DOCUMENT #2145485

FORM 4
Rev 12/05

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303)894-2100 Fax (303)894-2109

DE	ET	DE	ES

Rec. 1/22/13

SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)

1. OGCC Operator Number: 96850
2. Name of Operator: WPX Energy Rocky Mountain LLC
3. Address: 1058 County Road 215
City: Parachute State: CO Zip: 81635
4. Contact Name: Karolina Blaney
Phone: 970 683 2295
Fax: 970 285 9573

Complete the Attachment Checklist

	OP	OGCC
Survey Plat		
Directional Survey		
Surface Eqpmt Diagram		
Technical Info Page		
Other	X	

5. API Number 05- 045-10372
OGCC Facility ID Number
6. Well/Facility Name: RWF 342-22
7. Well/Facility Number RWF 342-22
8. Location (QtrQtr, Sec, Twp, Rng, Meridian): SE NE, S22, T6S, R94W, 6th
9. County: Garfield
10. Field Name: Rulison
11. Federal, Indian or State Lease Number:

Project ID: 4989

General Notice

☐ CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

	FNL/FSL		FEL/FWL	
Change of **Surface** Footage **from** Exterior Section Lines:				
Change of **Surface** Footage **to** Exterior Section Lines:				
Change of **Bottomhole** Footage **from** Exterior Section Lines:				
Change of **Bottomhole** Footage **to** Exterior Section Lines:				attach directional survey

Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer
Latitude
Longitude
Ground Elevation
Distance to nearest property line
Distance to nearest lease line
Distance to nearest well same formation
Distance to nearest bldg, public rd, utility or RR
Is location in a High Density Area (rule 603b)? Yes/No
Surface owner consultation date:

GPS DATA:
Date of Measurement PDOP Reading Instrument Operator's Name

☐ CHANGE SPACING UNIT

Formation	Formation Code	Spacing order number	Unit Acreage	Unit configuration

☐ Remove from surface bond
Signed surface use agreement attached

☐ CHANGE OF OPERATOR (prior to drilling):
Effective Date:
Plugging Bond: ☐ Blanket ☐ Individual

☐ CHANGE WELL NAME NUMBER
From:
To:
Effective Date:

☐ ABANDONED LOCATION:
Was location ever built? ☐ Yes ☐ No
Is site ready for Inspection? ☐ Yes ☐ No
Date Ready for Inspection:

☐ NOTICE OF CONTINUED SHUT IN STATUS
Date well shut in or temporarily abandoned:
Has Production Equipment been removed from site? ☐ Yes ☐ No
MIT required if shut in longer than two years. Date of last MIT

☐ SPUD DATE:

☐ REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

☐ SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK *submit cbl and cement job summaries

Method used	Cementing tool setting/perf depth	Cement volume	Cement top	Cement bottom	Date

☐ RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.
Final reclamation will commence on approximately
☐ Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

☐ Notice of Intent
Approximate Start Date:
☒ Report of Work Done
Date Work Completed: 1/22/2013

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

☐ Intent to Recomplete (submit form 2)	☐ Request to Vent or Flare	☐ E&P Waste Disposal
☐ Change Drilling Plans	☐ Repair Well	☐ Beneficial Reuse of E&P Waste
☐ Gross Interval Changed?	☐ Rule 502 variance requested	☐ Status Update/Change of Remediation Plans for Spills and Releases
☐ Casing/Cementing Program Change	☒ Other: NFA request	

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct and complete.

Signed: Karolina Blaney Date: 1/22/2013 Email: Karolina.Blaney@WPXEnergy.com
Print Name: Karolina Blaney Title: Environmental Specialist

COGCC Approved: Title: Env. Sup. Date: 7/1/13
CONDITIONS OF APPROVAL, IF ANY:

Please see Recommendations provided in June 27, 2013 Kaveva Ltd. "Surface Cty Seepage Survey." Attached

6. Based on WPX's groundwater sampling, the groundwater around well pad 342-22 has not been significantly impacted by the surface methane seepages occurring in that area.

Recommendations:

1. Conduct bradenhead pressure build-up test on all wells on pad 342-22 to verify mechanical integrity of each well.

2. Revisit to determine if there are remedial actions that may be taken to reduce surface methane seepages around well pad 342-22 based on the findings presented in this study.

3. Even in the absence of remedial actions to reduce surface methane seepages, bradenhead pressures in RWF 342-22 should be closely monitored due to its abnormally high pressure build-up.

The purpose of this Form 4 is to summarize gas sampling, ground water sampling, and well integrity testing activities undertaken by WPX Energy at the RWF 342-22 well since February 2010. The data described below supports the conclusion that the gas detected leaking at the conductor level at the RWF 342-22 is not from WPX Energy's producing Williams Fork reservoir but rather from near-surface, low-saturation gas sands in the Wasatch Formation and that the well has good mechanical integrity. Based on the information presented in this document, WPX respectfully requests COGCC to grant a No Further Action Determination regarding this incident (COGCC remediation #4989).

Well Construction

The attached Figure 1 graphically depicts various components of the RWF 342-22 well, and is representative of a typical natural gas production well. Key components in the investigation of venting gas are the conductor, surface casing, production casing and various cement and perforation intervals. It is important to note the primary functions of each casing element and their relationship to the venting gas. For instance, conductor casing is not designed to prevent seeps of shallow hydrocarbons but rather to isolate the area around the well head from surface and near surface waters, to ensure unconsolidated materials in the near-surface do not interfere with drilling of the surface casing, and to facilitate the capture of drilling mud and cuttings returns to the mud tanks while drilling the hole for surface casing. In some instances, conductor pipe also serves as a safety device to prevent blowouts.

Surface casing is designed to prevent interaction with ground water aquifers and to contain drilling fluids while drilling the deeper sections of the well. The cement behind the production casing (between the production casing and the production borehole) isolates the higher pressure reservoirs from venting to the surface so we can produce the hydrocarbons, control the well, and put production tools in and out of the well.

Based on the available data, RWF 342-22 is a well with good mechanical integrity. The review of construction logs for this well did not identify any problems encountered during the drilling process or in the primary installation of casing, cementing or completion of the well. As summarized on the attached Table 1, logs from the cement job indicate good returns to surface on the back side of the surface casing, as well as successful cementing of the production casing to 3300 feet below grade, which supports the conclusion that RWF 342-22 is a well with good mechanical integrity.

Bradenhead and Pressure Testing

WPX Energy has conducted two different Bradenhead tests and collected various gas samples from this well at the request of COGCC since gas was first discovered venting to the surface in the annulus between the conductor pipe and surface casing in March of 2010. In addition, two different Bradenhead tests were performed on the other wells on this pad. The attached Figure 2 shows the dates and types of testing and sampling at the RWF 342-22 wellhead. The two Bradenhead tests that were performed on the wells on this pad included a 72-hour test and a 7-day shut-in test. These tests were conducted several months apart, and results consistently indicate there is good integrity in the production casing/surface casing annulus or Bradenhead (see Figure 1 for Bradenhead location). Maximum pressures on the 72-hour test conducted in March remained below 5 psi for the duration of the test. Pressures recorded during the 7-day shut-in test conducted in May 2010 leveled off at 8 psi on day 5 and did not increase over the next two days (see Table 2). Similar or lower pressures measured in the other five wells on the

pad support the assumption that all of the wells have good integrity and no production gas is reaching the surface. These Bradenhead tests demonstrate that there are no problems with the production casings and surface casings of these wells.

The gas venting from between the conductor pipe and the surface casing is flowing at such a low rate that it is not able to be measured. Shut-in pressures can reach approximately 20 psi over several days, but the pressure quickly blows down to zero psi when measurement is attempted and remains at zero as long as the valve remains open. The vent pipe that was placed on the wellhead removes the gas from the immediate work zone by elevating the venting activity, and thereby removing any health or safety risks associated with an accumulation of gas at ground surface.

Gas Analysis – Extended Analytical and Isotopic Results

Extended gas analyses were conducted on gas samples from multiple locations at the wellhead (see Figure 2) as well as from the several Wasatch wells in Rulison Field, which are completed into the lower Wasatch "G-sand" for comparison purposes. A summary of these results is provided in the attached Table 3. In order to account for atmospheric sample contamination and to compare sample to sample, the gas analyses were normalized to just the hydrocarbon components in Table 3. Compositionally, the samples were from two distinctive groups (Table 3, Figure 3). Based on normalized hydrocarbon compositions, the Wasatch gasses are compositionally drier (greater than 95 mole % methane) than Williams Fork gasses (commonly less than 90 mole % methane) and contain very little to no CO_2. This compositional variation is due to, in part, the source of the organic material (Type III terrestrial sourced kerogen) and potential stripping of heavier gases and isotopes (fractionization) during migration of the gasses generated from deeper sources. The conductor casing and bradenhead samples are compositionally similar to the Wasatch samples; drier (wetness factor of 3 and 2), consisting predominantly of methane with minor amounts of heavier hydrocarbons and CO_2 concentrations near zero or below detection limits of the analytical equipment. In comparison, the tubing samples from the Williams Fork production are wetter (wetness factor near 10), contain significantly more concentrations of heavier hydrocarbons (e.g. ethane – 6-7%, propane – 2%, etc.), and have over 1 mole % CO_2. The tubing samples are very similar to other composition analyses of WPX production gasses from the Williams Fork reservoir in this area.

Isotopic analyses were conducted on gas samples taken from the production tubing, surface casing (bradenhead) and a separate sample from the isolated conductor casing where the leak was originally detected (Figure 2, Table 3). In addition, three samples of Wasatch "G-sand" gas from Rulison Field are included for comparison. Three cross plots are shown in Figure 3, one that cross plots del ^{13}C from methane against a gas wetness factor (sum of hydrocarbon gases C_2 through nC_5 divided by sum C_1 through nC_5 times 100), another that cross plots wetness against mol % CO_2, and one that plots del ^{13}C from methane against the del Deuterium from methane. These plots show that the gases sampled from the tubing, bradenhead and the conductor casing are of a thermogenic origin ruling out a biogenic, near-surface source of the gas (degrading (microbial) organic matter in the alluvium). On a wetness genetic classification plot (Figure 3a) the conductor and bradenhead plot in the Post Mature Lean Gas field in a similar area as the Wasatch samples. The RWF 342-22 tubing sample plots closer to the classifications for gasses formed with oils indicating a different source material. On a Whiticar diagram (isotopic carbon-deuterium cross plot, Figure 3c), the conductor, bradenhead and Wasatch samples plot closer to a humic source (Type III) whereas the tubing sample is

indicative of a mixture of humic and sapropelic organic matter indicating a mixture of deeper seated gas most likely from a Type II kerogen originating from the Cameo or Mancos formation below the productive Williams Fork Formation.

The bradenhead, conductor and Wasatch samples are isotopically more mature, compositionally drier and devoid of CO2 in comparison to the Williams Fork tubing samples. These two groups of gases are clearly distinctive resulting from variations in source material, maturation history and migration pathways. These observations are consistent with other data WPX Energy has collected across the basin that supports our conclusion that the gas detected leaking at the conductor level is not from our producing Williams Fork reservoir but rather from near-surface, low-saturation gas sands in the Wasatch Formation.

The gas leaking near the conductor is most likely the result of the hydrocarbon system at play in the Rulison Field. The natural gasses in the Williams Fork and Wasatch Formations are considered basin-centered gas accumulations. These types of systems do not have traditional seals normally associated with hydrocarbon accumulations. In this case, the seal is the extremely low permeabilities of the formations, pore throat geometries and the discontinuous, lenticular nature of the fluvial deposited sandstones that also create a stratigraphic trapping component. The currently producing units in the Rulison Field were buried to considerably deeper depths in the geologic past and have since been exhumed closer to the surface by uplift of the Rockies and downcutting of the Colorado River that removed in excess of 5000 ft of overburden rock. Gas was generated by thermogenic processes during maximum burial prior to uplift and has remained trapped in the discontinuous lenticular sands of the Williams Fork and Wasatch Formations. Residual gas saturation left in sands of the Wasatch Formation after uplift and erosion is most likely the source of the conductor gas. This residual, low-saturation, near-surface gas (nuisance gas) is very common in this basin (and elsewhere) but is at very low pressures and volumes and is not found in economic quantities throughout the basin. The shut-in pressure testing of the bradenhead supports this low-saturation residual gas interpretation. If we had pressure communication with the Williams Fork through the cement sheath in the bradenhead annulus, we would see much higher pressures, quicker pressure build-up and composition and isotopic signatures similar to the Williams Fork reservoirs.

Groundwater Test Results

As requested by the COGCC Environmental Staff on 5/17/2010, WPX Energy installed two ground water monitoring wells surrounding the RWF 342-22 well pad. A third monitoring well (MW-3) was installed on 8/4/2010. Three WPX Energy ground water monitoring wells along with two background DOE monitoring wells were sampled in June and August of 2010 and November of 2012. Samples from these wells documents that the naturally occurring shallow Wasatch gas vented from the RWF 342-22 well has not impacted ground water. (See Attachment A - Drilling Logs).

Based on the potentiometric map (Figure 4) ground water flow direction is from the east to the west, parallel to the direction of flow of the Colorado River. If shallow gas released near the RWF 342-22 well was impacting ground water, impacts would have most likely been observed in MW-3. No benzene was found in MW-3.

Analytical results of the three monitoring wells (MW-1, MW-2, and MW-3) verify that the gas venting by the RWF 342-22 well is not causing any impact to ground water and surrounding environment. BTEX concentrations are non-detectable and Methane concentrations are less

than 1 ppm. Analytical results are summarized in Table 4. Full analytical laboratory reports are included as an attachment B.

Summary and Proposed Next Steps

Residual, low-saturation, near-surface gas is a common condition encountered in many natural gas producing basins throughout the world. The source can be as simple as rotting vegetation buried near the surface or in swamps or from past geologic generation of hydrocarbons seeping to the surface. Any penetration in the subsurface runs the chance of encountering very low quantities of gas-saturated rock. It is common to find naturally occurring gas in domestic water wells even in areas without oil and gas development. Gas is naturally and constantly moving upward through time to the surface. As a result, there are natural seeps of hydrocarbons, including oil, in many regions of the world, both on land and under the ocean. Shallow gas is so prevalent in the surface hole sections in many areas of the US that the BLM requires BOP equipment be installed on top of conductor casing. The conductor BOP equipment is usually in the form of a bag type diverter in conjunction with a large diameter valve-less blooie line to the pit.

Based on the testing and gas sampling results to date, WPX Energy believes the gas venting to the surface, between the surface casing and the conductor pipe, is most likely coming from a naturally-occurring shallow, low pressure, uneconomic, thermogenic gas accumulation in the upper Wasatch Formation. Most likely, a microannulus in the surface casing/conductor casing annulus (Figure 1) provides a pathway for this gas to migrate to the surface. It is unlikely that we will be able to identify the exact depth or nature of this gas accumulation through subsurface logging or additional drilling of test holes in the immediate area. It is not possible to identify the exact nature and location of a microannulus in the cement with downhole logging techniques like cement bond logs.

Based on the groundwater sampling results included in Table 4, the gas venting to the surface is not impacting groundwater as the BTEX concentrations in all three groundwater monitoring wells are non-detectable. Upon the approval of this plan, the groundwater monitoring wells will be plugged, sealed, and abandoned either pursuant to Rule 16.2 of the Colorado Water Well Construction Rules, or by filling the holes with clean native clays, cement, or high solid bentonite grout to within five (5) feet of the ground surface. The top five (5) feet of the hole shall be filled with materials less permeable than the surrounding soils that are adequately compacted to prevent settling.

WPX Energy reviewed several possible remedies to stop the venting gas, from low pressure (<20 psi) injection of fresh water between the conductor casing and the surface casing to additional grouting at the surface. However, with each of these remedies there is a risk that we will increase the size of the microannulus to the surface and make the venting worse. The venting gas is currently at very low pressure and an unmeasureably low rate of flow. Therefore, in the absence of any environmental, health or safety risks, WPX Energy would like to close this incident and proposes to allow the naturally occurring, low pressure gas to continue to vent at the surface and naturally dissipate over time.

Tables

Table 1 - Well Construction Details

WELL: RWF 342-22	As of 7/15/2010

Spud Date	8/9/2005
Final Sales	11/23/2005
KB	14
PBTD	7,400

CIBP from compl

CASING DATA									
TYPE	**Hole Size (in)**	**Csg Size (in)**	**ID (Drift) (in)**	**Weight (ppf)**	**Grade**	**TOC (MD)**	**BOC (MD)**	**TOP (MD)**	**BOTTOM (MD)**
Conductor	24	18				0	60	0	60
Surface	13 1/2	9 5/8	8.625	32.3	H-40	0	1,124	0	1,124
Production	7 7/8	4 1/2	3.875	11.6	I-80	3,300	7,501	0	7,501

TUBING DATA					
Tbg Size (in)	**ID (Drift) (in)**	**Weight (ppf)**	**Grade**	**TOP (MD)**	**BOTTOM (MD)**
2 3/8	1.995	4.6	J-55	0	6,819

Cement Jobs					
String	**Type**	**Amount (sx)**	**TOC**	**BOC**	**Remarks**
SURFACE CASING			0	1,124	Good returns, bumped plug, float held, 22 bbls of cement to pit
Lead	HLC Type III	240			
Tail	Type 3	240			
PRODUCTION CASING			3,300	7,501	Reciprocatred pipe while cementing, good returns throughout job, float held
CMT	MG 50/50 POZ	907			

Tubing Details				
Component	**Jts**	**Length (ft)**	**MD Top Set (ft)**	**MD Base Set (ft)**
Tubing Hanger	0	0.9	14.0	14.9
Tubing	215	6771.2	14.9	6,786.1
Seating Nipple	0	1.1	6,786.1	6,787.2
Tubing	1	31.5	6,787.2	6,818.7
Bit Sub	0	0.3	6,818.7	6,819.0

Perf Data		
Set	Top	Bottom
Mesa Verde 5	5,378	5,505
Mesa Verde 4	5,566	5,790
Mesa Verde 3	5,857	6,088
Mesa Verde 2	6,170	6,336
Mesa Verde 1	6,412	6,459
Cameo	6,678	6,927
Lower Cameo	7,038	7,372

Table 2 – Seven Day Bradenhead Pressure Test Report

Table 1: RWF 342-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 10:00 a.m. May 14th, 2010
5/15/2010	4	
5/16/2010	5	
5/17/2010	6	
5/18/2010	6	
5/19/2010	8	
5/20/2010	8	
5/21/2010	8	

Table 2: RWF 541-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 10:00 a.m. May 14th, 2010
5/15/2010	0	
5/16/2010	0	
5/17/2010	0	
5/18/2010	0	
5/19/2010	0	
5/20/2010	0	
5/21/2010	0	

Table 3: RWF 42-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 11:00 a.m. May 14th, 2010
5/15/2010	0	
5/16/2010	0	
5/17/2010	0	
5/18/2010	0	
5/19/2010	0	
5/20/2010	0	
5/21/2010	0	

Table 4: RWF 542-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 11:00 a.m. May 14th, 2010
5/15/2010	0	
5/16/2010	0	
5/17/2010	0	
5/18/2010	0	
5/19/2010	0	
5/20/2010	0	
5/21/2010	0	

Table 5: RWF 442-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 1:00 p.m. May 14th, 2010
5/15/2010	0	
5/16/2010	0	
5/17/2010	0	
5/18/2010	0	
5/19/2010	0	
5/20/2010	0	
5/21/2010	0	

Table 6: RWF 532-22 Seven Day Bradehhead Test

Date	Bradenhead Pressure (psi)	Notes
5/14/2010	0	Shut in 10:00 a.m. May 14th, 2010
5/15/2010	4	
5/16/2010	8	
5/17/2010	10	
5/18/2010	10	
5/19/2010	10	
5/20/2010	12	
5/21/2010	12	

Table 3

Analysis		Isotopic	Extended Gas	Extended Gas	Isotopic	Extended Gas	Isotopic	Extended Gas	Extended Gas	Isotopic	Isotopic
Well		RWF 342-22 Conductor	RWF 342-22 Conductor	RWF 342-22 Tubing	RWF 342-22 Tubing	RWF 342-22 Production Casing	RWF 342-22 Bradenhead	RWF 342-22 Bradenhead	RW 3-27	Federal 118 Tubing	Clough 119 Tubing
Formation →		UNK	UNK	Williams Fork	Williams Fork	Williams Fork	UNK	UNK	Wasatch	Wasatch	Wasatch
Sample Date →	Name ↓	4/7/2010	4/14/2010	4/14/2010	4/22/2010	4/14/2010	10/4/2010	8/18/2010	3/27/2010	6/7/2012	6/7/2012
Normalized to Hydrocarbons Only											
mole % C1	Methane	96.7114	96.4709	89.9082	89.4877	88.5722	97.5231	97.6197	94.8386	96.0438	95.9377
mole % C2	Ethane	2.4986	2.4884	6.6243	7.0157	6.7497	2.0317	1.9406	3.2729	2.8790	2.9541
mole % C3	Propane	0.4786	0.4734	1.9872	2.0813	2.4484	0.2794	0.2557	0.9239	0.6058	0.6201
mole % iC4	Iso-butane	0.1048	0.2897	0.4153	0.4417	0.6444	0.0544	0.0516	0.2226	0.1437	0.1451
mole % nC4	N-butane	0.0931	0.0928	0.4148	0.4335	0.6064	0.0468	0.0434	0.2664	0.1360	0.1368
mole % iC5	Iso-pentane	0.0378	0.0696	0.1683	0.1665	0.2773	0.0218	0.0212	0.1231	0.0658	0.0641
mole % nC5	N-pentane	0.0252	0.0294	0.1297	0.1249	0.2126	0.0135	0.0125	0.1015	0.0465	0.0466
mole % C6+	Hexanes and higher	0.0506	0.0859	0.3523	0.2487	0.4890	0.0294	0.0553	0.2511	0.0793	0.0956
Gas Wetness	(C2:nC5)/(C1:nC5)*100	3.2	3.4	9.8	10.3	11.0	2.4	2.3	4.9	3.9	4.0
	S.G. (calculated)	0.579	0.583545	0.644212	0.654	0.653045	0.609	0.6213	0.598998		
	BTU/cu.ft. dry (@60F, 14.7 psia)	1041	1050.4742	1126.4519	1120	1165.3216	940	907.4	1080.7785		
Raw bulk gas from FID											
mole % C1	Methane	95.9900	95.9595	88.8948	88.1400	88.4496	88.3200	85.2413	94.6962	96.0323	95.9203
mole % C2	Ethane	2.4800	2.4752	6.5496	6.9100	6.7404	1.8400	1.6945	3.2680	2.8786	2.9536
mole % C3	Propane	0.4750	0.4709	1.9648	2.0500	2.4450	0.2530	0.2233	0.9225	0.6057	0.6200
mole % iC4	Iso-butane	0.1040	0.2882	0.4106	0.4350	0.6435	0.0493	0.0451	0.2223	0.1437	0.1451
mole % nC4	N-butane	0.0924	0.0923	0.4101	0.4270	0.6056	0.0424	0.0379	0.2660	0.1360	0.1368
mole % iC5	Iso-pentane	0.0375	0.0692	0.1664	0.1640	0.2769	0.0197	0.0185	0.1229	0.0658	0.0641
mole % nC5	N-pentane	0.0250	0.0292	0.1282	0.1230	0.2123	0.0122	0.0109	0.1013	0.0465	0.0466
mole % C6+	Hexanes and higher	0.0502	0.0854	0.3483	0.2450	0.4883	0.0266	0.0483	0.2507	0.0793	0.0955
mole % CO2	Carbon dioxide	0.0000	0.0030	1.0336	1.3100	0.0202	0.0110	0.0365	0.0161	0.0081	0.0181
mole % N2	Nitrogen	0.6600	0.5271	0.0936	0.1700	0.1182	7.8700	12.6437	0.1340	0.0000	0.0000
$\delta^{13}C$ C_1 ‰ PDB		-35.3			-38.7		-35.7			-34.8	-35.3
$\delta^{13}C$ C_2 ‰ PDB		-25.3			-27.3		-25.8			-25.3	-25.4
$\delta^{13}C$ C_3 ‰ PDB		-23.6			-25.1		22.9			-24.4	-24.7
$\delta^{13}C$ iC_4 ‰ PDB		-23.6			-25.6						
$\delta^{13}C$ nC_4 ‰ PDB		-24.0			-25.0						
δD C_1 ‰		-163.6			-186.1		-162.5			-159.0	-163.0

Table 4
RWF 342-22 WATER TESTING
Sample Analytical Summary

SAMPLE SUMMARY								
Location Description	WPX RWF 342-22 Water Testing							
Sample ID	**MW1**	**MW1**	**MW2**	**MW2**	**MW3**	**MW3**	**US DOE 620**	**US DOE 172**
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	6/24/2010	11/7/2012	6/24/2010	11/7/2012	8/25/2010	11/7/2012	6/24/2010	6/24/2010

LABORATORY DATA SUMMARY									
Analytical Parameters	**Sample ID**								**Units**
	MW1	**MW1**	**MW2**	**MW2**	**MW3**	**MW3**	**US DOE 620**	**US DOE 172**	
Organic Compounds									
Gasoline Range Organics (GRO)	<0.20	NT	<0.20	NT	<0.20	NT	<0.20	1.3	mg/l
Diesel Range Organics (DRO)	<0.40	NT	<0.40	NT	<0.40	NT	<0.40	<0.40	mg/l
Methane	0.015	0.00547	0.00643	0.00076	0.173	0.231	<0.0080	0.0724	mg/l
Benzene	<1.0	<0.20	<1.0	<0.20	<0.30	<0.20	<1.0	33.3	µg/l
Toluene	<2.0	<1.0	<2.0	<1.0	<1.0	<1.0	<2.0	<10	µg/l
Ethylbenzene	<2.0	<1.0	<2.0	<1.0	<0.30	<1.0	<2.0	23.4	µg/l
Xylene	<2.0	<2.0	<2.0	<2.0	<0.60	<2.0	<2.0	303	µg/l
General Chemistry									
Alkalinity - Total as CaCO3	620	NT	653	NT	1060	NT	514	800	mg/l
Bromide	< 2.0	NT	< 2.0	NT	<1.0	NT	< 1.0	< 4.0	mg/l
Chloride	851	851	779	941	736	857	670	2900	mg/l
Fluoride	< 2.0	NT	< 2.0	NT	0.68	NT	< 1.0	< 4.0	mg/l
Nitrogen, Nitrate	< 0.45	NT	0.61	NT	<0.23	NT	28.3	< 0.90	mg/l
Nitrogen, Nitrite	< 6.1	NT	< 6.1	NT	<3.1	NT	< 3.1	< 6.1	mg/l
Sulfate	3770	NT	3010	NT	3450	NT	2390	7090	mg/l
Metals									
Calcium	463	NT	373	NT	699	NT	382	502	mg/l
Iron	1.84	NT	13.5	NT	230	NT	< 0.07	3.66	mg/l
Magnesium	289	NT	247	NT	322	NT	239	683	mg/l
Manganese	2.93	NT	1.6	NT	5.76	NT	1.45	1.07	mg/l
Potassium	15.3	NT	11.1	NT	27.1	NT	8.59	18.4	mg/l
Selenium	< 0.05	NT	< 0.05	NT	<0.1	NT	< 0.05	< 0.05	mg/l
Sodium	1630	1560	1460	1590	1450	1750	942	3660	mg/l
Field Parameters									
Temp	13.96	16.38	14.22	20.71	15.01	19.14	14.82	14.64	°C
SpC	9.23	9.13	7.9	8.76	8.42	9.45	6.839	18.523	mmhos/cm
DO	4.24	1.35	3.3	2.06	1.24	0.38	NT	NT	mg/l
pH	7.58	7.56	7.37	7.41	7.29	7.44	7.21	7.05	unit
TDS	5.9	NT	5.1	NT	5.4	NT	NT	NT	g/l
Turb	2000	879	5.99	548	5999+	2000	1.88	1.91	NTU

mg/l - milligrams per liter
µg/l - micrograms per liter
°C - degrees Celsius
mmhos/cm - milliohms per centimeter
NTU - nephelometric turbidity units

Figures

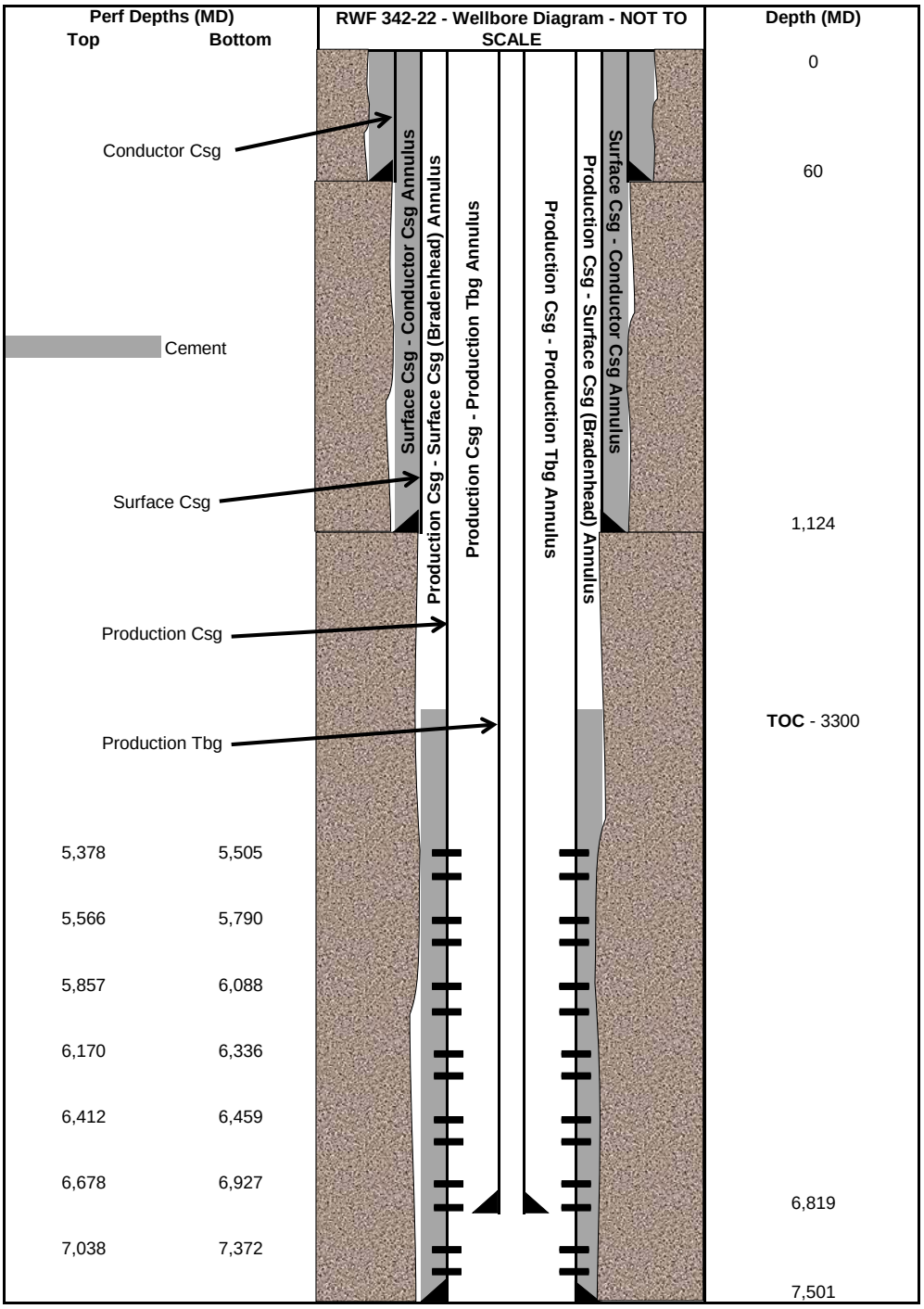
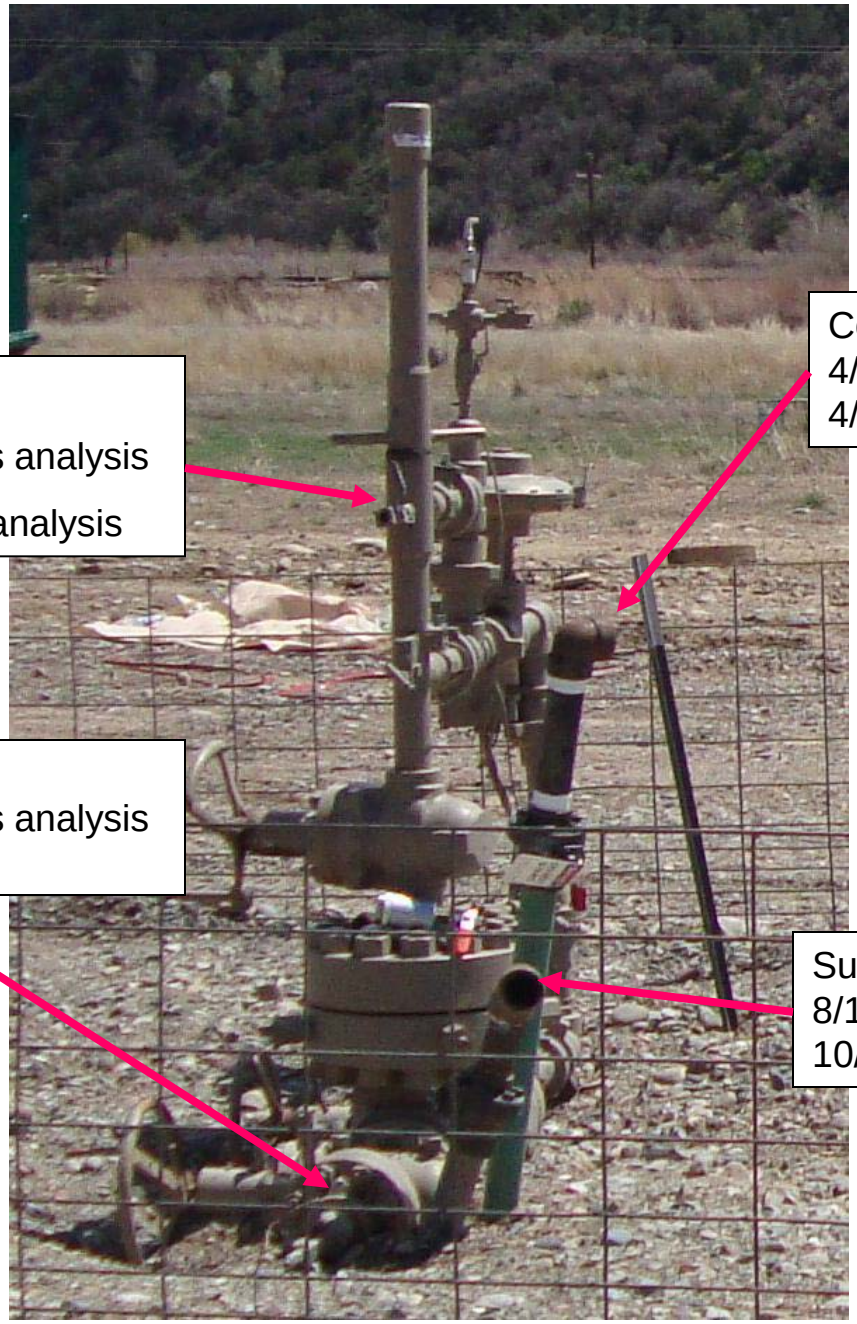


Figure 1 - Well Construction Diagram

Figure 2 – RWF 342-22 Wellhead Configuration



Production Tubing

4/14/2010 – expanded gas analysis

4/22/2010 – isotopic gas analysis

Conductor Vent
4/07/2010 – isotopic gas analysis
4/14/2010 – expanded gas analysis

Production Casing
4/14/2010 – expanded gas analysis
(same gas as tubing)

Surface Casing/Bradenhead
8/18/2010 – extended gas analysis
10/4/2010 – isotopic gas analysis

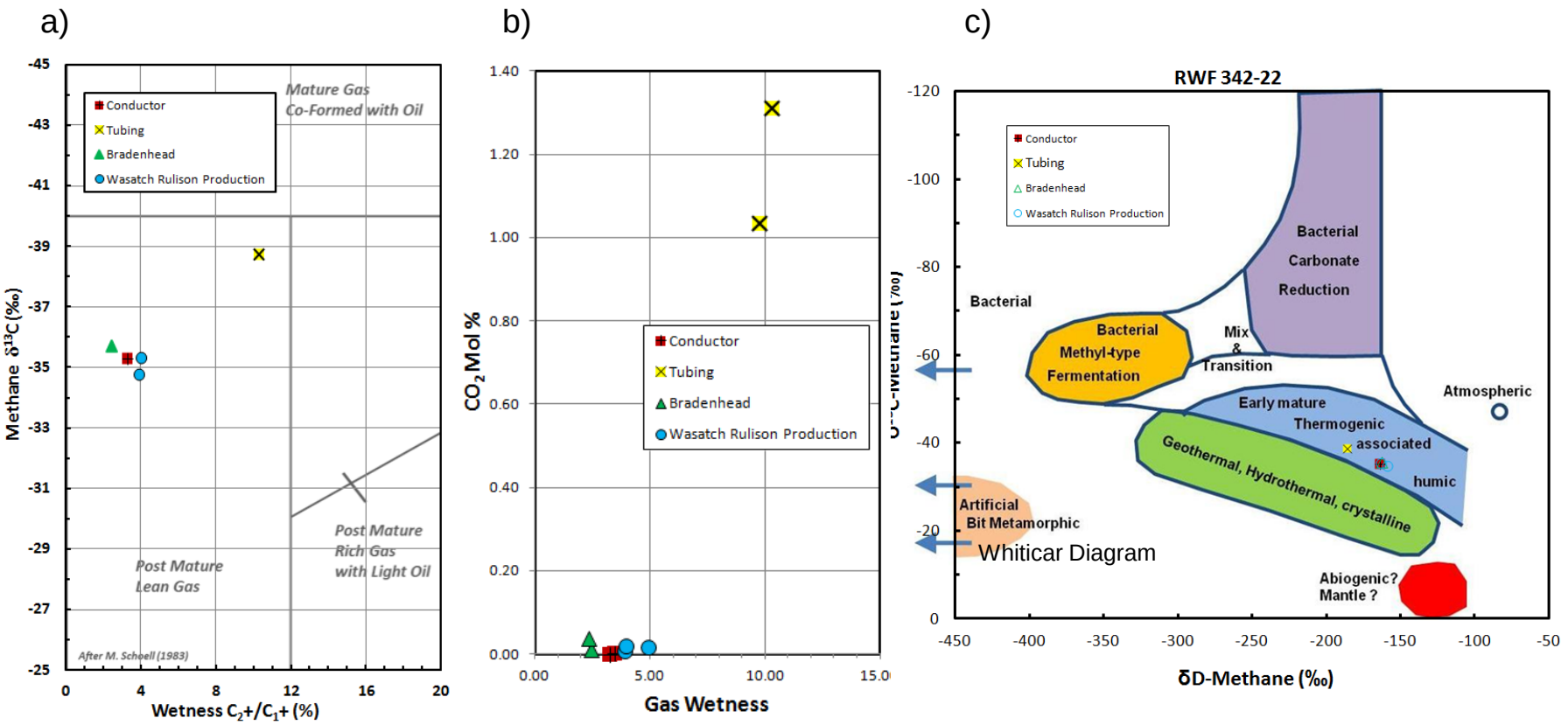
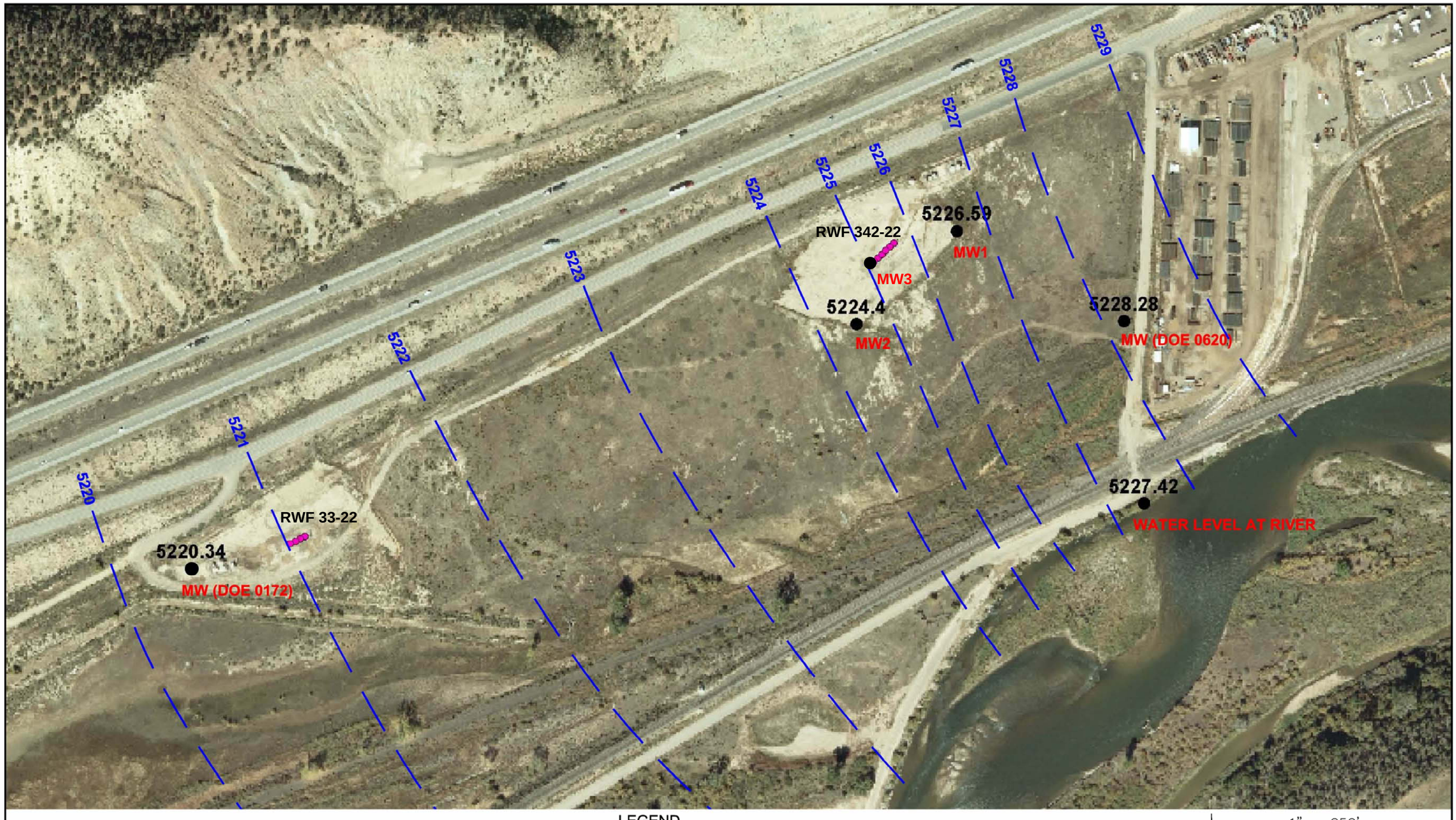


Figure 3: Gas composition and isotopic plots related to the analyses of the RWF 342-22. Figure a) is a Wetness Genetic Classification Plot (gas wetness versus $\delta^{13}C$ from Methane). Figure b) is a plot of gas wetness versus mol % CO_2. Figure c) is a cross plot of $\delta^{13}C$ from Methane versus δDeuterium from Methane. These plots indicate that the gas from the conductor is more similar to the bradenhead sample and gases analyzed from the Wasatch G interval of Rulison Field than it is to the Williams Fork gas from the tubing sample of the RWF 342-22. The Wasatch gas system in this area is distinctively isotopically more mature, drier and contains little to no detectible CO_2 in comparison to the gases in the Williams Fork reservoir. The conductor and bradenhead analyses clearly show that they are from a residual, near-surface, low-saturation, low-pressure Wasatch gas system and not from our producing Williams Fork reservoir completed in this well.



NOTE:
BASE MAP CREATED FROM "MONITORING WELLS, RWF 342-22 LOCATION" BY BOOKCLIFF SURVEY SERVICES, INC. DATED 6/30/2010.

LEGEND

5226.59
MW1
MONITORING WELL (WITH GW ELEVATION)

N
1" = 250'
0' 125' 250' 500'
SCALE IN FEET

PROJECT:	010-1302
DRAWN BY:	BLM
DATE:	07.16.10

POTENTIOMETRIC SURFACE MAP
RWF 342-22
WPX ENERGY ROCKY MOUNTAIN, LLC
GARFIELD COUNTY, COLORADO

OLSSON ASSOCIATES
4690 TABLE MOUNTAIN DRIVE
SUITE 200
GOLDEN, CO 80403
TEL 303.237.2072
FAX 303.237.2659

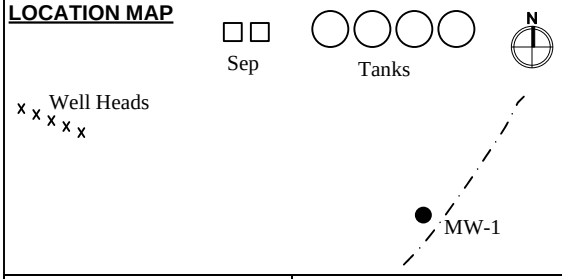
FIGURE
4

DWG: C:\Projects\Projects\Williams\Base Map.dwg
DATE: Jul 16, 2010 3:20pm XREFS:

Attachment A

Drilling Logs

LOCATION MAP



OLSSON ASSOCIATES
826 21 ½ Road
Grand Junction, CO 81505
T: 970.263.7800
F: 970.263.7456

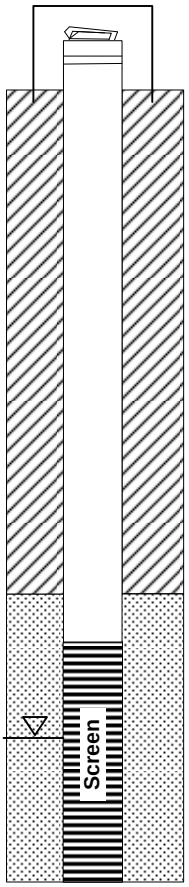
TEST HOLE/WELL LOG | **PAGE 1 of 1**

Test/Well Number: MW-1	Project: RWF 342-22
Date: 6/18/10	Project Number: 010-1302
Logged by: T. Dobransky	Drilled by: O'Dell
Drilling Method: HS Auger CME	Sampling Method: HS Auger CME

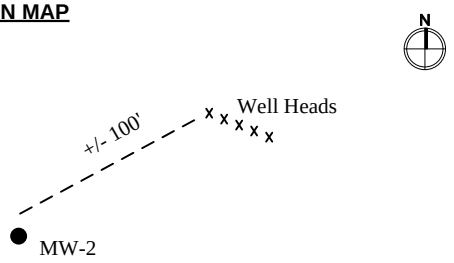
Elevation:	Detector: PID	Seal: Bentonite	Grout: -	
Gravel Pack: 10-20 Silica Sand			Hole Diameter: 6"	F. L. Meter:
Casing Type: Sch 40 PVC		Diameter: 2" Length: 11.5'	DTP: NA	DTW: 13.5'
Screen Type: Sch 40 PVC	Slot: 10	Diameter: 2" Length: 5'	Well Depth: 16.5'	Total Depth: 16.5'

Soil/Rock Type	Color	Moisture Content	% Fines	Stucture	Vapor (ppm)	Staining	Sample #	Depth (ft)	Sample Recovery %	Penetration Resistance	LITHOLOGY/REMARKS
	Lt Brn	Dry	30		-	N		0–4			Pad Fill Silty Loam, gravel, dry, some fines
	Dk Brn	Moist	60		0	N		5–8			Silty, Loam, Sand (fine) Low plasticity
	Brn		15			N		9–12			Course gravel sands Gravel 1-3" Dia. Low to non-plastic
	Lt Brn Sandy Silt	Sat	10		0	N		13–16			13.5' Lgr consolidated cobble w/ coarse gravel sands increasing Some silt
								17–20			TD @ 16.5' (refusal)

WELL COMPLETION



LOCATION MAP



OLSSON ASSOCIATES
826 21 ½ Road
Grand Junction, CO 81505
T: 970.263.7800
F: 970.263.7456

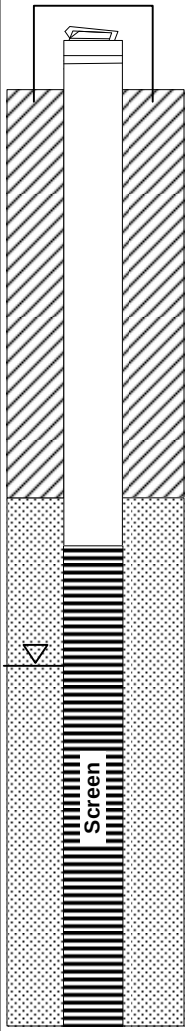
TEST HOLE/WELL LOG | **PAGE 1 of 1**

Test/Well Number: MW-2	Project: RWF 342-22
Date: 6/18/10	Project Number: 010-1302
Logged by: T. Dobransky	Drilled by: Odell
Drilling Method: HS Auger CME	Sampling Method: HS Auger CME

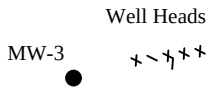
Elevation:	Detector: PID	Seal: Bentonite	Grout: -	
Gravel Pack: 10-20 Silica Sand			Hole Diameter: 6"	F. L. Meter:
Casing Type: Sch 40 PVC		Diameter: 2" Length: 9.5'	DTP: NA	DTW: 12.0'
Screen Type: Sch 40 PVC	Slot: 10	Diameter: 2" Length: 10'	Well Depth: 19.5'	Total Depth: 19.5'

Soil/Rock Type	Color	Moisture Content	% Fines	Stucture	Vapor (ppm)	Staining	Sample #	Depth (ft)	Sample Recovery %	Penetration Resistance	LITHOLOGY/REMARKS
								0			Stick up
	Lt Brn					N		1			Pad Fill Silty, sandy, dry
	Lt Brn		30					2			
	Brn ↓	70						3			Silty clay, increased fines Low to non plastic
			50			N		4			Bentonite
								5			Clayey, silt, increasing fines, medium plasticity
								6			
								7			
								8			
	Dk Brn	50	25			N		9			Silty, sandy loam, low fines, low plasticity
								10			
			20		0 ↓			11			Silty, Sandy, Gravel <1" dia 12.0' ▽
		Sat ↓				N		12			
	Brn		75					13			Clayey silt sand (med) fine sands increasing <1" dia, dense, plastic
								14			
								15			Sand Pack
								16			
						N		17			Coarse gravel sands increasing, clayey sand, moderate plasticity </=1-3"
								18			
								19			
	Lt Brn	100	10			N		20			TD @ 19.5' (refusal) Dense cobble w/ coarse gravel sands (med to fine)

WELL COMPLETION



LOCATION MAP



OLSSON ASSOCIATES
826 21 ½ Road
Grand Junction, CO 81505
T: 970.263.7800
F: 970.263.7456

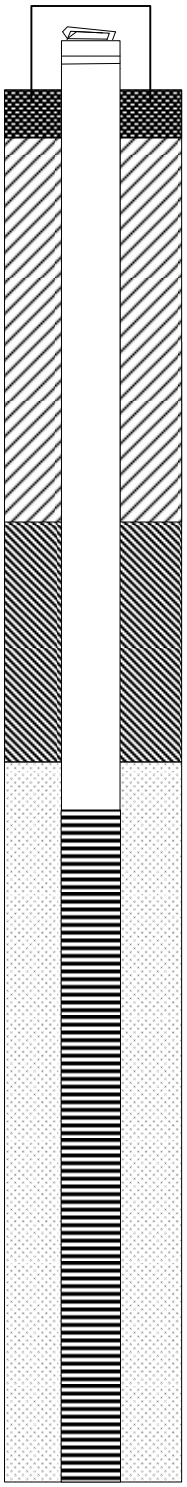
TEST HOLE/WELL LOG | **PAGE 1 of 1**

Test/Well Number: MW3	Project: RWF 342-22
Date: 8/4/10	Project Number: 010-1302
Logged by: Dobranksy	Drilled by: Shelton
Drilling Method: Rotary (Air)	Sampling Method: Rotary (Air)

Elevation:	Detector: PID	Seal: Bentonite	Grout:
Gravel Pack: 10/20 Silica Sand			Hole Diameter: 7 in. / F. L. Meter:
Casing Type: Sch. 40 PVC	Diameter: 2 in.	Length: 15'	DTP: - / DTW: Approx. 17'
Screen Type: Sch. 40 PVC	Slot: 10 / Diameter: 2 in.	Length: 15'	Well Depth: 29.5' / Total Depth: 33'

Soil/Rock Type	Color	Moisture Content	% Fines	Stucture	Vapor (ppm)	Staining	Sample #	Depth (ft)	Sample Recovery %	Penetration Resistance	LITHOLOGY/REMARKS
						NA					
	Brwn.	30	60		0			0			Cobble road base fill, lightly moist, clayey silt
	Brwn.	20	60		4.3			1			Clayey silt, some RB, gravel, slightly moist, medium plasticity
	Brwn. -Tan	20	40		12.6			2			Sands increasing, fine grained
	Tan	20	35		8.7			3			Gravel decreasing and moisture and plasticity
	Brwn. Tan	40	40		5.7			4			
	Red	20	45		2.0			5			Silty, clayey, minimal to no gravel
	Brwn.										
	Brwn.	35	50		2.0			6			Clay content increasing, and increasing plasticity
		40	50		4.5			7			
					3.4			8			Plasticity decreasing
		10	5		0.8			9			Gravel and some cobble
		15	5		0			10			Cobble increasing, sand increasing, non-plasticity
		5			0			11			Dry
	Lt. Grey	<5			0			12			
					0			13			Granitic cobble and sand, coarse
					0			14			Dense
					0			15			
	Med. Grey	15			0			16			Moisture increasing, cobble decreasing, hole caving
					0			17			Increasing fine grains
					0			18			
					0			19			
					0			20			
		SAT						21			
								22			
								23			
								24			
								25			
								26			
								27			
								28			
								29			

WELL COMPLETION



Attachment B

Laboratory Reports

Mountain States ACCUTEST Laboratories

IT'S ALL IN THE CHEMISTRY

07/02/10

Technical Report for

Olsson Associates

RWF 342-22 Water Testing

010-1302_100_100002

Accutest Job Number: D14615

Sampling Date: 06/24/10

Report to:

Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

Total number of pages in report: **31**

ACCUTEST LABORATORIES 50 YEARS 1956-2006

ACCREDITED IN ACCORDANCE WITH nelac

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

Jesse L. Smith
Laboratory Director

Client Service contact: Shea Greiner 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

Sections: 1 2 3

Table of Contents

Sample Summary

Olsson Associates

Job No: D14615

RWF 342-22 Water Testing
Project No: 010-1302_100_100002

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
D14615-1	06/24/10	10:10	JK	06/25/10	AQ	Ground Water	DOE 172
D14615-2	06/24/10	10:45	JK	06/25/10	AQ	Ground Water	DOE 620
D14615-3	06/24/10	13:45	JK	06/25/10	AQ	Ground Water	MW1
D14615-4	06/24/10	12:50	JK	06/25/10	AQ	Ground Water	MW2

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 172		
Lab Sample ID:	D14615-1	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA7228.D	5	06/29/10	DG	n/a	n/a	GGA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	1.30	1.0	1.0	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	108%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 172		
Lab Sample ID:	D14615-1	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB1915.D	1	06/25/10	EH	n/a	n/a	GFB43
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0724	0.00080	0.00080	mg/l	

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 172		
Lab Sample ID:	D14615-1	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8021B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA7228.D	5	06/29/10	DG	n/a	n/a	GTA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	33.3	5.0	5.0	ug/l	
108-88-3	Toluene	ND	10	10	ug/l	
100-41-4	Ethylbenzene	23.4	10	10	ug/l	
	m,p-Xylene	303	10	10	ug/l	
95-47-6	o-Xylene	ND	10	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	114%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: DOE 172
Lab Sample ID: D14615-1
Matrix: AQ - Ground Water
Method: SW846-8015B SW846 3510C
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE3031.D	1	06/29/10	CP	06/28/10	OP2084	GFE189
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	93%		40-137%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: DOE 172
Lab Sample ID: D14615-1
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	502000	400	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Iron	3660	70	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Magnesium	683000	200	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Manganese	1070	5.0	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Potassium	18400	1000	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Selenium	< 50	50	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Sodium	3660000	8000	ug/l	20	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA787
(2) Prep QC Batch: MP2200

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 172		
Lab Sample ID:	D14615-1	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	800	5.0	mg/l	1	07/01/10	JD	SM20 2320B
Bromide	< 4.0	4.0	mg/l	20	06/25/10 13:43	GH	EPA 300/SW846 9056
Chloride	2900	50	mg/l	100	06/25/10 14:51	GH	EPA 300/SW846 9056
Fluoride	< 4.0	4.0	mg/l	20	06/25/10 13:43	GH	EPA 300/SW846 9056
Nitrogen, Nitrate	< 0.90	0.90	mg/l	20	06/25/10 13:43	GH	EPA 300/SW846 9056
Nitrogen, Nitrite	< 6.1	6.1	mg/l	100	06/25/10 14:51	GH	EPA 300/SW846 9056
Sulfate	7090	100	mg/l	200	06/25/10 15:04	GH	EPA 300/SW846 9056

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID: DOE 620
Lab Sample ID: D14615-2
Matrix: AQ - Ground Water
Method: SW846 8015B
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA7236.D	1	06/29/10	DG	n/a	n/a	GGA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.20	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	93%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 620		
Lab Sample ID:	D14615-2	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB1882.D	1	06/25/10	EH	n/a	n/a	GFB43
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00080	mg/l	

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 620		
Lab Sample ID:	D14615-2	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8021B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA7236.D	1	06/29/10	DG	n/a	n/a	GTA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	1.0	ug/l	
108-88-3	Toluene	ND	2.0	2.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	2.0	ug/l	
	m,p-Xylene	ND	2.0	2.0	ug/l	
95-47-6	o-Xylene	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	111%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: DOE 620
Lab Sample ID: D14615-2
Matrix: AQ - Ground Water
Method: SW846-8015B SW846 3510C
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE3032.D	1	06/29/10	CP	06/28/10	OP2084	GFE189
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	83%		40-137%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: DOE 620
Lab Sample ID: D14615-2
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	382000	400	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Iron	< 70	70	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Magnesium	239000	200	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Manganese	1450	5.0	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Potassium	8590	1000	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Selenium	< 50	50	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Sodium	942000	400	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA787
(2) Prep QC Batch: MP2200

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	DOE 620		
Lab Sample ID:	D14615-2	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	514	5.0	mg/l	1	07/01/10	JD	SM20 2320B
Bromide	< 1.0	1.0	mg/l	5	06/25/10 13:56	GH	EPA 300/SW846 9056
Chloride	670	25	mg/l	50	06/25/10 15:18	GH	EPA 300/SW846 9056
Fluoride	< 1.0	1.0	mg/l	5	06/25/10 13:56	GH	EPA 300/SW846 9056
Nitrogen, Nitrate	28.3	0.23	mg/l	5	06/25/10 13:56	GH	EPA 300/SW846 9056
Nitrogen, Nitrite	< 3.1	3.1	mg/l	50	06/25/10 15:18	GH	EPA 300/SW846 9056
Sulfate	2390	25	mg/l	50	06/25/10 15:18	GH	EPA 300/SW846 9056

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	D14615-3	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8015B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA7237.D	1	06/29/10	DG	n/a	n/a	GGA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.20	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	109%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	D14615-3	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB1883.D	1	06/25/10	EH	n/a	n/a	GFB43
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.0150	0.00080	0.00080	mg/l	

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	D14615-3	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8021B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA7237.D	1	06/29/10	DG	n/a	n/a	GTA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	1.0	ug/l	
108-88-3	Toluene	ND	2.0	2.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	2.0	ug/l	
	m,p-Xylene	ND	2.0	2.0	ug/l	
95-47-6	o-Xylene	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	112%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: MW1
Lab Sample ID: D14615-3
Matrix: AQ - Ground Water
Method: SW846-8015B SW846 3510C
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE3033.D	1	06/29/10	CP	06/28/10	OP2084	GFE189
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		40-137%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: MW1
Lab Sample ID: D14615-3
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	463000	400	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Iron	1840	70	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Magnesium	289000	200	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Manganese	2930	5.0	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Potassium	15300	1000	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Selenium	< 50	50	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Sodium	1630000	8000	ug/l	20	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA787
(2) Prep QC Batch: MP2200

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW1		
Lab Sample ID:	D14615-3	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	620	5.0	mg/l	1	07/01/10	JD	SM20 2320B
Bromide	< 2.0	2.0	mg/l	10	06/25/10 14:10	GH	EPA 300/SW846 9056
Chloride	851	50	mg/l	100	06/25/10 15:31	GH	EPA 300/SW846 9056
Fluoride	< 2.0	2.0	mg/l	10	06/25/10 14:10	GH	EPA 300/SW846 9056
Nitrogen, Nitrate	< 0.45	0.45	mg/l	10	06/25/10 14:10	GH	EPA 300/SW846 9056
Nitrogen, Nitrite	< 6.1	6.1	mg/l	100	06/25/10 15:31	GH	EPA 300/SW846 9056
Sulfate	3770	50	mg/l	100	06/25/10 15:31	GH	EPA 300/SW846 9056

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID: MW2
Lab Sample ID: D14615-4
Matrix: AQ - Ground Water
Method: SW846 8015B
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA7238.D	1	06/29/10	DG	n/a	n/a	GGA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.20	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	102%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	D14615-4	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB1884.D	1	06/25/10	EH	n/a	n/a	GFB43
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.00643	0.00080	0.00080	mg/l	

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

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	D14615-4	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
Method:	SW846 8021B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	TA7238.D	1	06/29/10	DG	n/a	n/a	GTA428
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	1.0	ug/l	
108-88-3	Toluene	ND	2.0	2.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	2.0	ug/l	
	m,p-Xylene	ND	2.0	2.0	ug/l	
95-47-6	o-Xylene	ND	2.0	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	114%		60-140%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: MW2
Lab Sample ID: D14615-4
Matrix: AQ - Ground Water
Method: SW846-8015B SW846 3510C
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FE3034.D	1	06/29/10	CP	06/28/10	OP2084	GFE189
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		40-137%

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

Accutest Laboratories

Report of Analysis

Client Sample ID: MW2
Lab Sample ID: D14615-4
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 06/24/10
Date Received: 06/25/10
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	373000	400	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Iron	13500	70	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Magnesium	247000	200	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Manganese	1600	5.0	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Potassium	11100	1000	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Selenium	< 50	50	ug/l	1	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]
Sodium	1460000	8000	ug/l	20	06/28/10	06/29/10	JM	SW846 6010B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA787
(2) Prep QC Batch: MP2200

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	MW2		
Lab Sample ID:	D14615-4	**Date Sampled:**	06/24/10
Matrix:	AQ - Ground Water	**Date Received:**	06/25/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	653	5.0	mg/l	1	07/01/10	JD	SM20 2320B
Bromide	< 2.0	2.0	mg/l	10	06/25/10 14:23	GH	EPA 300/SW846 9056
Chloride	779	50	mg/l	100	06/25/10 15:45	GH	EPA 300/SW846 9056
Fluoride	< 2.0	2.0	mg/l	10	06/25/10 14:23	GH	EPA 300/SW846 9056
Nitrogen, Nitrate	0.61	0.45	mg/l	10	06/25/10 14:23	GH	EPA 300/SW846 9056
Nitrogen, Nitrite	< 6.1	6.1	mg/l	100	06/25/10 15:45	GH	EPA 300/SW846 9056
Sulfate	3010	50	mg/l	100	06/25/10 15:45	GH	EPA 300/SW846 9056

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

D14615

ACCUTEST Laboratories

2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

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

Client / Reporting Information

Company Name: Olsson Associates
Address: 826 21½ Road
City: Grand Junction State: CO Zip: 81505
Project Contact: Tim Dobransky E-mail: tdobransky@oaconsulting.com
Phone #: 970.270.2986
Samplers's Name: J. Kent/J. Sutrina

Project Information

Project Name: RWF 342-22 Water Testing
Street: –
City: – State:
Project #: 010-1302_100_10002
Fax #: 970.263.7456
Client Purchase Order #:

Requested Analysis

Matrix Codes

DW- Drinking Water
GW- Ground Water
WW- Water
SW- Surface Water
SO- Soil
SL-Sludge
OI-Oil
LIQ- Other Liquid
AIR- Air
SOL-Other Solid
WP-Wipe

Accutest Sample #	Field ID / Point of Collection	SUMMA # / MEOH Vial #	Collection: Date	Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	NaHSO4	MEOH	ENCORE	Dissolved Methane	BTEX	GRO/DRO	Anions*	Total Metals**	LAB USE ONLY
	DOE 172	–	6/24/10	1010	JK/JS	GW	10	1		1		8				X	X	X	X	X	01
	DOE 620	–	6/24/10	1045	JK/JS	GW	10	1		1		8				X	X	X	X	X	02
	MW1	–	6/24/10	1345	JK/JS	GW	10	1		1		8				X	X	X	X	X	03
	MW2	–	6/24/10	1250	JK/JS	GW	10	1		1		8				X	X	X	X	X	04

Turnaround Time (Business days)

- [ ] Std. 15 Business Days
- [X] 10 Day *RUSH*
- [ ] 5 Day *RUSH*
- [ ] 3 Day *EMERGENCY*
- [ ] 2 Day *EMERGENCY*
- [ ] 1 Day *EMERGENCY*
- [ ] Other

Approved By:/ Date:

Emergency T/A data available VIA Lablink

Data Deliverable Information

- [X] Commercial "A"
- [ ] Commercial "B"
- [ ] NJ Reduced
- [ ] NJ Full
- [ ] Other
- [ ] FULL CLP
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format

Commercial "A" = Results Only

Comments / Remarks

Anions*-Cl, F, Br, SO_4, NO_2, NO_3, Alkalinity

Total Metals**-Ca, Mg, Mn, Fe, K, Na, Se

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		6/24/10 1630	1	2		2 6.25.10
3	Relinquished by:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
			3	4		4
5	Relinquished by:	Date Time:	Received By:	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp.
			5		MES	2.5

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D14615 **Client:** OLSSON ASS. **Immediate Client Services Action Required:** No

Date / Time Received: 6/25/2010 9:15:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: RWF 342-22-WATER TESTING **Airbill #'s:** fedex

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☑		☐	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021
4036 Youngfield Street
F: (303) 425-6854
Wheat Ridge, CO
www/accutest.com

D14615: Chain of Custody
Page 2 of 2

Technical Report for

Olsson Associates

RWF 342-22 Water Testing

010-1302_100_100002

Accutest Job Number: D16816

Sampling Date: 08/25/10

Report to:

Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

Total number of pages in report: **45**

ACCUTEST LABORATORIES 50 YEARS 1956-2006

ACCREDITED IN ACCORDANCE WITH nelac

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

Jesse L. Smith
Laboratory Director

Client Service contact: Shea Greiner 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

Sections: 1 2 3 4 5 6 7 8 9

Table of Contents

Sample Summary

Olsson Associates

Job No: D16816

RWF 342-22 Water Testing
Project No: 010-1302_100_100002

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D16816-1	08/25/10	11:20	TPD	08/26/10	AQ	Ground Water	MW3
D16816-1A	08/25/10	11:20	TPD	08/26/10	DW	Drinking Water	MW3

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Olsson Associates	**Job No**	D16816
Site:	RWF 342-22 Water Testing	**Report Dat**	9/10/2010 3:12:59 PM

On 08/26/2010, two (2) samples, 0 Trip Blanks, and 0 Field Blanks were received at Accutest Mountain States (AMS) at a temperature of 4.1°C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D16816 was assigned to the project. The lab sample IDs, client sample IDs, and dates 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 GCMS By Method SW846 8260B

Matrix AQ **Batch ID:** V3V369

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D16812-1MS and D16812-1MSD were used as the QC samples indicated.

Volatiles by GC By Method RSK175 MOD

Matrix AQ **Batch ID:** GFB61

- All samples were analyzed within the recommended method holding time.
- Samples D16812-1MS and D16812-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Volatiles by GC By Method SW846 8015B

Matrix AQ **Batch ID:** GGB379

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D16816-1MS and D16816-1MSD were used as the QC samples indicated.

Extractables by GC By Method SW846-8015B

Matrix AQ **Batch ID:** OP2438

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Samples D16971-1MS and D16971-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

Metals By Method SW846 6010B

Matrix AQ **Batch ID:** MP2787

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D16705-1MS and D16705-1MSD were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300/SW846 9056

Matrix	AQ	Batch ID:	GP2669

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D16807-2MS and D16807-2MSD were used as the QC samples for the Bromide, Chloride, Nitrate-N, Nitrite-N, and Sulfate analysis.

Wet Chemistry By Method SM20 2320B

Matrix	AQ	Batch ID:	GN6126

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D16730-1DUP, D16730-1MS, and D16730-1MSD were used as the QC samples for the Total Alkalinity, as CaCO3 analysis.

Wet Chemistry By Method SM20 4500F C

Matrix	AQ	Batch ID:	GP2741

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D17105-3DUP, D17105-3MS, and D17105-3MSD were used as the QC samples for the Fluoride analysis.
- D16816-1A for Fluoride: The matrix was changed to allow analysis by Electrode. The laboratory was unable to analyze the sample by IC due to matrix interference.

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.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1	**Date Sampled:**	08/25/10
Matrix:	AQ - Ground Water	**Date Received:**	08/26/10
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3V06864.D	1	09/01/10	DC	n/a	n/a	V3V369
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.30	ug/l	
	m,p-Xylene	ND	4.0	0.60	ug/l	
95-47-6	o-Xylene	ND	2.0	0.60	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
17060-07-0	1,2-Dichloroethane-D4	97%		63-130%
2037-26-5	Toluene-D8	87%		68-130%
460-00-4	4-Bromofluorobenzene	79%		61-130%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: MW3
Lab Sample ID: D16816-1
Matrix: AQ - Ground Water
Method: SW846 8015B
Project: RWF 342-22 Water Testing

Date Sampled: 08/25/10
Date Received: 08/26/10
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB7027.D	1	09/06/10	JL	n/a	n/a	GGB379
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.20	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
120-82-1	1,2,4-Trichlorobenzene	99%		60-140%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1	**Date Sampled:**	08/25/10
Matrix:	AQ - Ground Water	**Date Received:**	08/26/10
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FB2368.D	1	09/02/10	JB	n/a	n/a	GFB61
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.173	0.00080	0.00080	mg/l	

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

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1	**Date Sampled:**	08/25/10
Matrix:	AQ - Ground Water	**Date Received:**	08/26/10
Method:	SW846-8015B SW846 3510C	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD3925.D	1	09/01/10	JB	08/31/10	OP2438	GFD172
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	111%		40-137%

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

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1	**Date Sampled:**	08/25/10
Matrix:	AQ - Ground Water	**Date Received:**	08/26/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Calcium	699000	800	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Iron	230000	140	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Magnesium	322000	400	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Manganese	5760	10	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Potassium	27100	2000	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Selenium	< 100	100	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]
Sodium	1450000	800	ug/l	1	09/03/10	09/07/10	JM	SW846 6010B [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA954
(2) Prep QC Batch: MP2787

RL = Reporting Limit

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1	**Date Sampled:**	08/25/10
Matrix:	AQ - Ground Water	**Date Received:**	08/26/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3	1060	5.0	mg/l	1	08/28/10	JK	SM20 2320B
Bromide	< 1.0	1.0	mg/l	5	08/27/10 08:46	GH	EPA 300/SW846 9056
Chloride	736	25	mg/l	50	08/27/10 10:37	GH	EPA 300/SW846 9056
Nitrogen, Nitrate	< 0.23	0.23	mg/l	5	08/27/10 08:46	GH	EPA 300/SW846 9056
Nitrogen, Nitrite	< 3.1	3.1	mg/l	50	08/27/10 10:37	GH	EPA 300/SW846 9056
Sulfate	3450	100	mg/l	200	08/27/10 15:51	GH	EPA 300/SW846 9056

RL = Reporting Limit

Report of Analysis

Client Sample ID:	MW3		
Lab Sample ID:	D16816-1A	**Date Sampled:**	08/25/10
Matrix:	DW - Drinking Water	**Date Received:**	08/26/10
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	MCL	Units	DF	Analyzed	By	Method
Fluoride [a]	0.68	4.0	mg/l	1	09/09/10	CJ	SM20 4500F C

(a) Matrix changed to DW to allow analysis by Electrode. Unable to analyze by IC due to matrix interference.

MCL = Maximum Contamination Level (40 CFR 141)

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

CHAIN OF CUSTODY

ACCUTEST Laboratories

2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

D16816

FED-EX Tracking # | Bottle Order Control #
Accutest Quote # | Accutest Job #

Client / Reporting Information

Company Name: Olsson Associates
Address: 826 21½ Road
City: Grand Junction State: CO Zip: 81505
Project Contact: Tim DoBRANSKY E-mail: tdobransky@olssonconsulting.com
Phone #: 970.230.2986
Samplers's Name: T. DoBRANSKY

Project Information

Project Name: RWF 342-22 Water Testing
Street
City State
Project #: 010-1302-100-100002
Fax #: 970.263.7456
Client Purchase Order #

Requested Analysis

Matrix Codes: DW- Drinking Water; GW- Ground Water; WW- Water; SW- Surface Water; SO- Soil; SL-Sludge; OI-Oil; LIQ- Other Liquid; AIR- Air; SOL-Other Solid; WP-Wipe

Accutest Sample #	Field ID / Point of Collection	SUMMA # / MEOH Vial #	Collection Date	Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	HONa	SONA	MSA	NONE	NaHSO4	MEOH	ENCORE	Dissolved Methane	BTEX	GRO/DRO	Anions*	Total Metals**	LAB USE ONLY
	MW3	—	8/25/10	1120	TPD	GW	10	1		1		8				X	X	X	X	X	01

Turnaround Time (Business days)

- ~~X Std. 15 Business Days~~
- X 10 Day RUSH
- 5 Day RUSH
- 3 Day EMERGENCY
- 2 Day EMERGENCY
- 1 Day EMERGENCY
- Other

Approved By:/ Date:

Emergency T/A data available VIA Lablink

Data Deliverable Information

- X Commercial "A"
- X Commercial "B"
- NJ Reduced
- NJ Full
- Other

- FULL CLP
- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format

Commercial "A" = Results Only

Comments / Remarks

Anions* - Cl, F, Br, SO4, NO2, NO3, Alkalinity
Total Metals** - Ca, Fe, Mg, Mn, K, Na, Sc

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		8/25/10 1600	1	2		2 8.26.10 900
3	Relinquished by:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal # ✓	Preserved where applicable ☐	On Ice X Cooler Temp. 4.1

4.1 4

D16816: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D16816 **Client:** OLSSON ASS. **Immediate Client Services Action Required:** No

Date / Time Received: 8/26/2010 9:00:00 AM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: RWF 342-22WATER TESTING **Airbill #'s:** fedex

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021
4036 Youngfield Street
F: (303) 425-6854
Wheat Ridge, CO
www/accutest.com

D16816: Chain of Custody
Page 2 of 2

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V369-MB1	3V06849A.D	1	09/01/10	DC	n/a	n/a	V3V369

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

D16816-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.30	ug/l	
100-41-4	Ethylbenzene	ND	2.0	0.30	ug/l	
108-88-3	Toluene	ND	2.0	1.0	ug/l	
	m,p-Xylene	ND	4.0	0.60	ug/l	
95-47-6	o-Xylene	ND	2.0	0.60	ug/l	

CAS No.	Surrogate Recoveries		Limits
17060-07-0	1,2-Dichloroethane-D4	89%	63-130%
2037-26-5	Toluene-D8	90%	68-130%
460-00-4	4-Bromofluorobenzene	85%	61-130%

Blank Spike Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V3V369-BS1	3V06850A.D	1	09/01/10	DC	n/a	n/a	V3V369

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

D16816-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	50	48.9	98	70-130
100-41-4	Ethylbenzene	50	51.3	103	70-130
108-88-3	Toluene	50	49.7	99	70-140
	m,p-Xylene	50	44.5	89	55-134
95-47-6	o-Xylene	50	44.7	89	55-134

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	83%	63-130%
2037-26-5	Toluene-D8	86%	68-130%
460-00-4	4-Bromofluorobenzene	88%	61-130%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D16812-1MS	3V06856.D	1	09/01/10	DC	n/a	n/a	V3V369
D16812-1MSD	3V06857.D	1	09/01/10	DC	n/a	n/a	V3V369
D16812-1	3V06855.D	1	09/01/10	DC	n/a	n/a	V3V369

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

D16816-1

CAS No.	Compound	D16812-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		50	50.2	100	51.9	104	3	59-132/30
100-41-4	Ethylbenzene	ND		50	53.1	106	56.3	113	6	68-130/30
108-88-3	Toluene	ND		50	50.3	101	54.2	108	7	56-142/30
	m,p-Xylene	ND		50	47.0	94	48.4	97	3	36-146/30
95-47-6	o-Xylene	ND		50	47.3	95	48.8	98	3	36-146/30

CAS No.	Surrogate Recoveries	MS	MSD	D16812-1	Limits
17060-07-0	1,2-Dichloroethane-D4	88%	87%	87%	63-130%
2037-26-5	Toluene-D8	87%	88%	88%	68-130%
460-00-4	4-Bromofluorobenzene	87%	88%	84%	61-130%

GC Volatiles

6

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB379-MB	GB7021.D	1	09/06/10	JL	n/a	n/a	GGB379

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

D16816-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	0.20	0.20	mg/l	

CAS No.	Surrogate Recoveries		Limits
120-82-1	1,2,4-Trichlorobenzene	102%	60-140%

Method Blank Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB61-MB	FB2361.D	1	09/02/10	JB	n/a	n/a	GFB61

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

D16816-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00080	mg/l	

Blank Spike Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB379-BS	GB7022.D	1	09/06/10	JL	n/a	n/a	GGB379

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

D16816-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-GRO (C6-C10)	2.2	2.08	95	70-130

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

Blank Spike/Blank Spike Duplicate Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GFB61-BS	FB2362.D	10	09/02/10	JB	n/a	n/a	GFB61
GFB61-BSD	FB2363.D	10	09/02/10	JB	n/a	n/a	GFB61

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

D16816-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	BSD mg/l	BSD %	RPD	Limits Rec/RPD
74-82-8	Methane	0.5094	0.615	121	0.614	121	0	70-130/30

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D16816-1MS	GB7028.D	1	09/06/10	JL	n/a	n/a	GGB379
D16816-1MSD	GB7029.D	1	09/06/10	JL	n/a	n/a	GGB379
D16816-1	GB7027.D	1	09/06/10	JL	n/a	n/a	GGB379

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

D16816-1

CAS No.	Compound	D16816-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND		2.2	2.19	100	1.92	87	13	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D16816-1	Limits
120-82-1	1,2,4-Trichlorobenzene	117%	109%	99%	60-140%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D16812-1MS	FB2378.D	10	09/02/10	JB	n/a	n/a	GFB61
D16812-1MSD	FB2379.D	10	09/02/10	JB	n/a	n/a	GFB61
D16812-1	FB2367.D	1	09/02/10	JB	n/a	n/a	GFB61

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

D16816-1

CAS No.	Compound	D16812-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	ND		0.5094	0.533	105	0.533	105	0	70-130/30

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2438-MB	FD3913.D	1	09/01/10	JB	08/31/10	OP2438	GFD172

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

D16816-1

CAS No.	Compound	Result	RL	Units	Q
	TPH-DRO (C10-C28)	ND	0.40	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	90%	40-137%

Blank Spike Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2438-BS	FD3914.D	1	09/01/10	JB	08/31/10	OP2438	GFD172

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

D16816-1

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
	TPH-DRO (C10-C28)	20	18.7	94	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	93%	40-137%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D16816
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP2438-MS	FD3915.D	1	09/01/10	JB	08/31/10	OP2438	GFD172
OP2438-MSD	FD3916.D	1	09/01/10	JB	08/31/10	OP2438	GFD172
D16971-1	FD3917.D	1	09/01/10	JB	08/31/10	OP2438	GFD172

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

D16816-1

CAS No.	Compound	D16971-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND		20	19.0	95	19.2	96	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D16971-1	Limits
84-15-1	o-Terphenyl	94%	91%	84%	40-137%

Metals Analysis

QC Data Summaries

Includes the following where applicable:

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 09/03/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	7	49		
Antimony	30	1.7	13		
Arsenic	25	2.8	6.5		
Barium	10	.14	2.4		
Beryllium	10	1.4	4.4		
Boron	50	3.5	19		
Cadmium	10	.22	1.2		
Calcium	400	17	9.2	26.4	<400
Chromium	10	.27	1.6		
Cobalt	5.0	.48	.3		
Copper	5.0	1.6	2.7		
Iron	70	7.7	10	15.2	<70
Lead	50	1.3	3.2		
Lithium	2.0	.76	1.6		
Magnesium	200	5.8	12	7.8	<200
Manganese	5.0	.21	.7	0.30	<5.0
Molybdenum	10	.41	1.2		
Nickel	30	.38	.6		
Phosphorus	100	15	54		
Potassium	1000	380	540	-160	<1000
Selenium	50	2.8	7.2	-1.7	<50
Silicon	50	12	20		
Silver	30	.98	.3		
Sodium	400	230	23	-60	<400
Strontium	5.0	.091	3.4		
Thallium	10	3.1	2.1		
Tin	50	14	4.4		
Titanium	10	.098	.7		
Uranium	50	2.2	3.9		
Vanadium	10	.27	.3		
Zinc	30	.76	1.7		

Associated samples MP2787: D16816-1

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 09/03/10

Metal	D16705-1 Original	MS	Spikelot MPICPALL	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium	anr				
Calcium	8130	31800	25000	94.7	75-125
Chromium					
Cobalt					
Copper	anr				
Iron	1930	7200	5000	105.4	75-125
Lead	anr				
Lithium	anr				
Magnesium	2870	27500	25000	98.5	75-125
Manganese	32.9	509	500	95.2	75-125
Molybdenum					
Nickel					
Phosphorus	anr				
Potassium	1230	26500	25000	101.1	75-125
Selenium	0.0	915	1000	91.5	75-125
Silicon					
Silver					
Sodium	5040	32600	25000	110.2	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP2787: D16816-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787 Methods: SW846 6010B
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 09/03/10

Metal	D16705-1 Original	MSD	Spikelot MPICPALL	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium	8130	31100	25000	91.9	2.2	20
Chromium						
Cobalt						
Copper	anr					
Iron	1930	6840	5000	98.2	5.1	20
Lead	anr					
Lithium	anr					
Magnesium	2870	25900	25000	92.1	6.0	20
Manganese	32.9	500	500	93.4	1.8	20
Molybdenum						
Nickel						
Phosphorus	anr					
Potassium	1230	24700	25000	93.9	7.0	20
Selenium	0.0	900	1000	90.0	1.7	20
Silicon						
Silver						
Sodium	5040	30500	25000	101.8	6.7	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP2787: D16816-1

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 09/03/10

Metal	BSP Result	Spikelot MPICPALL	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	23700	25000	94.8	80-120
Chromium				
Cobalt				
Copper	anr			
Iron	4970	5000	99.4	80-120
Lead	anr			
Lithium	anr			
Magnesium	23400	25000	93.6	80-120
Manganese	477	500	95.4	80-120
Molybdenum				
Nickel				
Phosphorus	anr			
Potassium	23500	25000	94.0	80-120
Selenium	916	1000	91.6	80-120
Silicon				
Silver				
Sodium	25900	25000	103.6	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP2787: D16816-1

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP2787
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Alkalinity, Total as CaCO3	GN6126	5.0	0.0	mg/l	100	99.3	99.3	90-110%
Bromide	GP2669/GN6120	0.20	0.0	mg/l	20	19.6	98.0	90-110%
Chloride	GP2669/GN6120	0.50	0.0	mg/l	20	21.1	105.5	90-110%
Fluoride	GP2741/GN6290	0.20	0.0	mg/l	10	9.9	98.8	95-105%
Nitrogen, Nitrate	GP2669/GN6120	0.045	0.0	mg/l	4.52	4.34	96.1	90-110%
Nitrogen, Nitrite	GP2669/GN6120	0.061	0.0	mg/l	6.09	6.15	101.0	90-110%
Phosphate, Ortho	GP2669/GN6120	0.065	0.0	mg/l	9.78	9.23	94.3	90-110%
Sulfate	GP2669/GN6120	0.50	0.0	mg/l	30	29.2	97.3	90-110%

Associated Samples:
Batch GN6126: D16816-1
Batch GP2669: D16816-1
Batch GP2741: D16816-1A
(*) Outside of QC limits

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Alkalinity, Total as CaCO3	GN6126	D16730-1	mg/l	313	313	0.1	0-20%
Fluoride	GP2741/GN6290	D17105-3	mg/l	0.18	0.18	0.0	0-20%

Associated Samples:
Batch GN6126: D16816-1
Batch GP2741: D16816-1A
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Alkalinity, Total as CaCO3	GN6126	D16730-1	mg/l	313	100	399	86.0	80-120%
Bromide	GP2669/GN6120	D16807-2	mg/l	0.44	12.5	12.6	97.3	80-120%
Bromide	GP2669/GN6120	D16807-2	mg/l	0.47	12.5	12.6	97.3	80-120%
Chloride	GP2669/GN6120	D16807-2	mg/l	117	50	160	86.0	80-120%
Fluoride	GP2741/GN6290	D17105-3	mg/l	0.18	10	10.2	102.4	85-115%
Nitrogen, Nitrate	GP2669/GN6120	D16807-2	mg/l	0.0	2.83	2.7	80.4	80-120%
Nitrogen, Nitrite	GP2669/GN6120	D16807-2	mg/l	0.0	1.52	1.5	98.5	80-120%
Phosphate, Ortho	GP2669/GN6120	D16807-2	mg/l	0.0	4.08	3.3	81.0	80-120%
Phosphate, Ortho	GP2669/GN6120	D16807-2	mg/l	0.0	4.08	3.3	81.0	80-120%
Sulfate	GP2669/GN6120	D16807-2	mg/l	868	500	1380	102.4	80-120%

Associated Samples:
Batch GN6126: D16816-1
Batch GP2669: D16816-1
Batch GP2741: D16816-1A
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D16816
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Alkalinity, Total as CaCO3	GN6126	D16730-1	mg/l	313	100	399	0.0	20%
Bromide	GP2669/GN6120	D16807-2	mg/l	0.44	12.5	12.7	0.8	20%
Bromide	GP2669/GN6120	D16807-2	mg/l	0.47	12.5	12.7	0.8	20%
Chloride	GP2669/GN6120	D16807-2	mg/l	117	50	161	0.6	20%
Fluoride	GP2741/GN6290	D17105-3	mg/l	0.18	10	9.80	4.4	
Nitrogen, Nitrate	GP2669/GN6120	D16807-2	mg/l	0.0	2.83	2.8	3.6	20%
Nitrogen, Nitrite	GP2669/GN6120	D16807-2	mg/l	0.0	1.52	1.5	0.0	20%
Phosphate, Ortho	GP2669/GN6120	D16807-2	mg/l	0.0	4.08	3.2	3.1N	20%
Phosphate, Ortho	GP2669/GN6120	D16807-2	mg/l	0.0	4.08	3.2	3.1N	20%
Sulfate	GP2669/GN6120	D16807-2	mg/l	868	500	1370	0.7	20%

Associated Samples:
Batch GN6126: D16816-1
Batch GP2669: D16816-1
Batch GP2741: D16816-1A
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

Mountain States ACCUTEST LABORATORIES

11/26/12

Technical Report for

Olsson Associates

RWF 342-22 Water Testing

Accutest Job Number: D40738

Sampling Date: 11/07/12

Report to:

Olsson Associates
826 21 1/2 Road
Grand Junction, CO 81505
tdobransky@oaconsulting.com

ATTN: Tim Dobransky

Total number of pages in report: **44**

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

Brad Madadian
Laboratory Director

Client Service contact: Renea Jackson 303-425-6021

Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

Sections: 1 2 3 4 5 6 7 8

Table of Contents

Sample Summary

Olsson Associates

Job No: D40738

RWF 342-22 Water Testing

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
D40738-1	11/07/12	11:04	KR	11/08/12	AQ	Ground Water	RWF342-22-MW1
D40738-2	11/07/12	11:59	KR	11/08/12	AQ	Ground Water	RWF342-22-MW2
D40738-3	11/07/12	12:30	KR	11/08/12	AQ	Ground Water	RWF342-22-MW3

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	Olsson Associates	**Job No**	D40738
Site:	RWF 342-22 Water Testing	**Report Date**	11/26/2012 8:43:29 AM

On 11/08/2012, 3 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 4 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D40738 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 RSK175 MOD

Matrix AQ **Batch ID:** GFB305

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40513-1MS, D40513-1MSD were used as the QC samples indicated.
- D40738-3: The pH of the sample was >2 at time of analysis.
- D40738-2: The pH of the sample was >2 at time of analysis.
- D40738-1: The pH of the sample was >2 at time of analysis.
- D40513-1MSD: The pH of the sample was >2 at time of analysis.
- D40513-1MS: The pH of the sample was >2 at time of analysis.

Volatiles by GC By Method SW846 8021B

Matrix AQ **Batch ID:** GTA999

- All samples were analyzed within the recommended method holding time.
- Sample(s) D40818-1MS, D40818-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- D40738-3: Sample was not preserved to a pH < 2.
- D40738-1: Sample was not preserved to a pH < 2.
- D40738-2: Sample was not preserved to a pH < 2.

Metals By Method SW846 6010C

Matrix AQ **Batch ID:** MP8851

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40598-1MS, D40598-1MSD, D40598-1SDL were used as the QC samples for the metals analysis.

Wet Chemistry By Method EPA 300.0/SW846 9056

Matrix	AQ	Batch ID:	GP8718

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40862-1MS, D40862-1MSD were used as the QC samples for the Chloride analysis.

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: D40738
Account: Olsson Associates
Project: RWF 342-22 Water Testing
Collected: 11/07/12

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
D40738-1	**RWF342-22-MW1**					
Methane [a]		0.00547	0.00080	0.00040	mg/l	RSK175 MOD
Sodium		1560000	4000		ug/l	SW846 6010C
Chloride		851	25		mg/l	EPA 300.0/SW846 9056
D40738-2	**RWF342-22-MW2**					
Methane [a]		0.000760 J	0.00080	0.00040	mg/l	RSK175 MOD
Sodium		1590000	4000		ug/l	SW846 6010C
Chloride		941	25		mg/l	EPA 300.0/SW846 9056
D40738-3	**RWF342-22-MW3**					
Methane [a]		0.231	0.00080	0.00040	mg/l	RSK175 MOD
Sodium		1750000	4000		ug/l	SW846 6010C
Chloride		857	25		mg/l	EPA 300.0/SW846 9056

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

Mountain States ACCUTEST LABORATORIES

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: RWF342-22-MW1
Lab Sample ID: D40738-1
Matrix: AQ - Ground Water
Method: SW846 8021B
Project: RWF 342-22 Water Testing

Date Sampled: 11/07/12
Date Received: 11/08/12
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TA17663.D	1	11/13/12	SK	n/a	n/a	GTA999
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	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	96%		60-140%

(a) Sample was not preserved to a pH < 2.

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

Report of Analysis

Client Sample ID:	RWF342-22-MW1		
Lab Sample ID:	D40738-1	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB07376.D	1	11/09/12	SM	n/a	n/a	GFB305
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.00547	0.00080	0.00040	mg/l	

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

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

Report of Analysis

Client Sample ID: RWF342-22-MW1
Lab Sample ID: D40738-1
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 11/07/12
Date Received: 11/08/12
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Sodium	1560000	4000	ug/l	10	11/09/12	11/13/12	JM	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA2995
(2) Prep QC Batch: MP8851

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RWF342-22-MW1		
Lab Sample ID:	D40738-1	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	851	25	mg/l	50	11/19/12 19:09	JML	EPA 300.0/SW846 9056

RL = Reporting Limit

Report of Analysis

Client Sample ID: RWF342-22-MW2
Lab Sample ID: D40738-2
Matrix: AQ - Ground Water
Method: SW846 8021B
Project: RWF 342-22 Water Testing

Date Sampled: 11/07/12
Date Received: 11/08/12
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TA17664.D	1	11/13/12	SK	n/a	n/a	GTA999
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	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	98%		60-140%

(a) Sample was not preserved to a pH < 2.

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

Report of Analysis

Client Sample ID:	RWF342-22-MW2		
Lab Sample ID:	D40738-2	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB07377.D	1	11/09/12	SM	n/a	n/a	GFB305
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.000760	0.00080	0.00040	mg/l	J

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

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

Report of Analysis

Client Sample ID:	RWF342-22-MW2		
Lab Sample ID:	D40738-2	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Sodium	1590000	4000	ug/l	10	11/09/12	11/13/12	JM	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA2995
(2) Prep QC Batch: MP8851

RL = Reporting Limit

Report of Analysis

Client Sample ID:	RWF342-22-MW2		
Lab Sample ID:	D40738-2	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	941	25	mg/l	50	11/19/12 19:24	JML	EPA 300.0/SW846 9056

RL = Reporting Limit

Report of Analysis

Client Sample ID: RWF342-22-MW3
Lab Sample ID: D40738-3
Matrix: AQ - Ground Water
Method: SW846 8021B
Project: RWF 342-22 Water Testing

Date Sampled: 11/07/12
Date Received: 11/08/12
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	TA17665.D	1	11/13/12	SK	n/a	n/a	GTA999
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.20	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	99%		60-140%

(a) Sample was not preserved to a pH < 2.

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

Report of Analysis

Client Sample ID:	RWF342-22-MW3		
Lab Sample ID:	D40738-3	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
Method:	RSK175 MOD	**Percent Solids:**	n/a
Project:	RWF 342-22 Water Testing		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	FB07378.D	1	11/09/12	SM	n/a	n/a	GFB305
Run #2							

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	0.231	0.00080	0.00040	mg/l	

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

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

Report of Analysis

Client Sample ID:	RWF342-22-MW3		
Lab Sample ID:	D40738-3	**Date Sampled:**	11/07/12
Matrix:	AQ - Ground Water	**Date Received:**	11/08/12
		Percent Solids:	n/a
Project:	RWF 342-22 Water Testing		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Sodium	1750000	4000	ug/l	10	11/09/12	11/13/12	JM	SW846 6010C [1]	SW846 3010A [2]

(1) Instrument QC Batch: MA2995
(2) Prep QC Batch: MP8851

RL = Reporting Limit

Report of Analysis

Client Sample ID: RWF342-22-MW3
Lab Sample ID: D40738-3
Matrix: AQ - Ground Water
Project: RWF 342-22 Water Testing

Date Sampled: 11/07/12
Date Received: 11/08/12
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chloride	857	25	mg/l	50	11/19/12 20:08	JML	EPA 300.0/SW846 9056

RL = Reporting Limit

Mountain States ACCUTEST LABORATORIES

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

ACCUTEST LABORATORIES

CHAIN OF CUSTODY

PAGE 1 OF 1

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 # | Bottle Order Control #
Accutest Quote # | Accutest Job # D40738

Client / Reporting Information

Company Name: Olsson Assoc.
Street Address: 8260 21 1/2 Road
City: Gj State: CO Zip: 81505
Project Contact: Tim Dobrawsky E-mail: tdobrawsky@olsson.com
Phone #: 970.270.2866 Fax #:
Sampler(s) Name(s): K. Richards Phone #:

Project Information

Project Name: RWF 342-22 GW SAMPLING
Street:
City:
Project#:
Client PO#:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention: PO#:

Requested Analysis (see TEST CODE sheet)

BTEX (8021B) | Methane (RSK 175) | Chloride (300.0) | Sodium (6010B)

Matrix Codes

DW - Drinking Water
GW - Ground Water
WW - Water
SW - Surface Water
SO - Soil
SL- Sludge
SED-Sediment
OI - Oil
LIQ - Other Liquid
AIR - Air
SOL - Other Solid
WP - Wipe
FB-Field Blank
EB- Equipment Blank
RB- Rinse Blank
TB-Trip Blank

Accutest Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Bealzote	LAB USE ONLY
	~~RWF~~ RWF342-22-MW1		11/7/12	11:04	KR	GW	7					7					01
	RWF 342-22-MW2			11:59													02
	RWF 342-22-MW3			12:30													03

DR 11/8

Turnaround Time (Business days)

Approved By (Accutest PM): / Date:

- [x] Std. 10 Business Days
- [ ] Std. 5 Business Days (By Contract only)
- [ ] 5 Day RUSH
- [ ] 3 Day EMERGENCY
- [ ] 2 Day EMERGENCY
- [ ] 1 Day EMERGENCY

Emergency & Rush T/A data available VIA Lablink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] Commercial "B" +Narrative
- [ ] FULLT1 (Level 3+4)
- [ ] State Forms
- [ ] EDD Format
- [ ] PDF

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary

Comments / Special Instructions

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	K. R.	11/7/2012	1 Fed Ex Service Center	2		2 11/8 1230
3	Relinquished by Sampler:	Date Time: 1315	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal # HDCO	Intact / Not Intact	Preserved where applicable	On Ice	Cooler Temp. 4.0

D40738: Chain of Custody
Page 1 of 2

Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D40738 **Client:** OLSSON ASSOC. **Immediate Client Services Action Required:** No

Date / Time Received: 11/8/2012 12:30:00 PM **No. Coolers:** 1 **Client Service Action Required at Login:** No

Project: RWF 342-22 GW SAMPLING **Airbill #'s:** HDCO

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	Infared gun		
3. Cooler media:	Ice (bag)		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☐	
2. Trip Blank listed on COC:	☐		☐	
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume rec'd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Comments

Accutest Laboratories
V:(303) 425-6021

4036 Youngfield Street
F: (303) 425-6854

Wheat Ridge, CO
www/accutest.com

5.1

5

D40738: Chain of Custody
Page 2 of 2

Mountain States ACCUTEST LABORATORIES

GC Volatiles

QC Data Summaries

Includes the following where applicable:

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

Method Blank Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GC3229-MB	FB07370.D	1	11/09/12	SM	n/a	n/a	GFB305

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

D40738-1, D40738-2, D40738-3

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.00080	0.00040	mg/l	

Method Blank Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA999-MB	TA17651.D	1	11/13/12	SK	n/a	n/a	GTA999

The QC reported here applies to the following samples: **Method:** SW846 8021B

D40738-1, D40738-2, D40738-3

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	95%	60-140%

Blank Spike Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GC3229-BS	FB07372.D	10	11/09/12	SM	n/a	n/a	GFB305

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

D40738-1, D40738-2, D40738-3

CAS No.	Compound	Spike mg/l	BSP mg/l	BSP %	Limits
74-82-8	Methane	0.51	0.554	109	70-146

* = Outside of Control Limits.

Blank Spike Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GTA999-BS	TA17652.D	1	11/13/12	SK	n/a	n/a	GTA999

The QC reported here applies to the following samples: **Method:** SW846 8021B

D40738-1, D40738-2, D40738-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	27.2	24.6	90	70-130
100-41-4	Ethylbenzene	45.6	41.0	90	70-130
108-88-3	Toluene	212	186	88	70-130
1330-20-7	Xylenes (total)	216	212	98	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	99%	60-140%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D40513-1MS [a]	FB07374.D	10	11/09/12	SM	n/a	n/a	GFB305
D40513-1MSD [a]	FB07375.D	10	11/09/12	SM	n/a	n/a	GFB305
D40513-1 [a]	FB07373.D	1	11/09/12	SM	n/a	n/a	GFB305

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

D40738-1, D40738-2, D40738-3

CAS No.	Compound	D40513-1 mg/l	Q	Spike mg/l	MS mg/l	MS %	MSD mg/l	MSD %	RPD	Limits Rec/RPD
74-82-8	Methane	ND		0.51	0.386	76	0.486	95	23	67-155/30

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

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: D40738
Account: CORCCOGJ Olsson Associates
Project: RWF 342-22 Water Testing

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D40818-1MS	TA17654.D	1	11/13/12	SK	n/a	n/a	GTA999
D40818-1MSD	TA17655.D	1	11/13/12	SK	n/a	n/a	GTA999
D40818-1	TA17653.D	1	11/13/12	SK	n/a	n/a	GTA999

The QC reported here applies to the following samples: **Method:** SW846 8021B

D40738-1, D40738-2, D40738-3

CAS No.	Compound	D40818-1 ug/l	Q	Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		27.2	24.0	88	23.0	85	4	55-133/30
100-41-4	Ethylbenzene	ND		45.6	40.8	89	38.5	84	6	63-130/30
108-88-3	Toluene	ND		212	185	87	175	83	6	70-130/30
1330-20-7	Xylenes (total)	ND		216	211	98	199	92	6	64-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D40818-1	Limits
120-82-1	1,2,4-Trichlorobenzene	99%	97%	95%	60-140%

* = Outside of Control Limits.

Mountain States ACCUTEST LABORATORIES

Metals Analysis

QC Data Summaries

Includes the following where applicable:

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 11/09/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	100	9.6	25		
Antimony	30	1.7	3.6		
Arsenic	25	4.4	8.4		
Barium	10	.1	1.8		
Beryllium	10	1.3	3.1		
Boron	50	1	4.4		
Cadmium	10	.6	.59		
Calcium	400	5.4	16		
Chromium	10	.3	.56		
Cobalt	5.0	.4	.42		
Copper	10	1.2	3		
Iron	70	1.2	20		
Lead	50	1.9	2.9		
Lithium	2.0	.5			
Magnesium	200	6.5	22		
Manganese	5.0	1.2	1.2		
Molybdenum	10	2.1	2.1		
Nickel	30	.5	.57		
Phosphorus	100	14	59		
Potassium	1000	61	150		
Selenium	50	4.8	11		
Silicon	50	2.9			
Silver	30	.4	.98		
Sodium	400	5.9	98	45.7	<400
Strontium	5.0	.04	1.5		
Thallium	10	2.9	8.6		
Tin	50	12			
Titanium	10	.1			
Uranium	50	2.2	4.6		
Vanadium	10	.2	.48		
Zinc	30	.5	2.4		

Associated samples MP8851: D40738-1, D40738-2, D40738-3

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 11/09/12

Metal	D40598-1 Original MS		Spikelot ICPALL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic	anr				
Barium					
Beryllium					
Boron					
Cadmium	anr				
Calcium	anr				
Chromium					
Cobalt					
Copper	anr				
Iron					
Lead	anr				
Lithium					
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium	anr				
Silicon					
Silver					
Sodium	82000	105000	25000	92.0	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc	anr				

Associated samples MP8851: D40738-1, D40738-2, D40738-3

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 11/09/12

Metal	D40598-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium						
Beryllium						
Boron						
Cadmium	anr					
Calcium	anr					
Chromium						
Cobalt						
Copper	anr					
Iron						
Lead	anr					
Lithium						
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium	anr					
Silicon						
Silver						
Sodium	82000	104000	25000	88.0	1.0	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc	anr					

Associated samples MP8851: D40738-1, D40738-2, D40738-3

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

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 11/09/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	23800	25000	95.2	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP8851: D40738-1, D40738-2, D40738-3

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 11/09/12

Metal	D40598-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium				
Beryllium				
Boron				
Cadmium	anr			
Calcium	anr			
Chromium				
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Lithium				
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium	anr			
Silicon				
Silver				
Sodium	82000	84200	2.7	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP8851: D40738-1, D40738-2, D40738-3

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

QC Batch ID: MP8851
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

Mountain States ACCUTEST LABORATORIES

General Chemistry

QC Data Summaries

Includes the following where applicable:

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

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Bromide	GP8718/GN17754	0.050	0.0	mg/l	20	19.5	97.5	90-110%
Chloride	GP8718/GN17754	0.50	0.29	mg/l	20	21.5	107.5	90-110%
Sulfate	GP8718/GN17754	0.50	0.0	mg/l	30	29.3	97.7	90-110%

Associated Samples:
Batch GP8718: D40738-1, D40738-2, D40738-3
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Bromide	GP8718/GN17754	D40862-1	mg/l	0.068	2.5	2.5	97.3	80-120%
Chloride	GP8718/GN17754	D40862-1	mg/l	5.0	10	14.5	95.0	80-120%
Sulfate	GP8718/GN17754	D40862-1	mg/l	7.8	10	17.5	97.0	80-120%

Associated Samples:
Batch GP8718: D40738-1, D40738-2, D40738-3
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: D40738
Account: CORCCOGJ - Olsson Associates
Project: RWF 342-22 Water Testing

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Bromide	GP8718/GN17754	D40862-1	mg/l	0.068	2.5	2.6	3.9	20%
Chloride	GP8718/GN17754	D40862-1	mg/l	5.0	10	15.0	3.4	20%
Sulfate	GP8718/GN17754	D40862-1	mg/l	7.8	10	17.9	2.3	20%

Associated Samples:
Batch GP8718: D40738-1, D40738-2, D40738-3
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits