/l	RSK175	05/26/14	1
Hardness, Total (mg/L as CaCO3)	780	150	mg/l	130.1	05/23/14	5
Ammonia Nitrogen	BDL	0.25	mg/l	350.1	05/22/14	1
Nitrate-Nitrite	1.2	0.10	mg/l	353.2	05/28/14	1
Dissolved Solids	380	10.	mg/l	2540 C-2011	05/23/14	1
Suspended Solids	32.	2.5	mg/l	2540 D-2011	05/22/14	1
Arsenic, Dissolved	0.0026	0.0010	mg/l	6020	05/27/14	1
Barium, Dissolved	0.076	0.0020	mg/l	6020	05/27/14	1
Chromium, Dissolved	BDL	0.0020	mg/l	6020	05/27/14	1
Copper, Dissolved	BDL	0.0020	mg/l	6020	05/27/14	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	05/27/14	1
Manganese, Dissolved	BDL	0.0020	mg/l	6020	05/27/14	1
Nickel, Dissolved	0.0017	0.0010	mg/l	6020	05/27/14	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	05/27/14	1
Zinc, Dissolved	BDL	0.010	mg/l	6020	05/27/14	1
Aluminum, Dissolved	BDL	0.10	mg/l	6010B	05/23/14	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	05/23/14	1
Calcium, Dissolved	66.	0.50	mg/l	6010B	05/23/14	1
Iron, Dissolved	BDL	0.10	mg/l	6010B	05/23/14	1
Magnesium, Dissolved	28.	0.10	mg/l	6010B	05/23/14	1
Potassium, Dissolved	BDL	0.50	mg/l	6010B	05/23/14	1
Sodium, Dissolved	41.	0.50	mg/l	6010B	05/23/14	1
Benzene	BDL	0.00050	mg/l	8021B	05/23/14	1
Toluene	BDL	0.0050	mg/l	8021B	05/23/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	05/23/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	05/23/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)



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Est. 1970

REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

May 28, 2014

Date Received : May 20, 2014
Description : Berry Garden Gulch Water
Sample ID : 29-1
Collected By : DK Nicholson
Collection Date : 05/18/14 10:00

ESC Sample # : L699985-05
Site ID :
Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021B	05/23/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
This report shall not be reproduced, except in full, without the written approval from ESC.
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Reported: 05/28/14 13:43 Printed: 05/28/14 13:44

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L699985-01	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-02	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-03	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-04	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-05	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-06	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8
L699985-10	WG722130	SAMP	Nitrate	R2925506	T8
	WG722130	SAMP	Nitrite	R2925506	T8

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
T8	(ESC) - Additional method/sample information: Sample(s) received past/too close to holding time expiration.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
05/28/14 at 13:44:25

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L699985-01 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-02 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-03 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-04 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-05 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-06 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-07 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-08 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-09 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43
Sample: L699985-10 Account: BERPETDCO Received: 05/20/14 09:45 Due Date: 05/28/14 00:00 RPT Date: 05/28/14 13:43



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG721832	05/20/14 08:07
Fluoride	< .1	mg/l			WG721832	05/20/14 08:07
Nitrate	< .1	mg/l			WG721832	05/20/14 08:07
Nitrite	< .1	mg/l			WG721832	05/20/14 08:07
Sulfate	< 5	mg/l			WG721832	05/20/14 08:07
Chloride	< 1	mg/l			WG722130	05/20/14 22:49
Fluoride	< .1	mg/l			WG722130	05/20/14 22:49
Nitrate	< .1	mg/l			WG722130	05/20/14 22:49
Nitrite	< .1	mg/l			WG722130	05/20/14 22:49
Sulfate	< 5	mg/l			WG722130	05/20/14 22:49
Suspended Solids	< 2.5	mg/l			WG722033	05/22/14 13:48
Ammonia Nitrogen	< .25	mg/l			WG722371	05/22/14 09:19
Alkalinity	< 20	mg/l			WG722334	05/22/14 05:58
Hardness, Total (mg/L as CaCO3)	< 30	mg/l			WG722556	05/23/14 10:07
Aluminum,Dissolved	< .1	mg/l			WG722683	05/23/14 13:19
Boron,Dissolved	< .2	mg/l			WG722683	05/23/14 13:19
Calcium,Dissolved	< .5	mg/l			WG722683	05/23/14 13:19
Iron,Dissolved	< .1	mg/l			WG722683	05/23/14 13:19
Magnesium,Dissolved	< .1	mg/l			WG722683	05/23/14 13:19
Potassium,Dissolved	< .5	mg/l			WG722683	05/23/14 13:19
Sodium,Dissolved	< .5	mg/l			WG722683	05/23/14 13:19
Benzene	< .0005	mg/l			WG722193	05/22/14 16:52
Ethylbenzene	< .0005	mg/l			WG722193	05/22/14 16:52
Toluene	< .005	mg/l			WG722193	05/22/14 16:52
Total Xylene	< .0015	mg/l			WG722193	05/22/14 16:52
a,a,a-Trifluorotoluene(PID)		% Rec.	104.0	55-122	WG722193	05/22/14 16:52
Dissolved Solids	< 10	mg/l			WG722365	05/23/14 14:25
Dissolved Solids	< 10	mg/l			WG722034	05/23/14 17:10
Ethane	< .013	mg/l			WG723089	05/26/14 05:54
Ethene	< .013	mg/l			WG723089	05/26/14 05:54
Methane	< .01	mg/l			WG723089	05/26/14 05:54
Benzene	< .0005	mg/l			WG722308	05/24/14 04:33
Ethylbenzene	< .0005	mg/l			WG722308	05/24/14 04:33
Toluene	< .005	mg/l			WG722308	05/24/14 04:33
Total Xylene	< .0015	mg/l			WG722308	05/24/14 04:33
a,a,a-Trifluorotoluene(PID)		% Rec.	97.80	55-122	WG722308	05/24/14 04:33

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Arsenic, Dissolved	< .001	mg/l			WG722684	05/25/14 18:38
Barium, Dissolved	< .002	mg/l			WG722684	05/25/14 18:38
Chromium, Dissolved	< .002	mg/l			WG722684	05/25/14 18:38
Copper, Dissolved	< .002	mg/l			WG722684	05/25/14 18:38
Lead, Dissolved	< .001	mg/l			WG722684	05/25/14 18:38
Manganese, Dissolved	< .002	mg/l			WG722684	05/25/14 18:38
Nickel, Dissolved	< .001	mg/l			WG722684	05/25/14 18:38
Selenium, Dissolved	< .001	mg/l			WG722684	05/25/14 18:38
Zinc, Dissolved	< .01	mg/l			WG722684	05/25/14 18:38
Nitrate-Nitrite	< .1	mg/l			WG722820	05/28/14 11:22

Analyte	Units	Result	Duplicate		Limit	Ref Samp	Batch
			Duplicate	RPD			
Nitrite	mg/l	0.620	0.630	1.60	20	L694725-04	WG721832
Nitrite	mg/l	0.920	0.920	0.0	20	L694726-02	WG721832
Fluoride	mg/l	0.610	0.604	0.988	20	L699983-04	WG721832
Nitrate	mg/l	0.0	0.0	0.0	20	L699983-04	WG721832
Sulfate	mg/l	95.0	94.0	1.06	20	L699983-04	WG721832
Nitrate	mg/l	36.0	34.0	5.71	20	L698462-02	WG721832
Chloride	mg/l	56.0	56.0	0.0	20	L700075-01	WG721832
Sulfate	mg/l	85.0	85.0	0.0	20	L700075-01	WG721832
Chloride	mg/l	360.	360.	0.0	20	L699983-04	WG721832
Sulfate	mg/l	380.	390.	2.60	20	L698839-01	WG722130
Sulfate	mg/l	20.0	20.0	0.0	20	L699025-02	WG722130
Sulfate	mg/l	19.0	19.0	0.0	20	L699025-03	WG722130
Suspended Solids	mg/l	181.	187.	3.25	5	L699893-02	WG722033
Suspended Solids	mg/l	5.78	5.56	3.92	5	L699985-10	WG722033
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L699985-01	WG722371
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L699985-07	WG722371
Alkalinity	mg/l	260.	250.	3.54	20	L699985-01	WG722334
Alkalinity	mg/l	66.0	66.0	0.0	20	L700060-01	WG722334
Hardness, Total (mg/L as CaCO3)	mg/l	96.0	91.1	5.24	20	L699884-03	WG722556
Hardness, Total (mg/L as CaCO3)	mg/l	240.	260.	8.00	20	L699985-10	WG722556
Dissolved Solids	mg/l	1460	1520	4.19	5	L699931-01	WG722365
Dissolved Solids	mg/l	2240	2270	1.11	5	L699702-10	WG722034
Nitrate-Nitrite	mg/l	9.50	9.50	0.0	20	L699912-01	WG722820
Nitrate-Nitrite	mg/l	0.750	0.760	1.32	20	L699985-06	WG722820

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May 28, 2014

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chloride	mg/l	40	40.5	101.	90-110	WG721832
Fluoride	mg/l	8	8.25	103.	90-110	WG721832
Nitrate	mg/l	8	8.42	105.	90-110	WG721832
Nitrite	mg/l	8	8.08	101.	90-110	WG721832
Sulfate	mg/l	40	40.8	102.	90-110	WG721832
Chloride	mg/l	40	40.1	100.	90-110	WG722130
Fluoride	mg/l	8	8.13	102.	90-110	WG722130
Nitrate	mg/l	8	8.17	102.	90-110	WG722130
Nitrite	mg/l	8	8.05	101.	90-110	WG722130
Sulfate	mg/l	40	39.7	99.3	90-110	WG722130
Suspended Solids	mg/l	773	852.	110.	85-115	WG722033
Ammonia Nitrogen	mg/l	7.5	7.23	96.4	90-110	WG722371
Alkalinity	mg/l	100	100.	100.	85-115	WG722334
Hardness, Total (mg/L as CaCO3)	mg/l	200	207.	104.	85-115	WG722556
Aluminum,Dissolved	mg/l	1	0.954	95.0	80-120	WG722683
Boron,Dissolved	mg/l	1	1.04	104.	80-120	WG722683
Calcium,Dissolved	mg/l	10	11.1	111.	80-120	WG722683
Iron,Dissolved	mg/l	1	1.08	108.	80-120	WG722683
Magnesium,Dissolved	mg/l	10	11.2	112.	80-120	WG722683
Potassium,Dissolved	mg/l	10	10.6	106.	80-120	WG722683
Sodium,Dissolved	mg/l	10	10.5	105.	80-120	WG722683
Benzene	mg/l	.05	0.0385	77.1	70-130	WG722193
Ethylbenzene	mg/l	.05	0.0415	83.0	70-130	WG722193
Toluene	mg/l	.05	0.0399	79.7	70-130	WG722193
Total Xylene	mg/l	.15	0.126	84.3	70-130	WG722193
a,a,a-Trifluorotoluene(PID)				103.0	55-122	WG722193
Dissolved Solids	mg/l	8800	8040	91.4	85-115	WG722365
Dissolved Solids	mg/l	8800	7980	90.7	85-115	WG722034
Ethane	mg/l	.129	0.122	94.4	85-115	WG723089
Ethene	mg/l	.127	0.117	92.2	85-115	WG723089
Methane	mg/l	.0678	0.0672	99.1	85-115	WG723089
Benzene	mg/l	.05	0.0464	92.7	70-130	WG722308
Ethylbenzene	mg/l	.05	0.0450	90.1	70-130	WG722308
Toluene	mg/l	.05	0.0460	92.0	70-130	WG722308
Total Xylene	mg/l	.15	0.138	92.2	70-130	WG722308
a,a,a-Trifluorotoluene(PID)				97.40	55-122	WG722308

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Arsenic, Dissolved	mg/l	.05	0.0531	106.	85-115	WG722684
Barium, Dissolved	mg/l	.05	0.0517	103.	85-115	WG722684
Chromium, Dissolved	mg/l	.05	0.0483	97.0	85-115	WG722684
Copper, Dissolved	mg/l	.05	0.0522	104.	85-115	WG722684
Lead, Dissolved	mg/l	.05	0.0519	104.	85-115	WG722684
Manganese, Dissolved	mg/l	.05	0.0516	103.	85-115	WG722684
Nickel, Dissolved	mg/l	.05	0.0502	100.	85-115	WG722684
Selenium, Dissolved	mg/l	.05	0.0529	106.	85-115	WG722684
Zinc, Dissolved	mg/l	.05	0.0517	103.	85-115	WG722684
Nitrate-Nitrite	mg/l	5	5.46	109.	90-110	WG722820

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chloride	mg/l	40.4	40.5	101.	90-110	0.247	20	WG721832
Fluoride	mg/l	8.20	8.25	102.	90-110	0.608	20	WG721832
Nitrate	mg/l	8.39	8.42	105.	90-110	0.357	20	WG721832
Nitrite	mg/l	8.11	8.08	101.	90-110	0.371	20	WG721832
Sulfate	mg/l	40.6	40.8	102.	90-110	0.491	20	WG721832
Chloride	mg/l	40.1	40.1	100.	90-110	0.0	20	WG722130
Fluoride	mg/l	8.12	8.13	102.	90-110	0.123	20	WG722130
Nitrate	mg/l	8.19	8.17	102.	90-110	0.244	20	WG722130
Nitrite	mg/l	8.10	8.05	101.	90-110	0.619	20	WG722130
Sulfate	mg/l	39.8	39.7	100.	90-110	0.252	20	WG722130
Suspended Solids	mg/l	840.	852.	109.	85-115	1.42	5	WG722033
Ammonia Nitrogen	mg/l	7.20	7.23	96.0	90-110	0.416	20	WG722371
Alkalinity	mg/l	99.0	100.	99.0	85-115	1.01	20	WG722334
Hardness, Total (mg/L as CaCO3)	mg/l	208.	207.	104.	85-115	0.482	20	WG722556
Aluminum, Dissolved	mg/l	0.953	0.954	95.0	80-120	0.0	20	WG722683
Boron, Dissolved	mg/l	1.05	1.04	105.	80-120	1.00	20	WG722683
Calcium, Dissolved	mg/l	11.1	11.1	111.	80-120	1.00	20	WG722683
Iron, Dissolved	mg/l	1.08	1.08	108.	80-120	0.0	20	WG722683
Magnesium, Dissolved	mg/l	11.3	11.2	113.	80-120	1.00	20	WG722683
Potassium, Dissolved	mg/l	10.7	10.6	107.	80-120	1.00	20	WG722683
Sodium, Dissolved	mg/l	10.6	10.5	106.	80-120	1.00	20	WG722683
Benzene	mg/l	0.0394	0.0385	79.0	70-130	2.22	20	WG722193
Ethylbenzene	mg/l	0.0416	0.0415	83.0	70-130	0.310	20	WG722193
Toluene	mg/l	0.0400	0.0399	80.0	70-130	0.330	20	WG722193
Total Xylene	mg/l	0.127	0.126	84.0	70-130	0.380	20	WG722193
a,a,a-Trifluorotoluene(PID)				102.0	55-122			WG722193
Dissolved Solids	mg/l	8400	8040	95.0	85-115	4.38	5	WG722365

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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May 28, 2014

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Dissolved Solids	mg/l	8320	7980	94.0	85-115	4.17	5	WG722034
Ethane	mg/l	0.122	0.122	94.0	85-115	0.190	20	WG723089
Ethene	mg/l	0.116	0.117	91.0	85-115	1.05	20	WG723089
Methane	mg/l	0.0672	0.0672	99.0	85-115	0.0800	20	WG723089
Benzene	mg/l	0.0437	0.0464	87.0	70-130	5.96	20	WG722308
Ethylbenzene	mg/l	0.0427	0.0450	85.0	70-130	5.37	20	WG722308
Toluene	mg/l	0.0434	0.0460	87.0	70-130	5.82	20	WG722308
Total Xylene	mg/l	0.132	0.138	88.0	70-130	5.01	20	WG722308
a,a,a-Trifluorotoluene(PID)				97.40	55-122			WG722308
Arsenic,Dissolved	mg/l	0.0525	0.0531	105.	85-115	1.00	20	WG722684
Barium,Dissolved	mg/l	0.0519	0.0517	104.	85-115	0.0	20	WG722684
Chromium,Dissolved	mg/l	0.0484	0.0483	97.0	85-115	0.0	20	WG722684
Copper,Dissolved	mg/l	0.0516	0.0522	103.	85-115	1.00	20	WG722684
Lead,Dissolved	mg/l	0.0521	0.0519	104.	85-115	0.0	20	WG722684
Manganese,Dissolved	mg/l	0.0523	0.0516	105.	85-115	1.00	20	WG722684
Nickel,Dissolved	mg/l	0.0504	0.0502	101.	85-115	0.0	20	WG722684
Selenium,Dissolved	mg/l	0.0536	0.0529	107.	85-115	1.00	20	WG722684
Zinc,Dissolved	mg/l	0.0518	0.0517	104.	85-115	0.0	20	WG722684
Nitrate-Nitrite	mg/l	5.34	5.46	107.	90-110	2.22	20	WG722820

Analyte	Units	Matrix Spike				Limit	Ref Samp	Batch
		MS Res	Ref Res	TV	% Rec			
Nitrite	mg/l	5.09	0.0	5	100.	80-120	L699885-02	WG721832
Chloride	mg/l	53.0	3.80	50	98.0	80-120	L699985-06	WG722130
Fluoride	mg/l	4.68	0.0	5	94.0	80-120	L699985-06	WG722130
Nitrate	mg/l	5.57	0.680	5	98.0	80-120	L699985-06	WG722130
Nitrite	mg/l	5.05	0.0	5	100.	80-120	L699985-06	WG722130
Sulfate	mg/l	123.	78.0	50	90.0	80-120	L699985-06	WG722130
Ammonia Nitrogen	mg/l	9.51	0.0	10	95.0	90-110	L699985-02	WG722371
Alkalinity	mg/l	300.	200.	100	100.	80-120	L699985-02	WG722334
Hardness, Total (mg/L as CaCO3)	mg/l	207.	94.5	150	75.0*	80-120	L699884-04	WG722556
Iron,Dissolved	mg/l	1.07	-0.000098	1	110.	75-125	L699797-13	WG722683
Potassium,Dissolved	mg/l	12.1	1.49	10	110.	75-125	L699797-13	WG722683
Benzene	mg/l	0.274	0.257	.05	34.0*	57.2-131	L699473-07	WG722193
Ethylbenzene	mg/l	0.225	0.193	.05	64.0*	67.5-135	L699473-07	WG722193
Toluene	mg/l	0.115	0.0813	.05	66.0	63.7-134	L699473-07	WG722193
Total Xylene	mg/l	0.363	0.246	.15	78.0	65.9-138	L699473-07	WG722193
a,a,a-Trifluorotoluene(PID)					100.0	55-122		WG722193

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Benzene	mg/l	0.0464	0.0000591	.05	93.0	57.2-131	L700604-06	WG722308
Ethylbenzene	mg/l	0.0449	0.0000303	.05	90.0	67.5-135	L700604-06	WG722308
Toluene	mg/l	0.0459	0.0000317	.05	92.0	63.7-134	L700604-06	WG722308
Total Xylene	mg/l	0.138	0.000140	.15	92.0	65.9-138	L700604-06	WG722308
a,a,a-Trifluorotoluene(PID)					97.40	55-122		WG722308
Arsenic,Dissolved	mg/l	0.0570	0.00395	.05	110.	75-125	L699985-10	WG722684
Chromium,Dissolved	mg/l	0.0490	-0.00257	.05	98.0	75-125	L699985-10	WG722684
Copper,Dissolved	mg/l	0.0519	0.00185	.05	100.	75-125	L699985-10	WG722684
Lead,Dissolved	mg/l	0.0509	0.000210	.05	100.	75-125	L699985-10	WG722684
Manganese,Dissolved	mg/l	0.0524	0.00108	.05	100.	75-125	L699985-10	WG722684
Nickel,Dissolved	mg/l	0.0509	0.00179	.05	98.0	75-125	L699985-10	WG722684
Selenium,Dissolved	mg/l	0.0567	0.00126	.05	110.	75-125	L699985-10	WG722684
Zinc,Dissolved	mg/l	0.0559	0.00292	.05	110.	75-125	L699985-10	WG722684
Barium,Dissolved	mg/l	0.156	0.0995	.01	110.	75-125	L699985-10	WG722684
Nitrate-Nitrite	mg/l	10.7	5.30	5	110.	90-110	L699912-02	WG722820

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Nitrite	mg/l	5.12	5.09	102.	80-120	0.588	20	L699885-02	WG721832
Chloride	mg/l	53.2	53.0	98.8	80-120	0.377	20	L699985-06	WG722130
Fluoride	mg/l	5.09	4.68	102.	80-120	8.39	20	L699985-06	WG722130
Nitrate	mg/l	5.59	5.57	98.2	80-120	0.358	20	L699985-06	WG722130
Nitrite	mg/l	5.11	5.05	102.	80-120	1.18	20	L699985-06	WG722130
Sulfate	mg/l	123.	123.	90.0	80-120	0.0	20	L699985-06	WG722130
Ammonia Nitrogen	mg/l	9.36	9.51	93.6	90-110	1.59	20	L699985-02	WG722371
Alkalinity	mg/l	290.	300.	90.0	80-120	3.39	20	L699985-02	WG722334
Hardness, Total (mg/L as CaCO3)	mg/l	206.	207.	74.3*	80-120	0.484	20	L699884-04	WG722556
Iron,Dissolved	mg/l	1.07	1.07	107.	75-125	1.00	20	L699797-13	WG722683
Potassium,Dissolved	mg/l	12.1	12.1	106.	75-125	0.0	20	L699797-13	WG722683
Benzene	mg/l	0.260	0.274	5.83*	57.2-131	5.28	20	L699473-07	WG722193
Ethylbenzene	mg/l	0.213	0.225	41.1*	67.5-135	5.32	20	L699473-07	WG722193
Toluene	mg/l	0.109	0.115	55.6*	63.7-134	4.91	20	L699473-07	WG722193
Total Xylene	mg/l	0.347	0.363	67.2	65.9-138	4.72	20	L699473-07	WG722193
a,a,a-Trifluorotoluene(PID)				99.20	55-122				WG722193
Benzene	mg/l	0.0454	0.0464	90.6	57.2-131	2.19	20	L700604-06	WG722308
Ethylbenzene	mg/l	0.0441	0.0449	88.0	67.5-135	1.82	20	L700604-06	WG722308
Toluene	mg/l	0.0450	0.0459	90.0	63.7-134	2.01	20	L700604-06	WG722308
Total Xylene	mg/l	0.136	0.138	90.2	65.9-138	1.50	20	L700604-06	WG722308
a,a,a-Trifluorotoluene(PID)				97.30	55-122				WG722308

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref	Samp	Batch
			Ref	%Rec						
Arsenic, Dissolved	mg/l	0.0577	0.0570	108.	75-125	1.00	20	L699985-10	WG722684	
Chromium, Dissolved	mg/l	0.0491	0.0490	103.	75-125	0.0	20	L699985-10	WG722684	
Copper, Dissolved	mg/l	0.0522	0.0519	101.	75-125	0.0	20	L699985-10	WG722684	
Lead, Dissolved	mg/l	0.0514	0.0509	102.	75-125	1.00	20	L699985-10	WG722684	
Manganese, Dissolved	mg/l	0.0526	0.0524	103.	75-125	0.0	20	L699985-10	WG722684	
Nickel, Dissolved	mg/l	0.0519	0.0509	100.	75-125	2.00	20	L699985-10	WG722684	
Selenium, Dissolved	mg/l	0.0565	0.0567	110.	75-125	0.0	20	L699985-10	WG722684	
Zinc, Dissolved	mg/l	0.0568	0.0559	108.	75-125	2.00	20	L699985-10	WG722684	
Barium, Dissolved	mg/l	0.156	0.156	113.	75-125	0.0	20	L699985-10	WG722684	
Nitrate-Nitrite	mg/l	10.7	10.7	108.	90-110	0.0	20	L699912-02	WG722820	

Post Spike

Serial Dilution

Batch number /Run number / Sample number cross reference

WG721832: R2925372: L699985-07 08 09
WG722130: R2925506: L699985-01 02 03 04 05 06 10
WG722033: R2926488: L699985-01 02 03 04 05 06 07 08 09 10
WG722371: R2926547: L699985-01 02 03 04 05 06 07 08 09 10
WG722334: R2926576: L699985-01 02 03 04 05 06 07 08 09 10
WG722556: R2927127: L699985-01 02 03 04 05 06 07 08 09 10
WG722683: R2927246: L699985-01 02 03 04 05 06 07 08 09 10
WG722193: R2927269: L699985-01 02 03 04 05
WG722365: R2927394: L699985-07 08 09

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WG722034: R2927396: L699985-01 02 03 04 05 06 10
WG723089: R2928182: L699985-01 02 03 04 05 06 07 08 09 10
WG722308: R2928534: L699985-06 07 08 09 10
WG722684: R2928645: L699985-01 02 03 04 05 06 07 08 09 10
WG722820: R2929385: L699985-01 02 03 04 05 06 07 08 09 10

* * Calculations are performed prior to rounding of reported values.

* Performance of this Analyte is outside of established criteria.

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The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Nicholson GeoSolutions, LLC

3433 East Lake Drive
Centennial, CO 80121

Groundwater Monitoring Report for the 29-17 Injection Well Site, Fall 2014

Introduction

Nicholson GeoSolutions LLC conducted groundwater monitoring near the 29-17 injection well site (the O-29 well pad) on October 5th, 2014. For this monitoring event, field parameters were measured and water quality samples were collected at Spring 29-1, downgradient from the injection well site, and at surface water monitoring location LC-1 on Little Creek above Garden Gulch Road. These two locations are sampled semi-annually to provide groundwater monitoring for the 29-17 injection well permit.

Background

A walking survey of Little Creek was previously performed below Garden Gulch Road to look for groundwater springs that could be used to monitor shallow groundwater below the injection well site. Two springs (29-1 and 29-2) were located below Garden Gulch Road. Spring 29-1 has been sampled semi-annually since the fall of 2012. Spring 29-2 provides insufficient flow for sampling.

Surface water monitoring station LC-1 is located on Little Creek above Garden Gulch Road. This monitoring station is downgradient of the injection well site and the pipeline right-of-way that is located just north of the well pad. Previous sampling has shown that this location is in communication with groundwater that flows down the pipeline trench into Little Creek, and thus is an appropriate groundwater monitoring location for the 29-17 injection well.

Data Review

A data review was conducted using the quality assurance report supplied by the laboratory and standard EPA data validation guidelines. All analyses were conducted within the recommended holding times, except for nitrite. Nitrite was reported as not detected and qualified as estimated "UJ" for both samples. All method blank results were reported as not detected. All laboratory control sample (LCS), laboratory duplicate, surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries were within the laboratory control limits, except for alkalinity (MS = 70.0%, MSD = 74.0%), and ammonia (MSD = 84.9%). Alkalinity results were qualified as estimated "J". All ammonia results were reported as not detected and qualified as not detected at an estimated detection limit "UJ". All results are usable for all intended purposes (no results were rejected).

Results

Table 1 summarizes the field parameters and laboratory analytical results for the samples collected for the fall 2014 monitoring event. The laboratory analytical report is attached. All results are below the associated Federal and Colorado aquatic life standards, except for aluminum, iron, and manganese for Spring 29-1. Aluminum (1,700 µg/l) exceeded the aquatic standard of 750 µg/l, and iron (2,300 µg/l) and manganese (110 µg/l) exceeded the secondary drinking water standards of 300 µg/l and 50 µg/l, respectively for this spring. In addition, the detection limit for ammonia is above the standard for both samples. No petroleum constituents were detected in either sample.

The estimated flow for spring 29-1 was very low at 0.1 gallons per minute. Elevated concentrations of metals have occasionally been detected in other Garden Gulch springs during low-flow conditions and result from natural processes. The remaining analytical results are typical of natural water quality in the area.

Sincerely,

A handwritten signature in blue ink that reads "DK Nicholson". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

David K. Nicholson, P.G.
Nicholson GeoSolutions LLC

Table 1 29-17 Groundwater Monitoring Results, October 5th, 2014

Parameter	Standards		Sample ID and Date	
	Colorado Aquatic Life Standards ³	EPA Drinking Water Standards	LC-1 (Oct 5, 2014)	Spring 29-1 (Oct, 2014)
Field Parameters				
specific conductance (µS/cm)			767	739
pH (standard units)	6.5-9.0	6.5-8.5 ²	7.78	7.54
temperature (°C)			10.8	11.0
estimated flow			0.25 cfs	0.1 gpm
General Water Quality Parameters				
total alkalinity (mg/L)			300 J	270 J
total hardness (mg/l)			270	320
TDS (mg/l)		500 ²	420	460
TSS (mg/l)	90		5.0	NA
Organic Constituents				
benzene (µg/l)	5,300	5 ¹	<0.5	<0.5
toluene (µg/l)	17,500	1000 ¹	<5	<5
ethylbenzene (µg/l)	32,000	700 ¹	<0.5	<0.5
xylene (µg/l)	C ⁴	10,000 ¹	<1.5	<1.5
methane (µg/l)			<10	<10
ethane (µg/l)			<13	<13
ethene (µg/l)			<13	<13
Major Cations and Anions				
calcium (mg/l)			74	80
magnesium (mg/l)			30	34
potassium (mg/l)			<1.0	<1.0
sodium (mg/l)			49	49
chloride (mg/l)		250 ²	18	17
fluoride (mg/l)		4 ¹ , 2 ²	0.16	0.16
nitrate (mg/l)		10 ¹	<0.1	2.2
nitrite (mg/l)		1 ¹	<0.1 UJ	<0.1 UJ
sulfate (mg/l)		250 ²	59	150
ammonia (mg/l)	0.02 ⁵		<0.25 UJ	<0.25 UJ
Trace Metals				
aluminum (µg/l)	750		<100	1,400
arsenic (µg/l)	340	10 ¹	2.2	3.5
barium (µg/l)		2000 ¹	130	160
boron (µg/l)			<200	<200
chromium (µg/l)	1,773 ⁶	100 ¹	<2	<2
copper (µg/l)	50 ⁶	1300 ¹ , 1000 ²	<2	<2
iron (µg/l)		300 ²	<100	2,300
lead (µg/l)	281 ⁶	15 ¹	<1	<1
manganese (µg/l)	4,738 ⁶	50 ²	11	110
nickel (µg/l)	1,513 ⁶		<1	1.0
selenium (µg/l)	18.4	50 ¹	1.2	<1
zinc (µg/l)	379 ⁶	5000 ²	<10	14

Values in bold type exceed standards J = Estimated concentration UJ = Estimated detection limit NA = Not analyzed
 mg/l = milligrams per liter; ug/l = micrograms per liter; cfs = cubic feet per minute; gpm = gallons per minute;

uS/cm = microSiemens per centimeter ¹Federal Drinking Water Maximum Contaminant Level (MCL)

²Federal Drinking Water Secondary Standard

³Chronic aquatic life standard (Colorado Water Quality Standards, 5 CCR 1002-31).

⁴Carcinogenic compounds as classified by the EPA

⁵Chronic. Acute ammonia standard calculated based on 0.43/FT/FPH/2, where FT = acute temperature adjustment and FPH = acute pH adjustment. ⁶Aquatic standard is hardness dependent. Values shown are for a hardness of 400 mg/L

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APPENDIX A
Laboratory Report

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Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Monday October 20, 2014

Report Number: L725895

Samples Received: 10/07/14

Client Project:

Description: Garden Gulch Pits

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140, NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

October 20, 2014

Date Received : October 07, 2014
Description : Garden Gulch Pits
Sample ID : LC-1
Collected By : DK Nicholson
Collection Date : 10/05/14 12:00

ESC Sample # : L725895-05

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	18.	1.0	mg/l	9056MOD	10/08/14	1
Fluoride	0.16	0.10	mg/l	9056MOD	10/08/14	1
Nitrate	BDL	0.10	mg/l	9056MOD	10/08/14	1
Nitrite	BDL	0.10	mg/l	9056MOD	10/08/14	1
Sulfate	59.	5.0	mg/l	9056MOD	10/08/14	1
Alkalinity	300	20.	mg/l	2320 B-2011	10/12/14	1
Methane	BDL	0.010	mg/l	RSK175	10/13/14	1
Ethane	BDL	0.013	mg/l	RSK175	10/13/14	1
Ethene	BDL	0.013	mg/l	RSK175	10/13/14	1
Hardness, Total (mg/L as CaCO3)	270	150	mg/l	130.1	10/10/14	5
Ammonia Nitrogen	BDL	0.25	mg/l	350.1	10/09/14	1
Dissolved Solids	420	10.	mg/l	2540 C-2011	10/09/14	1
Suspended Solids	5.0	2.5	mg/l	2540 D-2011	10/10/14	1
Arsenic,Dissolved	0.0022	0.0010	mg/l	6020	10/09/14	1
Chromium,Dissolved	BDL	0.0020	mg/l	6020	10/09/14	1
Copper,Dissolved	BDL	0.0020	mg/l	6020	10/09/14	1
Lead,Dissolved	BDL	0.0010	mg/l	6020	10/09/14	1
Nickel,Dissolved	BDL	0.0010	mg/l	6020	10/09/14	1
Selenium,Dissolved	0.0012	0.0010	mg/l	6020	10/09/14	1
Zinc,Dissolved	BDL	0.010	mg/l	6020	10/09/14	1
Aluminum,Dissolved	BDL	0.10	mg/l	6010B	10/08/14	1
Barium,Dissolved	0.13	0.0050	mg/l	6010B	10/08/14	1
Boron,Dissolved	BDL	0.20	mg/l	6010B	10/08/14	1
Calcium,Dissolved	74.	1.0	mg/l	6010B	10/08/14	1
Iron,Dissolved	BDL	0.10	mg/l	6010B	10/08/14	1
Magnesium,Dissolved	30.	1.0	mg/l	6010B	10/08/14	1
Manganese,Dissolved	0.011	0.010	mg/l	6010B	10/08/14	1
Potassium,Dissolved	BDL	1.0	mg/l	6010B	10/08/14	1
Sodium,Dissolved	49.	1.0	mg/l	6010B	10/08/14	1
Benzene	BDL	0.00050	mg/l	8021B	10/11/14	1
Toluene	BDL	0.0050	mg/l	8021B	10/11/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	10/11/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	10/11/14	1
Surrogate Recovery(%) a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021B	10/11/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 10/20/14 10:55 Printed: 10/20/14 10:55



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Est. 1970

REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

October 20, 2014

Date Received : October 07, 2014
Description : Garden Gulch Pits
Sample ID : 29-1
Collected By : DK Nicholson
Collection Date : 10/05/14 12:20

ESC Sample # : L725895-06

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	17.	1.0	mg/l	9056MOD	10/08/14	1
Fluoride	0.16	0.10	mg/l	9056MOD	10/08/14	1
Nitrate	2.2	0.10	mg/l	9056MOD	10/08/14	1
Nitrite	0.12	0.10	mg/l	9056MOD	10/08/14	1
Sulfate	150	10.	mg/l	9056MOD	10/10/14	2
Alkalinity	270	20.	mg/l	2320 B-2011	10/12/14	1
Methane	BDL	0.010	mg/l	RSK175	10/13/14	1
Ethane	BDL	0.013	mg/l	RSK175	10/13/14	1
Ethene	BDL	0.013	mg/l	RSK175	10/13/14	1
Hardness, Total (mg/L as CaCO3)	320	150	mg/l	130.1	10/10/14	5
Ammonia Nitrogen	BDL	0.25	mg/l	350.1	10/09/14	1
Dissolved Solids	460	10.	mg/l	2540 C-2011	10/09/14	1
Arsenic, Dissolved	0.0035	0.0010	mg/l	6020	10/09/14	1
Chromium, Dissolved	BDL	0.0020	mg/l	6020	10/09/14	1
Copper, Dissolved	BDL	0.0020	mg/l	6020	10/09/14	1
Lead, Dissolved	BDL	0.0010	mg/l	6020	10/09/14	1
Nickel, Dissolved	0.0010	0.0010	mg/l	6020	10/09/14	1
Selenium, Dissolved	BDL	0.0010	mg/l	6020	10/09/14	1
Zinc, Dissolved	0.014	0.010	mg/l	6020	10/09/14	1
Aluminum, Dissolved	1.4	0.10	mg/l	6010B	10/08/14	1
Barium, Dissolved	0.16	0.0050	mg/l	6010B	10/08/14	1
Boron, Dissolved	BDL	0.20	mg/l	6010B	10/08/14	1
Calcium, Dissolved	80.	1.0	mg/l	6010B	10/08/14	1
Iron, Dissolved	2.3	0.10	mg/l	6010B	10/08/14	1
Magnesium, Dissolved	34.	1.0	mg/l	6010B	10/08/14	1
Manganese, Dissolved	0.11	0.010	mg/l	6010B	10/08/14	1
Potassium, Dissolved	BDL	1.0	mg/l	6010B	10/08/14	1
Sodium, Dissolved	49.	1.0	mg/l	6010B	10/08/14	1
Benzene	BDL	0.00050	mg/l	8021B	10/11/14	1
Toluene	BDL	0.0050	mg/l	8021B	10/11/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	10/11/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	10/11/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021B	10/11/14	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit(PQL)

Note:

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Reported: 10/20/14 10:55 Printed: 10/20/14 10:56

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L725895-01	WG747190	SAMP	Copper, Dissolved	R2996020	B
L725895-02	WG747236	SAMP	Ammonia Nitrogen	R2996654	J6
L725895-08	WG748166	SAMP	Alkalinity	R2997299	J6

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
B	(EPA) - The indicated compound was found in the associated method blank as well as the laboratory sample.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods, it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

- Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.
- Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Difference.
- Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromatography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.
- TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
10/20/14 at 10:56:03

TSR Signing Reports: 134
R5 - Desired TAT

Always log As, Cd, Cr, Cu, Ni, Pb, Se, Ag, & Zn GW by 6020 Log all PAHs by 8270-SIM

Sample: L725895-01 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55
UNV789885 - MB 10/17

Sample: L725895-02 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-03 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-04 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-05 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-06 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-07 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55

Sample: L725895-08 Account: BERPETDCO Received: 10/07/14 09:00 Due Date: 10/20/14 00:00 RPT Date: 10/20/14 10:55



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Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Chloride	< 1	mg/l			WG747078	10/07/14 09:38
Nitrate	< .1	mg/l			WG747078	10/07/14 09:38
Nitrite	< .1	mg/l			WG747078	10/07/14 09:38
Sulfate	< 5	mg/l			WG747078	10/07/14 09:38
Arsenic,Dissolved	< .001	mg/l			WG747190	10/08/14 11:08
Chromium,Dissolved	< .002	mg/l			WG747190	10/08/14 11:08
Copper,Dissolved	< .002	mg/l			WG747190	10/08/14 11:08
Lead,Dissolved	< .001	mg/l			WG747190	10/08/14 11:08
Nickel,Dissolved	< .001	mg/l			WG747190	10/08/14 11:08
Selenium,Dissolved	< .001	mg/l			WG747190	10/08/14 11:08
Zinc,Dissolved	< .01	mg/l			WG747190	10/08/14 11:08
Aluminum,Dissolved	< .1	mg/l			WG747191	10/08/14 18:21
Barium,Dissolved	< .005	mg/l			WG747191	10/08/14 18:21
Boron,Dissolved	< .2	mg/l			WG747191	10/08/14 18:21
Calcium,Dissolved	< 1	mg/l			WG747191	10/08/14 18:21
Iron,Dissolved	< .1	mg/l			WG747191	10/08/14 18:21
Magnesium,Dissolved	< 1	mg/l			WG747191	10/08/14 18:21
Manganese,Dissolved	< .01	mg/l			WG747191	10/08/14 18:21
Potassium,Dissolved	< 1	mg/l			WG747191	10/08/14 18:21
Sodium,Dissolved	< 1	mg/l			WG747191	10/08/14 18:21
Chloride	< 1	mg/l			WG746824	10/08/14 18:24
Fluoride	< .1	mg/l			WG746824	10/08/14 18:24
Nitrate	< .1	mg/l			WG746824	10/08/14 18:24
Nitrite	< .1	mg/l			WG746824	10/08/14 18:24
Sulfate	< 5	mg/l			WG746824	10/08/14 18:24
Suspended Solids	< 2.5	mg/l			WG747276	10/09/14 10:14
Arsenic,Dissolved	< .001	mg/l			WG747381	10/09/14 12:06
Chromium,Dissolved	< .002	mg/l			WG747381	10/09/14 12:06
Copper,Dissolved	< .002	mg/l			WG747381	10/09/14 12:06
Lead,Dissolved	< .001	mg/l			WG747381	10/09/14 12:06
Nickel,Dissolved	< .001	mg/l			WG747381	10/09/14 12:06
Selenium,Dissolved	< .001	mg/l			WG747381	10/09/14 12:06
Zinc,Dissolved	< .01	mg/l			WG747381	10/09/14 12:06
Ethane	< .013	mg/l			WG747663	10/09/14 12:41
Ethene	< .013	mg/l			WG747663	10/09/14 12:41
Methane	< .01	mg/l			WG747663	10/09/14 12:41
Dissolved Solids	< 10	mg/l			WG747277	10/09/14 16:05
Dissolved Solids	< 10	mg/l			WG747279	10/09/14 16:14
Suspended Solids	< 2.5	mg/l			WG747487	10/10/14 10:00

* Performance of this Analyte is outside of established criteria.

For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'



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October 20, 2014

Analyte	Result	Laboratory Blank		Limit	Batch	Date Analyzed
		Units	% Rec			
Hardness, Total (mg/L as CaCO ₃)	< 30	mg/l			WG747412	10/10/14 09:12
Ammonia Nitrogen	< .25	mg/l			WG747235	10/09/14 12:18
Ammonia Nitrogen	< .25	mg/l			WG747236	10/09/14 13:46
Alkalinity	< 20	mg/l			WG747842	10/10/14 07:55
Dissolved Solids	< 10	mg/l			WG747492	10/10/14 15:35
Sulfate	< 5	mg/l			WG747676	10/10/14 14:41
Benzene	< .0005	mg/l			WG747398	10/11/14 15:14
Ethylbenzene	< .0005	mg/l			WG747398	10/11/14 15:14
Toluene	< .005	mg/l			WG747398	10/11/14 15:14
Total Xylene	< .0015	mg/l			WG747398	10/11/14 15:14
a,a,a-Trifluorotoluene(PID)		% Rec.	101.0	55-122	WG747398	10/11/14 15:14
Ethane	< .013	mg/l			WG748311	10/13/14 15:30
Ethene	< .013	mg/l			WG748311	10/13/14 15:30
Methane	< .01	mg/l			WG748311	10/13/14 15:30
Alkalinity	< 20	mg/l			WG748166	10/12/14 12:59
Hardness, Total (mg/L as CaCO ₃)	< 30	mg/l			WG748514	10/16/14 10:53
Arsenic,Dissolved	< .001	mg/l			WG749336	10/19/14 22:20
Chromium,Dissolved	< .002	mg/l			WG749336	10/19/14 22:20
Copper,Dissolved	< .002	mg/l			WG749336	10/19/14 22:20
Lead,Dissolved	< .001	mg/l			WG749336	10/19/14 22:20
Nickel,Dissolved	< .001	mg/l			WG749336	10/19/14 22:20
Selenium,Dissolved	< .001	mg/l			WG749336	10/19/14 22:20
Zinc,Dissolved	< .01	mg/l			WG749336	10/19/14 22:20

Analyte	Units	Duplicate		RPD	Limit	Ref Samp	Batch
		Result	Duplicate				
Nitrate	mg/l	3.40	3.23	5.00	20	L725830-02	WG747078
Nitrite	mg/l	0.0	0.0	0.0	20	L725830-02	WG747078
Nitrate	mg/l	1.00	1.02	0.0	20	L725889-01	WG747078
Nitrite	mg/l	0.0	0.0	0.0	20	L725889-01	WG747078
Chloride	mg/l	120.	119.	1.00	20	L725747-05	WG746824
Nitrate	mg/l	17.0	17.4	0.0	20	L725747-05	WG746824
Chloride	mg/l	18.0	18.0	1.00	20	L725895-05	WG746824
Fluoride	mg/l	0.150	0.157	3.00	20	L725895-05	WG746824
Nitrate	mg/l	0.0	0.0	0.0	20	L725895-05	WG746824
Nitrite	mg/l	0.0	0.0	0.0	20	L725895-05	WG746824

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Analyte	Units	Result	Duplicate		RPD	Limit	Ref Samp	Batch
			Duplicate	Duplicate				
Sulfate	mg/l	60.0	59.4	0.0	20	L725895-05	WG746824	
Suspended Solids	mg/l	182.	190.	4.04	5	L725895-01	WG747276	
Suspended Solids	mg/l	49.0	51.0	4.00	5	L726050-01	WG747276	
Dissolved Solids	mg/l	423.	417.	1.43	5	L725895-02	WG747277	
Dissolved Solids	mg/l	485.	466.	4.00	5	L725850-02	WG747279	
Suspended Solids	mg/l	1760	1720	2.30	5	L725888-05	WG747487	
Suspended Solids	mg/l	49.5	49.0	1.02	5	L726096-01	WG747487	
Ammonia Nitrogen	mg/l	0.440	0.440	0.0	20	L725849-01	WG747235	
Hardness, Total (mg/L as CaCO3)	mg/l	55.0	57.2	3.92	20	L725937-02	WG747412	
Hardness, Total (mg/L as CaCO3)	mg/l	240.	240.	0.0	20	L725888-01	WG747412	
Ammonia Nitrogen	mg/l	2.60	2.60	0.0	20	L725956-02	WG747236	
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L725792-01	WG747236	
Alkalinity	mg/l	0.0	0.0	0.0	20	L725878-01	WG747842	
Dissolved Solids	mg/l	559.	580.	3.69	5	L725895-08	WG747492	
Sulfate	mg/l	150.	152.	0.0	20	L725895-06	WG747676	
Sulfate	mg/l	47.0	46.5	0.0	20	L725990-06	WG747676	
Ammonia Nitrogen	mg/l	0.0	0.0	0.0	20	L725888-04	WG747235	
Alkalinity	mg/l	280.	280.	1.80	20	L725895-02	WG748166	
Alkalinity	mg/l	130.	130.	3.13	20	L725952-01	WG748166	
Hardness, Total (mg/L as CaCO3)	mg/l	50.0	54.3	8.25	20	L727139-01	WG748514	
Hardness, Total (mg/L as CaCO3)	mg/l	52.0	53.6	3.03	20	L727246-01	WG748514	

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Chloride	mg/l	40	39.3	98.0	90-110	WG747078
Nitrate	mg/l	8	8.34	104.	90-110	WG747078
Nitrite	mg/l	8	8.02	100.	90-110	WG747078
Sulfate	mg/l	40	39.5	99.0	90-110	WG747078
Arsenic, Dissolved	mg/l	.05	0.0468	94.0	85-115	WG747190
Chromium, Dissolved	mg/l	.05	0.0507	101.	85-115	WG747190

* Performance of this Analyte is outside of established criteria.

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Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Copper,Dissolved	mg/l	.05	0.0523	105.	85-115	WG747190
Lead,Dissolved	mg/l	.05	0.0519	104.	85-115	WG747190
Nickel,Dissolved	mg/l	.05	0.0512	102.	85-115	WG747190
Selenium,Dissolved	mg/l	.05	0.0519	104.	85-115	WG747190
Zinc,Dissolved	mg/l	.05	0.0509	102.	85-115	WG747190
Aluminum,Dissolved	mg/l	1	1.03	103.	80-120	WG747191
Barium,Dissolved	mg/l	1	1.05	105.	80-120	WG747191
Boron,Dissolved	mg/l	1	0.998	100.	80-120	WG747191
Calcium,Dissolved	mg/l	10	10.6	106.	80-120	WG747191
Iron,Dissolved	mg/l	1	1.03	103.	80-120	WG747191
Magnesium,Dissolved	mg/l	10	10.9	109.	80-120	WG747191
Manganese,Dissolved	mg/l	1	1.03	103.	80-120	WG747191
Potassium,Dissolved	mg/l	10	11.0	110.	80-120	WG747191
Sodium,Dissolved	mg/l	10	10.8	108.	80-120	WG747191
Chloride	mg/l	40	39.4	99.0	90-110	WG746824
Fluoride	mg/l	8	7.85	98.0	90-110	WG746824
Nitrate	mg/l	8	8.39	105.	90-110	WG746824
Nitrite	mg/l	8	8.18	102.	90-110	WG746824
Sulfate	mg/l	40	38.9	97.0	90-110	WG746824
Suspended Solids	mg/l	773	844.	109.	85-115	WG747276
Arsenic,Dissolved	mg/l	.05	0.0458	92.0	85-115	WG747381
Chromium,Dissolved	mg/l	.05	0.0508	102.	85-115	WG747381
Copper,Dissolved	mg/l	.05	0.0510	102.	85-115	WG747381
Lead,Dissolved	mg/l	.05	0.0512	102.	85-115	WG747381
Nickel,Dissolved	mg/l	.05	0.0506	101.	85-115	WG747381
Selenium,Dissolved	mg/l	.05	0.0461	92.0	85-115	WG747381
Zinc,Dissolved	mg/l	.05	0.0485	97.0	85-115	WG747381
Ethane	mg/l	.129	0.121	93.9	85-115	WG747663
Ethene	mg/l	.127	0.120	94.2	85-115	WG747663
Methane	mg/l	.0678	0.0716	106.	85-115	WG747663
Dissolved Solids	mg/l	8800	8730	99.2	85-115	WG747277
Dissolved Solids	mg/l	8800	8820	100.	85-115	WG747279
Suspended Solids	mg/l	773	864.	112.	85-115	WG747487
Hardness, Total (mg/L as CaCO3)	mg/l	200	207.	104.	85-115	WG747412
Ammonia Nitrogen	mg/l	7.5	7.29	97.2	90-110	WG747235
Ammonia Nitrogen	mg/l	7.5	7.15	95.3	90-110	WG747236

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Est. 1970

October 20, 2014

Analyte	Units	Laboratory Control Sample		% Rec	Limit	Batch
		Known Val	Result			
Alkalinity	mg/l	100	100.	100.	85-115	WG747842
Dissolved Solids	mg/l	8800	8530	96.9	85-115	WG747492
Sulfate	mg/l	40	39.8	100.	90-110	WG747676
Benzene	mg/l	.05	0.0427	85.3	70-130	WG747398
Ethylbenzene	mg/l	.05	0.0464	92.9	70-130	WG747398
Toluene	mg/l	.05	0.0461	92.1	70-130	WG747398
Total Xylene	mg/l	.15	0.142	95.0	70-130	WG747398
a,a,a-Trifluorotoluene(PID)				101.0	55-122	WG747398
Ethane	mg/l	.129	0.125	97.2	85-115	WG748311
Ethene	mg/l	.127	0.122	96.1	85-115	WG748311
Methane	mg/l	.0678	0.0682	101.	85-115	WG748311
Alkalinity	mg/l	100	110.	110.	85-115	WG748166
Hardness, Total (mg/L as CaCO3)	mg/l	200	205.	103.	85-115	WG748514
Arsenic,Dissolved	mg/l	.05	0.0439	88.0	85-115	WG749336
Chromium,Dissolved	mg/l	.05	0.0433	87.0	85-115	WG749336
Copper,Dissolved	mg/l	.05	0.0441	88.0	85-115	WG749336
Lead,Dissolved	mg/l	.05	0.0439	88.0	85-115	WG749336
Nickel,Dissolved	mg/l	.05	0.0434	87.0	85-115	WG749336
Selenium,Dissolved	mg/l	.05	0.0432	86.0	85-115	WG749336
Zinc,Dissolved	mg/l	.05	0.0434	87.0	85-115	WG749336

Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Chloride	mg/l	39.3	39.3	98.0	90-110	0.0	20	WG747078
Nitrate	mg/l	8.34	8.34	104.	90-110	0.0	20	WG747078
Nitrite	mg/l	8.05	8.02	101.	90-110	0.0	20	WG747078
Sulfate	mg/l	39.2	39.5	98.0	90-110	1.00	20	WG747078
Arsenic,Dissolved	mg/l	0.0500	0.0468	100.	85-115	7.00	20	WG747190
Chromium,Dissolved	mg/l	0.0524	0.0507	105.	85-115	3.00	20	WG747190
Copper,Dissolved	mg/l	0.0542	0.0523	108.	85-115	4.00	20	WG747190
Lead,Dissolved	mg/l	0.0536	0.0519	107.	85-115	3.00	20	WG747190
Nickel,Dissolved	mg/l	0.0526	0.0512	105.	85-115	3.00	20	WG747190
Selenium,Dissolved	mg/l	0.0511	0.0519	102.	85-115	2.00	20	WG747190
Zinc,Dissolved	mg/l	0.0528	0.0509	106.	85-115	4.00	20	WG747190
Aluminum,Dissolved	mg/l	1.02	1.03	102.	80-120	1.00	20	WG747191
Barium,Dissolved	mg/l	1.04	1.05	104.	80-120	1.00	20	WG747191
Boron,Dissolved	mg/l	1.01	0.998	100.	80-120	1.00	20	WG747191
Calcium,Dissolved	mg/l	10.6	10.6	106.	80-120	1.00	20	WG747191
Iron,Dissolved	mg/l	1.03	1.03	103.	80-120	0.0	20	WG747191

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Magnesium,Dissolved	mg/l	10.8	10.9	108.	80-120	1.00	20	WG747191
Manganese,Dissolved	mg/l	1.03	1.03	103.	80-120	1.00	20	WG747191
Potassium,Dissolved	mg/l	11.0	11.0	110.	80-120	0.0	20	WG747191
Sodium,Dissolved	mg/l	10.9	10.8	109.	80-120	1.00	20	WG747191
Chloride	mg/l	39.4	39.4	98.0	90-110	0.0	20	WG746824
Fluoride	mg/l	7.86	7.85	98.0	90-110	0.0	20	WG746824
Nitrate	mg/l	8.37	8.39	105.	90-110	0.0	20	WG746824
Nitrite	mg/l	8.21	8.18	102.	90-110	0.0	20	WG746824
Sulfate	mg/l	39.0	38.9	97.0	90-110	0.0	20	WG746824
Suspended Solids	mg/l	852.	844.	110.	85-115	0.943	5	WG747276
Arsenic,Dissolved	mg/l	0.0476	0.0458	95.0	85-115	4.00	20	WG747381
Chromium,Dissolved	mg/l	0.0534	0.0508	107.	85-115	5.00	20	WG747381
Copper,Dissolved	mg/l	0.0528	0.0510	106.	85-115	4.00	20	WG747381
Lead,Dissolved	mg/l	0.0537	0.0512	107.	85-115	5.00	20	WG747381
Nickel,Dissolved	mg/l	0.0535	0.0506	107.	85-115	6.00	20	WG747381
Selenium,Dissolved	mg/l	0.0471	0.0461	94.0	85-115	2.00	20	WG747381
Zinc,Dissolved	mg/l	0.0507	0.0485	101.	85-115	4.00	20	WG747381
Ethane	mg/l	0.121	0.121	94.0	85-115	0.0100	20	WG747663
Ethene	mg/l	0.120	0.120	94.0	85-115	0.0900	20	WG747663
Methane	mg/l	0.0653	0.0716	96.0	85-115	9.20	20	WG747663
Dissolved Solids	mg/l	8750	8730	99.0	85-115	0.229	5	WG747277
Dissolved Solids	mg/l	8610	8820	98.0	85-115	2.41	5	WG747279
Suspended Solids	mg/l	864.	864.	112.	85-115	0.00	5	WG747487
Hardness, Total (mg/L as CaCO3)	mg/l	205.	207.	102.	85-115	0.971	20	WG747412
Ammonia Nitrogen	mg/l	7.30	7.29	97.0	90-110	0.137	20	WG747235
Ammonia Nitrogen	mg/l	7.28	7.15	97.0	90-110	1.80	20	WG747236
Alkalinity	mg/l	100.	100.	100.	85-115	0.0	20	WG747842
Dissolved Solids	mg/l	8690	8530	99.0	85-115	1.86	5	WG747492
Sulfate	mg/l	39.7	39.8	99.0	90-110	0.0	20	WG747676
Benzene	mg/l	0.0425	0.0427	85.0	70-130	0.310	20	WG747398
Ethylbenzene	mg/l	0.0460	0.0464	92.0	70-130	0.870	20	WG747398

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Analyte	Units	Laboratory Control Sample Duplicate			Limit	RPD	Limit	Batch
		Result	Ref	%Rec				
Toluene	mg/l	0.0457	0.0461	91.0	70-130	0.810	20	WG747398
Total Xylene	mg/l	0.141	0.142	94.0	70-130	0.980	20	WG747398
a,a,a-Trifluorotoluene(PID)				101.0	55-122			WG747398
Ethane	mg/l	0.132	0.125	102.	85-115	4.82	20	WG748311
Ethene	mg/l	0.128	0.122	101.	85-115	5.02	20	WG748311
Methane	mg/l	0.0708	0.0682	104.	85-115	3.81	20	WG748311
Alkalinity	mg/l	93.0	110.	93.0	85-115	16.7	20	WG748166
Hardness, Total (mg/L as CaCO3)	mg/l	205.	205.	102.	85-115	0.0	20	WG748514
Arsenic,Dissolved	mg/l	0.0428	0.0439	86.0	85-115	3.00	20	WG749336
Chromium,Dissolved	mg/l	0.0432	0.0433	86.0	85-115	0.0	20	WG749336
Copper,Dissolved	mg/l	0.0428	0.0441	86.0	85-115	3.00	20	WG749336
Lead,Dissolved	mg/l	0.0424	0.0439	85.0	85-115	3.00	20	WG749336
Nickel,Dissolved	mg/l	0.0427	0.0434	85.0	85-115	2.00	20	WG749336
Selenium,Dissolved	mg/l	0.0437	0.0432	87.0	85-115	1.00	20	WG749336
Zinc,Dissolved	mg/l	0.0429	0.0434	86.0	85-115	1.00	20	WG749336

Analyte	Units	Matrix Spike			% Rec	Limit	Ref Samp	Batch
		MS Res	Ref Res	TV				
Nitrate	mg/l	5.37	0.261	5	100.	80-120	L725793-01	WG747078
Nickel,Dissolved	mg/l	0.0873	0.0395	.05	96.0	75-125	L724344-01	WG747190
Barium,Dissolved	mg/l	1.10	0.0283	1	110.	75-125	L725049-01	WG747191
Chloride	mg/l	92.3	43.4	50	98.0	80-120	L725747-01	WG746824
Nitrate	mg/l	8.57	3.58	5	100.	80-120	L725747-01	WG746824
Arsenic,Dissolved	mg/l	0.0502	0.00218	.05	96.0	75-125	L725895-05	WG747381
Chromium,Dissolved	mg/l	0.0481	0.00100	.05	94.0	75-125	L725895-05	WG747381
Copper,Dissolved	mg/l	0.0487	0.000937	.05	96.0	75-125	L725895-05	WG747381
Lead,Dissolved	mg/l	0.0481	0.000141	.05	96.0	75-125	L725895-05	WG747381
Nickel,Dissolved	mg/l	0.0482	0.000556	.05	95.0	75-125	L725895-05	WG747381
Selenium,Dissolved	mg/l	0.0476	0.00118	.05	93.0	75-125	L725895-05	WG747381
Zinc,Dissolved	mg/l	0.0485	0.00491	.05	87.0	75-125	L725895-05	WG747381
Ammonia Nitrogen	mg/l	9.34	0.0	10	93.0	90-110	L725850-01	WG747235
Hardness, Total (mg/L as CaCO3)	mg/l	201.	55.8	150	97.0	80-120	L725937-01	WG747412
Ammonia Nitrogen	mg/l	8.97	0.0	10	90.0*	90-110	L725895-02	WG747236
Alkalinity	mg/l	380.	310.	100	70.0*	80-120	L725850-04	WG747842

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Analyte	Units	MS Res	Matrix Spike		% Rec	Limit	Ref Samp	Batch
			Ref Res	TV				
Sulfate	mg/l	89.7	40.5	50	99.0	80-120	L725990-05	WG747676
Benzene	mg/l	0.0437	0.00385	.05	80.0	57.2-131	L726005-01	WG747398
Ethylbenzene	mg/l	0.0456	0.000783	.05	90.0	67.5-135	L726005-01	WG747398
Toluene	mg/l	0.0418	0.00306	.05	78.0	63.7-134	L726005-01	WG747398
Total Xylene	mg/l	0.138	0.00123	.15	91.0	65.9-138	L726005-01	WG747398
a,a,a-Trifluorotoluene(PID)					97.70	55-122		WG747398
Alkalinity	mg/l	400.	340.	100	60.0*	80-120	L725895-08	WG748166
Hardness, Total (mg/L as CaCO3)	mg/l	199.	50.0	150	99.0	80-120	L726918-01	WG748514
Arsenic,Dissolved	mg/l	0.0493	0.00442	.05	90.0	75-125	L725895-07	WG749336
Chromium,Dissolved	mg/l	0.0441	0.00103	.05	86.0	75-125	L725895-07	WG749336
Copper,Dissolved	mg/l	0.0447	0.00210	.05	85.0	75-125	L725895-07	WG749336
Lead,Dissolved	mg/l	0.0424	0.000130	.05	85.0	75-125	L725895-07	WG749336
Nickel,Dissolved	mg/l	0.0444	0.00273	.05	83.0	75-125	L725895-07	WG749336
Selenium,Dissolved	mg/l	0.0490	0.00161	.05	95.0	75-125	L725895-07	WG749336
Zinc,Dissolved	mg/l	0.0521	0.00786	.05	89.0	75-125	L725895-07	WG749336

Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Nitrate	mg/l	5.35	5.37	102.	80-120	0.0	20	L725793-01	WG747078
Nickel,Dissolved	mg/l	0.0860	0.0873	93.1	75-125	1.00	20	L724344-01	WG747190
Barium,Dissolved	mg/l	1.09	1.10	106.	75-125	1.00	20	L725049-01	WG747191
Chloride	mg/l	91.8	92.3	96.8	80-120	1.00	20	L725747-01	WG746824
Nitrate	mg/l	8.45	8.57	97.4	80-120	1.00	20	L725747-01	WG746824
Arsenic,Dissolved	mg/l	0.0489	0.0502	93.4	75-125	3.00	20	L725895-05	WG747381
Chromium,Dissolved	mg/l	0.0485	0.0481	94.9	75-125	1.00	20	L725895-05	WG747381
Copper,Dissolved	mg/l	0.0477	0.0487	93.6	75-125	2.00	20	L725895-05	WG747381
Lead,Dissolved	mg/l	0.0480	0.0481	95.8	75-125	0.0	20	L725895-05	WG747381
Nickel,Dissolved	mg/l	0.0474	0.0482	93.7	75-125	2.00	20	L725895-05	WG747381
Selenium,Dissolved	mg/l	0.0459	0.0476	89.5	75-125	3.00	20	L725895-05	WG747381
Zinc,Dissolved	mg/l	0.0494	0.0485	89.0	75-125	2.00	20	L725895-05	WG747381
Ammonia Nitrogen	mg/l	8.49	9.34	84.9*	90-110	9.53	20	L725850-01	WG747235
Hardness, Total (mg/L as CaCO3)	mg/l	201.	201.	96.8	80-120	0.0	20	L725937-01	WG747412
Ammonia Nitrogen	mg/l	9.20	8.97	92.0	90-110	2.53	20	L725895-02	WG747236
Alkalinity	mg/l	380.	380.	70.0*	80-120	0.0	20	L725850-04	WG747842

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Analyte	Units	MSD	Matrix Spike Duplicate		Limit	RPD	Limit	Ref Samp	Batch
			Ref	%Rec					
Sulfate	mg/l	89.2	89.7	97.5	80-120	1.00	20	L725990-05	WG747676
Benzene	mg/l	0.0428	0.0437	77.9	57.2-131	2.00	20	L726005-01	WG747398
Ethylbenzene	mg/l	0.0444	0.0456	87.2	67.5-135	2.57	20	L726005-01	WG747398
Toluene	mg/l	0.0409	0.0418	75.7	63.7-134	2.21	20	L726005-01	WG747398
Total Xylene	mg/l	0.135	0.138	89.0	65.9-138	2.54	20	L726005-01	WG747398
a,a,a-Trifluorotoluene(PID)				97.60	55-122				WG747398
Alkalinity	mg/l	400.	400.	60.0*	80-120	0.0	20	L725895-08	WG748166
Hardness, Total (mg/L as CaCO3)	mg/l	200.	199.	100.	80-120	0.501	20	L726918-01	WG748514
Arsenic,Dissolved	mg/l	0.0500	0.0493	91.2	75-125	1.00	20	L725895-07	WG749336
Chromium,Dissolved	mg/l	0.0442	0.0441	86.4	75-125	0.0	20	L725895-07	WG749336
Copper,Dissolved	mg/l	0.0439	0.0447	83.5	75-125	2.00	20	L725895-07	WG749336
Lead,Dissolved	mg/l	0.0426	0.0424	85.0	75-125	1.00	20	L725895-07	WG749336
Nickel,Dissolved	mg/l	0.0439	0.0444	82.3	75-125	1.00	20	L725895-07	WG749336
Selenium,Dissolved	mg/l	0.0493	0.0490	95.3	75-125	1.00	20	L725895-07	WG749336
Zinc,Dissolved	mg/l	0.0525	0.0521	89.3	75-125	1.00	20	L725895-07	WG749336

Post Spike

Serial Dilution

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Serial Dilution

Batch number /Run number / Sample number cross reference

WG747078: R2995900: L725895-08
WG747190: R2996020: L725895-01 02 03 04
WG747191: R2996148: L725895-01 02 03 04 05 06 07 08
WG746824: R2996219: L725895-01 02 03 04 05 06 07 08
WG747276: R2996268: L725895-01 02 03
WG747381: R2996353: L725895-05 06 07 08
WG747663: R2996360: L725895-01 02
WG747277: R2996407: L725895-01 02
WG747279: R2996412: L725895-03 04 05 06 07
WG747487: R2996574: L725895-04 05 07 08
WG747235: R2996618: L725895-01
WG747412: R2996622: L725895-01 03 04 05 06 07 08
WG747236: R2996654: L725895-02 03 04 05 06 07 08
WG747842: R2996741: L725895-01
WG747492: R2996743: L725895-08
WG747676: R2996818: L725895-06
WG747398: R2996912: L725895-01 02 03 04 05 06 07 08
WG748311: R2997181: L725895-03 04 05 06 07 08
WG748166: R2997299: L725895-02 03 04 05 06 07 08
WG748514: R2998022: L725895-02
WG749336: R2998604: L725895-07

* * Calculations are performed prior to rounding of reported values.

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Est. 1970

October 20, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Nicholson GeoSolutions, LLC

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**Groundwater Monitoring Plan for the Linn Energy, LLC 29-17
Injection Well Facility**

Hydrologic Setting

The 29-17 injection well facility is located adjacent to Little Creek on the O-29 well pad and is operated by Linn Energy, LLC. Little Creek, a perennial tributary to the West Fork of Parachute Creek, lies just east of the facility and flows to the northeast to Light Gulch. Light Gulch flows into the West Fork of Parachute Creek, which joins Parachute Creek about 5 miles east of the site. Little Creek drains areas that are underlain by the Green River Formation and Uinta Formation and has extensive oil and gas development. Oil and gas facilities in this area include wells, storage tanks, processing facilities, and pipelines.

Shallow groundwater exists in saturated alluvium along Little Creek and in near-surface fractures beneath the site. Groundwater may also be present in deeper bedrock formations beneath the injection well location. Two springs are present in the channel of Little Creek downgradient from the injection well site. One spring is located just upstream of the crossing of the Garden Gulch Road and was sampled for another operator in a previous investigation. The chemistry of this spring suggests that it may represent a deeper groundwater source. A second similar spring is located just below the Garden Gulch Road and east of the creek and is dry most of the time. A reconnaissance of the creek between the Garden Gulch Road and Light Gulch was conducted in fall 2012 to identify additional groundwater springs. Two springs (Springs 29-1 and 29-2) were located. Only Spring 29-1 provides sufficient flow for sampling.

In addition to the springs, a previous investigation conducted for Berry Petroleum Company showed that the trench constructed for the Enterprise pipeline located just north and downgradient of the well pad acts to channel shallow groundwater from the water storage pit area to Little Creek. This location (LC-1) has been sampled twice per year since fall 2009, initially as part of the Berry Surface Water and Spring Supplemental Environmental Program (SEP) and continued as part of routine monitoring conducted by Linn.

Existing Water Wells

The Division of Water Resources (DWR) of the Colorado Department of Natural Resources (DNR) maintains records of permitted water wells (CDNR 2012). A search of this database was performed to identify water wells (other than monitoring wells) that are located within one mile of the injection well facility. No wells were found.

Proposed Groundwater Sampling

Sampling of surface water location LC-1 on Little Creek and Spring 29-1 has been conducted twice per year to monitor water quality for the Little Creek alluvial groundwater downgradient of the injection well facility and pipeline crossing. Figure 1 shows the two monitoring locations. Sampling of the two deep sourced springs in Little Creek is not proposed unless a release from the injection well facility occurs and investigation is justified.

Water samples are shipped to Environmental Science Corporation (ESC) of Mt. Juliet, Tennessee for analysis. Table 1 provides the analytical parameters, containers, preservatives, holding times, and analytical methods. Following receipt of the analytical data, a data review is conducted using the quality assurance reports supplied by the laboratory and standard EPA data validation guidelines (EPA 1999; EPA 2002). The data review evaluates compliance with recommended holding times, the results of method blanks, laboratory control sample (LCS), surrogate, and matrix spike/matrix spike duplicate (MS/MSD) recoveries, and laboratory duplicate results. Data are qualified as estimated "J", not detected at an estimated detection limit "UJ", not detected "U", or rejected "R" based on the EPA guidance.

Table 1. Groundwater Parameters, Containers, Holding Times, Preservatives, and Analytical Methods

Parameter	Container and Preservative	Analytical Method	Holding Time (Days)
pH	Field Measured		Immediate
Specific Conductance			
Temperature			
Total Dissolved Solids	500 ml poly	SM2540C	7
Alkalinity (total)	500 ml poly	SM 2320B	14
Hardness (total)	125-ml poly w HNO3	EPA 130.1	180
Anions (total)	250-ml poly	EPA 9056	28; nitrite = 2
Chloride			
Fluoride			
Sulfate			
Nitrate			
Nitrite			
Ammonia	250-ml poly w H2SO4	EPA 350.1	28
Cations and Metals (Dissolved)	500-ml poly (unpreserved and lab filtered)	EPA 6010B/6020	180
Aluminum			
Arsenic			
Barium			
Boron			
Calcium			
Chromium			
Copper			
Lead			
Iron			
Magnesium			
Manganese			
Nickel			
Potassium			
Selenium			
Sodium			
Zinc			
Dissolved Gases	3 x 40-ml VOA	RSK175	14
Methane			
Ethane			
Ethene			
Volatile Organic Compounds and BTEX	3 x 40-ml VOA w HCl	EPA 8260B	14
Benzene			
Toluene			
Ethylbenzene			
Xylenes			

REFERENCES

United States Environmental Protection Agency (USEPA). (1999). *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*. USEPA-540-R-99-008. Office of Emergency and Remedial Response (OSWER). October.

United States Environmental Protection Agency (USEPA). (2002). *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. USEPA-540-R-01-008. Office of Emergency and Remedial Response (OSWER). July.

Colorado Department of Natural Resources (2012) Water well search conducted on September 11, 2012 at <http://www.dwr.state.co.us/waterwellpermitsearch>

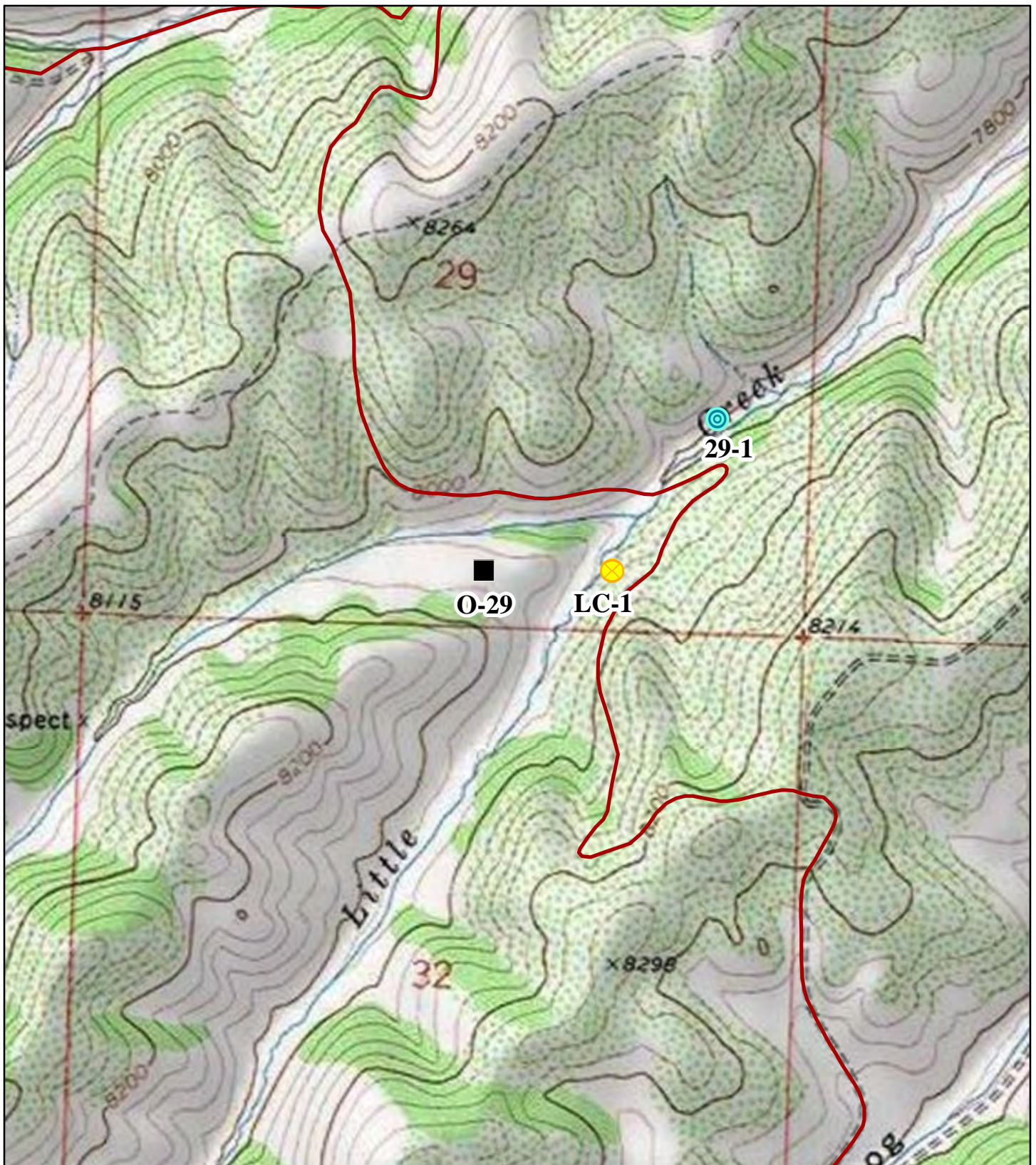


Figure 1

February
2015

GeoSolutions
NICHOLSON

Legend

- Pad
- ⊙ Spring
- ⊗ Surface Water Sample
- Garden Gulch Road

0 500 1,000 2,000 Feet 1" = 1,000'

Linn Operating, Inc

Water Quality Monitoring
Locations Near
the O-29 Well Pad
Garfield County, Colorado

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