

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division



MEMORANDUM

Date: October 24, 2017

To: Files: Administrative Orders SWD-806-B, SWD-1010, SWD-1055

From: Phillip Goetze, Engineering Bureau, OCB 

RE: ADDITION OF NEW WATER SOURCES FOR THREE CLASS II DISPOSAL WELLS, SAN JUAN COUNTY, NEW MEXICO

CLASS II WELL INFORMATION:

- Well Name: **Juniper SWD Well No. 1** API No. 30-045-29732
Well Location: Unit D, Section 16, T24N, R10W, NMPM; 880' FNL and 730' FWL
Injection Authority: SWD-806-B dated May 18, 2006 [IPI-302 dated June 30, 2008]
- Well Name: **Juniper West SWD Well No. 1** API No. 30-045-33771
Well Location: Unit N, Section 24, T24N, R11W, NMPM; 700' FSL and 1715' FWL
Injection Authority: SWD-1055 dated December 1, 2006 [IPI-293 dated March 11, 2008]
- Well Name: **Juniper Well No. 4** API No. 30-045-32783
Well Location: Unit N, Section 17, T24N, R10W, NMPM; 660' FSL and 2015' FWL
Injection Authority: SWD-1010 dated December 27, 2005 [IPI-416 dated February 14, 2014]

Coleman Oil & Gas, Inc. (OGRID No. 4838), the operator for the referenced salt water disposal (SWD) wells, has requested the addition of a new fluid source for disposal into all three SWD wells. All three SWD wells are active disposal wells with completions in the Mesaverde Group (with a combination of perforations in the Menefee Formation and Point Lookout Sandstone). Additionally, all three wells operate under approved Injection Pressure Increase (IPI) orders. The surface pressure gradients for these IPI orders range from 0.44 psi/foot to 0.62 psi/foot.

Previous sources for disposal in the three SWD had been identified in the C-108 applications for each well as being from coalbed methane (CBM) production in the Fruitland Formation.

The new sources will be from horizontal oil wells recently completed in the Mancos Shale. The operator proposes blending of the new source water with the Fruitland Formation production water to reduce any potential impacts to the SWD wells and their reservoir.

The operator provided recent analyses of the general chemistry for both the existing fluids being injected into the SWD wells and the new sources. This data is summarized in Table 1 (New Sources) and Table 2 (Existing SWD Fluids).

Table 1: Summary of New Sources Analytical Results

Source Identification	Sample Date	Major Ion Concentrations*						
		TDS	Cl	Na ⁺	K ⁺	SO ₄	Fe(II)	pH
Good Times 24-10	11/13/2015	24700	12200	7720	203	18.1	178	5.59
Pinon 1H	11/13/2015	29100	16300	10500	86.4	<2.00	<4.5	7.39
Pinon 2H	11/13/2015	28800	15400	10400	88.6	<2.00	23.1	7.08

*All concentrations, except pH value, are in milligrams per liter (mg/L).

Table 2: Summary of Analytical Results for SWD Wells

Source Identification	Sample Date	Major Ion Concentrations*						
		TDS	Cl	Na ⁺	K ⁺	SO ₄	Fe(II)	pH
Juniper SWD No. 1	9/26/2017	16600	10100	3440	50.0	<200	<2.00	7.46
Juniper West SWD No. 1	9/26/2017	14100	8380	2930	35.9	<2.00	<2.00	7.86
Juniper SWD No. 4	9/26/2017	13400	8480	2860	34.8	<200	<2.00	7.41

*All concentrations, except pH value, are in milligrams per liter (mg/L).

The analytical results for the new source waters indicate an average range of total dissolved concentrations (TDS) that are approximately 87 percent greater than current TDS values in the SWD well samples. However, the blending of the old and new produced water sources will reduce the TDS values as not to impact the reservoir. Accelerated scaling in the well bore will require additional maintenance and should be considered before application for a new IPI in any of the wells. Overall cation/anion concentrations of the new sources do not indicate any unusual distribution that might cause concern.

The review by the Engineering Bureau of the proposed action to include the new sources (while blending with the exiting CBM produced waters) is acceptable. The addition of new disposal fluids is defined as a minor modification [not requiring notice for permit modification] and the Bureau recommends the approval by the District of the C-103s for the inclusion of the new sources for each SWD well.

The Bureau does recommend that any future IPI applications have step-rate tests that are conducted using this new produced water chemistry.

Submit 1 Copy To Appropriate District Office

District I - (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II - (575) 748-1283
811 S. First St., Artesia, NM 88210
District III - (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV - (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

Form C-103
Revised July 18, 2013

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

WELL API NO. 30-045-32783
5. Indicate Type of Lease STATE <input type="checkbox"/> FEE <input type="checkbox"/>
6. State Oil & Gas Lease No. NMMN 101058 (Federal)
7. Lease Name or Unit Agreement Name Juniper SWD
8. Well Number #4
9. OGRID Number 4838
10. Pool name or Wildcat SWD: Mesa Verde
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 6650' GL

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

1. Type of Well: Oil Well Gas Well Other SWD; Mesa Verde

2. Name of Operator
Coleman Oil & Gas, Inc

3. Address of Operator
P.O. Drawer 3337, Farmington NM 87401

4. Well Location
Unit Letter N : 660 feet from the South line and 2015 feet from the West line
Section 17 Township 24N Range 10W NMPM County San Juan

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK <input type="checkbox"/>	PLUG AND ABANDON <input type="checkbox"/>	REMEDIAL WORK <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
TEMPORARILY ABANDON <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	COMMENCE DRILLING OPNS. <input type="checkbox"/>	P AND A <input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	MULTIPLE COMPL <input type="checkbox"/>	CASING/CEMENT JOB <input type="checkbox"/>	
DOWNHOLE COMMINGLE <input type="checkbox"/>			
CLOSED-LOOP SYSTEM <input type="checkbox"/>			
OTHER: <input checked="" type="checkbox"/>		OTHER: <input type="checkbox"/>	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

Coleman Oil & Gas respectfully request permission to accept Mancos Produced Water into the Juniper SWD #4 Disposal. Water will be primarily transferred through produced water gathering system operated by Coleman Oil & Gas, Inc. If produced water gathering system is down for repairs, water will be trucked. See the attached water analysis taken from three Mancos producers. Mancos produced water will be blended with Basin Fruitland Coal water.

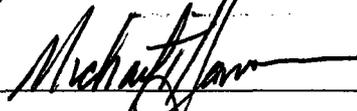
Coleman Oil & Gas is a joint working interest owner in the Pinon Unit, Horizontal Mancos producers.

Juniper SWD #4 Administrative Order SWD-1010

Spud Date: July 4, 2005

Rotary Rig Release Date: July 9, 2005

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE  TITLE: Operations Engineer DATE: August 29, 2017

Type or print name: Michael T. Hanson E-mail address: mhanson@cog-fmn.com PHONE: (505) 327-0356

APPROVED BY: _____ TITLE _____ DATE _____
Conditions of Approval (if any): _____

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dzufelt@greenanalytical.com p: 970.247.4220 f: 970.247.4227 75 Suttle Street Durango, CO 81303

www.GreenAnalytical.com

Baker Hughes
1215 Basin Rd
Farmington NM, 87401

Project: API +
Project Name / Number: Coleman
Project Manager: Matt Pulte

Reported:
01/03/14 15:33

Coleman Juniper SWD #4

1312198-03 (Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
General Chemistry									
Alkalinity, Bicarbonate*	450	10.0		mg/L	10	01/02/14	2320 B	Q1	JAW
Alkalinity, Carbonate*	<10.0	10.0		mg/L	10	01/02/14	2320 B	Q1	JAW
Alkalinity, Hydroxide*	<10.0	10.0		mg/L	10	01/02/14	2320 B	Q1	JAW
Alkalinity, Total*	450	10.0		mg/L	10	01/02/14	2320 B	Q1	JAW
Chloride*	8700	1000	500	mg/L	100	12/31/13	4500-Cl- C		JAW
Conductivity*	25400	10.0		uS/cm	1	12/27/13	2510 B		MJV
Hardness	389	66.2	0.880	mg/L	10	01/02/14	2340 B		JGS
pH*	7.83			pH Units	1	12/27/13	EPA150.1	H1	MJV
Resistivity	39.4			ohm/cm	1	12/31/13	2510 B		DJZ
Silica Potentially Dissolved	14.2	10.7	7.38	mg/L	10	01/02/14	2340 B		JGS
Specific Gravity	1.011			N/A	1	12/30/13	Hydrometer, Modified Bouyoucos	H2	ABP
Sulfate	<10.0	10.0	1.08	mg/L	1	12/31/13	4500-SO42- E		ABP
TDS*	13400	10.0		mg/L	1	01/02/14	EPA160.1	H2, Q1	JAW
Potentially Dissolved Metals by ICP									
Barium*	3.90	0.100	0.038	mg/L	10	01/02/14	EPA200.7		JGS
Calcium*	109	10.0	0.039	mg/L	10	01/02/14	EPA200.7		JGS
Iron*	4.64	0.500	0.040	mg/L	10	01/02/14	EPA200.7		JGS
Lead*	<1.00	1.00	0.240	mg/L	10	01/02/14	EPA200.7		JGS
Magnesium*	28.4	10.0	0.190	mg/L	10	01/02/14	EPA200.7		JGS
Manganese*	0.088	0.050	0.004	mg/L	10	01/02/14	EPA200.7		JGS
Potassium*	26.9	10.0	3.64	mg/L	10	01/02/14	EPA200.7		JGS
Silicon	6.64	5.00	3.45	mg/L	10	01/02/14	EPA200.7		JGS
Sodium*	5160	10.0	0.041	mg/L	10	01/02/14	EPA200.7		JGS
Strontium*	7.98	1.00	0.003	mg/L	10	01/02/14	EPA200.7		JGS
Zinc*	<0.500	0.500	0.025	mg/L	10	01/02/14	EPA200.7		JGS
Cation/Anion Balance	-4.06								

Green Analytical Laboratories

Debbie Zufelt

Debbie Zufelt, Reports Manager

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Analytical Report

Report Summary

Client: Coleman Oil & Gas
Chain Of Custody Number:
Samples Received: 9/26/2017 5:15:00PM
Job Number: 05206-0001
Work Order: P709057
Project Name/Location: Juniper SWD #4

Report Reviewed By:



cp

Date: 10/13/17

Walter Hinchman, Laboratory Director



Date: 10/13/17

Tim Cain, Quality Assurance Officer

The results in this report apply to the samples submitted to Envirotech's Analytical Laboratory and were analyzed in accordance with the chain of custody document supplied by you, the client, and as such are for your exclusive use only. The results in this report are based on the sample as received unless otherwise noted. Partial or incomplete reproduction of this report is prohibited, unless approved by Envirotech, Inc. If you have any questions regarding this analytical report, please don't hesitate to contact Envirotech's Laboratory Staff.



Coleman Oil & Gas	Project Name:	Juniper SWD #4	Reported: 13-Oct-17 14:28
P.O. Box 3337	Project Number:	05206-0001	
Farmington NM, 87499	Project Manager:	Mike Hanson	

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Produced Water	P709057-01A	Water	09/26/17	09/26/17	Poly 500mL

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laboratory@envirotech inc.com



Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
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**Produced Water
P709057-01 (Water)**

Reporting

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Wet Chem/Gravimetric									
Total Dissolved Solids	13400	10.0	mg/L	1	1739026	09/29/17	10/03/17	SM2540C	
Dissolved Metals by 6010									
Calcium	113	0.50	mg/L	1	1739020	09/28/17	10/12/17	EPA 6010C	
Iron	ND	2.00	mg/L	1	1739020	09/28/17	10/12/17	EPA 6010C	
Magnesium	24.6	0.20	mg/L	1	1739020	09/28/17	10/12/17	EPA 6010C	
Potassium	34.8	0.50	mg/L	1	1739020	09/28/17	10/12/17	EPA 6010C	
Sodium	2860	2.00	mg/L	1	1739020	09/28/17	10/12/17	EPA 6010C	
Sodium Absorption Ratio	63.6		N/A	1	1741028	10/13/17	10/13/17	[CALC]	
Anions by 300.0									
Fluoride	ND	25.0	mg/L	100	1739016	09/27/17	09/27/17	EPA 300.0	
Chloride	8480	200	mg/L	100	1739016	09/27/17	09/27/17	EPA 300.0	
Nitrite-N	ND	25.0	mg/L	100	1739016	09/27/17 11:33	09/27/17 15:29	EPA 300.0	
Nitrate-N	ND	25.0	mg/L	100	1739016	09/27/17 11:33	09/27/17 15:29	EPA 300.0	
o-Phosphate-P	ND	25.0	mg/L	100	1739016	09/27/17 11:33	09/27/17 15:29	EPA 300.0	
Sulfate	ND	200	mg/L	100	1739016	09/27/17	09/27/17	EPA 300.0	
Wet Chemistry									
pH @25°C	7.41		pH Units	1	1739023	09/29/17 08:27	09/29/17 10:51	9040C/4500 H+B	HI
Specific Conductance (@ 25 C)	23800	10.0	uS/cm	1	1739024	09/29/17	09/29/17	9050A/2510 B	
Total Alkalinity (as CaCO3 at pH 4.5)	610	10.0	mg/L	1	1739025	09/29/17	10/02/17	SM2320B	
Bicarbonate Alkalinity (as CaCO3)	610		mg/L	1	1739025	09/29/17	10/02/17	SM2320B	
Hydroxide Alkalinity (as CaCO3)	0.00		mg/L	1	1739025	09/29/17	10/02/17	SM2320B	
Carbonate Alkalinity (as CaCO3)	0.00		mg/L	1	1739025	09/29/17	10/02/17	SM2320B	

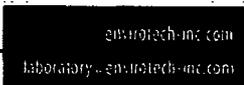
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Colcman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
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Wet Chem/Gravimetric - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1739026 - Wet Chemistry Preparation

Blank (1739026-BLK1)		Prepared: 29-Sep-17 Analyzed: 03-Oct-17								
Total Dissolved Solids	ND	10.0	mg/L							
LCS (1739026-BS1)		Prepared: 29-Sep-17 Analyzed: 03-Oct-17								
Total Dissolved Solids	84.0	10.0	mg/L	100		84.0	50-150			
Duplicate (1739026-DUPI)		Source: P709055-01 Prepared: 29-Sep-17 Analyzed: 03-Oct-17								
Total Dissolved Solids	16100	10.0	mg/L		16600			3.31	5	

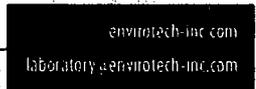
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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
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Dissolved Metals by 6010 - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1739020 - Metals Water Hotblock Digestion EPA 3010A/200.2

Blank (1739020-BLK1)

Prepared: 28-Sep-17 Analyzed: 03-Oct-17

Calcium	ND	0.50	mg/L							
Iron	ND	2.00	"							
Magnesium	ND	0.20	"							
Potassium	ND	0.50	"							
Sodium	ND	2.00	"							

LCS (1739020-BS1)

Prepared: 28-Sep-17 Analyzed: 03-Oct-17

Calcium	55.6	0.50	mg/L	50.0		111	85-115			
Iron	55.2	2.00	"	50.0		110	80-120			
Magnesium	46.6	0.20	"	50.0		93.2	85-115			
Potassium	4.75	0.50	"	5.00		95.0	85-115			
Sodium	48.2	2.00	"	50.0		96.3	85-115			

Matrix Spike (1739020-MS1)

Source: P709062-06

Prepared: 28-Sep-17 Analyzed: 03-Oct-17

Calcium	102	0.50	mg/L	50.0	50.5	103	70-130			
Iron	51.3	2.00	"	50.0	ND	103	75-125			
Magnesium	49.8	0.20	"	50.0	2.53	94.6	70-130			
Potassium	7.29	0.50	"	5.00	2.14	103	70-130			
Sodium	66.0	2.00	"	50.0	15.2	101	70-130			

Matrix Spike Dup (1739020-MSD1)

Source: P709062-06

Prepared: 28-Sep-17 Analyzed: 03-Oct-17

Calcium	105	0.50	mg/L	50.0	50.5	109	70-130	2.71	20	
Iron	53.5	2.00	"	50.0	ND	107	75-125	4.05	20	
Magnesium	49.8	0.20	"	50.0	2.53	94.5	70-130	0.0402	20	
Potassium	7.12	0.50	"	5.00	2.14	99.6	70-130	2.30	20	
Sodium	64.9	2.00	"	50.0	15.2	99.4	70-130	1.60	20	

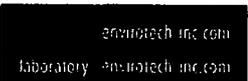
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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
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Anions by 300.0 - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1739016 - Anion Extraction EPA 300.0

Blank (1739016-BLK1)				Prepared & Analyzed: 27-Sep-17						
Fluoride	ND	0.25	mg/L							
Chloride	ND	2.00	"							
Nitrite-N	ND	0.25	"							
Nitrate-N	ND	0.25	"							
o-Phosphate-P	ND	0.25	"							
Sulfate	ND	2.00	"							

LCS (1739016-BS1)				Prepared & Analyzed: 27-Sep-17						
Fluoride	2.57	0.25	mg/L	2.50		103	90-110			
Chloride	25.6	2.00	"	25.0		102	90-110			
Nitrite-N	2.59	0.25	"	2.50		104	90-110			
Nitrate-N	2.45	0.25	"	2.50		98.1	90-110			
o-Phosphate-P	11.8	0.25	"	12.5		94.5	90-110			
Sulfate	25.3	2.00	"	25.0		101	90-110			

Matrix Spike (1739016-MS1)				Source: P709055-01		Prepared & Analyzed: 27-Sep-17				
Fluoride	262	25.0	mg/L	250	ND	105	80-120			
Chloride	12600	200	"	2500	10100	102	80-120			
Nitrite-N	257	25.0	"	250	ND	103	80-120			
Nitrate-N	248	25.0	"	250	ND	99.1	80-120			
o-Phosphate-P	1200	25.0	"	1250	ND	95.6	80-120			
Sulfate	2560	200	"	2500	ND	102	80-120			

Matrix Spike Dup (1739016-MSD1)				Source: P709055-01		Prepared & Analyzed: 27-Sep-17				
Fluoride	261	25.0	mg/L	250	ND	104	80-120	0.650	20	
Chloride	12500	200	"	2500	10100	98.6	80-120	0.633	20	
Nitrite-N	257	25.0	"	250	ND	103	80-120	0.117	20	
Nitrate-N	246	25.0	"	250	ND	98.6	80-120	0.567	20	
o-Phosphate-P	1190	25.0	"	1250	ND	95.1	80-120	0.554	20	
Sulfate	2540	200	"	2500	ND	102	80-120	0.671	20	

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
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Wet Chemistry - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1739023 - Wet Chemistry Preparation

LCS (1739023-BS1)		Prepared & Analyzed: 29-Sep-17								
pH	7.98		pH Units	8.00		99.9	98.75-101.25			
Duplicate (1739023-DUP1)		Source: P709055-01 Prepared & Analyzed: 29-Sep-17								
pH	7.41		pH Units	7.46				0.672	20	

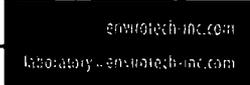
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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
--	--	------------------------------

Wet Chemistry - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1739024 - Wet Chemistry Preparation										
Blank (1739024-BLK1) Prepared & Analyzed: 29-Sep-17										
Specific Conductance (@ 25 C)	ND	10.0	uS/cm							
LCS (1739024-BS1) Prepared & Analyzed: 29-Sep-17										
Specific Conductance (@ 25 C)	1420	10.0	uS/cm	1410		101	98-102			
Duplicate (1739024-DUPI) Source: P709055-01 Prepared & Analyzed: 29-Sep-17										
Specific Conductance (@ 25 C)	28100	10.0	uS/cm		28000			0.357	20	

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Juniper SWD #4 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 13-Oct-17 14:28
--	--	------------------------------

Wet Chemistry - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1739025 - Wet Chemistry Preparation

LCS (1739025-BS1)				Prepared: 29-Sep-17 Analyzed: 02-Oct-17		
Total Alkalinity (as CaCO ₃ at pH 4.5)	260	10.0	mg/L	250	104	70-130
Duplicate (1739025-DUP1)		Source: P709055-01		Prepared: 29-Sep-17 Analyzed: 02-Oct-17		
Total Alkalinity (as CaCO ₃ at pH 4.5)	385	10.0	mg/L	375	2.63	20

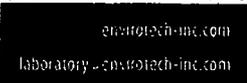
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Colman Oil & Gas
P.O. Box 3337
Farmington NM, 87499

Project Name: Juniper SWD #4
Project Number: 05206-0001
Project Manager: Mike Hanson

Reported:
13-Oct-17 14:28

Notes and Definitions

H1 Sample was received after regulatory hold-time exceeded for target analyte.
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

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Analytical Report

Report Summary

Client: Coleman Oil & Gas

Chain Of Custody Number:

Samples Received: 11/16/2015 7:05:00AM

Job Number: 05206-0001

Work Order: P511033

Project Name/Location: Good Times 24-10

Entire Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Tim Cain', is written over a horizontal line.

Date: 11/25/15

Tim Cain, Laboratory Manager

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Good Times 24-10 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:07
--	--	------------------------------

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Good Times 24-10	P511033-01A	Aqueous	11/13/15	11/16/15	Poly 500mL

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Good Times 24-10 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:07
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**Good Times 24-10
PS11033-01 (Water)**

Analyte	Result	Reporting			Batch	Prepared	Analyzed	Method	Notes
		Limit	Units	Dilution					
Cation/Anion Analysis									
pH @20.6°C	5.59		pH Units	1	1547032	11/20/15 14:31	11/20/15 14:35	150.1/4500H	
Electrical Conductivity	28900		umhos/cm	1	1547032	11/20/15 14:31	11/20/15 14:35	EPA 120.1	
Total Dissolved Solids	24700	10.0	mg/L	1	1547020	11/19/15	11/19/15	160.1/2540C	
Sodium Absorption Ratio	140		N/A	1	1548015	11/25/15	11/25/15	[CALC]	
Total Alkalinity as CaCO3	1080	10.0	mg/L	1	1547021	11/19/15	11/19/15	Hach Method 8203	
Total Hardness as CaCO3	574	18.6	mg/L		[CALC]	11/20/15	11/24/15	[CALC]	
Bicarbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/19/15	Hach Method 8203	
Carbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/19/15	Hach Method 8203	
Hydroxide as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/19/15	Hach Method 8203	
Nitrate-N	4.43	0.25	mg/L	1	1547013	11/18/15 09:00	11/18/15 18:35	EPA 300.0	H2
Nitrite-N	54.1	0.25	mg/L	1	1547013	11/18/15 09:00	11/19/15 19:09	EPA 300.0	H2
Chloride	12200	2.00	mg/L	1	1547013	11/18/15	11/19/15	EPA 300.0	
Fluoride	ND	0.25	mg/L	1	1547013	11/18/15	11/19/15	EPA 300.0	
o-Phosphate-P	105	0.25	mg/L	1	1547013	11/18/15 09:00	11/19/15 19:09	EPA 300.0	H2
Sulfate	18.1	2.00	mg/L	1	1547013	11/18/15	11/18/15	EPA 300.0	
Iron	178	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Calcium	174	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Magnesium	33.9	1.80	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Potassium	203	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Sodium	7720	18.0	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Good Times 24-10 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:07
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Cation/Anion Analysis - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1547013 - Anion Extraction EPA 300.0

Blank (1547013-BLK1)			Prepared & Analyzed: 18-Nov-15							
Nitrate-N	ND	0.25	mg/L							
Nitrite-N	ND	0.25	"							
Chloride	ND	2.00	"							
Fluoride	ND	0.25	"							
o-Phosphate-P	ND	0.25	"							
Sulfate	ND	2.00	"							

LCS (1547013-BS1)			Prepared & Analyzed: 18-Nov-15							
Nitrate-N	4.76	0.25	mg/L	5.00	ND	95.2	90-110			
Nitrite-N	5.13	0.25	"	5.00	ND	103	90-110			
Chloride	48.6	2.00	"	50.0	ND	97.1	90-110			
Fluoride	5.13	0.25	"	5.00	ND	103	90-110			
o-Phosphate-P	25.6	0.25	"	25.0	ND	102	90-110			
Sulfate	47.2	2.00	"	50.0	ND	94.5	90-110			

Matrix Spike (1547013-MS1)			Source: P511036-01		Prepared & Analyzed: 18-Nov-15					
Nitrate-N	48.2	2.50	mg/L	50.0	ND	96.4	80-120			
Nitrite-N	51.4	2.50	"	50.0	ND	103	80-120			
Chloride	571	20.0	"	500	77.7	98.6	80-120			
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120			
o-Phosphate-P	257	2.50	"	250	ND	103	80-120			
Sulfate	475	20.0	"	500	ND	95.0	80-120			

Matrix Spike Dup (1547013-MSD1)			Source: P511036-01		Prepared & Analyzed: 18-Nov-15					
Nitrate-N	48.1	2.50	mg/L	50.0	ND	96.3	80-120	0.104	20	
Nitrite-N	51.5	2.50	"	50.0	ND	103	80-120	0.136	20	
Chloride	570	20.0	"	500	77.7	98.6	80-120	0.0473	20	
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120	0.0715	20	
o-Phosphate-P	257	2.50	"	250	ND	103	80-120	0.0778	20	
Sulfate	475	20.0	"	500	ND	95.0	80-120	0.0211	20	

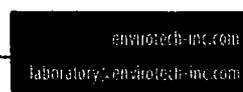
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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Good Times 24-10 Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:07
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Notes and Definitions

- H2 Sample was analyzed after regulatory hold-time exceeded for target analyte.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

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Client: Coleman Oil & Gas, Inc
 Project: Good Times 24-10
 Sampler: Mike Hanson
 Phone: 505-330-2903
 Email(s): mhanson@co9-fmw.com
 Project Manager: Mike Hanson

RUSH?
 1d
 3d

Lab Use Only		Analysis and Method				Lab Only
Lab WO# <u>PE11033</u>		GRO/DRO by 8015	BTEX by 8021	TPH by 418.1	Chloride by 300.0	Lab Number
Job Number <u>05206-0001</u>						

Sample ID	Sample Date	Sample Time	Matrix	Containers		GRO/DRO by 8015	BTEX by 8021	TPH by 418.1	Chloride by 300.0	CATION ANION WRITE ANALYSIS	Lab Number	Correct Cont/Presv (S)/N
				QTY	Vol/TYPE/Preservative							
<u>Good Times 24-10</u>	<u>11/13/15</u>	<u>3:00 PM</u>	<u>H2O</u>	<u>None</u>								

Relinquished by: (Signature) <u>Mike Hanson</u>	Date <u>11/13</u>	Time <u>5:30 PM</u>	Received by: (Signature) <u>Demo 7/2/15</u>	Date <u>11-16-15</u>	Time <u>7:05</u>	Lab Use Only
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	**Received on ice Y//N T1 <u>0</u> T2 <u> </u> T3 <u> </u> AVG Temp °C <u> </u>

Sample Matrix: S - Soil, Sd - Solid, Sg - Sludge, A - Aqueous, O - Other _____ Container Type: g - glass, p - poly/plastic, ag - amber glass, v - VOA

**Samples requiring thermal preservation must be received on ice the day they are sampled or received packed in ice at an avg temp above 0 but less than 6 °C on subsequent days.

Sample(s) dropped off after hours to a secure drop off area. Chain of Custody Notes/Billing Info:



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Analytical Report

Report Summary

Client: Coleman Oil & Gas
Chain Of Custody Number:
Samples Received: 11/16/2015 7:05:00AM
Job Number: 05206-0001
Work Order: P511032
Project Name/Location: Pinon 01H

Entire Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Tim Cain', is written over a horizontal line.

Date: 11/25/15

Tim Cain, Laboratory Manager

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Pinon 01H Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:05
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Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Pinon 01H	P511032-01A	Aqueous	11/13/15	11/16/15	Poly 500mL

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Pinon 01H Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:05
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Pinon 01H
P511032-01 (Water)

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Cation/Anion Analysis									
pH @20.1°C	7.39		pH Units	1	1547032	11/20/15 14:31	11/20/15 14:35	150.1/4500H	
Electrical Conductivity	42800		umbos/cm	1	1547032	11/20/15 14:31	11/20/15 14:35	EPA 120.1	
Total Dissolved Solids	29100	10.0	mg/L	1	1547020	11/19/15	11/19/15	160.1/2540C	
Sodium Absorption Ratio	178		N/A	1	1548015	11/25/15	11/25/15	[CALC]	
Total Alkalinity as CaCO3	519	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Total Hardness as CaCO3	657	18.6	mg/L		[CALC]	11/20/15	11/24/15	[CALC]	
Bicarbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Carbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Hydroxide as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Nitrate-N	4.40	0.25	mg/L	1	1547013	11/18/15 09:00	11/18/15 16:02	EPA 300.0	H2
Nitrite-N	50.5	0.25	mg/L	1	1547013	11/18/15 09:00	11/19/15 18:25	EPA 300.0	H2
Chloride	16300	2.00	mg/L	1	1547013	11/18/15	11/19/15	EPA 300.0	
Fluoride	1.75	0.25	mg/L	1	1547013	11/18/15	11/18/15	EPA 300.0	
o-Phosphate-P	105	0.25	mg/L	1	1547013	11/18/15 09:00	11/19/15 18:25	EPA 300.0	H2
Sulfate	ND	2.00	mg/L	1	1547013	11/18/15	11/18/15	EPA 300.0	
Iron	ND	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Calcium	187	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Magnesium	46.4	1.80	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Potassium	86.4	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Sodium	10500	18.0	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	

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Coleman Oil & Gas P.O. Box 3337 Farmington NM, 87499	Project Name: Pinon 01H Project Number: 05206-0001 Project Manager: Mike Hanson	Reported: 25-Nov-15 12:05
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Cation/Anion Analysis - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1547013 - Anion Extraction EPA 300.0

Blank (1547013-BLK1)

Prepared & Analyzed: 18-Nov-15

Nitrate-N	ND	0.25	mg/L							
Nitrite-N	ND	0.25	"							
Chloride	ND	2.00	"							
Fluoride	ND	0.25	"							
o-Phosphate-P	ND	0.25	"							
Sulfate	ND	2.00	"							

LCS (1547013-BS1)

Prepared & Analyzed: 18-Nov-15

Nitrate-N	4.76	0.25	mg/L	5.00		95.2	90-110			
Nitrite-N	5.13	0.25	"	5.00		103	90-110			
Chloride	48.6	2.00	"	50.0		97.1	90-110			
Fluoride	5.13	0.25	"	5.00		103	90-110			
o-Phosphate-P	25.6	0.25	"	25.0		102	90-110			
Sulfate	47.2	2.00	"	50.0		94.5	90-110			

Matrix Spike (1547013-MS1)

Source: P511036-01

Prepared & Analyzed: 18-Nov-15

Nitrate-N	48.2	2.50	mg/L	50.0	ND	96.4	80-120			
Nitrite-N	51.4	2.50	"	50.0	ND	103	80-120			
Chloride	571	20.0	"	500	77.7	98.6	80-120			
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120			
o-Phosphate-P	257	2.50	"	250	ND	103	80-120			
Sulfate	475	20.0	"	500	ND	95.0	80-120			

Matrix Spike Dup (1547013-MSD1)

Source: P511036-01

Prepared & Analyzed: 18-Nov-15

Nitrate-N	48.1	2.50	mg/L	50.0	ND	96.3	80-120	0.104	20	
Nitrite-N	51.5	2.50	"	50.0	ND	103	80-120	0.136	20	
Chloride	570	20.0	"	500	77.7	98.6	80-120	0.0473	20	
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120	0.0715	20	
o-Phosphate-P	257	2.50	"	250	ND	103	80-120	0.0778	20	
Sulfate	475	20.0	"	500	ND	95.0	80-120	0.0211	20	

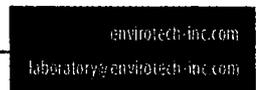
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Coleman Oil & Gas
P.O. Box 3337
Farmington NM, 87499

Project Name: Pinon 01H
Project Number: 05206-0001
Project Manager: Mike Hanson

Reported:
25-Nov-15 12:05

Notes and Definitions

- H2 Sample was analyzed after regulatory hold-time exceeded for target analyte.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

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Analytical Report

Report Summary

Client: Coleman Oil & Gas
Chain Of Custody Number:
Samples Received: 11/16/2015 7:05:00AM
Job Number: 05206-0001
Work Order: P511031
Project Name/Location: Pinon 02H

Entire Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Tim Cain', is written over a horizontal line.

Date: 11/25/15

Tim Cain, Laboratory Manager

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Coleman Oil & Gas
P.O. Box 3337
Farmington NM, 87499

Project Name: Pinon 02H
Project Number: 05206-0001
Project Manager: Mike Hanson

Reported:
25-Nov-15 12:04

Analytical Report for Samples

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
Pinon 2H	P511031-01A	Aqueous	11/13/15	11/16/15	Poly 500mL

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Pinon 2H
P511031-01 (Water)

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Cation/Anion Analysis									
pH @20.4°C	7.08		pH Units	1	1547032	11/20/15 14:31	11/20/15 14:35	150.1/4500H	
Electrical Conductivity	43000		umbos/cm	1	1547032	11/20/15 14:31	11/20/15 14:35	EPA 120.1	
Total Dissolved Solids	28800	10.0	mg/L	1	1547020	11/19/15	11/19/15	160.1/2540C	
Sodium Absorption Ratio	164		N/A	1	1548015	11/25/15	11/25/15	[CALC]	
Total Alkalinity as CaCO3	950	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Total Hardness as CaCO3	765	18.6	mg/L		[CALC]	11/20/15	11/24/15	[CALC]	
Bicarbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Carbonate as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Hydroxide as CaCO3	ND	10.0	mg/L	1	1547021	11/19/15	11/20/15	Hach Method 8203	
Nitrate-N	5.32	0.25	mg/L	1	1547013	11/18/15 09:00	11/18/15 14:35	EPA 300.0	H2
Nitrite-N	3.04	0.25	mg/L	1	1547013	11/18/15 09:00	11/18/15 14:35	EPA 300.0	H2
Chloride	15400	2.00	mg/L	1	1547013	11/18/15	11/19/15	EPA 300.0	
Fluoride	ND	0.25	mg/L	1	1547013	11/18/15	11/18/15	EPA 300.0	
o-Phosphate-P	6.77	0.25	mg/L	1	1547013	11/18/15 09:00	11/18/15 14:35	EPA 300.0	H2
Sulfate	ND	2.00	mg/L	1	1547013	11/18/15	11/18/15	EPA 300.0	
Iron	23.1	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Calcium	226	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Magnesium	48.5	1.80	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Potassium	88.6	4.50	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	
Sodium	10400	18.0	mg/L	9	1547033	11/20/15	11/24/15	EPA 6010C	

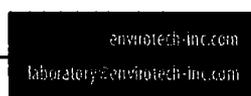
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Cation/Anion Analysis - Quality Control
Envirotech Analytical Laboratory

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1547013 - Anion Extraction EPA 300.0

Blank (1547013-BLK1)				Prepared & Analyzed: 18-Nov-15						
Nitrate-N	ND	0.25	mg/L							
Nitrite-N	ND	0.25	"							
Chloride	ND	2.00	"							
Fluoride	ND	0.25	"							
o-Phosphate-P	ND	0.25	"							
Sulfate	ND	2.00	"							

LCS (1547013-BS1)				Prepared & Analyzed: 18-Nov-15						
Nitrate-N	4.76	0.25	mg/L	5.00		95.2	90-110			
Nitrite-N	5.13	0.25	"	5.00		103	90-110			
Chloride	48.6	2.00	"	50.0		97.1	90-110			
Fluoride	5.13	0.25	"	5.00		103	90-110			
o-Phosphate-P	25.6	0.25	"	25.0		102	90-110			
Sulfate	47.2	2.00	"	50.0		94.5	90-110			

Matrix Spike (1547013-MS1)				Source: P511036-01 Prepared & Analyzed: 18-Nov-15						
Nitrate-N	48.2	2.50	mg/L	50.0	ND	96.4	80-120			
Nitrite-N	51.4	2.50	"	50.0	ND	103	80-120			
Chloride	571	20.0	"	500	77.7	98.6	80-120			
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120			
o-Phosphate-P	257	2.50	"	250	ND	103	80-120			
Sulfate	475	20.0	"	500	ND	95.0	80-120			

Matrix Spike Dup (1547013-MSD1)				Source: P511036-01 Prepared & Analyzed: 18-Nov-15						
Nitrate-N	48.1	2.50	mg/L	50.0	ND	96.3	80-120	0.104	20	
Nitrite-N	51.5	2.50	"	50.0	ND	103	80-120	0.136	20	
Chloride	570	20.0	"	500	77.7	98.6	80-120	0.0473	20	
Fluoride	56.0	2.50	"	50.0	3.90	104	80-120	0.0715	20	
o-Phosphate-P	257	2.50	"	250	ND	103	80-120	0.0778	20	
Sulfate	475	20.0	"	500	ND	95.0	80-120	0.0211	20	

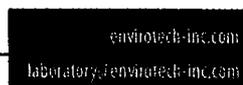
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Notes and Definitions

- H2 Sample was analyzed after regulatory hold-time exceeded for target analyte.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

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