

## A Report for the Application of

# Cool-Ox<sup>®</sup>

for

**Karolina Blaney**

*WPX*



### **Project**

RMV216-21  
Garfield County, CO.

DTI Project # 1951

***DeepEarth Technologies, Inc., is a WOMAN OWNED SMALL BUSINESS ENTERPRISE***

**Client:** WPX

**Attn:** Karolina Blaney

**Site:** RMV 216-21

**Re:** *Report for the In-Situ Cool-Ox<sup>®</sup> Treatment of Hydro-carbon and constituents in the soil at the RMV-216-21 site in Garfield county CO.*

**Introduction:**

DeepEarth Technologies, Inc. (DTI) had been invited by WPX to implement a remedial program to treat soil contamination associated with a completion pit at the RMV216-21 well site. The site is currently an Active Gas well.

**Summary:**

It is the goal of this project to use Cool-Ox<sup>®</sup> reagent to treat the target pollutants and reduce their concentrations to the maximum extent possible. The work scope of the project consisted of treating Soil in the area(s) as depicted on the enclosed modified Figure 1. The area(s) of treatment includes an area approximately 2,500 cubic yards. The Vertical treatment area stayed within the screened intervals of six (6) monitoring wells. The site lithology is described as sandy clay followed by broken sand stone.

**Application:**

On 4-14-14, DeepEarth Technologies (DTI) mobilized to the site to conduct a survey of the treatment area and to coordinate on-site injection activities. DTI personnel met with the WPX representative and held a Site Specific Health and Safety (SSHS) meeting, wherein all points concerning general and specific safety requirements of the client, consultant, and DTI were discussed and understood. DTI and the WPX representative established the location of the proposed injection wells. The application was completed with the DTI *Deep-Shot<sup>TM</sup>* trailer #3. DTI constructed well head manifolds so that reagent could be efficiently injected down the wells. All injection activity was completed on 4-17-14. DTI injected 15,000 gallons of the Cool-Ox<sup>®</sup> reagent into six (6) wells.

Surfacing Cool-Ox<sup>®</sup> was noted around the wells and up to 15 feet from the wells. Surfacing Cool-Ox<sup>®</sup> was also noted coming up in old soil boring sites and natural cracks around BH-22, BH-23, and BH-27, with some odor and slight product. Due to the inability of BH-22, BH-23, and BH-27 to hold the prescribed amount of reagent, BH-24, BH-25, BH-26 received additional Cool-Ox<sup>®</sup>.

BH-22 received 1400 gal of Cool-Ox<sup>®</sup> reagent.  
BH-23 received 1800 gal of Cool-Ox<sup>®</sup> reagent.  
BH-24 received 3000 gal of Cool-Ox<sup>®</sup> reagent.  
BH-25 received 2400 gal of Cool-Ox<sup>®</sup> reagent.  
BH-26 received 4200 gal of Cool-Ox<sup>®</sup> reagent.  
BH-27 received 2200 gal of Cool-Ox<sup>®</sup> reagent.



The above photo depicts the reaction occurring in BH-23.



Surfacing Cool-Ox<sup>®</sup> 15 feet from southwest of BH-27

**Conclusions:**

DTI believes that in the treatment area, significant reductions of contaminants in the soil will be accomplished. DTI believes that the subsequent biological activity associated with all Cool-Ox<sup>®</sup> injections will produce on-going remedial activity. DTI's Site Safety program was implemented at the onset of operations and no reportable incidents were suffered.

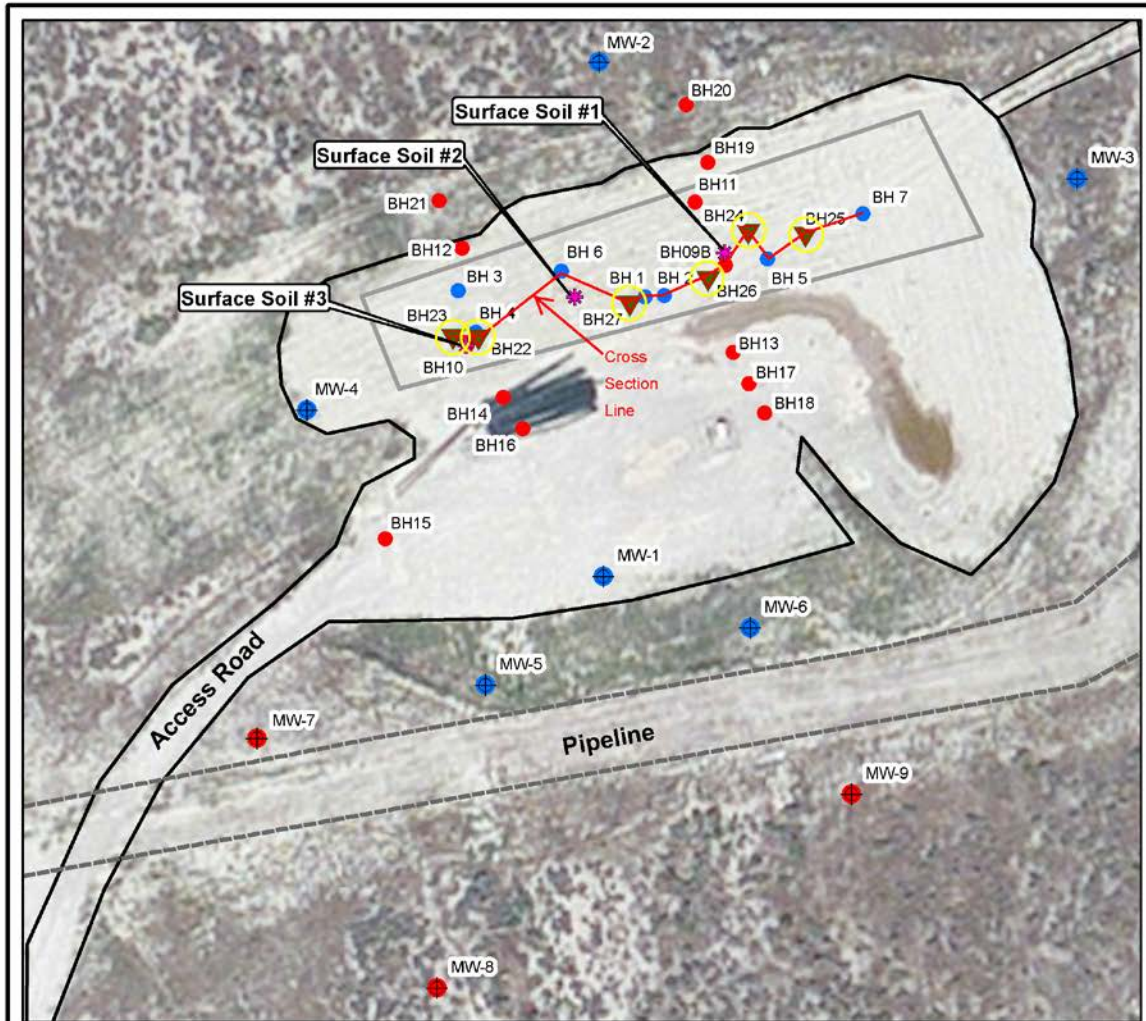
DTI would like to thank WPX for choosing the Cool-Ox<sup>®</sup> Technology to remediate the RMV216-21 site. Should you have any questions or comments, please call or email the address listed below.

Sincerely,

*James Gainey*

Field Application Manager  
DeepEarth Technologies, Inc.  
12635 South Kroll Drive  
Alsip, IL 60803  
(708) 396-0100

# Cool-Ox® Treatment Map (4/14/14)



	Previous Soil Boring
	February 2013 Dry Well Locations
	May 2012 Monitoring Well
	May 2012 Soil Boring
	Previous Monitoring Well
	May 2012 Surface Soil
	Wells Cool-Ox has been injected into

0 37.5 75 150 Feet



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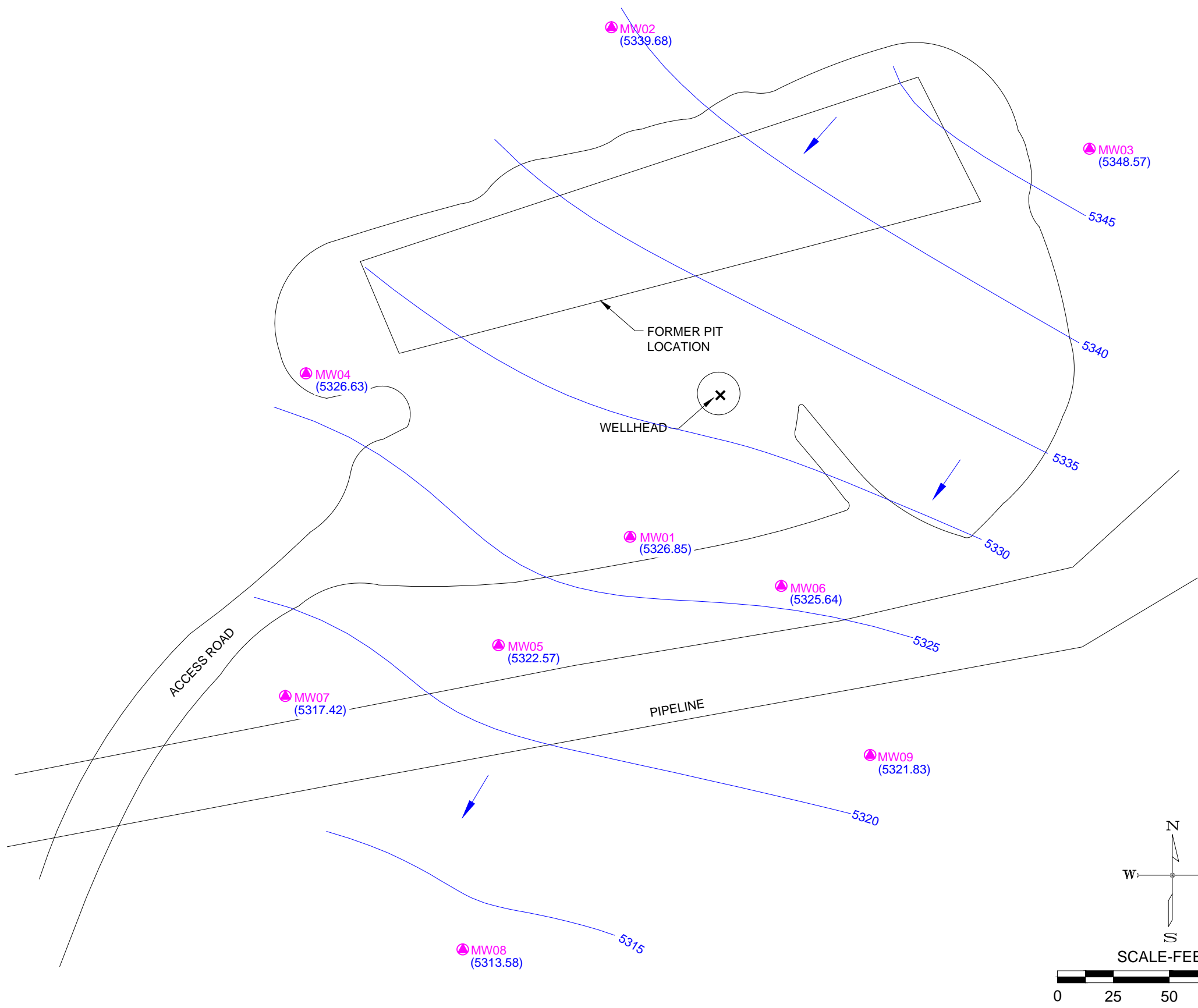
PROJECT: 013-0180
DRAWN BY: HD
DATE: March, 2013

Soil Boring and Monitoring Well Locations  
Clough RMV 216-21  
WXP Energy Rocky Mountain, LLC

1111 Lincoln Mall, Suite 111  
P.O. Box 98928  
Lincoln, NE 68509-9828  
TEL: 402-474-6211  
FAX: 402-474-5193  
www.olsoninc.com

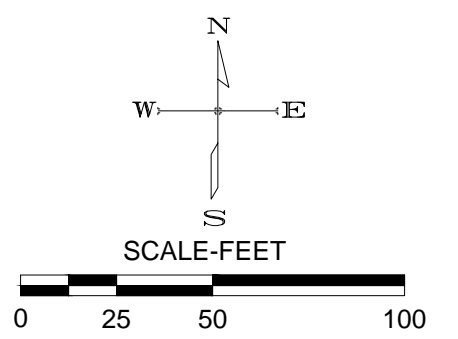
FIGURE  
1

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**LEGEND:**

- MW01 MONITORING WELL/BOREHOLE
- 5325.0 GROUNDWATER ELEVATION CONTOUR (FT-MSL)
- (5325.55) GROUNDWATER ELEVATION (FT-MSL)
- GROUNDWATER FLOW DIRECTION
- NS NOT SAMPLED



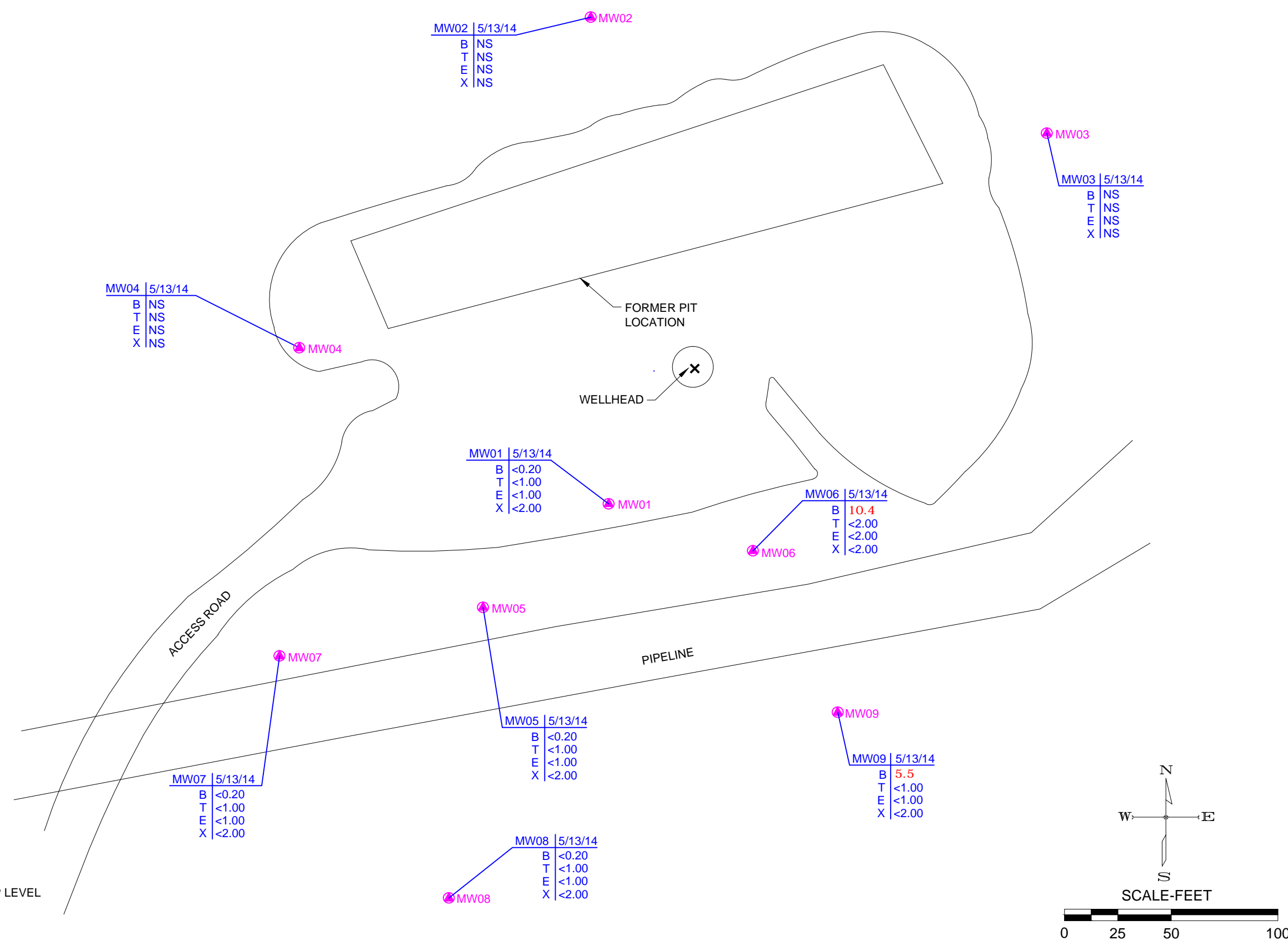
PROJECT NO:	012-1539
DRAWN BY:	sds
DATE:	6.10.2014

POTENTIOMETRIC SURFACE MAP - MAY 2014  
 WPX RMV 216-21  
 WPX ENERGY ROCKY MOUNTAIN, LLC  
 GARFIELD COUNTY, COLORADO

**OLSSON ASSOCIATES**  
 760 Horizon Drive, Ste. 102  
 Grand Junction, CO 81506  
 TEL 970.263.7800  
 FAX 970.263.7456

FIGURE	2
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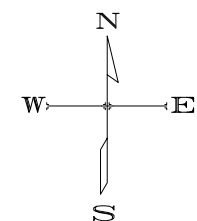


**LEGEND:**

MW01 ● MONITORING WELL/BOREHOLE

CHEMICAL DATA

- B = BENZENE (ug/l)
- T = TOLUENE (ug/l)
- E = ETHYLBENZENE (ug/l)
- X = XYLENES (ug/l)
- BOLD** = EXCEEDS COGCC GROUNDWATER CLEANUP LEVEL
- NS = NOT SAMPLED



SCALE- FEET



PROJECT NO:	012-1539
DRAWN BY:	sds
DATE:	6.10.2014

GROUNDWATER ANALYTICAL RESULTS - MAY 2014  
 WPX RMV 216-21  
 WPX ENERGY ROCKY MOUNTAIN, LLC  
 GARFIELD COUNTY, COLORADO

**OLSSON**  
 ASSOCIATES  
 760 Horizon Drive, Ste. 102  
 Grand Junction, CO 81506  
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FIGURE  
**3**

**Table 1  
RMV 216-21 Groundwater Monitoring  
Water Quality Data Summary**

SAMPLE SUMMARY									
Location Description									
Sample Type									
LABORATORY DATA SUMMARY									
Sample ID	COGCC Table 910-1 Standards	UNITS	RMV 216-21 MW1	RMV 216-21 MW1	RMV 216-21 MW1	RMV 216-21 MW1	RMV 216-21 MW1	RMV 216-21 MW1	RMV 216-21 MW2
Depth to Water (feet)			84.45	84.54	84.56	84.45	84.64	84.65	79.2
Sample Date			3/7/2013	6/25/2013	8/20/2013	11/21/2013	2/19/2014	5/13/2014	3/7/2013
Analytical Parameters									
<b>BTEX</b>									
Benzene	5	ug/l	<0.20	<0.20	0.70 J	<1.0	0.41 J	<0.20	<0.20
Toluene	560 to 1000	ug/l	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
Ethylbenzene	700	ug/l	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0
Xylene (total)	1400 to 10000	ug/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
<b>Metals</b>									
Calcium	NA	mg/l	212	214	226	225	215	207	209
Iron	NA	mg/l	<0.07	<0.07	<0.07	<0.070	<0.070	<0.070	<0.07
Magnesium	NA	mg/l	213	201	201	196	206	200	171
Manganese	NA	mg/l	0.369	0.378	0.429	0.438	0.513	0.447	0.0488
Potassium	NA	mg/l	6.34	5.24	5.65	10.2	5.24	5.68	6.43
Selenium	NA	mg/l	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.05
Sodium	NA	mg/l	446	391	3.93	412	394	396	343
<b>General Chemistry</b>									
Alkalinity, Bicarbonate as CaCO3	NA	mg/l	726	577	559	569	613	725	638
Alkalinity, Carbonate	NA	mg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO3	NA	mg/l	729	577	559	569	613	725	638
Chloride	1.25 x bkgd	mg/l	225	213	199	193	202	177	17
Nitrogen, Nitrate	NA	mg/l	31.1	32	28.5	27.6	30.4	28.5	25.9
Nitrogen Nitrite	NA	mg/l	0.15	0.16	0.12	0.14	0.14	0.27	<0.020 <sup>b</sup>
Solids, Total Dissolved	NA	mg/l	3210	3230	3160	3110	3120	3350	2780
Sulfate	1.25 x bkgd	mg/l	1390	1460	1310	1310	1350	1370	1350
pH	NA	su	7.04	7.2	7.29	7.29	7.06	7.18	7.13
<b>Field Readings</b>									
Temperature	NA	deg. C	14.34	14.20	14.20	13.70	14.30	13.90	14.20
Specific Conductivity	NA	mS/cm	3.91	3.852	3.787	3.817	3.777	3.844	2.94
Dissolved Oxygen	NA	mg/l	1.05	1.26	0.75	0.45	0.18	0.31	0.81
pH	NA	su	7.60	7.29	7.51	7.12	10.11	7.15	7.04
Solids, Total Dissolved	NA	mg/l	2.5	2.5	2.4	2.48	2.41	2509	1.9
Turbidity	NA	NTU	5999	NT	NT	NT	NT	NT	5999

ug/l - micrograms per liter  
mg/l - milligrams per liter  
J - indicates an estimated value  
umhos/cm - micromhos per centimeter  
mS/cm - millisiemens per centimeter  
su - standard units  
NA - not applicable  
NTU - nephelometric turbidity units  
NT - not tested

a - Dilution required due to matrix interference  
b - Elevated detection limit due to matrix interference  
c - Elevated detection limit due to dilution required for possible matrix interference

**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW2	RMV 216-21 MW2	RMV 216-21 MW2	RMV 216-21 MW2	RMV 216-21 MW2	RMV 216-21 MW3	RMV 216-21 MW3	RMV 216-21 MW3
<b>Depth to Water (feet)</b>	NS	NT	79.2	79.43	79.51	68.14	NS	NT
<b>Sample Date</b>	6/25/2013	8/20/2013	11/21/2013	2/19/2014	5/13/2014	3/7/2013	6/25/2013	8/20/2013
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	NS	NT	NT	NT	NT	<0.20	NS	NT
Toluene	NS	NT	NT	NT	NT	<1.0	NS	NT
Ethylbenzene	NS	NT	NT	NT	NT	<1.0	NS	NT
Xylene (total)	NS	NT	NT	NT	NT	<2.0	NS	NT
<b>Metals</b>								
Calcium	NS	NT	NT	NT	NT	222	NS	NT
Iron	NS	NT	NT	NT	NT	<0.07	NS	NT
Magnesium	NS	NT	NT	NT	NT	184	NS	NT
Manganese	NS	NT	NT	NT	NT	0.137	NS	NT
Potassium	NS	NT	NT	NT	NT	6.62	NS	NT
Selenium	NS	NT	NT	NT	NT	<0.05	NS	NT
Sodium	NS	NT	NT	NT	NT	358	NS	NT
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO3	NS	NT	NT	NT	NT	567	NS	NT
Alkalinity, Carbonate	NS	NT	NT	NT	NT	<5.0	NS	NT
Alkalinity, Total as CaCO3	NS	NT	NT	NT	NT	567	NS	NT
Chloride	NS	NT	NT	NT	NT	29.2	NS	NT
Nitrogen, Nitrate	NS	NT	NT	NT	NT	44.9	NS	NT
Nitrogen Nitrite	NS	NT	NT	NT	NT	0.04	NS	NT
Solids, Total Dissolved	NS	NT	NT	NT	NT	2890	NS	NT
Sulfate	NS	NT	NT	NT	NT	1400	NS	NT
pH	NS	NT	NT	NT	NT	7.16	NS	NT
<b>Field Readings</b>								
Temperature	NS	NT	NT	NT	NT	14.53	NS	NT
Specific Conductivity	NS	NT	NT	NT	NT	3.36	NS	NT
Dissolved Oxygen	NS	NT	NT	NT	NT	1.48	NS	NT
pH	NS	NT	NT	NT	NT	7.67	NS	NT
Solids, Total Dissolved	NS	NT	NT	NT	NT	2.2	NS	NT
Turbidity	NS	NT	NT	NT	NT	1509	NS	NT

ug/l -micrograms per liter  
mg/l -milligrams per liter  
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umhos/cm - micromhos per centimeter  
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su - standard units  
NA - not applicable  
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**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW3	RMV 216-21 MW3	RMV 216-21 MW3	RMV 216-21 MW4	RMV 216-21 MW4	RMV 216-21 MW4	RMV 216-21 MW4	RMV 216-21 MW4
<b>Depth to Water (feet)</b>	68.16	68.34	68.53	85.69	NS	NT	85.85	86.05
<b>Sample Date</b>	11/21/2013	2/19/2014	5/13/2014	3/7/2013	6/25/2013	8/20/2013	11/21/2013	2/19/2014
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	NT	NT	NT	<0.20	NS	NT	NT	NT
Toluene	NT	NT	NT	<1.0	NS	NT	NT	NT
Ethylbenzene	NT	NT	NT	<1.0	NS	NT	NT	NT
Xylene (total)	NT	NT	NT	<2.0	NS	NT	NT	NT
<b>Metals</b>								
Calcium	NT	NT	NT	225	NS	NT	NT	NT
Iron	NT	NT	NT	<0.07	NS	NT	NT	NT
Magnesium	NT	NT	NT	183	NS	NT	NT	NT
Manganese	NT	NT	NT	<0.005	NS	NT	NT	NT
Potassium	NT	NT	NT	6.59	NS	NT	NT	NT
Selenium	NT	NT	NT	<0.05	NS	NT	NT	NT
Sodium	NT	NT	NT	345	NS	NT	NT	NT
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO <sub>3</sub>	NT	NT	NT	577	NS	NT	NT	NT
Alkalinity, Carbonate	NT	NT	NT	<5.0	NS	NT	NT	NT
Alkalinity, Total as CaCO <sub>3</sub>	NT	NT	NT	577	NS	NT	NT	NT
Chloride	NT	NT	NT	15.6	NS	NT	NT	NT
Nitrogen, Nitrate	NT	NT	NT	19.7	NS	NT	NT	NT
Nitrogen Nitrite	NT	NT	NT	<0.020 <sup>b</sup>	NS	NT	NT	NT
Solids, Total Dissolved	NT	NT	NT	2980	NS	NT	NT	NT
Sulfate	NT	NT	NT	1480	NS	NT	NT	NT
pH	NT	NT	NT	7.14	NS	NT	NT	NT
<b>Field Readings</b>								
Temperature	NT	NT	NT	14.37	NS	NT	NT	NT
Specific Conductivity	NT	NT	NT	3.24	NS	NT	NT	NT
Dissolved Oxygen	NT	NT	NT	2.21	NS	NT	NT	NT
pH	NT	NT	NT	7.00	NS	NT	NT	NT
Solids, Total Dissolved	NT	NT	NT	2.1	NS	NT	NT	NT
Turbidity	NT	NT	NT	2000	NS	NT	NT	NT

ug/l -micrograms per liter  
mg/l -milligrams per liter  
J - indicates an estimated value  
umhos/cm - micromhos per centimeter  
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su - standard units  
NA - not applicable  
NTU - nephelometric turbidity units  
NT - not tested

**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW4	RMV 216-21 MW5	RMV 216-21 MWX	RMV 216-21 MW5	RMV 216-21 MW5	RMV 216-21 MW5	RMV 216-21 MW5	RMV 216-21 MW5
<b>Depth to Water (feet)</b>	86.16	85.81	MW5 Duplicate	85.95	86.01	86	81.8	86.26
<b>Sample Date</b>	5/13/2014	3/7/2013	3/7/2013	6/25/2013	8/20/2013	11/21/2013	2/19/2014	5/13/2014
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	NT	<0.20	<0.20	<0.20	<0.20	<1.0	<0.20	<0.20
Toluene	NT	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
Ethylbenzene	NT	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
Xylene (total)	NT	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
<b>Metals</b>								
Calcium	NT	221	221	222	238	243	221	226
Iron	NT	<0.07	<0.07	<0.07	<0.07	0.158	0.0919	<0.070
Magnesium	NT	234	234	227	225	219	223	222
Manganese	NT	0.123	0.124	0.113	0.117	0.112	0.116	0.099
Potassium	NT	6.51	6.29	5.17	5.66	5.55	5.01	5.88
Selenium	NT	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050
Sodium	NT	500	490	446	4.52	478	438	442
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO3	NT	565	548	525	536	524	546	544
Alkalinity, Carbonate	NT	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO3	NT	565	548	525	536	524	546	544
Chloride	NT	325	331	325	284	272	282	270
Nitrogen, Nitrate	NT	33.1	33.4	33.7	31.8	30.6	32.4	32.2
Nitrogen Nitrite	NT	0.031	0.043	<0.040	<0.020	<0.020	0.048	<0.020
Solids, Total Dissolved	NT	3470	3470	3530	3480	3380	3420	3450
Sulfate	NT	1480	1480	1490	1390	1390	1430	1450
pH	NT	7.07	7.12	7.47	7.26	7.26	7.06	7.09
<b>Field Readings</b>								
Temperature	NT	26.37	26.37	14.10	14.40	14.00	14.00	14.10
Specific Conductivity	NT	4.24	4.24	4.166	4.19	3.882	4.022	4.237
Dissolved Oxygen	NT	1.65	1.65	0.58	0.32	0.34	0.22	0.53
pH	NT	6.97	6.97	7.22	7.31	7.16	9.26	7.14
Solids, Total Dissolved	NT	2.8	2.8	2.7	2.7	2.53	2.61	2762
Turbidity	NT	11.3	11.3	NT	NT	NT	NT	NT

ug/l -micrograms per liter  
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**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW6	RMV 216-21 MW6	RMV 216-21 MW6	RMV 216-21 MW6	RMV 216-21 MW6	RMV 216-21 MW6	RMV 216-21 MW7	RMV 216-21 MW7
<b>Depth to Water (feet)</b>	81.79	82.89	82.91	82.83	83.05	83.1	90.79	90.95
<b>Sample Date</b>	3/7/2013	6/25/2013	8/20/2013	11/21/2013	2/19/2014	5/13/2014	3/7/2013	6/25/2013
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	17.3	16.7	14.7	9.8	6.2	10.4	<0.20	<0.20
Toluene	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0	<1.0
Xylene (total)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
<b>Metals</b>								
Calcium	217	212	231	233	258	288	224	220
Iron	<0.07	<0.07	<0.07	<0.070	<0.070	0.51	<0.07	<0.07
Magnesium	252	234	250	244	299	343	219	206
Manganese	0.182	0.171	0.207	0.189	0.260	0.303	0.0076	0.0069
Potassium	7.07	5.45	6.14	8.24	5.65	7.21	6.46	5.39
Selenium	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.05	<0.05
Sodium	593	513	5.48	556	555	616	464	403
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO3	1050	827	599	584	609	610	727	615
Alkalinity, Carbonate	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO3	1050	827	599	584	609	610	727	615
Chloride	493	466	430	480	767	813	215	192
Nitrogen, Nitrate	35	35.3	33.2	31.6	38	40.9	24.6	25.9
Nitrogen Nitrite	4.5	4.1	4	4.2	5.9	4.7	0.024	<0.040
Solids, Total Dissolved	3830	3570	3610	3670	4180	4520	3330	3270
Sulfate	1460	1440	1360	1350	1460	1570	1490	1530
pH	7.04	7.23	7.27	7.19	7	7.08	7.15	7.29
<b>Field Readings</b>								
Temperature	18.93	15.10	14.80	14.00	14.00	14.10	13.77	14.40
Specific Conductivity	4.93	4.687	4.766	5.591	5.471	6.071	3.94	3.802
Dissolved Oxygen	1.3	0.2	1.02	0.57	0.42	0.72	2.17	2.01
pH	6.95	7.13	7.29	7.18	9.96	7.05	7.60	7.26
Solids, Total Dissolved	3.2	3.0	3.1	3.45	2.53	3945	2.5	2.5
Turbidity	859	NT	NT	NT	NT	NT	1834	NT

ug/l -micrograms per liter  
mg/l -milligrams per liter  
J - indicates an estimated value  
umhos/cm - micromhos per centimeter  
mS/cm - millisiemens per centimeter  
su - standard units  
NA - not applicable  
NTU - nephelometric turbidity units  
NT - not tested

**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW7	RMV 216-21 MW7	RMV 216-21 MW7	RMV 216-21 MW7	RMV 216-21 MW8	RMV 216-21 MW8	RMV 216-21 MW8	RMV 216-21 MW8
<b>Depth to Water (feet)</b>	91.0	91.1	91.2	91.4	88.23	88.34	88.36	88.36
<b>Sample Date</b>	8/20/2013	11/21/2013	2/19/2014	5/13/2015	3/7/2013	6/25/2013	8/20/2013	11/21/2013
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Toluene	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
Ethylbenzene	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0
Xylene (total)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
<b>Metals</b>								
Calcium	233	239	224	224	202	199	203	218
Iron	<0.07	<0.070	<0.070	<0.070	<0.07	<0.07	<0.07	<0.070
Magnesium	209	201	215	214	248	236	222	233
Manganese	<0.005	<0.005	<0.005	0.0061	0.0133	0.0168	0.0177	0.0205
Potassium	5.58	6	4.93	5.82	6.67	5.5	5.63	7.19
Selenium	<0.05	<0.050	<0.050	<0.050	<0.05	<0.05	<0.05	<0.050
Sodium	4.1	423	397	415	494	4.41	4.27	496
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO <sub>3</sub>	563	553	620	587	822	541	569	528
Alkalinity, Carbonate	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO <sub>3</sub>	563	553	620	587	822	541	569	528
Chloride	201	137	163	143	319	296	282	304
Nitrogen, Nitrate	23.8	21.8	23.8	23.7	33.9	33.4	31.9	31.7
Nitrogen Nitrite	<0.020	<0.020	0.041	0.026	<0.020 <sup>b</sup>	<0.040	<0.020	<0.020
Solids, Total Dissolved	3270	3130	3180	3260	3490	3490	3420	3380
Sulfate	1400	1390	1420	1430	1500	1440	1370	1420
pH	7.3	7.27	7.11	7.13	7.17	7.25	7.34	7.32
<b>Field Readings</b>								
Temperature	14.50	13.90	13.80	14.00	17.48	14.30	14.40	14.00
Specific Conductivity	3.787	3.679	3.72	3.82	4.13	4.146	4.123	3.987
Dissolved Oxygen	1.7	1.54	0.87	1.18	1.6	0.78	0.61	0.84
pH	7.40	7.15	10.39	7.18	7.01	7.25	7.40	7.25
Solids, Total Dissolved	2.5	2.39	2.43	2483.00	2.7	2.7	2.7	2.59
Turbidity	NT	NT	NT	NT	568	NT	NT	NT

ug/l -micrograms per liter  
mg/l -milligrams per liter  
J - indicates an estimated value  
umhos/cm - micromhos per centimeter  
mS/cm - millisiemens per centimeter  
su - standard units  
NA - not applicable  
NTU - nephelometric turbidity units  
NT - not tested

**Table 1**  
**RMV 216-21 Groundwater Monitoring**  
**Water Quality Data Summary**

<b>SAMPLE SUMMARY</b>								
<b>Location Description</b>								
<b>Sample Type</b>								
<b>LABORATORY DATA SUMMARY</b>								
<b>Sample ID</b>	RMV 216-21 MW8	RMV 216-21 MW8	RMV 216-21 MW9	RMV 216-21 MW9	RMV 216-21 MW9	RMV 216-21 MW9	RMV 216-21 MW9	RMV 216-21 MW9
<b>Depth to Water (feet)</b>	88.55	88.64	81.54	81.66	81.72	81.69	81.9	82.01
<b>Sample Date</b>	2/19/2014	5/13/2014	3/7/2013	6/25/2013	8/20/2013	11/21/2013	2/19/2014	5/13/2014
<b>Analytical Parameters</b>								
<b>BTEX</b>								
Benzene	<0.20	<0.20	2.9	4.9	6.1	4.3	2.7	5.5
Toluene	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
Xylene (total)	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
<b>Metals</b>								
Calcium	211	205	256	236	259	255	318	327
Iron	<0.070	<0.070	<0.07	<0.07	<0.07	<0.070	<0.070	<0.070
Magnesium	233	232	266	245	248	242	333	360
Manganese	0.0083	0.0236	0.0933	0.1340	0.1160	0.1290	0.1880	0.284
Potassium	5.13	5.9	7.73	6.2	6.56	7.65	6.62	8.11
Selenium	<0.050	<0.050	<0.05	<0.05	<0.05	0.0501	<0.050	<0.050
Sodium	435	446	502	457	4.43	492	504	590
<b>General Chemistry</b>								
Alkalinity, Bicarbonate as CaCO3	551	559	975	576	610	644	700	651
Alkalinity, Carbonate	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Alkalinity, Total as CaCO3	551	559	975	576	610	644	700	651
Chloride	283	261	427	383	337	325	655	670
Nitrogen, Nitrate	33.3	32.1	46.8	45.8	43.1	40.5	54.4	58
Nitrogen Nitrite	0.07	<0.020	3.3	2.7	2.7	2.2	3.3	3
Solids, Total Dissolved	3390	3470	3830	3710	3570	3620	4450	5050
Sulfate	1440	1450	1560	1540	1430	1420	1780	1850
pH	7.12	7.17	7.03	7.28	7.27	7.13	7	7.03
<b>Field Readings</b>								
Temperature	13.80	14.40	14.31	15.30	14.50	14.00	13.80	14.50
Specific Conductivity	4.016	4.257	4.79	4.47	4.491	4.334	5.293	5.992
Dissolved Oxygen	0.7	1.94	0.92	0.52	0.41	0.43	1.54	0.36
pH	9.95	7.31	7.62	7.17	7.40	7.09	9.72	7.01
Solids, Total Dissolved	2.52	2769	3.1	2.9	2.9	2.81	3.42	3893.50
Turbidity	NT	NT	2000	NT	NT	NT	NT	NT

ug/l - micrograms per liter  
mg/l - milligrams per liter  
J - indicates an estimated value  
umhos/cm - micromhos per centimeter  
mS/cm - millisiemens per centimeter  
su - standard units  
NA - not applicable  
NTU - nephelometric turbidity units  
NT - not tested

**Technical Report for**

**WPX Energy Rocky Mountain, LLC**

**CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)**

**NXEPPARACH**

**Accutest Job Number: D57710**

**Sampling Date: 05/13/14**

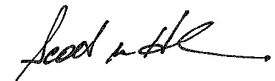
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ATTN: Tim Dobransky**

**Total number of pages in report: 52**



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



**Scott Heideman**  
**Laboratory Director**

**Client Service contact: Renea Jackson 303-425-6021**

Certifications: CO (CO00049), ID, NE (CO00049), ND (R-027), NJ (CO 0007), OK (D9942), UT (NELAP CO00049), TX (T104704511)

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Test results relate only to samples analyzed.

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## Sample Summary

WPX Energy Rocky Mountain, LLC

Job No: D57710

CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Project No: NXEPPARACH

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
D57710-1	05/13/14	09:10 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW1
D57710-1F	05/13/14	09:10 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW1
D57710-2	05/13/14	10:20 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW5
D57710-2F	05/13/14	10:20 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW5
D57710-3	05/13/14	10:10 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW6
D57710-3F	05/13/14	10:10 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW6
D57710-4	05/13/14	10:55 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW7
D57710-4F	05/13/14	10:55 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW7
D57710-5	05/13/14	11:45 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW8
D57710-5F	05/13/14	11:45 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW8
D57710-6	05/13/14	11:00 KBJ	05/14/14	AQ	Ground Water	RMV 216-21 MW9
D57710-6F	05/13/14	11:00 KBJ	05/14/14	AQ	Groundwater Filtered	RMV 216-21 MW9

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** WPX Energy Rocky Mountain, LLC

**Job No** D57710

**Site:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

**Report Date** 5/21/2014 4:33:52 PM

On 05/14/2014, 6 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.1 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D57710 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Volatiles by GC By Method SW846 8021B

**Matrix:** AQ

**Batch ID:** GTA1226

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57684-1MS, D57684-1MSD were used as the QC samples indicated.
- D57684-1MS, -1MSD: The pH of the sample was >2 at time of analysis.

**Matrix:** AQ

**Batch ID:** GTA1229

- All samples were analyzed within the recommended method holding time.
- Sample(s) D57530-17MS, D57530-17MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Metals By Method SW846 6010C

**Matrix:** AQ

**Batch ID:** MP12919

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57710-1FMS, D57710-1FMSD, D57710-1FSDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) and matrix spike duplicate (MSD) recovery(s) of Selenium are outside control limits. Spike recovery indicates possible matrix interference.
- The serial dilution RPD(s) for Iron, Selenium are outside control limits for sample MP12919-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP12919-SD1 for Calcium, Sodium: Serial dilution indicates possible matrix interference.

### Wet Chemistry By Method EPA 300.0/SW846 9056

**Matrix:** AQ

**Batch ID:** GP12570

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57710-4MS were used as the QC samples for the Chloride, Nitrogen, Nitrate, Nitrogen, Nitrite, Sulfate analysis.
- D57710-2, -5 for Nitrogen, Nitrite: Elevated detection limit due to matrix interference.

### Wet Chemistry By Method SM 2320B-2011

**Matrix:** AQ                      **Batch ID:** GN24752

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57802-2DUP, D57802-2MS, D57802-2MSD were used as the QC samples for the Alkalinity, Total as CaCO<sub>3</sub> analysis.

**Matrix:** AQ                      **Batch ID:** GN24755

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

**Matrix:** AQ                      **Batch ID:** GN24756

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

### Wet Chemistry By Method SM 2540C-2011

**Matrix:** AQ                      **Batch ID:** GN24762

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57783-1DUP were used as the QC samples for the Solids, Total Dissolved analysis.

### Wet Chemistry By Method SM 5310B-2011

**Matrix:** AQ                      **Batch ID:** GP12563

- All samples were prepared and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D57705-1DUP, D57705-1MS, D57705-1MSD were used as the QC samples for the Total Organic Carbon analysis.

### Wet Chemistry By Method SM4500HB+-2011/9040C

**Matrix:** AQ                      **Batch ID:** GN24705

- The following samples were run outside of holding time for method SM4500HB+-2011/9040C: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

## Summary of Hits

**Job Number:** D57710  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)  
**Collected:** 05/13/14



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

### D57710-1 RMV 216-21 MW1

Alkalinity, Bicarbonate as CaCO3	725	5.0			mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	725	5.0			mg/l	SM 2320B-2011
Chloride	177	50			mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate	28.5	1.0			mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.27	0.020			mg/l	EPA 300.0/SW846 9056
Solids, Total Dissolved	3350	10			mg/l	SM 2540C-2011
Sulfate	1370	50			mg/l	EPA 300.0/SW846 9056
Total Organic Carbon	5.4	1.0			mg/l	SM 5310B-2011
pH	7.18				su	SM4500HB+ -2011/9040C

### D57710-1F RMV 216-21 MW1

Calcium	207000	400			ug/l	SW846 6010C
Magnesium	200000	200			ug/l	SW846 6010C
Manganese	447	5.0			ug/l	SW846 6010C
Potassium	5680	1000			ug/l	SW846 6010C
Sodium	396000	400			ug/l	SW846 6010C

### D57710-2 RMV 216-21 MW5

Alkalinity, Bicarbonate as CaCO3	544	5.0			mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	544	5.0			mg/l	SM 2320B-2011
Chloride	270	50			mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate	32.2	1.0			mg/l	EPA 300.0/SW846 9056
Solids, Total Dissolved	3450	10			mg/l	SM 2540C-2011
Sulfate	1450	50			mg/l	EPA 300.0/SW846 9056
Total Organic Carbon	5.6	1.0			mg/l	SM 5310B-2011
pH	7.09				su	SM4500HB+ -2011/9040C

### D57710-2F RMV 216-21 MW5

Calcium	226000	400			ug/l	SW846 6010C
Magnesium	222000	200			ug/l	SW846 6010C
Manganese	99.2	5.0			ug/l	SW846 6010C
Potassium	5880	1000			ug/l	SW846 6010C
Sodium	442000	400			ug/l	SW846 6010C

### D57710-3 RMV 216-21 MW6

Benzene	10.4	1.0	0.20		ug/l	SW846 8021B
Alkalinity, Bicarbonate as CaCO3	610	5.0			mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3	610	5.0			mg/l	SM 2320B-2011
Chloride	813	50			mg/l	EPA 300.0/SW846 9056

## Summary of Hits

**Job Number:** D57710  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)  
**Collected:** 05/13/14



Lab Sample ID	Client Sample ID	Result/ Analyte	RL	MDL	Units	Method
		Nitrogen, Nitrate	40.9	1.0	mg/l	EPA 300.0/SW846 9056
		Nitrogen, Nitrite	4.7	0.40	mg/l	EPA 300.0/SW846 9056
		Solids, Total Dissolved	4520	10	mg/l	SM 2540C-2011
		Sulfate	1570	50	mg/l	EPA 300.0/SW846 9056
		Total Organic Carbon	8.5	1.0	mg/l	SM 5310B-2011
		pH	7.08		su	SM4500HB+ -2011/9040C
<b>D57710-3F RMV 216-21 MW6</b>						
		Calcium	288000	400	ug/l	SW846 6010C
		Iron	510	70	ug/l	SW846 6010C
		Magnesium	343000	200	ug/l	SW846 6010C
		Manganese	303	5.0	ug/l	SW846 6010C
		Potassium	7210	1000	ug/l	SW846 6010C
		Sodium	616000	400	ug/l	SW846 6010C
<b>D57710-4 RMV 216-21 MW7</b>						
		Alkalinity, Bicarbonate as CaCO3	587	5.0	mg/l	SM 2320B-2011
		Alkalinity, Total as CaCO3	587	5.0	mg/l	SM 2320B-2011
		Chloride	143	50	mg/l	EPA 300.0/SW846 9056
		Nitrogen, Nitrate	23.7	1.0	mg/l	EPA 300.0/SW846 9056
		Nitrogen, Nitrite	0.026	0.020	mg/l	EPA 300.0/SW846 9056
		Solids, Total Dissolved	3260	10	mg/l	SM 2540C-2011
		Sulfate	1430	50	mg/l	EPA 300.0/SW846 9056
		Total Organic Carbon	6.7	1.0	mg/l	SM 5310B-2011
		pH	7.13		su	SM4500HB+ -2011/9040C
<b>D57710-4F RMV 216-21 MW7</b>						
		Calcium	224000	400	ug/l	SW846 6010C
		Magnesium	214000	200	ug/l	SW846 6010C
		Manganese	6.1	5.0	ug/l	SW846 6010C
		Potassium	5820	1000	ug/l	SW846 6010C
		Sodium	415000	400	ug/l	SW846 6010C
<b>D57710-5 RMV 216-21 MW8</b>						
		Alkalinity, Bicarbonate as CaCO3	559	5.0	mg/l	SM 2320B-2011
		Alkalinity, Total as CaCO3	559	5.0	mg/l	SM 2320B-2011
		Chloride	261	50	mg/l	EPA 300.0/SW846 9056
		Nitrogen, Nitrate	32.1	1.0	mg/l	EPA 300.0/SW846 9056
		Solids, Total Dissolved	3470	10	mg/l	SM 2540C-2011
		Sulfate	1450	50	mg/l	EPA 300.0/SW846 9056
		Total Organic Carbon	5.7	1.0	mg/l	SM 5310B-2011

## Summary of Hits

**Job Number:** D57710  
**Account:** WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)  
**Collected:** 05/13/14



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		7.17			su	SM4500HB+ -2011/9040C
<b>D57710-5F</b>	<b>RMV 216-21 MW8</b>					
Calcium		205000	400		ug/l	SW846 6010C
Magnesium		232000	200		ug/l	SW846 6010C
Manganese		23.6	5.0		ug/l	SW846 6010C
Potassium		5900	1000		ug/l	SW846 6010C
Sodium		446000	400		ug/l	SW846 6010C
<b>D57710-6</b>	<b>RMV 216-21 MW9</b>					
Benzene		5.5	1.0	0.20	ug/l	SW846 8021B
Alkalinity, Bicarbonate as CaCO3		651	5.0		mg/l	SM 2320B-2011
Alkalinity, Total as CaCO3		651	5.0		mg/l	SM 2320B-2011
Chloride		670	50		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrate		58.0	1.0		mg/l	EPA 300.0/SW846 9056
Nitrogen, Nitrite		3.0	0.40		mg/l	EPA 300.0/SW846 9056
Solids, Total Dissolved		5050	10		mg/l	SM 2540C-2011
Sulfate		1850	50		mg/l	EPA 300.0/SW846 9056
Total Organic Carbon		10.9	1.0		mg/l	SM 5310B-2011
pH		7.03			su	SM4500HB+ -2011/9040C
<b>D57710-6F</b>	<b>RMV 216-21 MW9</b>					
Calcium		327000	400		ug/l	SW846 6010C
Magnesium		360000	200		ug/l	SW846 6010C
Manganese		284	5.0		ug/l	SW846 6010C
Potassium		8110	1000		ug/l	SW846 6010C
Sodium		590000	400		ug/l	SW846 6010C

Sample Results

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Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW1	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-1	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8021B	
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21807.D	1	05/14/14	EV	n/a	n/a	GTA1226
Run #2							

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

**Purgeable Aromatics**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	116%		60-140%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.1  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW1	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-1	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	725	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	725	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	177	50	mg/l	100	05/14/14 16:31	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	28.5	1.0	mg/l	100	05/14/14 16:31	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.27	0.020	mg/l	5	05/14/14 13:59	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	3350	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1370	50	mg/l	100	05/14/14 16:31	SK	EPA 300.0/SW846 9056
Total Organic Carbon	5.4	1.0	mg/l	1	05/14/14 17:58	GH	SM 5310B-2011
pH	7.18		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW1	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-1F	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	207000	400	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	< 70	70	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	200000	200	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	447	5.0	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	5680	1000	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	396000	400	ug/l	1	05/15/14	05/19/14 KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

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RL = Reporting Limit

4.2  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW5		<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-2		<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8021B		
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21808.D	1	05/14/14	EV	n/a	n/a	GTA1226
Run #2							

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

**Purgeable Aromatics**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	115%		60-140%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW5	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-2	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	544	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	544	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	270	50	mg/l	100	05/14/14 16:44	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	32.2	1.0	mg/l	100	05/14/14 16:44	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite <sup>a</sup>	< 0.020	0.020	mg/l	5	05/14/14 14:13	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	3450	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1450	50	mg/l	100	05/14/14 16:44	SK	EPA 300.0/SW846 9056
Total Organic Carbon	5.6	1.0	mg/l	1	05/14/14 18:09	GH	SM 5310B-2011
pH	7.09		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

4.3  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW5	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-2F	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	226000	400	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	< 70	70	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	222000	200	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	99.2	5.0	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	5880	1000	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	442000	400	ug/l	1	05/15/14	05/19/14 KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

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RL = Reporting Limit

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW6 <b>Lab Sample ID:</b> D57710-3 <b>Matrix:</b> AQ - Ground Water <b>Method:</b> SW846 8021B <b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	<b>Date Sampled:</b> 05/13/14 <b>Date Received:</b> 05/14/14 <b>Percent Solids:</b> n/a
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Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21884.D	1	05/20/14	EV	n/a	n/a	GTA1229
Run #2							

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

**Purgeable Aromatics**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	10.4	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	103%		60-140%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.5  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW6	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-3	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	610	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	610	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	813	50	mg/l	100	05/14/14 16:57	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	40.9	1.0	mg/l	100	05/14/14 16:57	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	4.7	0.40	mg/l	100	05/14/14 16:57	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	4520	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1570	50	mg/l	100	05/14/14 16:57	SK	EPA 300.0/SW846 9056
Total Organic Carbon	8.5	1.0	mg/l	1	05/14/14 18:20	GH	SM 5310B-2011
pH	7.08		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

RL = Reporting Limit

4.5  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW6	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-3F	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	288000	400	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	510	70	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	343000	200	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	303	5.0	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	7210	1000	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	616000	400	ug/l	1	05/15/14	05/19/14 KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

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RL = Reporting Limit

4.6  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW7		<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-4		<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8021B		
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21811.D	1	05/14/14	EV	n/a	n/a	GTA1226
Run #2							

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

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	116%		60-140%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.7  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW7	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-4	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	587	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	587	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	143	50	mg/l	100	05/14/14 17:37	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	23.7	1.0	mg/l	100	05/14/14 17:37	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	0.026	0.020	mg/l	5	05/14/14 15:05	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	3260	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1430	50	mg/l	100	05/14/14 17:37	SK	EPA 300.0/SW846 9056
Total Organic Carbon	6.7	1.0	mg/l	1	05/14/14 18:32	GH	SM 5310B-2011
pH	7.13		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

RL = Reporting Limit

4.7  
 4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW7		<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-4F		<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)		

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	224000	400	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	< 70	70	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	214000	200	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	6.1	5.0	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	5820	1000	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	415000	400	ug/l	1	05/15/14	05/20/14 KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

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RL = Reporting Limit

4.8  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW8		<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-5		<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8021B		
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21812.D	1	05/14/14	EV	n/a	n/a	GTA1226
Run #2							

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

**Purgeable Aromatics**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	118%		60-140%

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.9  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW8	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-5	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	559	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO <sub>3</sub>	559	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	261	50	mg/l	100	05/14/14 18:03	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	32.1	1.0	mg/l	100	05/14/14 18:03	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite <sup>a</sup>	< 0.020	0.020	mg/l	5	05/14/14 15:18	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	3470	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1450	50	mg/l	100	05/14/14 18:03	SK	EPA 300.0/SW846 9056
Total Organic Carbon	5.7	1.0	mg/l	1	05/14/14 18:43	GH	SM 5310B-2011
pH	7.17		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

(a) Elevated detection limit due to matrix interference.

RL = Reporting Limit

4.9  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW8	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-5F	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	205000	400	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	< 70	70	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	232000	200	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	23.6	5.0	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	5900	1000	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14 05/16/14	KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	446000	400	ug/l	1	05/15/14 05/20/14	KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

RL = Reporting Limit

4.10  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW9		<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-6		<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SW846 8021B		
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA21885.D	1	05/20/14	EV	n/a	n/a	GTA1229
Run #2							

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

**Purgeable Aromatics**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	5.5	1.0	0.20	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

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

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ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.11  
 4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW9	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-6	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Ground Water	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Bicarbonate as CaC	651	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Carbonate	< 5.0	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Alkalinity, Total as CaCO3	651	5.0	mg/l	1	05/19/14	BF	SM 2320B-2011
Chloride	670	50	mg/l	100	05/14/14 18:16	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrate	58.0	1.0	mg/l	100	05/14/14 18:16	SK	EPA 300.0/SW846 9056
Nitrogen, Nitrite	3.0	0.40	mg/l	100	05/14/14 18:16	SK	EPA 300.0/SW846 9056
Solids, Total Dissolved	5050	10	mg/l	1	05/20/14	BF	SM 2540C-2011
Sulfate	1850	50	mg/l	100	05/14/14 18:16	SK	EPA 300.0/SW846 9056
Total Organic Carbon	10.9	1.0	mg/l	1	05/14/14 18:54	GH	SM 5310B-2011
pH	7.03		su	1	05/15/14 10:00	JB	SM4500HB+ -2011/9040C

RL = Reporting Limit

4.11  
4

## Report of Analysis

<b>Client Sample ID:</b> RMV 216-21 MW9	<b>Date Sampled:</b> 05/13/14
<b>Lab Sample ID:</b> D57710-6F	<b>Date Received:</b> 05/14/14
<b>Matrix:</b> AQ - Groundwater Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)	

### Dissolved Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	327000	400	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Iron	< 70	70	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Magnesium	360000	200	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Manganese	284	5.0	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Potassium	8110	1000	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Selenium	< 50	50	ug/l	1	05/15/14	05/16/14 KV	SW846 6010C <sup>1</sup>	SW846 3010A <sup>3</sup>
Sodium	590000	400	ug/l	1	05/15/14	05/20/14 KV	SW846 6010C <sup>2</sup>	SW846 3010A <sup>3</sup>

- (1) Instrument QC Batch: MA4769
- (2) Instrument QC Batch: MA4780
- (3) Prep QC Batch: MP12919

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RL = Reporting Limit

4.12  
4

## Misc. Forms

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5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

Accutest Laboratories Mountain States  
4036 Youngfield Street Wheat Ridge, Co. 80033  
TEL. 303-425-6021 877-737-4521  
FAX 303-425-6021

FED-EX Tracking #  
Accutest Quote #  
Bottle Order Control #  
Accutest Job # **D57710**

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)												Matrix Codes							
Company Name <b>DISEON Associates</b>		Project Name <b>RMV 210-21 GW Monitoring (02-1539)</b>		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank												Matrix Codes LAB USE ONLY							
Street Address <b>700 Horizon Drive Suite 202</b>		Street <b>202</b>																					
City, State, Zip <b>Grand Jct, CO 81506</b>		City, State, Zip <b>1058 Grand Rd 215</b>																					
Project Contact <b>970-210-3700</b>		Project Manager <b>NIXEE PRABACH</b>																					
Billing Information (if different from Report to)		Company Name <b>WPE Energy Rocky Mtn.</b>																					
Street Address <b>1100 (W. 1st St)</b>		Street Address <b>1058 Grand Rd 215</b>																					
City, State, Zip <b>Grand Jct, CO 81506</b>		City, State, Zip <b>Parachute CO 81455</b>																					
Project Contact <b>970-210-3700</b>		Project Manager <b>NIXEE PRABACH</b>																					
Sample ID(s) Name(s) <b>Jessica K. Boaz</b>		Project Manager <b>NIXEE PRABACH</b>																					
Sample ID / Point of Collection		MECH/DI Vial #	Collection		Number of preserved bottles												LAB USE ONLY						
			Date	Time	Sampled by	Matrix	# of bottles	HC	HC	NH <sub>3</sub>	NH <sub>3</sub>	HPO <sub>4</sub>	HPO <sub>4</sub>	NO <sub>2</sub>	NO <sub>2</sub>	NO <sub>3</sub>	NO <sub>3</sub>	DI Water	ENCORE	ENCORE	Bottle		
RMV 210-21 MW1			5/13/14	0910	KB	GW	8	3	1	4													C1
RMV 210-21 MW5				1020	SS																		C2
RMV 210-21 MW6				1010	KB																		C3
RMV 210-21 MW7				1055	SS																		C4
RMV 210-21 MW8				1145	SS																		C5
RMV 210-21 MW9			5/13/14	1100	KB	GW	8	3	1	4													C6

Turnaround Time (Business days)		Approved By (Accutest PM) / Date:		Data Deliverable Information												Comments / Special Instructions
<input type="checkbox"/> Std. 10 Business Days <input checked="" type="checkbox"/> Std. 5 Business Days (By Contract only) <input type="checkbox"/> 5 Day / SH <input type="checkbox"/> 3 Day EMERGENC <input type="checkbox"/> 2 Day EMERGENC <input type="checkbox"/> 1 Day EMERGENC				<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> Commercial "B" - Narrative <input type="checkbox"/> FULLT1 (Level 3+4) Commercial "A" = Results Only Commercial "B" = Results + QC Summary												All COC email report to Kaitlyn - Jacob Prabhakar *Parachute - NO2, NO3, SO4, Cl, nitrate nitrite *Parachute - Ca, Fe, K, mg, Mn, Na, etc.

Emergency & Rush T/A data available VIA Lablink				Sample Custody must be documented below each time samples change possession, including courier delivery.											
Relinquished by Sampler:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:	Relinquished By:	Date Time:	Received By:	Date Time:
<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45	<i>[Signature]</i>	5/13/14 12:45
3		3		4		4		4		4		4		4	
5		5		5		5		5		5		5		5	
				Custody Seal #	Intact	Not Intact	Preserved where applicable	On Ice	Cooler Temp.						
				40/11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	TDSO	2.1						

5.1  
5

## GC Volatiles

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## QC Data Summaries

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Includes the following where applicable:

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

## Method Blank Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1226-MB	TA21796.D	1	05/14/14	EV	n/a	n/a	GTA1226

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-1, D57710-2, D57710-4, D57710-5

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	116% 60-140%

## Method Blank Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1229-MB	TA21879.D	1	05/20/14	EV	n/a	n/a	GTA1229

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-3, D57710-6

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	ND	2.0	1.0	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
1330-20-7	Xylenes (total)	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	101% 60-140%

# Blank Spike Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1226-BS	TA21797.D	1	05/14/14	EV	n/a	n/a	GTA1226

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-1, D57710-2, D57710-4, D57710-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	27.2	24.8	91	70-130
100-41-4	Ethylbenzene	45.6	45.1	99	70-130
108-88-3	Toluene	212	197	93	70-130
1330-20-7	Xylenes (total)	216	222	103	70-130

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

\* = Outside of Control Limits.

# Blank Spike Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA1229-BS	TA21880.D	1	05/20/14	EV	n/a	n/a	GTA1229

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-3, D57710-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	27.2	25.5	94	70-130
100-41-4	Ethylbenzene	45.6	45.3	99	70-130
108-88-3	Toluene	212	197	93	70-130
1330-20-7	Xylenes (total)	216	224	104	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	106%	60-140%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57684-1MS <sup>a</sup>	TA21799.D	1	05/14/14	EV	n/a	n/a	GTA1226
D57684-1MSD <sup>a</sup>	TA21800.D	1	05/14/14	EV	n/a	n/a	GTA1226
D57684-1 <sup>a</sup>	TA21798.D	1	05/14/14	EV	n/a	n/a	GTA1226

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-1, D57710-2, D57710-4, D57710-5

CAS No.	Compound	D57684-1 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	27.2	24.8	91	27.2	24.7	91	0	55-133/30
100-41-4	Ethylbenzene	ND	45.6	44.9	98	45.6	44.2	97	2	63-130/30
108-88-3	Toluene	ND	212	197	93	212	193	91	2	70-130/30
1330-20-7	Xylenes (total)	ND	216	222	103	216	218	101	2	64-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D57684-1	Limits
120-82-1	1,2,4-Trichlorobenzene	119%	120%	115%	60-140%

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

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D57710  
**Account:** WILLCOP WPX Energy Rocky Mountain, LLC  
**Project:** CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D57530-17MS	TA21882.D	1	05/20/14	EV	n/a	n/a	GTA1229
D57530-17MSD	TA21883.D	1	05/20/14	EV	n/a	n/a	GTA1229
D57530-17	TA21881.D	1	05/20/14	EV	n/a	n/a	GTA1229

The QC reported here applies to the following samples:

Method: SW846 8021B

D57710-3, D57710-6

CAS No.	Compound	D57530-17 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	27.2	26.3	97	27.2	25.6	94	3	55-133/30
100-41-4	Ethylbenzene	ND	45.6	46.6	102	45.6	45.3	99	3	63-130/30
108-88-3	Toluene	ND	212	205	97	212	200	95	2	70-130/30
1330-20-7	Xylenes (total)	ND	216	230	107	216	224	104	3	64-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D57530-17	Limits
120-82-1	1,2,4-Trichlorobenzene	107%	107%	102%	60-140%

\* = Outside of Control Limits.

## Metals Analysis

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
Matrix Type: AQUEOUS

Methods: SW846 6010C  
Units: ug/l

Prep Date: 05/15/14

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	8.6	41		
Antimony	30	2.1	19		
Arsenic	25	3.8	5.6		
Barium	10	.2	1.4		
Beryllium	10	.8	1.2		
Boron	50	.8	6.6		
Cadmium	10	.2	.36		
Calcium	400	2.2	41	2.7	<400
Chromium	10	.3	.4		
Cobalt	5.0	.4	.57		
Copper	10	.8	1.9		
Iron	70	1.5	9.5	4.9	<70
Lead	50	2.1	21		
Lithium	5.0	.4	2.7		
Magnesium	200	6.8	19	-0.20	<200
Manganese	5.0	.01	.46	0.30	<5.0
Molybdenum	10	.4	.84		
Nickel	30	.5	.87		
Phosphorus	100	15	20		
Potassium	1000	99	270	17.2	<1000
Selenium	50	7.1	11	-7.1	<50
Silicon	50	4.7	5.2		
Silver	30	.3	.6		
Sodium	400	4.9	170	68.4	<400
Strontium	5.0	.01	.12		
Thallium	10	1.8	4		
Tin	50	12	16		
Titanium	10	.1	2.1		
Uranium	50	2.9	5.5		
Vanadium	10	.4	.4		
Zinc	30	.4	3.2		

Associated samples MP12919: D57710-1F, D57710-2F, D57710-3F, D57710-4F, D57710-5F, D57710-6F

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

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

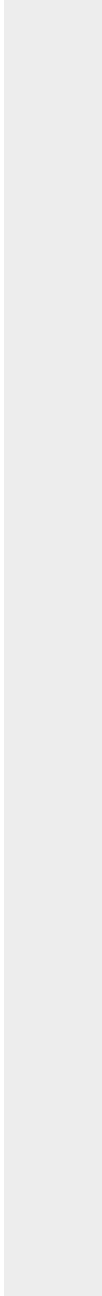
QC Batch ID: MP12919  
Matrix Type: AQUEOUS

Methods: SW846 6010C  
Units: ug/l

Prep Date: 05/15/14

Metal	RL	IDL	MDL	MB raw	final
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(anr) Analyte not requested



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7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57710  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
 Matrix Type: AQUEOUS

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F Original MS	SpikeLot ICPAL2		% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium	anr				
Beryllium					
Boron					
Cadmium	anr				
Calcium	217000	230000	25000	92.0	75-125
Chromium	anr				
Cobalt					
Copper	anr				
Iron	7.0	4830	5000	96.3	75-125
Lead	anr				
Lithium					
Magnesium	200000	219000	25000	76.0	75-125
Manganese	447	911	500	92.8	75-125
Molybdenum					
Nickel					
Phosphorus					
Potassium	6050	32100	25000	105.7	75-125
Selenium	52.2	1310	1000	128.6N(a)	75-125
Silicon					
Silver	anr				
Sodium	412000	416000	25000	80.0	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP12919: D57710-1F, D57710-2F, D57710-3F, D57710-4F, D57710-5F, D57710-6F

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

7.12  
 7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
Matrix Type: AQUEOUS

Methods: SW846 6010C  
Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F Original MS	SpikeLot ICPALL2	% Rec	QC Limits
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(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57710  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
 Matrix Type: AQUEOUS

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F Original MSD	SpikeLot ICPAL2 % Rec		MSD RPD	QC Limit	
Aluminum						
Antimony						
Arsenic	anr					
Barium	anr					
Beryllium						
Boron						
Cadmium	anr					
Calcium	217000	229000	25000	88.0	0.4	20
Chromium	anr					
Cobalt						
Copper	anr					
Iron	7.0	4840	5000	96.5	0.2	20
Lead	anr					
Lithium						
Magnesium	200000	218000	25000	72.0 (a)	0.5	20
Manganese	447	903	500	91.2	0.9	20
Molybdenum						
Nickel						
Phosphorus						
Potassium	6050	32000	25000	105.3	0.3	20
Selenium	52.2	1330	1000	130.6N(b)	1.5	20
Silicon						
Silver	anr					
Sodium	412000	414000	25000	72.0 (a)	0.5	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP12919: D57710-1F, D57710-2F, D57710-3F, D57710-4F, D57710-5F, D57710-6F

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

7.1.2  
 7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D57710  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
 Matrix Type: AQUEOUS

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F Original MSD	SpikeLot ICPALL2	% Rec	MSD RPD	QC Limit
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- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- (b) Spike recovery indicates possible matrix interference.

7.1.2  
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57710  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
 Matrix Type: AQUEOUS

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 05/15/14

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium	25000	25000	100.0	80-120
Chromium	anr			
Cobalt				
Copper	anr			
Iron	4890	5000	97.8	80-120
Lead	anr			
Lithium				
Magnesium	25500	25000	102.0	80-120
Manganese	490	500	98.0	80-120
Molybdenum				
Nickel				
Phosphorus				
Potassium	26400	25000	105.6	80-120
Selenium	1160	1000	116.0	80-120
Silicon				
Silver	anr			
Sodium	26000	25000	104.0	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP12919: D57710-1F, D57710-2F, D57710-3F, D57710-4F, D57710-5F, D57710-6F

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

7.1.3  
7

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D57710

Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

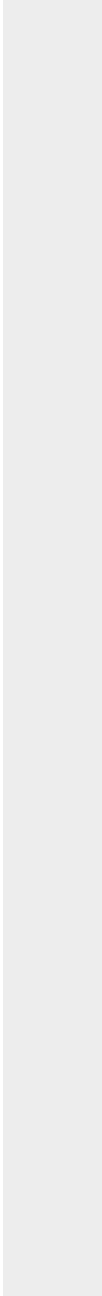
QC Batch ID: MP12919  
Matrix Type: AQUEOUS

Methods: SW846 6010C  
Units: ug/l

Prep Date: 05/15/14

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



SERIAL DILUTION RESULTS SUMMARY

Login Number: D57710  
 Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
 Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
 Matrix Type: AQUEOUS

Methods: SW846 6010C  
 Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	anr			
Beryllium				
Boron				
Cadmium	anr			
Calcium	217000	232000	12.5*(a)	0-10
Chromium	anr			
Cobalt				
Copper	anr			
Iron	7.00	11.5	30.7 (b)	0-10
Lead	anr			
Lithium				
Magnesium	200000	213000	6.7	0-10
Manganese	447	482	7.8	0-10
Molybdenum				
Nickel				
Phosphorus				
Potassium	6050	5780	1.6	0-10
Selenium	52.2	0.00	100.0(b)	0-10
Silicon				
Silver	anr			
Sodium	412000	460000	16.2*(a)	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP12919: D57710-1F, D57710-2F, D57710-3F, D57710-4F, D57710-5F, D57710-6F

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

7.1.4  
 7

SERIAL DILUTION RESULTS SUMMARY

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

QC Batch ID: MP12919  
Matrix Type: AQUEOUS

Methods: SW846 6010C  
Units: ug/l

Prep Date: 05/15/14

Metal	D57710-1F	QC
	Original SDL 1:5 %DIF	Limits

- (anr) Analyte not requested
- (a) Serial dilution indicates possible matrix interference.
- (b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

## General Chemistry

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### QC Data Summaries

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Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D57710  
Account: WILLCOPI - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Bicarbonate as CaC	GN24755	5.0	2.2	mg/l	100	99.1	99.1	90-110%
Alkalinity, Carbonate	GN24756	5.0	2.2	mg/l	100	99.1	99.1	80-120%
Alkalinity, Total as CaCO3	GN24752	5.0	2.2	mg/l	100	99.1	99.1	90-110%
Chloride	GP12570/GN24695	0.50	0.0	mg/l	5	4.69	93.8	90-110%
Nitrogen, Nitrate	GP12570/GN24695	0.010	0.0	mg/l	0.1	0.0961	96.1	90-110%
Nitrogen, Nitrite	GP12570/GN24695	0.0040	0.0	mg/l	0.05	0.0481	96.2	90-110%
Solids, Total Dissolved	GN24762	10	0.0	mg/l	400	394	98.5	90-110%
Sulfate	GP12570/GN24695	0.50	0.0	mg/l	5	5.00	100.0	90-110%
Total Organic Carbon	GP12563/GN24688	1.0	0.0	mg/l	8.82	8.70	98.6	90-110%
pH	GN24705			su	8.00	8.01	100.1	99.3-100.7%

Associated Samples:

Batch GN24705: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GN24752: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GN24755: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GN24756: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GN24762: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GP12563: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 Batch GP12570: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6  
 (\*) Outside of QC limits

8.1  
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DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	118	1.9	0-20%
Solids, Total Dissolved	GN24762	D57783-1	mg/l	52.0	56.0	7.4	0-20%
Total Organic Carbon	GP12563/GN24688	D57705-1	mg/l	5.8	5.7	1.7	0-20%

Associated Samples:

Batch GN24752: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

Batch GN24762: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

Batch GP12563: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

(\*) Outside of QC limits

8.2

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MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D57710  
Account: WILLCOPI - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	100	215	94.8	80-120%
Chloride	GP12570/GN24695	D57710-4	mg/l	151	500	606	92.6	80-120%
Chloride	GP12570/GN24695	D57710-4	mg/l	143	500	606	92.6	80-120%
Nitrogen, Nitrate	GP12570/GN24695	D57710-4	mg/l	23.7	10	33.9	102.0	80-120%
Nitrogen, Nitrate	GP12570/GN24695	D57710-4	mg/l	55.5	10	33.9	102.0	80-120%
Nitrogen, Nitrite	GP12570/GN24695	D57710-4	mg/l	0.026	5	4.8	95.5	80-120%
Nitrogen, Nitrite	GP12570/GN24695	D57710-4	mg/l	0.0	5	4.8	95.5	80-120%
Sulfate	GP12570/GN24695	D57710-4	mg/l	-1800	500	1910	96.0	80-120%
Sulfate	GP12570/GN24695	D57710-4	mg/l	1430	500	1910	96.0	80-120%
Total Organic Carbon	GP12563/GN24688	D57705-1	mg/l	5.8	10	15.9	101.0	80-120%

Associated Samples:

Batch GN24752: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

Batch GP12563: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

Batch GP12570: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

(\* ) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits



MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D57710  
Account: WILLCOP - WPX Energy Rocky Mountain, LLC  
Project: CORCCOGJ: RMV 216-21 GW Monitoring(012.1539)

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN24752	D57802-2	mg/l	120	100	217	-0.6	20%
Total Organic Carbon	GP12563/GN24688	D57705-1	mg/l	5.8	10	15.9	0.0	20%

Associated Samples:

Batch GN24752: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

Batch GP12563: D57710-1, D57710-2, D57710-3, D57710-4, D57710-5, D57710-6

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits