Appendix F

Laboratory Analysis of Shallow Sediment Near a Former Uranium Mill: Riverton, Wyoming, Site

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Abbreviations

ASW	artificial site water
CARB	carbonate extractant
DOE	U.S. Department of Energy
ft	feet
g	gram
K_d	distribution coefficient
K_d^*	apparent distribution coefficient
LM	Office of Legacy Management
LOD	loss-on-drying
µg/g	micrograms per gram
µg/L	micrograms per liter
µL	microliter
µm	micrometer
mL	milliliter
mL/g	milliliters per gram
mm	millimeter
N	normality (equivalent weight of a solute per liter of solution)
PV	pore volume
rpm	revolutions per minute

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1.0 Introduction

A uranium and vanadium ore-processing mill operated at a site 2 miles from the city of Riverton, Wyoming, from 1958 to 1963 (DOE 2011). Surface restoration, which included removal of the mill tailings from the site, was completed in 1989. The milling operation resulted in contamination of groundwater with uranium and other constituents. The site is now managed by the U.S. Department of Energy Office of Legacy Management (LM).

In June 2010, following a record flooding of the adjacent Little Wind River, uranium concentrations in groundwater monitoring well 0707 increased by three times their previous values (DOE 2012a). This observation led to the hypothesis that shallow sediments were contaminated with uranium, which was released as water from the flooding passed through the sediments (DOE 2012b). A workplan was developed to investigate this concept (DOE 2012c). As stated by DOE (2012c), the purpose of the investigation was to "obtain additional data to further characterize the surficial aquifer. Specific objectives of the investigation were to:

- Provide enhanced definition of contaminant plumes including the location of the centroid of each plume and the extent of groundwater contamination for each constituent of concern (COC).
- Provide a detailed distribution of contaminants for input into the updated groundwater computer model.
- Provide data that will guide placement of new monitoring wells outside of the contaminant plumes to monitor lateral plume behavior.
- Provide a detailed and updated baseline of groundwater contamination for tracking plume configuration, movement, and size over time. This will be used to assess the progress of natural flushing if this study is repeated in the future.
- Provide information on soil characteristics including leachability of uranium.
- Estimate the masses of uranium remaining in the unsaturated zone of the surficial aquifer, to gather data that can be used to develop appropriate contaminant source terms in the transport modeling. The resulting computer model will be capable of simulating the effects of periodic flooding of the Little Wind River."

To satisfy a portion of these objectives, core samples from the upper 5 feet (ft) of sediment were collected at 34 locations in August 2012 (Figure 1). The core samples were subjected to laboratory batch and column testing over the period September through December 2012. LM prepared a report that summarizes the coring and groundwater sampling activities conducted during the August 2012 field episode, and the subsequent laboratory analysis (DOE 2013). The purpose of the current report is to document, in more detail, the methods used and results of the laboratory analyses of the core material.

2.0 Methods

2.1 Sample Preparation

Samples were collected from August 21 through 28, 2012, by pushing a core barrel vertically to 5 ft using a Geoprobe drilling rig. Sampling locations were arranged along nine transects denoted T01 through T09 (Figure 1). Samples were composited from two intervals, 0 to 2.5 ft and 2.5 to 5 ft. Core recovery ranged from 2.24 ft (44 percent) to 4.6 ft (92 percent). In borings where core recovery was less than the full 5 ft, it was assumed that the bottom portion of the core was lost. For example, if the recovered core was 3 ft long, the upper 2.5 ft represented the 0–2.5 ft interval, and the lower 0.5 ft represented the 2.5–5 ft interval. Sample numbers are designated by the boring location and upper (U) or lower (L) interval; thus, T01-05U and T01-05L are samples from the 0–2.5 ft and 2.5–5 ft intervals, respectively, of a boring on transect T01at location T01-05. Appendix A contains core descriptions provided by field personnel.

Samples were received at the laboratory on August 30, 2012, in plastic zip-lock bags. Laboratory personnel made some additional sample descriptions during sample processing. In particular, it was noted that roots were present in many of the samples, particularly in those collected from the upper zone. These descriptions are included in Appendix A. Laboratory notes are provided as Appendix B.

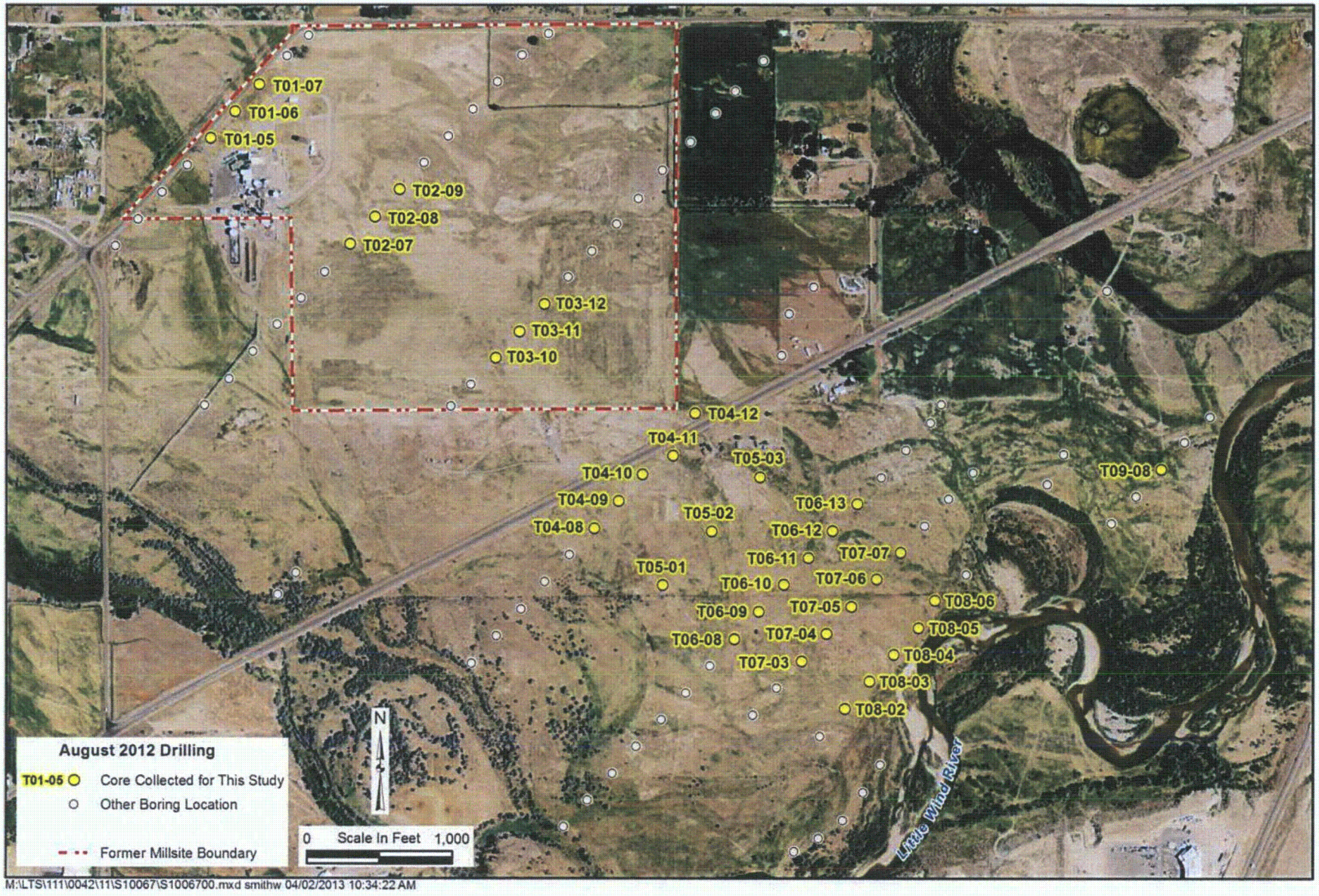


Figure 1. Location Map, Riverton, Wyoming, Site

2.2 Loss-on-Drying and Sieving

The sample bags were opened on August 31, 2012, and weighed to the nearest 0.1 gram (g). The samples were air dried in aluminum pans (Figure 2) for 17 days. Samples were weighed several times during drying to determine the rate of water loss. Because moisture content in a sample can be affected by moisture in the air, relative humidity in the drying room was recorded on 7 days during drying. Relative humidity was reasonably consistent throughout the drying, averaging 42 percent with standard deviation 8 percent. No attempt was made to adjust loss-on-drying (LOD) results for relative humidity. LOD was calculated by subtracting the weight following the drying period from the initial weight.

Figure 2. Air Drying of Samples

Dried samples were sieved through a 2 millimeter (mm) (#10) sieve on a Rotap table (Gilson model SS-15) for 5 minutes. In some samples, clumps of dirt remained after the Rotap agitation; however, no additional effort was made to break these apart. Disaggregating these clumps by aggressive actions such as grinding might have broken up intact shale grains and was avoided. Therefore, some of the fraction retained by the 2 mm sieve is actually finer grained. Splits were weighed to determine the fraction of the sample that was less than 2 mm (<2 mm).

2.3 Preparation of Artificial Site Water

Some of the tests used a water composition containing major ion concentrations similar to those in a sample of Little Wind River water collected on June 12, 2012. This artificial site water (ASW) was made by adding stock solutions of reagent grade chemicals to laboratory water that was deionized to 18.2 megaohms per centimeter (Table 1). Two trials at making the artificial Little Wind River water indicated that the solution equilibrated with the atmosphere, and pH gradually increased as carbon dioxide (CO_2) was lost. Nitric acid (HNO_3) was added to maintain

pH but resulted in additional CO_2 release. As a result, the alkalinity of the ASW was lower than the value measured on the Little Wind River sample. Since a goal of this project was to examine uranium mobility, and because it is well known that uranium mobility is affected by the dissolved carbonate concentration, a third recipe was developed that maintained the dissolved carbonate at a level near that of the Little Wind River analysis by adjusting pH with gaseous CO_2 rather than HNO_3. The composition of major ions in this ASW is compared to the analysis of the Little Wind River sample in Table 2. The slight differences between ASW and the Little Wind River analysis are not likely to significantly influence the results of the study. Alkalinity and pH of the ASW solutions were checked regularly during the testing to ensure that these parameters remained at the desired levels. A chemical analysis was conducted on the ASW solution and indicated that all of the constituents had the expected concentrations, verifying the methodology and the purity of the source chemicals.

Table 1. Recipe for Artificial Little Wind River Site Water (ASW)

Stock	Stock Concentration (g/L)	Stock Volume (mL/L)
K_2CO_3	10	0.30
$NaHCO_3$	50	5.0
$CaSO_4 \cdot 2H_2O$	1.5	140
$MgSO_4 \cdot 7H_2O$	200	0.04
$MgCl_2 \cdot 6H_2O$	100	0.11

g/L = grams per liter
mL/L = milliliters per liter

Table 2. Composition of Artificial Little Wind River Water (ASW) Compared to the June 12, 2012, Analysis

	Na (mg/L)	K (mg/L)	Ca (mg/L)	Mg (mg/L)	SO_4 (mg/L)	Cl (mg/L)	C (mg/L)	Alk[a]
ASW	68.5	1.7	48.9	2.1	120	3.8	36.0	~130
Measured	24.0	1.7	48.0	16.0	120	3.8	27.8	116

mg/L = milligrams per liter
[a] alkalinity as $CaCO_3$ (mg/L)

2.4 Batch Testing Methods

All batch tests were conducted on dried samples that had been sieved to <2 mm. Care was taken to obtain a representative sample by mixing the sample and minimizing gravity separation. A weighed mass of sample was placed in a 50 milliliter (mL) plastic centrifuge tube, a known volume of ASW was added, and the tubes were agitated on an end-over-end shaker at 8 revolutions per minute (rpm) (Figure 3). After agitation, samples were centrifuged for 10 minutes at 3500 rpm, decanted, and syringe filtered through 0.45 micrometer (μm) nylon Acrodisk filters. The filtered solutions were brought to 50 mL in a glass volumetric flask by adding ASW. They were then acidified with 100 microliters (μL) of concentrated nitric acid and analyzed for uranium.

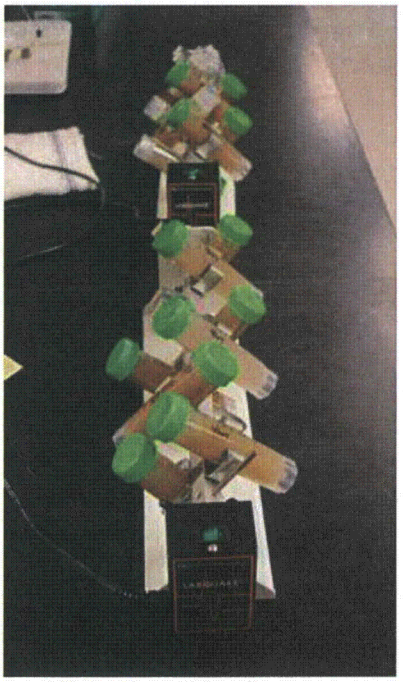


Figure 3. End-Over-End Agitation of Batch Test Samples

2.5 Column Test Methods

All column tests were conducted on dried samples that had been sieved to <2 mm. A weighed mass of sample was placed in an Omnifit glass chromatography column. Care was taken to obtain a representative sample by mixing the sample and minimizing gravity separation. Sediment was placed in each column in approximately 1 centimeter (cm) lifts with gentle tapping between lifts. The volume of the columns is about 21 mL. Volumes of sediment ranged from 20.68 to 20.85 mL, as determined from the column area (1.7671 cm^2) and measured length of the sediment column. The pore volume (PV) in each column was determined from the flow rate and the length of time required to fill the column with ASW.

A fraction collector was used to collect column effluent in glass test tubes (Figure 4). A Masterflex peristaltic pump with number 13 nylon tubing was used to pump ASW through the column from bottom to top. The ASW was kept in a collapsible plastic container to minimize exposure to air. Flow rate was set on the pump but was accurately determined from the volume collected during each collection period. The actual flow rate was generally within 10 percent of the pump setting. Residence time (RT) was calculated as:

$$RT = (PV/60)/AFR$$

where
RT = residence time, hours (h)
PV = pore volume, mL
AFR = average flow rate, mL per minute

Figure 4. Column with Auto Sampler
Arrow points to sediment-filled column. In one column (sample T05-02U), flow could not be established because the sediment was too fine grained, and this sample was mixed with a 50% volume of high silica sand (Unimin Corp. #2075).

2.6 CARB Extractions

An extractant solution of sodium bicarbonate ($NaHCO_3$) and sodium carbonate (Na_2CO_3) was developed by Kohler et al. (2004) as an inexpensive method to determine the amount of adsorbed and other lightly held uranium (labile uranium) in solid samples. The solution was prepared by dissolving 1.2097 g of $NaHCO_3$ and 0.2968 g of $NaCO_3$ in deionized water and bringing to a volume of 1 L with deionized water. pH was adjusted to 9.5 with 100 to 150 µL of 10 N sodium hydroxide (Murray et al. 2012). The solution has a carbonate concentration of 17.2 millimol per liter and is referred to here as CARB.

Following each column test, all of the sediment was removed from the column and placed in a 500 mL glass Erlenmeyer flask. A predetermined volume of CARB solution ranging from 522 to 547 mL was added to each flask. The CARB volume was selected to approximate a solid-to-solution ratio of 50 g/L as was used by Kohler et al. (2004); however, volume was limited by the flask size, and the actual solid-to-solution ratios ranged from 51.71 to 71.32 g/L. The variations

in solid-to-solution ratios should not affect the resulting determination of labile uranium. The flasks were stoppered, placed on an orbital shaker table, and agitated for 3 weeks (Figure 5). Following the agitation period, a 30 mL sample of the solution was removed by pipette from the center of the flask. The sample was syringe filtered through a 0.45 µm nylon Acrodisk filter. The samples sometimes had a yellow color after filtering. The filtered samples were acidified to pH <2 using 200 µL of concentrated nitric acid (HNO_3) and analyzed for uranium. The labile uranium fraction was calculated as:

$$U^{solid}_{labile} = (U^{CARB}_{labile}/1000) \times (V^{CARB}/M^{solid})$$

where
U^{solid}_{labile} = labile U in solids, µg/g
U^{CARB}_{labile} = labile U measured in the CARB solution, micrograms per liter (µg/L)
V^{CARB} = volume of the CARB solution, mL
M^{solid} = mass of the solids, g

Figure 5. CARB Extractions on Orbital Shaker Table

2.7 Analytical Methods

Alkalinity was determined by titration with 1.6 N sulfuric acid using a Hach model 16900 digital titrator. pH was determined with a gel-filled glass electrode (Cole-Parmer model U59001) and calibrated with buffer solutions at the same temperature as the samples. Dissolved carbon concentrations were estimated from alkalinity and pH using equations in the U.S. Geological

Survey Alkalinity Calculator (USGS 2011). Uranium was analyzed by laser-induced kinetic phosphorescence on a Chemchek model KPA-11. Standard additions were run on every 10th sample, and recoveries were generally 95 to 100 percent.

3.0 Results

The samples varied considerably in texture, grain size, and visible properties. Many of the samples contained roots and other plant matter, particularly in samples collected from the upper zone (Appendix A).

3.1 Loss-on-Drying and Sieving

LOD ranged from 0.42 to 20.67 percent (Table 3). Sample weight loss was rapid over the first few days and more gradual thereafter (Figure 6). The 17-day period was sufficient to dry the samples to near equilibrium with the moisture of the laboratory atmosphere. All weights reported in the batch and column testing were the air-dried samples weights.

Table 3. Loss-on-Drying (LOD) and <2 mm Fractions

	LOD	<2mm		LOD	<2mm		LOD	<2mm
Sample	%	%	Sample	%	%	Sample	%	%
T01-05U	2.28	46.14	T04-10L	0.76	32.91	T07-03U	1.18	65.14
T01-05L	2.55	23.40	T04-11U	11.82	79.80	T07-03L	0.68	30.56
T01-06U	1.40	55.21	T04-11L	9.48	83.14	T07-04U	1.35	54.11
T01-06L	4.47	26.99	T04-12U	10.09	78.81	T07-04L	0.40	22.72
T01-07U	9.36	76.07	T05-01U	2.88	97.35	T07-05U	2.23	70.94
T02-07U	1.16	50.69	T05-01L	1.68	99.57	T07-05L	0.97	27.00
T02-07L	1.58	25.13	T05-02U	16.03	99.79	T07-06U	2.90	83.61
T02-08U	10.84	70.79	T05-02L	2.77	22.75	T07-06L	0.87	33.45
T02-08L	20.67	91.31	T05-03U	6.59	92.63	T07-07U	1.15	47.51
T02-09U	3.48	99.67	T05-03L	10.61	89.50	T07-07L	1.68	25.36
T02-09L	1.70	47.83	T06-08U	0.85	47.45	T08-02U	14.83	67.37
T03-10U	6.24	80.39	T06-08L	0.95	26.62	T08-03U	6.18	95.80
T03-10L	9.78	74.15	T06-09U	0.83	56.76	T08-03L	3.99	99.95
T03-11U	2.40	79.47	T06-09L	0.42	20.95	T08-04U	5.91	86.26
T03-11L	0.57	25.51	T06-10U	0.96	51.55	T08-04L	0.90	55.61
T03-12U	8.38	78.43	T06-10L	1.30	27.89	T08-05U	6.06	81.26
T03-12L	11.95	71.05	T06-11U	10.04	90.10	T08-05L	1.21	36.79
T04-08U	3.36	99.98	T06-11L	3.50	93.28	T08-06U	6.96	86.65
T04-08L	1.04	51.70	T06-12U	7.67	66.60	T08-06L	3.46	70.15
T04-09U	7.30	92.77	T06-12L	0.78	27.44	T09-08U	4.98	97.69
T04-09L	2.96	55.18	T06-13U	3.08	98.41	T09-08L	9.71	92.99
T04-10U	3.21	66.43	T06-13L	1.55	83.90			

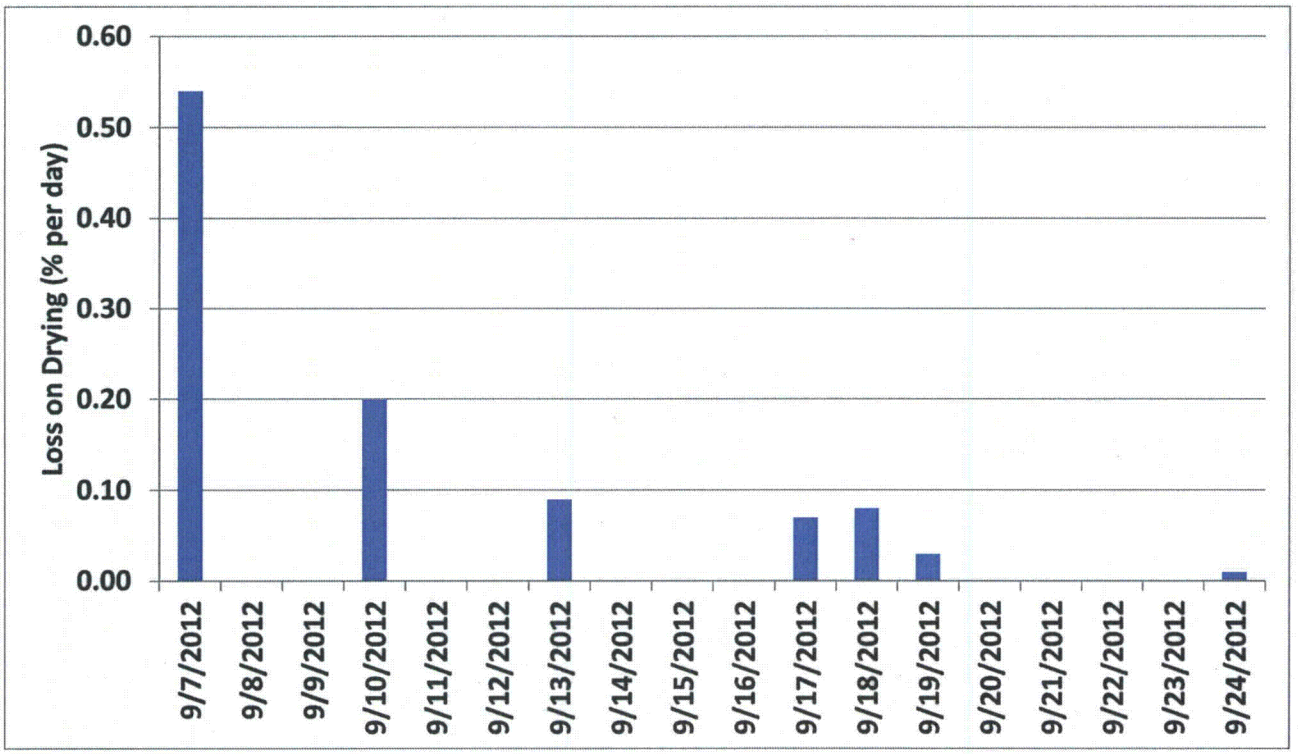


Figure 6. Rate of Loss-on-Drying in Percent of Sample Weight per Day (Average of 65 Samples)

Moisture content varied spatially but did not noticeably correlate with distance along the sampled profile (Figure 7). Within a single boring, both upper and lower samples usually had similar relative moisture contents, as seen by comparing paired samples in Figure 7.

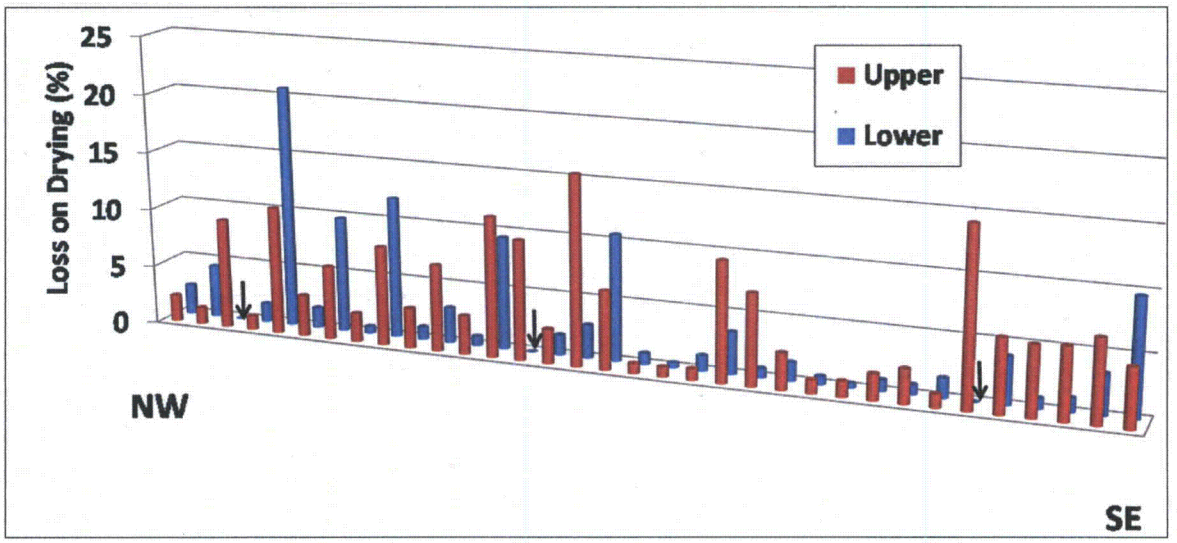


Figure 7. Distribution of Moisture Content from NW (near the Former Mill) to the SE (near the Little Wind River). Values for the upper zone samples are in red and the lower zone in blue. Arrows indicate missing samples.

The grain-size distribution varied substantially among the samples, with the <2 mm fractions comprising 20.95 to 99.98 percent of the sample (Table 3). Figure 8 shows a histogram indicating that the distribution of the <2 mm fraction is not a normal distribution. Instead, the distribution is broad based with peaks at about 27 and 98 percent <2 mm fraction. The cluster around the 27 percent peak is dominated by sandy gravel textures, and every sample with a <2 mm fraction of less than 40 percent contained pebbles with diameters more than 1 inch. The group of samples with <2 mm fractions of more than 90 percent had a powdery consistency and contained more roots than the coarser samples.

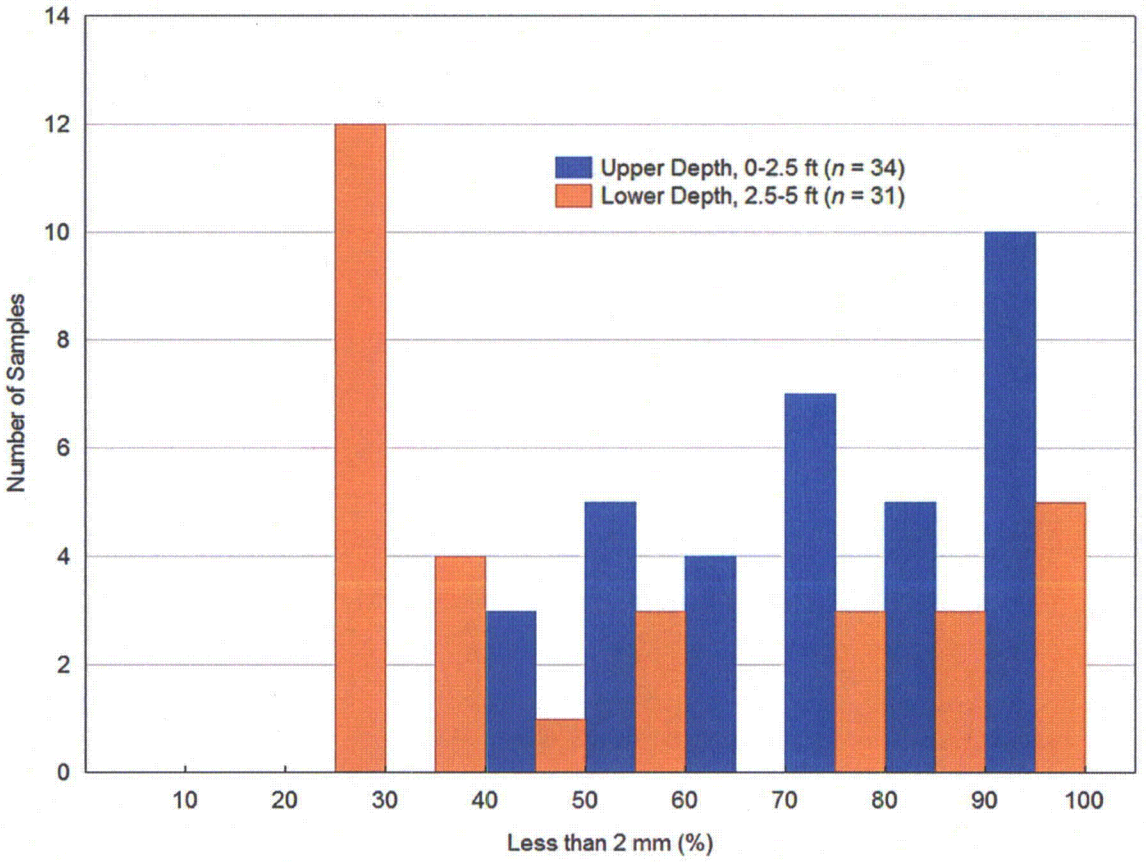


Figure 8. Distribution of Grain Size (percent of sample that is <2 mm)

3.2 Batch Test Results

Batch tests using variable agitation times were conducted to determine the length of time required for uranium to reach a steady-state, solid-phase concentration. Eight samples from locations throughout the study area were agitated for 10 different time periods (0.08, 0.25, 0.50, 1, 2, 4, 8, 16, 48, and 96 hours). In all tests, uranium concentrations increased relatively fast for about the first 24 hours, after which less increase was observed (Figure 9). Based on these results, a 24-hour agitation time was used to determine the distribution of uranium removal by ASW.

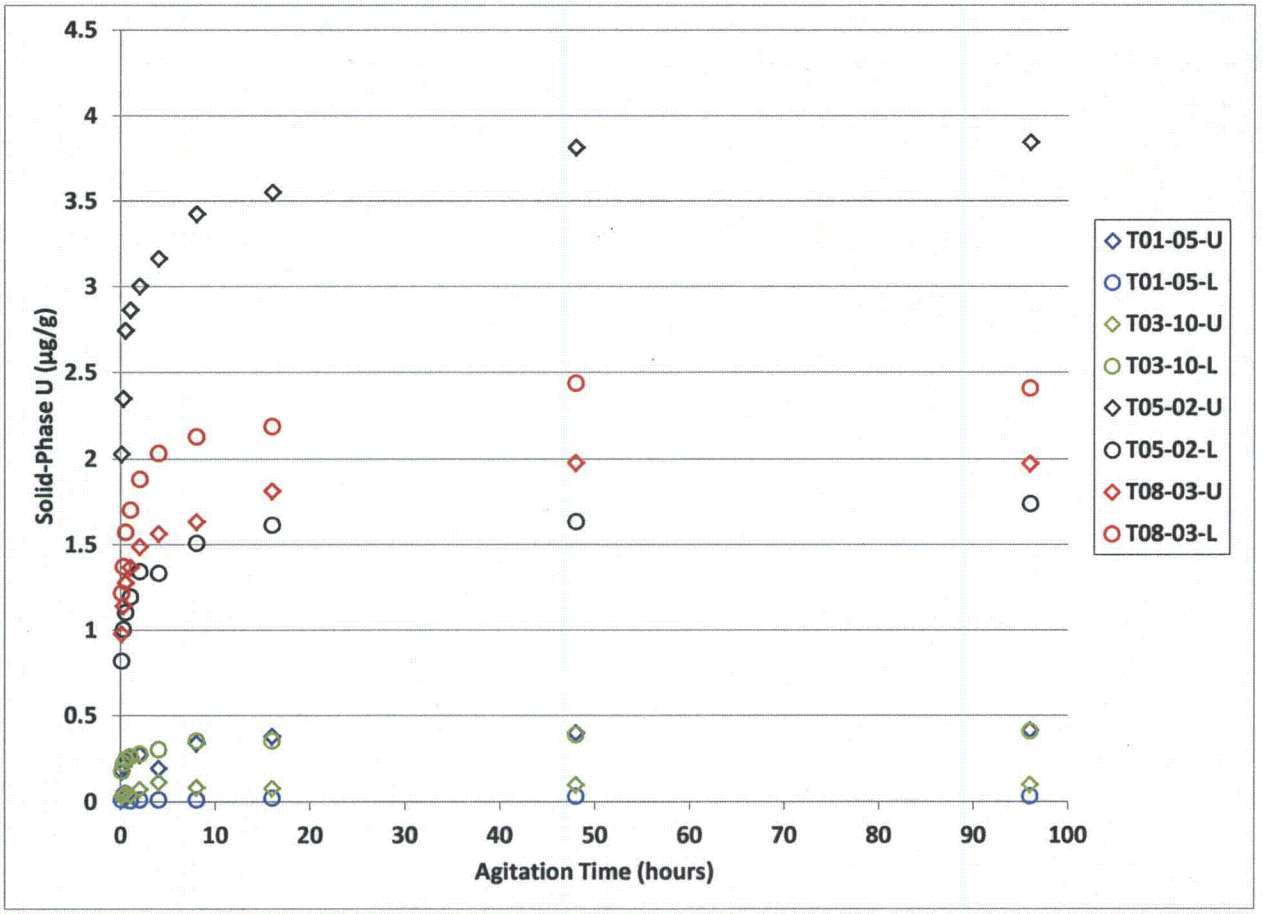


Figure 9. Effect of Agitation Time on Batch Test Results

The concentrations of uranium in the <2 mm sediments that was removed by a 24-hour agitation with ASW were variable, ranging from 0.04 to 4.8 µg/g with an average of 1.5 µg/g and standard deviation of 1.4 µg/g (Figure 10). The concentrations were generally higher in the offsite (transects 04 through 08) samples than in the onsite (transects 01 through 03) samples (Figure 11). Removable uranium concentrations were low in the upper (0.49 µg/g) and lower (0.3 µg/g) samples collected at location T09-08. In nearly all paired samples, the upper sample had a higher concentration of removable uranium than the lower sample (Figure 11).

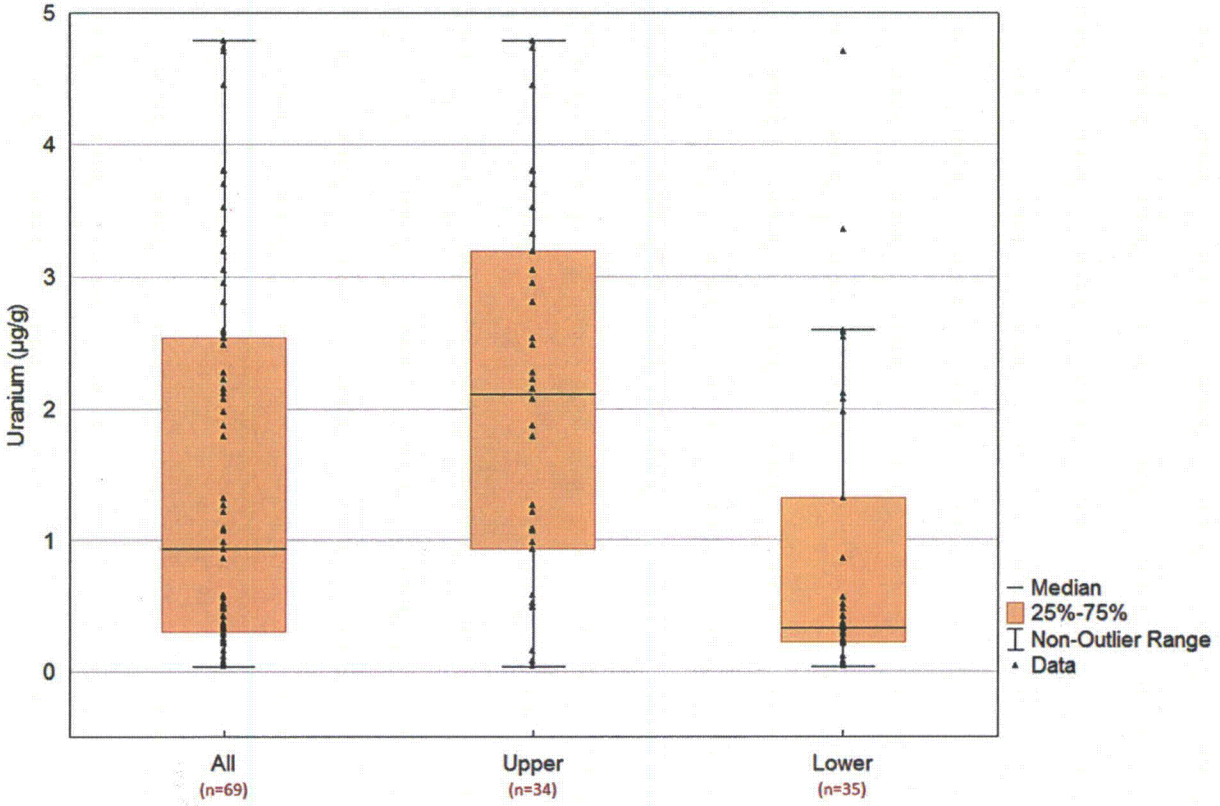


Figure 10. Distribution of Solid-Phase Uranium in Upper Zone (0 – 2.5 ft) vs. Lower Zone (2.5 – 5 ft) Samples. Batch test data using ASW and 24-hour agitation time.

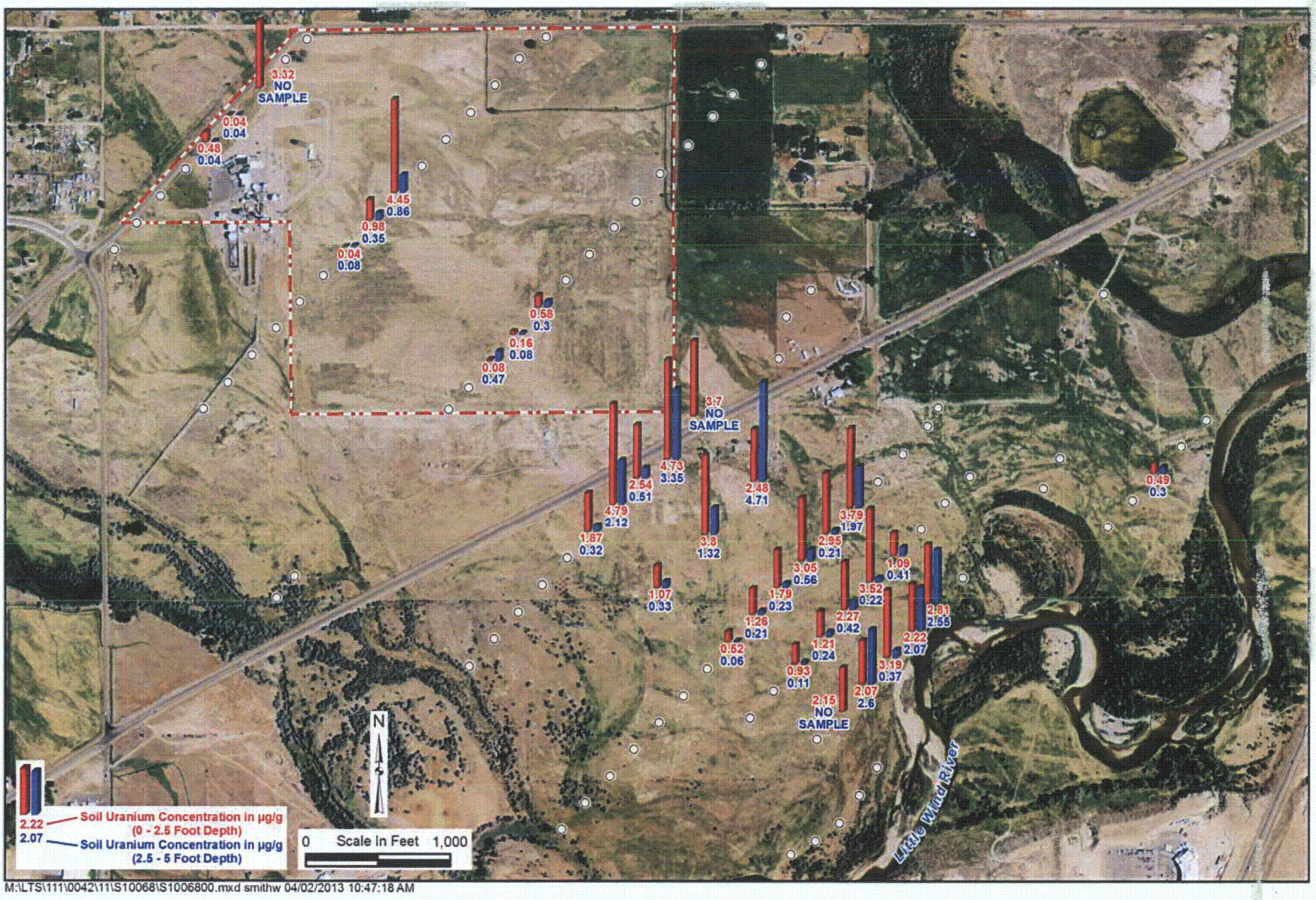


Figure 11. Distribution of Solid-Phase Uranium Concentrations Removed by 24-Hour Batch Tests with ASW

Solid-phase uranium concentrations in contaminated sediments are often higher in the fine-grained fraction than in the coarse-grained fraction. This relationship is thought to occur largely because uranium is complexed at grain surfaces, and fine-grained sediment has more surface area per unit weight than does coarse sediment. A positive correlation appears to exist between the abundance of fine-grained sediment (<2 mm) and the solid-phase uranium concentrations of the Riverton sample (Figure 12). All samples with solid-phase uranium concentrations of more than 3 µg/g have more than 78 percent of the sample in the <2 mm size fraction (Figure 12).

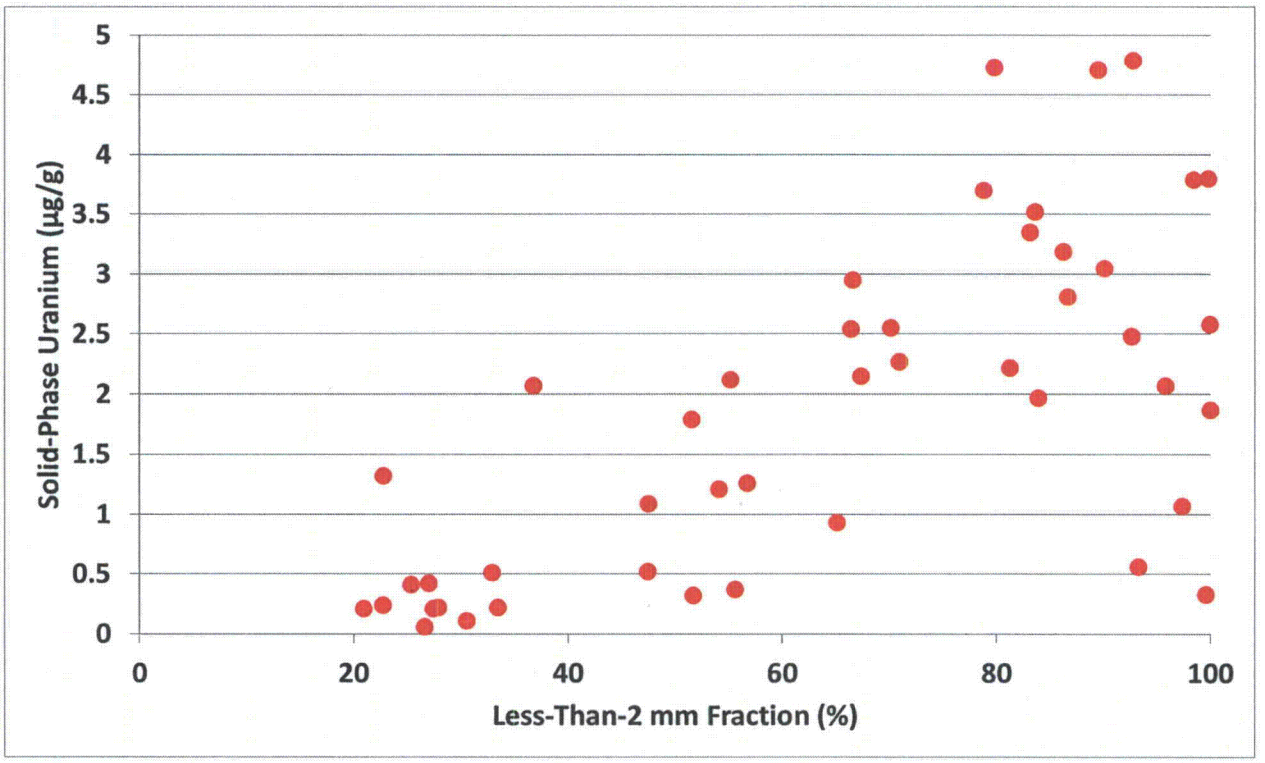


Figure 12. Relationship of Solid-Phase Uranium Removed by ASW to the Percent of <2 mm Grain Size for Offsite (Transects 04 Through 08) Samples

3.3 Column Test Results

Column tests were conducted on samples from one location in each of the eight transects. Two tests were run for each location, one each from the upper and lower sediment samples. Column properties were relatively constant for each test; Table 4 provides specifications for each column test.

Table 4. Column Properties

Sample	Sediment Volume (mL)	Sediment Dry Weight (g)	Pore Volume (mL)	Average Flow Rate (mL/min)	Residence Time (h)	Pore-Water Velocity (cm/d)	Type[a]
T01-05U	20.85	33.62	5.7	0.0831	1.14	247.7	A
T01-05L	20.85	35.99	5.1	0.0948	0.90	315.9	A
T02-07U	20.85	33.89	5.6	0.0900	1.04	273.1	A
T02-07L	20.85	35.14	4.5	0.0732	1.02	276.4	A
T03-10U	20.85	30.52	6.6	0.0900	1.22	231.7	B
T03-10L	20.85	30.16	6.7	0.0950	1.18	240.9	B
T04-10U	20.85	30.28	8.0	0.0901	1.48	191.4	C
T04-10L	20.85	37.94	4.5	0.0951	0.79	359.1	B
T05-02U[b]	20.32	34.75	5.8	0.0735	1.32	209.9	A
T05-02L	20.85	32.14	6.0	0.0899	1.11	254.6	B
T06-10U	20.85	32.17	6.2	0.0897	1.15	245.8	A
T06-10L	20.85	37.42	8.1	0.0900	1.50	188.8	A
T07-04U	20.85	31.98	8.4	0.0917	1.53	185.5	C
T07-04L	20.85	36.35	5.3	0.0960	0.92	307.8	A
T08-03U	20.68	27.51	8.6	0.0932	1.54	182.6	C
T08-03L	20.85	29.28	7.9	0.0906	1.45	194.9	C

h = hours
cm/d = centimeters per day
[a] Curve type (see text).
[b] 50% sand mix

3.3.1 Effluent Uranium Concentrations

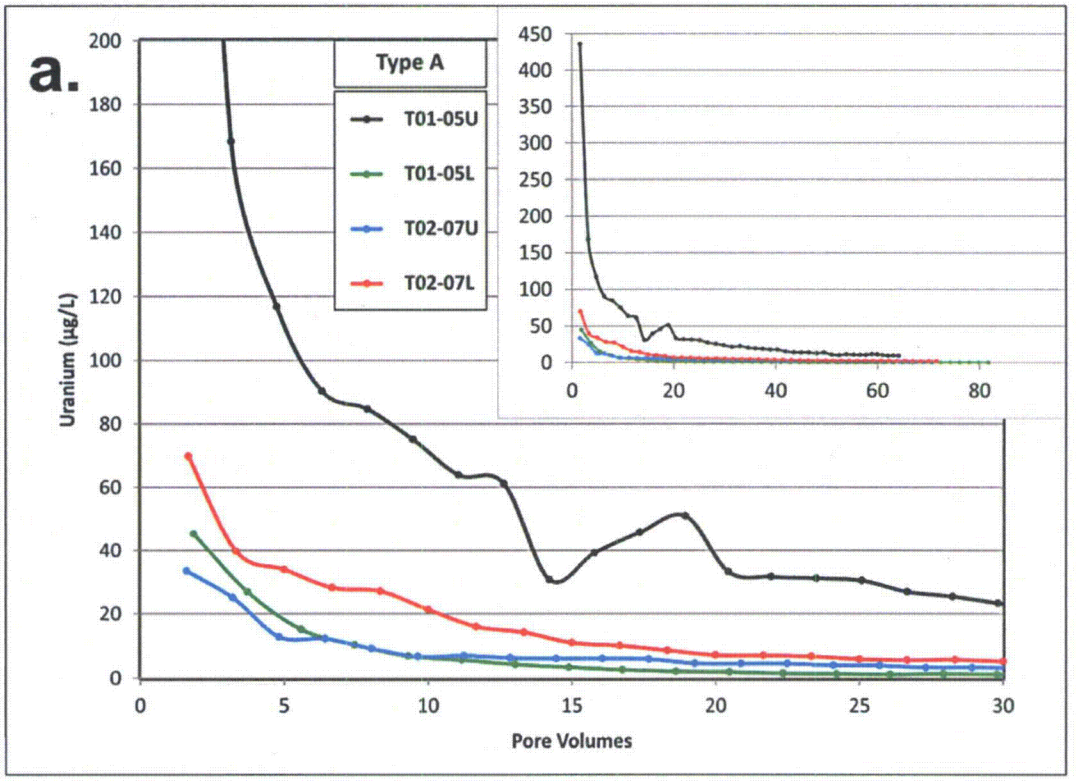
Effluent uranium concentrations were variable among the columns. With exceptions of the unanticipated fluctuations in the early stages, the uranium concentrations demonstrated a monotonic decrease throughout the tests. The uranium concentrations displayed three distinct profiles in the early stages, referred to as profile types A, B, and C, described as follows (Figure 13):

Type A: Uranium concentrations have a monotonic decrease throughout the test.

Type B: Uranium concentrations are low initially, then increase before finally having a monotonic decrease.

Type C: Uranium concentrations are initially high, then decrease, then increase again before finally having a monotonic decrease.

All four profiles from the two farthest upgradient transects (T01 and T02) were Type A and had relatively low effluent uranium concentrations (Figure 13). In contrast, three of the four samples from the two farthest downgradient transects (T07 and T08) had Type C profiles. Samples from the intermediate transects (T03, T04, T05, and T06) had mostly Type A and Type B profiles. Both samples from the T05-02 location had the highest peak uranium concentrations of any of the samples.



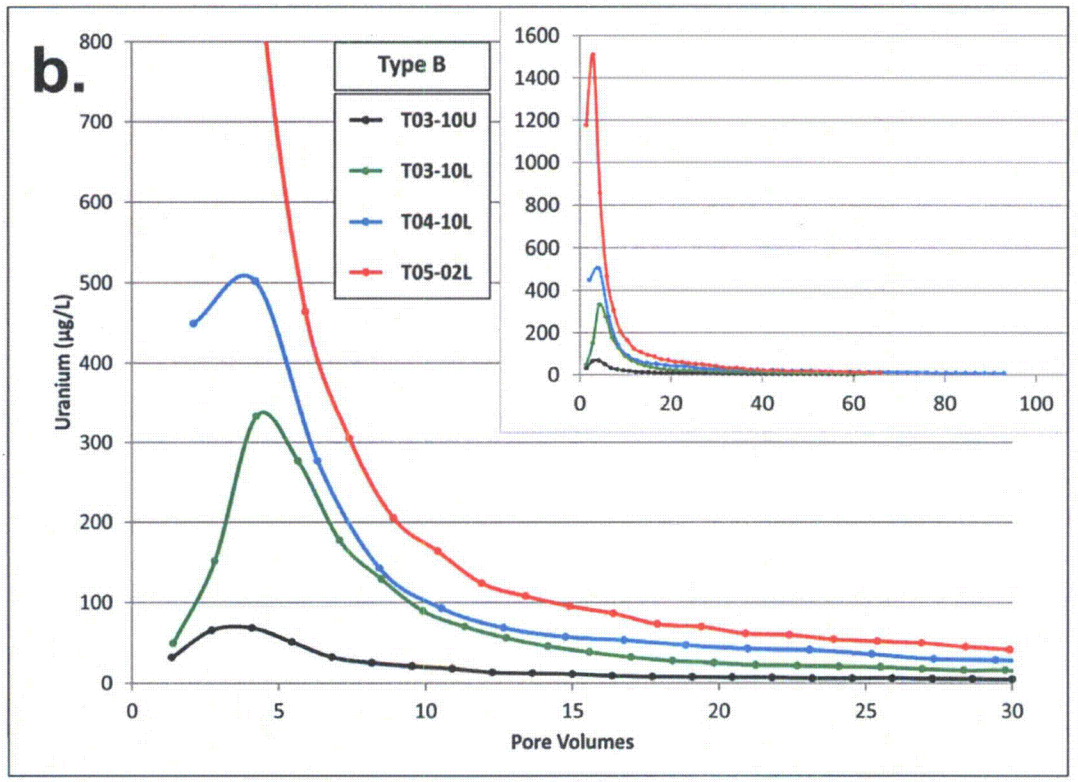
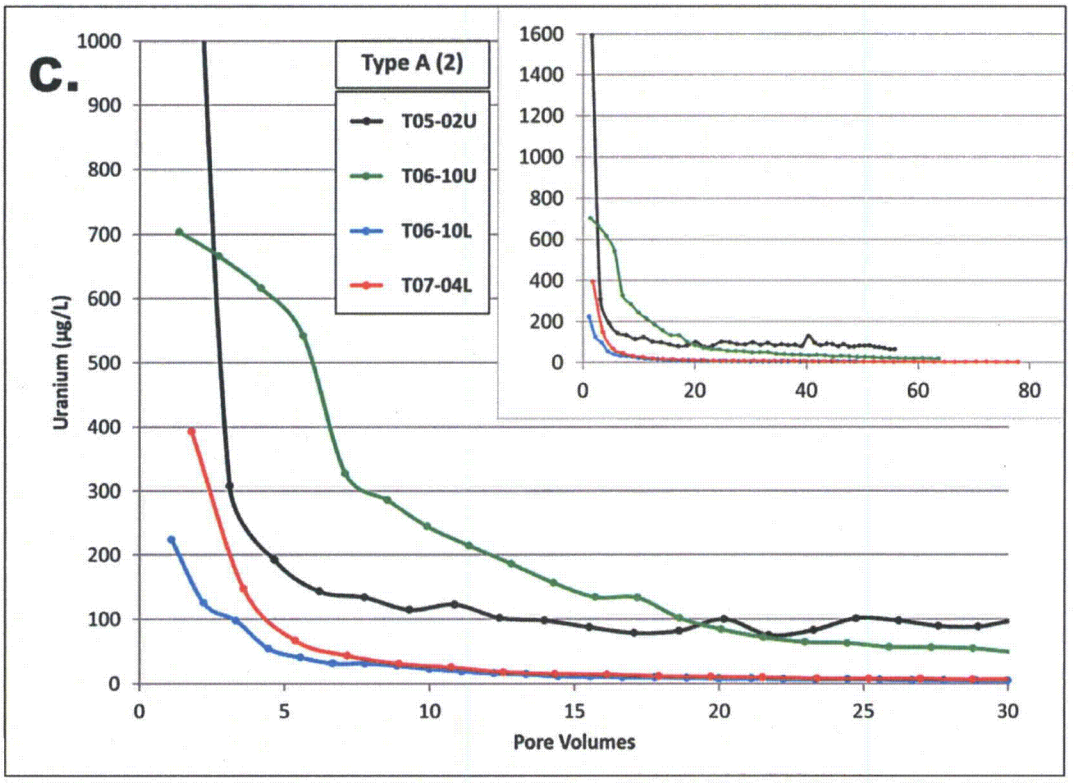


Figure 13. Uranium Concentrations in Column Effluents Arranged by Profile Type



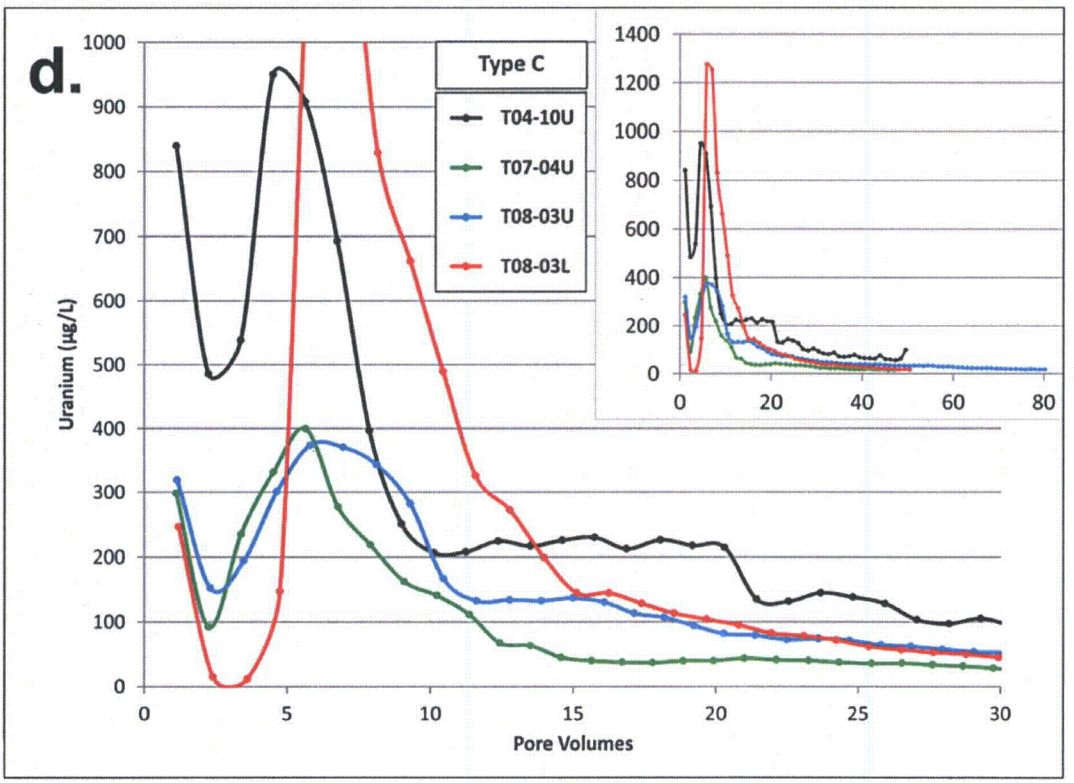


Figure 13 (continued). Uranium Concentrations in Column Effluents Arranged by Profile Type

The first effluent samples from many of the columns had a pale yellow to deep yellow-brown color that may be caused by dissolved organic acids. As indicated by descriptions in the laboratory notes (Appendix B), coloration in the Type C effluents was the deepest yellow-brown of all column effluents. Organics may be derived from the roots or other organic matter contained in the sediment. The first effluent samples from the columns may also be affected by the initial wetting of the column. As the columns wet up, water gradually seeps into immobile pores and as the pores become saturated, outward diffusion rates of uranium may increase.

3.3.2 Labile Fractions

The easily removable mass of uranium from a sediment is called the labile fraction. The labile fraction is generally considered to be the mass that is weakly sorbed to mineral surfaces and is the fraction that most readily participates in interactions with groundwater. Isotope exchange methods are used to provide a rigorous assessment of the uranium in the labile fraction; however, Kohler et al. (2004) developed an extraction technique that is simpler to perform and provides estimates of the uranium labile fraction that are comparable to isotopic exchange methods. The Kohler et al. (2004) method, which was used in this study, uses a carbonate solution (CARB) as the extraction medium.

The labile fractions were determined as the sum of the uranium mass removed by ASW during column operation and the mass subsequently removed by CARB extraction on the column sediment. The labile fractions in the Riverton sediment samples used for column testing ranged from 0.055 to 3.761 µg/g (Table 5). ASW removed between 58 and 87 percent of the labile fraction during column operation (Table 5). The concentrations of labile uranium are comparable to abundances of uranium in sedimentary rocks that make up the crust of the earth. For example, Rogers and Adams (1974) provide a compilation of data on average uranium concentrations in common sedimentary rocks as follows: sandstone (0.5 to 3.2 µg/g), shale (2 to 8 µg/g), Mancos Shale (3.7 µg/g), black shale (8 µg/g), bentonite (5 µg/g), and limestone (0.4 to 2.3 µg/g).

Table 5. Uranium Removed by ASW and by Subsequent CARB Digestion. The total labile fraction is the sum of the ASW and CARB extractions

Sample	ASW Removed (µg/g) (%)[a]	CARB Removed (µg/g)	Total Labile (µg/g)
T01-05U	0.473 (72 %)	0.184	0.657
T01-05L	0.039 (71 %)	0.016	0.055
T02-07U	0.056 (58 %)	0.040	0.096
T02-07L	0.085 (63 %)	0.051	0.136
T03-10U	0.145 (70 %)	0.062	0.207
T03-10L	0.580 (81 %)	0.135	0.715
T04-10U	2.840 (76 %)	0.921	3.761
T04-10L	0.579 (79 %)	0.150	0.729
T05-02U	1.325 (43 %)	1.758	3.083
T05-02L	1.677 (87 %)	0.244	1.921
T06-10U	1.523 (75 %)	0.510	2.033
T06-10L	0.218 (66 %)	0.111	0.329
T07-04U	0.968 (77 %)	0.294	1.262
T07-04L	0.239 (77 %)	0.073	0.312
T08-03U	1.959 (86 %)	0.306	2.265
T08-03L	2.301 (85 %)	0.415	2.716

[a] Percent of labile fraction removed by ASW.

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Appendix A

Field Logs for Sample Cores Used in This Study

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Location	Core Recovery (%)	Depth Interval (ft.)	Core Description
T01-05	70	0-2.5	Pale yellowish-brown silt with rock fragments; dry. Roots in sample.
		2.5-3.5	Brownish-gray sand and gravel (5YR 4/1); moist (not wet).
T01-06	72	0-2.5	0–1 feet, pale yellowish-brown silt grades to light gray sand and gravel; dry. A few roots in sample.
		2.5-3.6	Medium dark gray (N4) sand and gravel; very wet.
T01-07	44	0-2.2	Pale yellowish-brown (10YR 6/2) silt; dry, well consolidated core. Abundant roots in sample.
T02-07	66	0-2.5	Moderate yellowish-brown (10YR 5/4) silt with roots. At 1.5 feet grades to sand and gravel—light gray (N7); dry. Abundant roots in sample.
		2.5-3.3	Well-rounded to angular rock fragments up to 1 inch and smaller pebbles and sand. Increase in moisture content 2.5-3.3 feet.
T02-08	82	0-2.5	Top 6 inches root fragments in silt becomes partially saturated from 2.4 to 2.7 feet (inside core); core well consolidated, moderate yellowish-brown (10YR 5/4). Abundant roots in sample.
		2.5-4.1	Very moist silt (no sand or clay observed); core stuck inside tube; difficult to remove. Dark yellowish brown (10YR 4/2); no rock fragments.
T02-09	78	0-2.5	Pale yellowish-brown (10YR 6/2) silt (no sand, clay, or rock); very dry. Some roots in sample.
		2.5-3.9	Light-gray sand and gravel; very dry; rock fragments up to 0.2 feet.
T03-10	78	0-2.5	Moderate yellowish-brown (10YR 5/4) silt (no sand and clay). Root in sample.
		2.5-3.9	Grades into dark yellow-brown (10YR 4/2) silty clay with orange (oxidized) minerals; dry to slightly moist.
T03-11	72	0-2.5	Pale yellow-brown (10YR 6/2) silt becomes rocky fill fragments at 2 feet. Angular to rounded rocks up to 1 inch; dry. Abundant roots in sample.
		2.5-3.6	Very light gray (N8) rock fragments and sand—fill material; dry.
T03-12	82	0-2.5	0–3 inches, roots; pale yellowish brown (10YR 6/2) pure silt, no sand or clay; dry. Occasional orange oxidized grains. A few roots in sample.
		2.5-4.1	Increasing clay content with depth and color change at 32 inches to dark yellowish brown; mottled clay with black-gray zones. No alluvium observed, slightly moist.
T04-08	86	0-2.5	Pale yellowish-brown silt; dry. Abundant roots in sample.
		2.5-4.3	2.5–2.8 feet, silt as above. 2.8–4.0 feet, pale brown (10YR 5/2) medium grained sand and gravel. 4.0–4.3 feet, light-medium gray/black medium grain sand and gravel. A few roots in sample.
T04-09	76	0-2.5	Pale yellowish silt; dry.
		2.5-3.8	2.5–3.0 feet, silt, gray sand and gravel; dry. 3.0–3.8 feet, light gray-black sand and gravel; dry.
T04-10	62	0-2.5	0–1.4 feet, silt (as above); dry. 1.4–2.5 feet, light gray sand and gravel; dry.
		2.5-3.1	2.5–3.1 feet, light gray sand and gravel, pebbles well rounded to angular; dry.
T04-11	74	0-2.5	0–1.7 feet, pale yellowish-brown silt (soft); dry. 1.7–2.5 feet, moderate brown (5YR 4/4) silt (hard); dry. Abundant roots in sample.
		2.5-3.7	2.5–3.5 feet, same as above. 3.5–3.7 feet, coarse sand (light gray) with subrounded pebbles. Abundant roots in sample.
T04-12	50	0-2.5	0–0.9 feet, pale yellowish-brown (10YR 6/2) silt; dry. 0.9-2.5 feet, dark yellowish brown (10YR 4/2); slightly moist, rocky at 2.4-2.5 feet. Abundant roots in sample.
T05-01	76	0-2.5	Pale yellowish-brown silt; dry. Abundant roots in sample.
		2.5-3.8	Pale yellowish-brown silt; dry. A few roots in sample.

Location	Core Recovery (%)	Depth Interval (ft.)	Core Description
T05-02	58	0-2.5	0–1.4 feet, moderate yellowish brown silt; dry. 1.4–2.4 feet, moderate yellowish-brown clayey silt; moist. Many roots in sample.
		2.5-2.9	2.4–2.9 feet, light gray gravel and dark yellowish brown (10YR 4/2) sand, fine-grained; dry.
T05-03	92	0-2.5	0–2.5 feet, pale yellowish brown silt; dry. Top 0.5 feet, crusty/hard, weathered; dry. 0.5–2.5 feet, soft silt; dry. Abundant roots in sample.
		2.5-4.6	2.4–4.4 feet, soft silt; dry. 4.4–4.6 feet, silty sand, pale yellowish-brown; dry. Some roots in sample.
T06-08	62	0-2.5	0–0.8 feet, pale yellowish-brown silt; dry. 0.8–2.5 feet, gravel and sand, light gray and black. Some roots in sample.
		2.5-3.1	2.5–3.1 feet, gravel and sand, light gray and black.
T06-09	68	0-2.5	0–0.5 feet, pale yellowish-brown silt; dry. 0.5–2.5 feet, gravel with minor sand, light gray; dry. Some roots in sample.
		2.5-3.4	2.5–3.0 feet, gravel and light gravelly sand, angular gravel. 3.0–3.4 feet, black sand and light gray gravel.
T06-10	70	0-2.5	0–0.9 feet, pale yellowish-brown silt; dry. 0.9–2.5 feet, brown sand (10YR 6/2) and pebbles, rounded. Abundant roots in sample.
		2.5-3.5	2.5–3.5 feet, brown sand and gravel grading to light gray sand and gravel; dry.
T06-11	76	0-2.5	0–2.5 feet, moderate brown (10YR 4/4) silt; dry and hard. Abundant roots in sample.
		2.5-3.8	2.5–2.7 feet, same as above; dry. 2.7–3.8 feet, silt and very fine grained sand (no gravel). A few roots in sample.
T06-12	66	0-2.5	0–2.1 feet, moderate brown silt; dry and hard. 2.1–2.5 feet, light gray sand and gravel; dry. Some roots in sample.
		2.5-3.3	2.5–3.3 feet, light gray sand and gravel; dry.
T06-13	82	0-2.5	Pale yellowish-brown silt; dry and soft. Abundant roots in sample.
		2.5-4.1	2.5–3.8 feet, same as above. 3.8–4.1 feet, light gray sand and gravel; dry. A few roots in sample.
T07-03	72	0-2.5	0–2.2 feet, pale yellowish-brown silt; dry. 2.2 to 2.5 feet, sand and gravel; dry.
		2.5-3.6	2.5–3.6 feet, sand and gravel, light gray, pebbles and gravel subangular to round, fine to medium grain sand; dry. Abundant roots in sample.
T07-04	62	0-2.5	0–1.5 feet, pale yellowish-brown silt; dry. 1.5–2.5 feet, sand and gravel, light gray; dry. Some roots in sample.
		2.5-3.1	1.5–3.1 feet, sand and gravel, light gray; dry.
T07-05	72	0-2.5	0–2.0 feet, pale yellowish-brown silt; dry. 2.0–2.5 feet, sand and gravel, poorly sorted, light gray; dry. Abundant roots in sample.
		2.5-3.6	2.5–3.6 feet, sand and gravel, light gray and black pebbles and sand, subangular gravel; dry.
T07-06	80	0-2.5	0–2.3 feet, pale yellowish-brown silt; dry. 2.3–2.5 feet, light gray-black fine to medium grained sand and well rounded pebbles. Abundant roots in sample.
		2.5-4	Same as above to 4.0 feet.
T07-07	58	0-2.5	0–1.0 feet, pale yellowish-brown silt; dry. 1.0–1.7 feet, light gray sand and well rounded pebbles, very fine grained sand.
		2.5-2.9	1.7–2.9 feet, dark gray medium grained sand and gray gravel (angular) and well rounded black pebbles. Abundant roots in sample.
T08-02	48	0-2.4	Pale yellowish-brown silt; dry. A few roots in sample.
T08-03	86	0-2.5	Pale yellowish-brown silt; dry. Many roots in sample. Organic sediment.
		2.5-4.3	2.5–4.3 feet, pale yellowish-brown silt; dry with roots observed to bottom of core.

Location	Core Recovery (%)	Depth Interval (ft.)	Core Description
T08-04	80	0-2.5	0–2.0 feet, pale yellowish-brown silt. 2.0–2.5 feet, grades to river sand and gravel. Many roots in sample. A few roots in sample.
		2.5-4.0	2.5–4.0 feet, river sand, medium light gray (N6) with well-rounded pebbles/gravel.
T08-05	86	0-2.5	Pale yellowish-brown silt; dry to 2.8 feet. Abundant roots in sample.
		2.5-4.3	2.8–4.3 feet, river sand and gravel, medium light gray; dry. Some roots in sample.
T08-06	82	0-2.5	Pale yellowish-brown silt; dry. Abundant roots in sample.
		2.5-4.1	2.5–3.3 feet, same as above. 3.3–4.1 feet, river sand and gravel; dry. Some roots in sample.
T09-08	82	0-2.5	Pale yellowish-brown silt; dry. Abundant roots in sample.
		2.5-4.1	2.5–3.3 feet, same as above. 3.3–3.5 feet, light gray fine sand; dry. 3.5–4.1 feet, moderate brown clay and silt; dry. (Additional location that was not in the plan.) Abundant roots in sample.

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Appendix B

Copies of Laboratory Notes

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Riverton "CARB" Extractions (Kohler et al 2004; we are using slight modification as per Murray et al 2012)

Solution Composition

	1 M	2 mM	3 g/L	4 g/2L	5	6
$NaHCO_3$ 1	1.44×10^{-2}	14.4	1.2097	2.4194		Formula Wgts (From Reagent bottles):
Na_2CO_3 2	2.80×10^{-3}	2.8	0.2968	0.5935		Fisher $NaHCO_3$ (S233-B, Lot 028924) = 84.01 g/mol
3						Fisher Na_2CO_3 (S263-500, Lot 915501A) = 105.99 g/mol
Adjusted to pH 9.5 using NaOH						
5						$NaHCO_3$ 0.0144 mol/L × 84.01 g/mol = 1.2097 g/L
6						Na_2CO_3 0.0028 mol/L × 105.99 g/mol = 0.2968 g/L
7						
CARB 8	Solutions					GOAL was to use 50 g/L but limited by 500mL
BATCH 9	DATE made		10N NaOH (or EQ)			VOL flasks (which fit well on orbital shaker
# 10			(mL) used			table) - so slightly higher ratios were used
1 11	9/5/12		140 mL			
12						Used ORBITAL (FLOOR-MODEL Eberbach) shaker at Low Setting
13						
14						
15						

Column No 16	Sample 17	DRY Weight 18	(50 g/L) Desired CARB VOL (mL) 19	Actual CARB VOL (mL) 20	Actual WGT/VOL RATIO (g/L) 21	START DATE/Time 22	END DATE/Time 23	U (ug/L) 24	U (ug/g) 25
1	T08-034	27.5 g	550 mL	532 mL	51.71 g/L	11/5/12 18:18	11/26/12 18:18	15.8	0.306
2	T08-032	29.28 g	586 mL	547 mL	53.53 g/L	11/9/12 12:38	11/30/12 12:38	22.2	0.415
3	T07-040	31.98	640 mL	538 mL	59.44 g/L	11/9/12 17:35	11/30/12 17:35	17.5	0.294
4	T07-042	36.35	727 mL	522 mL	69.64 g/L	11/10/12 10:10	12/1/12 10:10	5.1	0.073
5	T06-100-2.5	32.17	643 mL	542 mL	59.35 g/L	11/12/12 17:10	12/3/12 17:10	30.3	0.510
6	T06-102.5-5	37.42	748 mL	533 mL	70.21 g/L	11/13/12 16:30	12/4/12 16:30	7.8	0.111
7	T05-020-25	29.91	598 mL	531 mL	56.33 g/L	11/15/12 12:40	12/6/12 12:40	57.5	1.758
8	T05-022.5-5	32.14	643 mL	538 mL	59.74	11/16/12 15:45	12/7/12 @ 15:45	45.1 (14.6 HT)	0.755
9	T04-100-2.5	30.28	606 mL	533 mL	56.81 g/L	11/17/12 17:45	12/8/12 @ 17:45	52.3	0.923
10	T04-102.5-5	37.94	758 mL	532 mL	71.32 g/L	11/18/12 15:15	12/9/12 @ 15:15	10.7	0.150
11	T03-100-25	30.52	610	543 mL	56.21 g/L	11/19/12 16:25	12/10/12 @ 1625	3.5	0.062
12	T03-102.5-5	30.16	603	529 mL	57.01 g/L	11/23/12 11:18	12/14/12 11:18	7.7	0.135
13	T02-070-25	33.89	678	536 mL	63.23 g/L	11/23/12 11:40	12/14/12 11:40	2.5	0.040

Riverton Carb Extractions

Col		Samples	2 Dry Weight (g)	Desired Carb Vol (ml) (50g/L)	Actual Carb Vol (ml)	Actual Wgt/Vol ratio	6	Start Date/Time	8 End Date/Time	9	10 u (ug/L)	11 u (ug/g)	12	13
	1													
	2													
	3													
14	4	T02-07255	35.14	702.8	591	66.18		11/29/12 13:20	12/30/12 08:10		3.4	0.051		
15	5	T01-05025	33.62	672.4	537	62.61		11/29/12 13:40	12/30/12 08:10		11.5	0.184	* carb peak on 15 is	
16	6	T01-05255	35.99	719.8	534	67.40		11/29/12 13:30	12/30/12 08:10		1.1	0.016	max 280 ug/L / 320 ug/g	
	7													
	8													
	9													
	10													
	11													
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Riverton Carb Extractions

11/8/12

Preparing 8L of "CARB" solution as referenced in Kohler et al 2004. Will prepare in 2L batches.

Final concentrations should be 0.0144M $NaHCO_3$ and 0.0028M Na_2CO_3. pH should be 9.45 ± 0.05 and alkalinity should be 20 meq/L.

$NaHCO_3$ = 2.419g / 2L Na_2CO_3 = 0.594 g / 2L

Batch 1 $NaHCO_3$ = 2.418 g, Na_2CO_3 = 0.595 g

Batch 2 $NaHCO_3$ = 2.419g, Na_2CO_3 = 0.594

Batch 3 $NaHCO_3$ = 2.420, Na_2CO_3 = 0.594

Batch 4 $NaHCO_3$ = 2.420, Na_2CO_3 = 0.594

Check pH stds. 4=4.03 7=7.01 10=9.99

Measure pH of CARB solution
14:13 pH= 9.26
14:20 pH= 9.32

Using 10N and 1N NaOH adjust pH to 9.45 ± 0.05. After addition pH allowed to stabilize 1min. before reading taken

10N	1N	pH
100µL		9.34
100µL		9.37
200µL		9.40
~~200µL~~ 100µL		9.42
100µL		9.44
	100µL	9.44
	200µL	9.44

10N	1N	pH
	200µL	9.44
	100µL	9.45
200µL		9.48
100µL		9.50

— talked w/ Stan he wants pH = 7.50

960µL of 10N NaOH equiv.

11/8/12

Measure alkalinity of CARB solution using 1.6 N H_2SO_4 and ~~100mL sample~~ 50mL sample. diluted to 100mL. (DF2)

Final pH = 4.49 Digits = 455 Alk = $455 \times 2 \times 0.02 = 18.2$ meq/L

pH slowly climbed back up in alk. solution will add more acid until pH remains steady @ 4.5

6 more digits added final pH = 4.47 Total digits = 461 Alk = $461 \times 2 \times 0.02 = 18.4$ meq/L

11/13/12

Measured sodium on CARB solution. Measured value was 492 mg/L. Theoretical Na concentration is ~~487.4 mg/L~~. 487.4 mg/L. 0.94% high.

$NaHCO_3$ 0.0144M $\frac{0.0144\ mol}{L} \cdot \frac{22.99\ g}{mol} \cdot \frac{1000\ mg}{g} = 331.06$

Na_2CO_3 0.0028M $\frac{0.0028\ mol}{L} \cdot \frac{22.99\ g}{mol} \cdot 2 \cdot \frac{1000\ mg}{g} = 128.74$

331.06 + 128.74 = 487.4

10N NaOH $\frac{0.00096\ L}{1} \cdot \frac{10\ mol}{L} \cdot \frac{22.99\ g}{mol} \cdot \frac{1000\ mg}{g} \cdot \frac{1}{8L} = 27.59$

Riverton CARB Extractions

	1	2	3	4	5	6	0-2.5'	8	9	10	11	12	13
11/26/12	1	13:15	Removed sample from Column #1 T08-03 A from shaker table. Using a 15mL fixed volume pipet										
	2		took 15mL from middle of erlynmeyer flask and pipetted into an open 30mL syringe w/										
	3	col 1	a 0.45μm nylon acrodisk filter on it. Put the syringe plunger back into the syringe and										
	4		filtered sample into a 50mL centrifuge tube. It was hard to push the last 1-2mL through filter.										
	5		Sample had very light yellow color to it. Acidified w/ 200μL HNO_3 and checked pH to ensure it										
	6		was <2. The rest of the sample is retained for later use. Color remained even after acidification.										
	7												
	8												
11/30/12	9	12:35	Removed the next sample T08-03 2.5-5' from shaker table. Using same procedure as above filtered										
	10		sample into 50mL centrifuge tube. It required 2 filters to filter sample. It got very difficult to filter										
	11	col 2	after ~10mL. Filtered sample has no noticible color. Acidified w/ 200μL HNO_3.										
	12												
	13	12:45	Removed the next sample T07-04 0-2.5' from shaker table. Used same procedure to filter. Sample										
	14		very cloudy filtering might be difficult. It required 2 filters. 8mL passed through the 1st & through the 2nd.										
	15	col 3	Filtered sample has a very light yellow color. Acidified w/ 200 μL HNO_3										
	16												
12/1/12	17	18:00	Removed T07-04 2.5-5' from shaker table. Using procedure above to filter										
	18		Sample relatively clear directly off shaker table. Two filters required. Sample clear										
	19	col 4	Acidified HNO_3 200ul. ↳ not muddy looking, but ↑ fine particulates suspended										
	20												
	21												
2/3/12	22	0800	Remove T06-10 @ 0-2.5' from shaker table. Using above procedure to filter.										
	23		Sample rel. clear directly off shaker table. Two filters required. Sample clear										
	24	col 5	200ul HNO_3 (conc). ↳ not muddy looking, but ↑ fine particulates suspended										
	25												
2/4/12	26	0930	Remove T06-10 @ 2.5-5' from shaker table. Use above procedure to filter.										
	27		Sample relatively clear - not muddy looking but ↑ suspended fine particulates. Use										
	28	col 6	2 filters for 15ml. Resulting sample clear. Acidified HNO_3 200ul.										
	29												
	30												
	31												

Ruerton Core Extractions

12/6/12	0810	Remove T05-02@0-2.5' from shaker table. Use above procedure to filter.
	col 7	Sample v clear Very few suspended particles. Use 1 filter for 15mL.
		Resulting sample clear. Acidified 200ul conc. HNO_3
2/7/12	0900	Remove T05-02@2.5-5' from shaker table Use above procedure to filter
	col 8	Sample cloudy w/ ↑ suspended particulates. Use 6 filters for 15mL
		Resulting sample clear. Acidified 200 ul conc HNO_3
8/9/12	1600	Remove T04-10@0-2.5 from shaker table Use above procedure to filter
	col 9	Sample ~~not~~ cloudy w/ moderate suspended particles. Use 2 filters for 5mL
		Resulting sample clear. Acidify 200ul conc HNO_3
	col 10	Remove T04-10@2.5-10 from shaker table. Use above procedure to filter
		Sample mod cloudy w/ mod. suspended particles. Use 3 filters for 15mL
		Resulting sample clear. Acidify 200ul conc HNO_3
2/10/12	0815	Remove T03-10@0-2.5 from shaker table. Use above procedure to filter
		sample mostly clear w/ few suspended particles. Use 1 filter for 15mL
	col 11	Resulting sample clear. Acidify 200ul conc HNO_3
2/14/12	0850	Remove T03-10@2.5-5 from shaker table. Use above procedure to filter sample mostly clear
	col 12	w/ few suspended particles. Use 1 filter for 15mL. Resulting sample clear. Acidify 200μL conc HNO_3.
	col 13	Remove T02-07@0-2.5 from shaker table. Use above procedure to filter sample mostly clear
		w/ few suspended particles. Use 1 filter for 15mL. Resulting sample clear and pale yellow. Acidify
		200μL conc. HNO_3

Riverton Carb Extractions

3/20/12	0800	Remove T02-07@2.5-5 from shaker table. Use above procedure to filter											
2	col 14	Sample cloudy & mod. suspended particles. Use 3 filters for 15 ml											
3		Resulting sample clear. Acidify 200ul conc HNO_3											
4													
5		Remove T01-05@0-2.5 from shaker table. Use above procedure to filter.											
6	col 15	Sample cloudy w/ moderate suspended particulates Use 2 filters for 15 ml.											
7		Resulting sample clear ~~pale~~ pale amber. Acidify 200 ul conc HNO_3											
8													
9		Remove T01-05@2.5-5 from shaker table. Use above procedure to filter.											
10	col 16	Sample cloudy w/ moderate suspended particulates. Use 2 filters for 15 ml.											
11		Resulting sample clear. Acidify 200ul conc HNO_3											
12													
13													
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Riverton Column Tests

10/31/2012 Fraction collector Set up: Mode = Time, Rack Code = 22, Waste = 0.00 min, Inject = 0.01 min,
Wait = 0.00 min, No. of Collects = 44, Rinse = 0.00, Loop No. Inj = 1, Interval = NA, Cycles = 1
Collect Time = 100 min, Seperate Cycles = NO, Use Syncronization = NO

Using 100 min collect time. Masterflex peristaltic pump (#13 head) set at 0.10 mL/min yields
Approx 10 mL samples (Approx every Pore Vol).

Using OMNI 300 psi columns ~~1.7671 (length) x Bed~~ = Vol mL = 1.7671 x Bed length (cm) (n 22 mL empty)

Source Solution is RIV SPF-3. (See recipe)

~~TOTALS Na 51.15 K 7.00 Ca 20.00 Mg 16.44 SO4 121.23 Cl 3.84 C 78.83~~

~~Actual 24.00 1.70 48.00 16.00 120.00 3.80~~

	Na	K	Ca	Mg	SO_4	Cl	C
TOTAL	68.45	1.70	48.91	2.06	120.12	3.84	35.97
Actual	24.00	1.70	48.00	16.00	120.00	3.80	27.92

Bubbled CO_2 (very small amount) to adjust pH. High C was needed to get Actual
Alk value near 116 mg/L as $CaCO_3$. Couldn't get "perfect" solution solved
to get Ca and Alk correct (because of their importance in U mobilization).
And get pH close (using CO_2 gas). Na and Mg are slightly off - couldn't
be avoided.

Using a 1 gal plastic collapsible bag for source solution to avoid contact w/ Alm (See photo).

1330 Fill a column w/ soil from TO8-C3 0-2.5' <2mm fraction.
Column Tare 78.60 g
Full Column 106.11 g Mass of soil in column 27.51 g
Splits made by taking random scoops from a tray of <2mm soil. Probably mostly Silt/clay.
Lightly tamped to fill column. Length of fill = 11.9 cm (x 1.7671) = 20.68 cm^3 Dry Density = $\frac{27.51\,g}{20.68\,cm^3} = 1.33\,g/cm^3$ Dry
1339 SPF is filled to in the supply tubing. Using a collapsible plastic 2 gal bag for source fluid to prevent air exposure.
1340 Start flow @ 0.10 mL/min Flow from bottom to top.

Riverton Column Tests

10/31/12

Start by preparing ~~1 gal~~ 4L of SPF3.

0830 Prepared 2L of SPF3 and more 1.5g/L $CaSO_4 \cdot 2H_2O$.
0835 Check pH stds. 4=4.03 7=7.01 10=9.99
0837 Start measuring SPF3 pH ~8.4
0840 Bubble small amt. of CO_2 into SPF3 and measure pH.
0850 pH = 7.47
0900 Add another 2L of SPF3.
0905 pH = 7.99
0910 pH = 8.00
0915 alk measured on 100mL sample using 1.6 N H_2SO_4. Final pH = 4.82 Digits = 129 Alk = 129 mg/L as $CaCO_3$

11/6/12

Preparing another 4L batch of SPF3 for Riverton columns
0750 prepared 2L of SPF3
0755 Check pH stds. 4=4.05 7=7.01 10=10.01
0759 Start measuring pH of SPF3 pH ~8.4
0801 Bubble small amt of CO_2 into SPF3 and measure pH while making a second 2L of SPF3.
0810 pH = 6.67
0812 Add another 2L of SPF3
0815 pH = 6.91
0820 pH = 6.94
Let solution stir open to the atmosphere until pH is 7.90 - 8.10.
0835 pH = 7.07
0852 pH = 7.25
0902 pH = 7.35
0913 pH = 7.47
0928 pH = 7.61
0939 pH = 7.70
0951 pH = 7.80
1005 pH = 7.90
1010 pH = 7.93

1015 measure alk on 100mL sample using 1.6 N H_2SO_4.
Final pH = 4.76 Digits = 131 Alk = 131 mg/L as $CaCO_3$

		1	2	3	4	5	6	7	8	9	10	11	12	13
1/7/12	1	Preparing 1L of SPF3												
	2	0825 prepared 1L of SPF3												
	3	0830 check pH stds.			4=4.05		7=7.02		10=10.00					
	4	0835 measure pH of SPF3 ~ 8.5												
	5	Bubble small amt of CO_2 into SPF3 and measure pH												
	6	0840 pH=7.95												
	7	0845 pH=7.98												
	8	0845 measure alk on a 50mL sample diluted to 100mL (OF2) w/ 1.6N H_2SO_4												
	9		Final pH= 4.81			Digits = 67		x2 = Alk		134 mg/L as $CaCO_3$				
	10													
	11													
	12													
	13													
	14													
	15													
	16													
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Riverton Column 1 T08-03 0-2.5' COl 2

13:42 1st visible entry of SPF3 to bottom of column

5:08 ~~15:092~~ ~~15:08~~ Filled Soil Pores (56 min)

15:11 Fluid to column exit.

15:36 Fluid at Frac collector

Summary of Volumes Column 1

- Inlet Tubing ≈ 0.82 mL
- Inlet tubing to soil ≈ 0.20 mL
- Soil Pores ≈ 8.6 mL
- Outlet tubing = 2.8 mL

Dry Soil Den = 1.33 g/[illegible]

Soil (Dry) Vol = 20.68 c[illegible]

Tube No.	~~Start Fill~~ Date/Time	Actual Tube Vol (mL)	Cum Vol (mL)	PV (1 PV = 8.6 mL)	Cum PV	Flow Rate mL/min	U µg/L	Collect Time (hr)	Cum collect Time (hr)	
N/A	10/31/12 13:42	Start Flow in Soil								
1	10/31/12 15:37	10.0	10.0	1.16	1.16	0.10	319.3	1.67	1.67	Yellow-brown color (ORG?)
2	17:17	10.0	20.0	~~2.33~~ 1.16	2.33	0.10	152.1	1.67	3.34	
3	18:57	10.0	30.0	1.16	3.49	0.10	194.3	1.67	5.01	
4	20:37	10.0	40.0	1.16	4.65	0.10	301.2	1.67	6.68	
5	22:17	10.0	50.0	1.16	5.81	0.10	374.0	1.67	8.35	
6	23:57	10.0	60.0	1.16	6.98	0.10	370.7	1.67	10.02	
7	11/1/12 1:37	10.0	70.0	1.16	8.14	0.10	343.3	1.67	11.69	
8	3:17	10.0	80.0	1.16	9.30	0.10	282.1	1.67	13.36	
9	4:57	10.0	90.0	1.16	10.46	0.10	166.7	1.67	15.03	11/1/12 0750 Removed 9 samples. Acidified with 200 µL Conc HNO_3. Marked "A". All tubes had 10 mL
10	6:37	10.0	100.0	1.16	11.63	0.10	137.7	1.67	16.67	
11	8:17	10.0	110.0	1.16	12.79	0.10	134.1	1.67	18.33	
12	9:57	9.5	119.5	1.10	13.90	0.095	132.6	1.67	20.00	
13	11:37	9.5	129	1.10	15.00	0.095	136.7	1.67	21.67	
14	13:17	9.5	138.5	1.10	16.10	0.095	130.1	1.67	23.33	
15	14:57	9.0	147.5	1.05	17.15	0.09	113.3	1.67	25.00	
16	16:37	9.0	156.5	1.05	18.20	0.09	106.9	1.67	26.67	
17	18:17	9.0	165.5	1.05	19.24	0.09	94.0	1.67	28.33	
18	19:57	9.0	174.5	1.05	20.29	0.09	81.8	1.67	30.00	
19	21:37	9.5	184	1.10	21.40	0.095	79.3	1.67	31.67	
20	23:17	9.5	193.5	1.10	22.50	0.095	72.9	1.67	33.33	
21	11/2/12 0:57	9.5	203	1.10	23.60	0.095	74.4	1.67	35.00	
22	2:37	9.5	212.5	1.10	24.71	0.095	71.4	1.67	36.67	

PV calc'c 0.10 mL/min

Riverton Column 1 TO8-03 0-2.5'

TUBE NO		Fluid in Tube (mL)	Tube Effluent Date/Time	Cum Vol. (mL)	1 PV = 8.6 mL 4 PV	5 Cum PV	Flow Rate (mL/min)	Collect Time (hr)	Cum Collect Time (hr)	Cl (mg/L)	10	11	12	13
23	1	9.5	11/2/12 4:17	222	1.10	25.81	0.095	1.67	38.33	64.4				
24	2	9.0	5:57	231	1.05	26.86	0.09	1.67	40.00	62.3				
25	3	9.5	7:37	240.5	1.10	27.97	0.095	1.67	41.67	57.8				
26	4	9.5	9:17	250	1.10	29.07	0.095	1.67	43.33	53.6				
27	5	9.5	10:57	259.5	1.10	30.17	0.095	1.67	45.00	52.4				
28	6	9.0	12:37	268.5	1.05	31.22	0.09	1.67	46.67	48.0				
29	7	9.0	14:17	277.5	1.05	32.27	0.09	1.67	48.33	48.7				
30	8	9.0	15:57	286.5	1.05	33.31	0.09	1.67	50.00	46.1				
31	9	9.5	17:37	296	1.10	34.42	0.095	1.67	51.67	43.3				
32	10	9.0	19:17	305	1.05	35.47	0.09	1.67	53.33	41.7				
33	11	9.0	20:57	314	1.05	36.51	0.09	1.67	55.00	40.0				
34	12	9.0	22:37	323	1.05	37.56	0.09	1.67	56.67	41.2				
35	13	9.0	11/3/12 0:17	332	1.05	38.60	0.09	1.67	58.33	38.7				
36	14	9.0	1:57	341	1.05	39.65	0.09	1.67	60.00	40.2				
37	15	9.0	3:37	350	1.05	40.70	0.09	1.67	61.67	40.6				
38	16	9.0	5:17	359	1.05	41.74	0.09		63.33	38.9				
39	17	9.5	6:57	368.5	1.10	42.85	0.095		65.00	39.5				
40	18	9.5	8:37	378	1.10	43.95	0.095		66.67	38.8				
41	19	9.0	10:17	387	1.05	45.00	0.09		68.33	37.3				
42	20	9.0	11:57	396	1.05	46.05	0.09		70.00	35.9				
43	21	9.5	13:37	405.5	1.10	47.15	0.095		71.67	34.6				
44	22	9.0	15:17	414.5	1.05	48.20	0.09		73.33	34.9				
45	23	9.5	16:57	424	1.10	49.30	0.095		75.00	34.3				
46	24	9.0	18:37	433	1.05	50.35	0.09		76.67	32.7				
47	25	9.0	20:17	442	1.05	51.40	0.09		78.33	34.0				
48	26	9.5	21:57	451.5	1.10	52.50	0.095		80.00	34.5				
49	27	9.0	23:37	460.5	1.05	53.55	0.09		81.67	32.6				
50	28	9.0	11/4/12 1:17	469.5	1.05	54.59	0.09		83.33	34.3				
51	29	9.5	2:57	479	1.10	55.70	0.095		85.00	33.4				
52	30	9.5	4:37	488.5	1.10	56.80	0.095		86.67	30.5				
53	31	9.0	6:17	497.5	1.05	57.85	0.09		88.33	29.9				

Riverton Column 1 TO8-03 0-2.5'

Tube 16		Fluid in Tube (mL)	Tube Start Date/Time	Cum Vol (mL)	1 PV = 86 mL 4 PV	Cum 5 PV	Flow Rate (mL/min)	Collect Time (hr)	Cum Collect Time (hr)	U (ug/L)	10	11	12	13
54	1	9.0	11/4/12 7:57	506.5	1.05	58.90	0.09	1.67	90.00	30.1				
55	2	9.5	9:37	516	1.10	60.00	0.095		91.67	28.6				
56	3	9.0	11:17	525	1.05	61.05	0.09		93.33	26.6				
57	4	9.0	12:57	534	1.05	62.09	0.09		95.00	26.1				
58	5	9.0	14:37	543	1.05	63.14	0.09		96.67	24.9				
59	6	9.0	16:17	552	1.05	64.19	0.09		98.33	24.3				
60	7	9.5	17:57	561.5	1.10	65.29	0.095		100.00	24.0				
61	8	9.5	19:37	571	1.10	66.40	0.095		101.67	23.6				
62	9	9.0	21:17	580	1.05	67.44	0.09		103.33	24.2				
63	10	9.5	22:57	589.5	1.10	68.55	0.095		105.00	23.1				
64	11	9.0	11/5/12 0:37	598.5	1.05	69.59	0.09		106.67	21.9				
65	12	9.5	2:17	608	1.10	70.70	0.095		108.33	20.9				
66	13	9.0	3:57	617	1.05	71.74	0.09		110.00	20.1				
67	14	9.0	5:37	626	1.05	72.79	0.09		111.67	19.6				
68	15	9.5	7:17	635.5	1.10	73.90	0.095		113.33	~~24.6~~ ~~19~~ 19.8				
69	16	9.0	8:57	644.5	1.05	74.94	0.09		115.00	18.8				
70	17	9.0	10:37	653.5	1.05	75.99	0.09		116.67	16.9				
71	18	9.0	12:17	662.5	1.05	77.03	0.09		118.33	19.1				
72	19	9.0	13:57	671.5	1.05	78.08	0.09		120.00	18.8				
73	20	9.0	15:37	680.5	1.05	79.13	0.09		121.67	17.2				
74 last tube	21	9.0	17:17	689.5	1.05	80.17	0.09		123.33	17.7				
	22	11/5/2012	17:58	D/C Flow to column										
	23													
	24													
	25													
	26													
	27													
	28													
	29													
	30													
	31													

Riverton Column 2 TO8-03 2.5-5'

11/6/2012 0600 Using <2mm sieved fraction to fill 25mL OMNI glass column. Set up to the same as for Riverton Column 1. Flow from bottom to top

Column Fill: TARE (empty column) = 63.13 g
Filled Column = 92.41
Soil Weight = 29.28

Mostly Silt & clay. Scattered rootlets.
Soil Column length = 11.8 cm Vol = 11.8 × 1.767 = 20.8
Density (DRY) = 29.28/20.85 = 1.40 g/mL

1 PV = 83mL

TUBE NO	Fluid in TUBE (mL)	TUBE START DATE/Time	Cum VOL (mL)	PV	Cum PV	FLOW RATE (mL/min)	Collect TIME (hr)	Cum Collect Time (hr)	U (µg/L)
1	9.5	11/6/12 10:53	9.5	1.14	1.14	0.095	1.67	1.67	245.9
2	9.5	12:33	19	1.14	2.29	0.095	1.67	3.33	15.0
3	9.5	14:13	28.5	1.14	3.43	0.095	1.67	5.00	11.7
4	9.0	15:53	37.5	1.08	4.52	0.09	1.67	6.67	147.1
5	9.0	17:33	46.5	1.08	5.60	0.09	1.67	8.33	1275.7
6	9.0	19:13	55.5	1.08	6.69	0.09	1.67	10.00	1253.7
7	9.0	20:53	64.5	1.08	7.77	0.09	1.67	11.67	828.7
8	9.0	22:33	73.5	1.08	8.86	0.09	1.67	13.33	661.1
9	9.0	11/7/12 0:13	82.5	1.08	9.94	0.09	1.67	15.00	489.1
10	9.0	1:53	91.5	1.08	11.02	0.09	1.67	16.67	326.0
11	9.5	3:33	101	1.14	12.17	0.095	1.67	18.33	271.9
12	9.5	5:13	110.5	1.14	13.31	0.095	1.67	20.00	198.9
13	9.0	6:53	119.5	1.08	14.40	0.09	1.67	21.67	144.5
14	9.0	8:33	128.5	1.08	15.48	0.09	1.67	23.33	144.1
15	9.0	10:13	137.5	1.08	16.57	0.09	1.67	25.00	128.1
16	9.0	11:53	146.5	1.08	17.65	0.09	1.67	26.67	113.0
17	9.0	13:33	155.5	1.08	18.73	0.09	1.67	28.33	103.7
18	9.0	15:13	164.5	1.08	19.82	0.09	1.67	30.00	94.5
19	9.0	16:53	173.5	1.08	20.90	0.09	1.67	31.67	82.2
20	9.0	18:33	182.5	1.08	21.99	0.09	1.67	33.33	78.1
21	9.0	20:13	191.5	1.08	23.07	0.09	1.67	35.00	71.7

11/6/12 0903 Start Flow @ 0903
Pump RATE = 0.10 mL/min
1st Water to soil col @ 0.904
~10:27 soil col. filled (83 min)
PV = 8.3 mL
Flow 1st reached frac. col. tube @ 10:53 (26 min ~2 PV ~2 PV in outlet tube)
↑ Start Frac coll.

Pump rate = 0.10 mL/min
Collect Time = 100 min

* Yellow brown color noted in 1st sample subsequent samples clear

11/19 Change PV to account for 0.095 flow rate to 7.9 mL

Riverton Column 2 T08-03 2.5-5'

Tube No	Fluid in Tube (mL)	Tube Start Date/ Time	Cum Vol (mL)	4 PV= PV	5 Cum PV	6 Flow Rate (mL/min)	7 Collect Time (hr)	8 Cum Collect Time (hr)	9 U (µg/L)	10	11	12	13
1													
2													
3													
22 4	9.0	11/7/12 21:53	200.5	1.08	24.16	0.09	1.67	36.67	61.7				
23 5	9.0	23:33	209.5	1.08	25.24	0.09	1.67	38.33	56.9				
24 6	9.0	11/8/12 1:13	218.5	1.08	26.33	0.09	1.67	40.00	52.6				
25 7	9.0	2:53	227.5	1.08	27.41	0.09	1.67	41.67	50.0				
26 8	9.0	4:33	236.5	1.08	28.49	0.09	1.67	43.33	45.3				
27 9	9.0	6:13	245.5	1.08	29.58	0.09	1.67	45.00	41.1				
28 10	9.0	7:53	254.5	1.08	30.66	0.09	1.67	46.67	38.1				
29 11	9.0	9:33	263.5	1.08	31.75	0.09	1.67	48.33	39.7				
30 12	9.0	11:13	272.5	1.08	32.83	0.09	1.67	50.00	37.8				
31 13	9.0	12:53	281.5	1.08	33.92	0.09	1.67	51.67	34.7				
32 14	9.0	14:33	290.5	1.08	35.00	0.09	1.67	53.33	32.1				
33 15	9.0	16:13	299.5	1.08	36.08	0.09	1.67	55.00	31.5				
34 16	9.0	17:53	308.5	1.08	37.17	0.09	1.67	56.67	29.0				
35 17	9.0	19:33	317.5	1.08	38.25	0.09	1.67	58.33	27.3				
36 18	9.0	21:13	326.5	1.08	39.34	0.09	1.67	60.00	25.8				
37 19	9.0	22:53	335.5	1.08	40.42	0.09	1.67	61.67	25.5				
38 20	9.0	11/9/12 0:33	344.5	1.08	41.51	0.09	1.67	63.33	22.0				
39 21	9.0	2:13	353.5	1.08	42.59	0.09	1.67	65.00	21.1				
40 22	9.0	3:53	362.5	1.08	43.67	0.09	1.67	66.67	20.7				
41 23	9.0	5:33	371.5	1.08	44.76	0.09	1.67	68.33	19.4				
42 24	9.0	7:13	380.5	1.08	45.84	0.09	1.67	70.00	16.2				
43 25	9.0	8:53	389.5	1.08	46.93	0.09	1.67	71.67	17.1				
44 26	9.0	10:33	398.5	1.08	48.01	0.09	1.67	73.33	15.2				
27													
28													
29													
30													
31													

Riverton Column 3 T07-04 0-25

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/6/2012	0700	Filling column.	Same set up as Column 1. 25mL OMNI glass column. flow bottom to top										
2		<2mm Sieved fraction.											
3		Empty Column =	63.11 g			Mostly silt & clay. Scattered rootlets							
4		Col + Fill =	95.09 g			Soil Column length =	11.8 cm		Vol = 11.8 × 1.767 = 20.85 mL				
5		Soil lost =	31.98 g			Density (DRY) =	31.98/20.85 = 1.53 g/mL						
6													
7													
8	Fluid in	TUBE	Cum	PV = ~~8.8~~ 8.4 mL	Cum	Flow	Collect	Cum	U	START FLOW 11/6/12 14:04			
9	Tube	START	Vol			RATE	Time	Collect		1st water to soil @ 14:05			
Tube No. 10	(mL)	DATE/TIME	(mL)	PV	PV	(mL/min)	(hr)	Time (hr)	(µS/L)	Water to top @ ~15:33 (88 mins)			
1 11	9.5	11/6/12 16:04	9.5	1.08	1.08	0.095	1.67	1.67	298.4	of soil			8.8 mL
2 12	9.5	17:44	19	1.08	2.16	0.095	1.67	3.33	92.3	First Drip to Frac Coll @			16:04
3 13	9.5	19:24	28.5	1.08	3.24	0.095	1.67	5.00	234.9				
4 14	9.5	21:04	38	1.08	4.32	0.095	1.67	6.67	331.9	pump speed = 0.18 mL/min			
5 15	9.5	22:44	47.5	1.08	5.40	0.095	1.67	8.33	399.6	Collect Time = 100 mins			
6 16	9.5	11/7/12 0:24	57	1.08	6.48	0.095	1.67	10.00	276.9				
7 17	9.5	2:04	66.5	1.08	7.56	0.095	1.67	11.67	218.9	Clear yellow brown 1st sample			
8 18	10.0	3:44	76.5	1.14	8.69	0.10	1.67	13.33	162.1	subsequent samples clear			
9 19	9.5	5:24	86	1.08	9.77	0.095	1.67	15.00	140.8				
10 20	9.5	7:04	95.5	1.08	10.85	0.095	1.67	16.67	111.5				
11 21	9.0	8:44	104.5	1.02	11.88	0.09	1.67	18.33	67.7				
12 22	9.0	10:24	113.5	1.02	12.90	0.09	1.67	20.00	63.3				
13 23	9.0	12:04	122.5	1.02	13.92	0.09	1.67	21.67	45.3				
14 24	9.0	13:44	131.5	1.02	14.94	0.09	1.67	23.33	40.1				
15 25	9.0	15:24	140.5	1.02	15.97	0.09	1.67	25.00	37.8				
16 26	9.0	17:04	149.5	1.02	16.99	0.09	1.67	26.67	37.1				
17 27	9.0	18:44	158.5	1.02	18.01	0.09	1.67	28.33	39.9				
18 28	9.0	20:24	167.5	1.02	19.03	0.09	1.67	30.00	40.3				
19 29	9.0	22:04	176.5	1.02	20.06	0.09	1.67	31.67	43.9				
20 30	9.5	23:44	186	1.08	21.14	0.095	1.67	33.33	41.5				
21 31	9.5	11/8/12 1:24	195.5	1.08	22.22	0.095	1.67	35.00	40.4				

* Some drips missed tubes

Cu3

Tube No		Fluid in Tube (mL)	Tube Start Date/time	Cum Vol (mL)	4 1 PV = 8.4 PV	5 Cum PV	6 Flow Rate (mL/min)	7 Collect Time (hr)	8 Cum collect Time (hr)	9 U (µg/L)	10	11	12	13
22	1	9.0	11/8/12 3:04	204.5	1.02	23.24	0.09	1.67	36.67	37.8				
23	2	9.5	4:44	214	1.08	24.32	0.095	1.67	38.33	35.9				
24	3	9.0	6:24	223	1.02	25.34	0.09	1.67	40.00	36.2				
25	4	9.0	8:04	232	1.02	26.36	0.09	1.67	41.67	33.8				
26	5	9.0	9:44	241	1.02	27.39	0.09	1.67	43.33	31.7				
27	6	9.0	11:24	250	1.02	28.41	0.09	1.67	~~50.00~~ 45.00	28.7				
28	7	9.0	13:04	259	1.02	29.43	0.09	1.67	~~51.67~~ 46.67	25.3				
29	8	9.0	14:44	268	1.02	30.45	0.09	1.67	~~53.33~~ 48.33	25.7				
30	9	* ~~8.5~~ 9	16:24	277	1.02	31.48	0.09	1.67	~~55.00~~ 50.00	22.9				
31	10	~~8.0~~ 9	18:04	286	1.02	32.50	0.09	1.67	~~56.67~~ 51.67	23.1				
32	11	~~8.0~~ 9	19:44	295	1.02	33.52	0.09	1.67	~~58.33~~ 53.33	22.7				
33	12	~~8.5~~ 9	21:24	304	1.02	34.55	0.09	1.67	~~60.00~~ 55.00	21.4	Small amount was lost (missed tubes)			
34	13	~~8.0~~ 9	23:04	313	1.02	35.57	0.09	1.67	~~61.67~~ 56.67	18.3	corrections were made (minimal error) Best guess			
35	14	~~8.0~~ 9	11/9/12 0:44	322	1.02	36.59	0.09	1.67	~~63.33~~ 58.33	17.2				
36	15	~~8.0~~ 9	2:24	331	1.02	37.61	0.09	1.67	~~65.00~~ 60.00	17.8				
37	16	~~8.5~~ 9	4:04	340	1.02	38.64	0.09	1.67	~~66.67~~ 61.67	17.2				
38	17	9.0	5:44	349	1.02	39.66	0.09	1.67	~~68.33~~ 63.33	20.3				
39	18	9.0	7:24	358	1.02	40.68	0.09	1.67	65.00	17.6				
40	19	9.0	9:04	367	1.02	41.70	0.09	1.67	66.67	17.4				
41	20	9.0	10:44	376	1.02	42.73	0.09	1.67	68.33	16.9				
42	21	9.0	12:24	385	1.02	43.75	0.09	1.67	70.00	15.5				
43	22	9.5	14:04	394.5	1.08	44.83	0.095	1.67	71.67	14.9				
44	23	9.0	15:44	403.5	1.02	45.85	0.09	1.67	73.33	16.0				
	24	Stop flow @ 17:23												
	25													
	26													
	27													
	28													
	29													
	30													
	31													

Riverton Column 4 T07-04 2.5-5'

	1	2	3	4	5	6	7	8	9	10	11	12	13
11/6/12	1400	Filling column. Same set up as Column 1.					25mL Omni glass column.			Flow bottom to top			
		<2mm sieved fraction.											
		Empty column = 78.01g					Mostly sand, some silt.						
		Col + Fill = 114.36g					Soil column length = 11.8 cm			Vol = 11.8 × 1.767 = 20.85mL			
		Soil wgt. = 36.35g					Density (dry) = 36.35g / 20.85mL = 1.74 g/mL						
										Start flow 11/7/12 09:02			
	Fluid in	Tube	Cum	1 PV = 5.6 mL	Cum	Flow	Collect	Cum	U	1st water to soil @ 09:03			
	Tube	Start	Vol.			Rate	Time	Collect		Water to top of soil @ ~~09:57~~ 09:59			
Tube No.	(mL)	Date/Time	(mL)	PV	PV	(mL/min)	(hr)	Time (hr)	(µg/L)	1st drip to fraction collector @ 10:21			
1	9.5	11/6/12 10:21	9.5	1.70	1.70	0.095	1.67	1.67	392.7	Pump rate set @ 0.12mL/min			
2	9.5	12:01	19	1.70	3.39	0.095	1.67	3.34	147.4				
3	9.5	13:41	28.5	1.70	5.09	0.095	1.67	5.01	66.6				
4	9.5	15:21	38	1.70	6.79	0.095	1.67	6.68	43.6				
5	9.5	17:01	47.5	1.70	8.48	0.095	1.67	8.35	30.8				
6	9.5	18:41	57	1.70	10.18	0.095	1.67	10.02	25.4				
7	9.5	20:21	66.5	1.70	11.88	0.095	1.67	11.69	18.0				
8	9.5	22:01	76	1.70	13.57	0.095	1.67	13.36	15.2				
9	9.5	23:41	85.5	1.70	15.27	0.095	1.67	15.03	14.1				
10	9.5	11/8/12 1:21	95	1.70	16.96	0.095	1.67	16.67	11.4				
11	9.5	3:01	104.5	1.70	18.66	0.095	1.67	18.33	10.5				
12	9.5	4:41	114	1.70	20.36	0.095	1.67	20.00	9.5				
13	10	6:21	124	1.79	22.14	0.10	1.67	21.67	7.9				
14	9.5	8:01	133.5	1.70	23.84	0.095	1.67	23.33	7.6				
15	9.5	9:41	143	1.70	25.54	0.095	1.67	25.00	7.8				
16	9.5	11:21	152.5	1.70	27.23	0.095	1.67	26.67	6.5				
17	9.5	13:01	162	1.70	28.93	0.095	1.67	28.33	7.5				
18	9.5	14:41	171.5	1.70	30.63	0.095	1.67	30.00	7.3				
19	9.5	16:21	181	1.70	32.32	0.095	1.67	31.67	6.4				
20	9.5	18:01	190.5	1.70	34.02	0.095	1.67	33.33	6.2				
21	9.5	19:41	200	1.70	35.71	0.095	1.67	35.00	5.8				

PV = 5.6mL

Pump speed = 0.12 mL/min
Collect Time = 100 min

No color noted in samples

PV = 5.3

Col 4

Tube No.		Fluid in Tube (mL)	Tube Start Date/Time	Cum Vol (mL)	4 PV=5.6	5 cum PV	Flow Rate (mL/min)	7 Collect time (hr)	Cum collect Time (hr)	9 U (µg/L)	10	11	12	13
22	1	9.5	11/8/12 21:21	209.5	1.70	37.41	0.095	1.67	36.67	5.2				
23	2	9.5	23:01	219	1.70	39.11	0.095	1.67	38.33	4.1				
24	3	9.5	11/9 0:41	228.5	1.70	40.80	0.095	1.67	40.00	4.6				
25	4	9.5	2:21	238	1.70	42.50	0.095	1.67	41.67	4.4				
26	5	9.5	4:01	247.5	1.70	44.20	0.095	1.67	43.33	3.1				
27	6	9.5	5:41	257	1.70	45.89	0.095	1.67	45.00	3.2				
28	7	9.5	7:21	266.5	1.70	47.59	0.095	1.67	46.67	2.9				
29	8	9.5	9:01	276	1.70	49.29	0.095	1.67	48.33	3.2				
30	9	9.5	10:41	285.5	1.70	50.98	0.095	1.67	50.00	2.9				
31	10	9.5	12:21	295	1.70	52.68	0.095	1.67	51.67	2.7				
32	11	9.5	14:01	304.5	1.70	54.38	0.095	1.67	53.33	3.6	* Reset frac collector to position 1 @ start of tube 32			
33	12	9.5	15:41	314	1.70	56.07	0.095	1.67	55.00	3.0				
34	13	9.5	17:21	323.5	1.70	57.77	0.095	1.67	56.67	2.7				
35	14	9.5	19:01	333	1.70	59.46	0.095	1.67	58.33	2.8				
36	15	10	20:41	343	1.79	61.25	0.10	1.67	60.00	2.1				
37	16	10	22:21	353	1.79	63.04	0.10	1.67	61.67	2.0				
38	17	10	11/10 0:01	363	1.79	64.82	0.10	1.67	63.33	2.4				
39	18	10	1:41	373	1.79	66.61	0.10	1.67	65.00	2.8				
40	19	10	3:21	383	1.79	68.39	0.10	1.67	66.67	2.7				
41	20	10	5:01	393	1.79	70.18	0.10	1.67	68.33	1.9				
42	21	10	6:41	403	1.79	71.96	0.10	1.67	70.00	1.8				
43	22	10	8:21	413	1.79	73.75	0.10	1.67	71.67	1.7				
~~44~~	23	not collected												
	D/C	11/10/12 @ 10:02												
	25													
	26													
	27													
	28													
	29													
	30													
	31													

Riverton Column 5 T06-10 0-2.5'

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/9/12 1	1300	fill column.		Same setup as		Column 1.	25ml Omni glass column. Flow bottom to top						
2		<2mm sieved fraction											
3		Empty Column		= 63.17	g								
4		Col + soil		= 95.34	g		Soil column length = 11.8 cm Vol 11.8 x 1.7671 = 20.85 ml						
5		soil weight		32.17			Density (dry) = 32.17 / 20.85 = 1.54 g/ml						
6													
7													
8	Elution	Tube	Cum	PV=~~23~~ AT	Cum	Flow	Collect	Cum.	U	Start flow 13:50 11/9/12			
9	Tube	Start	Vol	=6.2		Rate	Time	Collect	(ug/L)	1st water to soil 13:51			
tube # 10	(mL)	Date/Time	(mL)	PV	PV	mL/min	(hr)	Time (hr)		Water to top of soil @ 15:03 (73min)			
1 11	8.5 yellow	11/9 15:30	8.5	1.16	1.16	0.085	1.67	1.67	703.7	*			
2 12	8.5	17:10	17	1.16	2.33	0.085	1.67	3.33	666.1	*	First drip to frac coll. @ 15:30		
3 13	9	18:50	26	1.23	3.56	0.09	1.67	5.00	616.6	*			
4 14	9	20:30	35	1.23	4.79	0.09	1.67	6.67	542.7	*	pump rate 0.1 ml/min PV = 7.3 ml		
5 15	9	22:10	44	1.23	6.03	0.09	1.67	8.33	327.5	*	tubing Vol (27 min) 2.7 ml		
6 16	9	23:50	53	1.23	7.26	0.09	1.67	10.00	285.9	*			
7 17	8.5	11/10 1:30	61.5	1.16	8.42	0.085	1.67	11.67	244.7	*	* Water (Effluent) has a yellow-brown color		
8 18	9	3:10	70.5	1.23	9.66	0.09	1.67	13.33	214.9	*			
9 19	9	4:50	79.5	1.23	10.89	0.09	1.67	15.00	186.2	*	Pump speed = 0.10 ml/min		
10 20	9	6:30	88.5	1.23	12.12	0.09	1.67	16.67	156.6	*	Collect time = 100 min		
11 21	9	8:10	97.5	1.23	13.36	0.09	1.67	18.33	134.2	*			
12 22	9	9:50	106.5	1.23	14.59	0.09	1.67	20.0	133.3	*	decreasing yellow intensity		
13 23	9	11:30	115.5	1.23	15.82	0.09	1.67	21.67	101.8	*	minutes thru 14		
14 24	9	13:10	124.5	1.23	17.05	0.09	1.67	23.33	84.3	*			
15 25	9	14:50	133.5	1.23	18.29	0.09	1.67	25.00	72.0		Sample 15 is clear		
16 26	9	16:30	142.5	1.23	19.52	0.09	1.67	26.67	64.7				
17 27	9	18:10	151.5	1.23	20.75	0.09	1.67	28.33	63.1	1/7/13	PV calculated using volume in		
18 28	9	19:50	160.5	1.23	21.99	0.09	1.67	30.00	57.2	AT	1st tube. 73min x 0.085mL/min		
19 29	9	21:30	169.5	1.23	23.22	0.09	1.67	31.67	56.7		=6.2mL		
20 30	9	23:10	178.5	1.23	24.45	0.09	1.67	33.33	55.0				
21 31	9	11/11 0:50	187.5	1.23	25.68	0.09	1.67	35.00	49.4				

Col 5 cont.

Col 5 cont.

Tube #	Fluid in tube (mL)	Tube Start Date/Time	3 Cum Vol (mL)	4 PV (1 PV = ~~7.3~~ 6.2 AT)	5 Cum. PV	Flow Rate (mL/min)	7 Collect Time (hr)	Cum Collect Time (hr)	U (µg/L)	10	11	12	13
22 1	9	11/11 2:30	196.5	1.23	26.92	0.09	1.67	36.67	50.3				
23 2	9	4:10	205.5	1.23	28.15	0.09	1.67	38.33	50.3				
24 3	9	5:50	214.5	1.23	29.38	0.09	1.67	40.00	43.1				
25 4	9	7:30	223.5	1.23	30.62	0.09	1.67	41.67	41.4				
26 5	9	9:10	232.5	1.23	31.85	0.09	1.67	43.33	38.6				
27 6	9	10:50	241.5	1.23	33.08	0.09	1.67	45.0	38.9				
28 7	9	12:30	250.5	1.23	34.32	0.09	1.67	46.67	35.4				
29 8	9	14:10	259.5	1.23	35.55	0.09	1.67	48.33	37.5				
30 9	9	15:50	268.5	1.23	36.78	0.09	1.67	50.00	35.7				
31 10	9	17:30	277.5	1.23	38.01	0.09	1.67	51.67	29.7				
32 11	9	19:10	286.5	1.23	39.25	0.09	1.67	53.33	32.4				
33 12	9	20:50	295.5	1.23	40.48	0.09	1.67	55.00	30.2				
34 13	9	22:30	304.5	1.23	41.71	0.09	1.67	56.67	27.5				
35 14	9	11/12 0:10	313.5	1.23	42.95	0.09	1.67	58.33	27.7				
36 15	9	1:50	322.5	1.23	44.18	0.09	1.67	60.00	26.2				
37 16	9	3:30	331.5	1.23	45.41	0.09	1.67	61.67	24.3				
38 17	9	5:10	340.5	1.23	46.64	0.09	1.67	63.33	23.3				
39 18	9	6:50	349.5	1.23	47.88	0.09	1.67	65.00	21.6				
40 19	9	8:30	358.5	1.23	49.11	0.09	1.67	66.67	21.5				
41 20	9	10:10	367.5	1.23	50.34	0.09	1.67	68.33	20.5				
42 21	9	11:50	376.5	1.23	51.58	0.09	1.67	70.00	21.7				
43 22	9	13:30	385.5	1.23	52.81	0.09	1.67	71.67	19.4				
44 23	9	15:10	394.5	1.23	54.04	0.09	1.67	73.33	19.6				
[illegible] 24	11/12/12 @ 16:50												
25													
26													
27													
28													
29													
30													
31													

Riverton Column 6 T06-10 @ 2.5-5'

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/9/12	1400	full column	Same setup	as col.		25mL Omni glass column				flow bottom to top			
		<2mm sieved fraction											
		Empty column = 61.62g											
		Col + soil = 99.04g						soil col. length = 11.8cm		Vol 11.8 × 1.7671 = 20.85mL			
		soil weight = 37.42g						Density (dry) 37.42/20.85 =		1.79 g/mL			
	Fluid in Tube (mL)	Tube Start Date/Time	Cum Vol (mL)	1PV = ~~20~~ 8.1 mL PV	Cum. PV	Flow Rate (mL/min)	Collect Time (hr)	Cum Collect Time (hr)	UL (ug/L)				
Tube # 1	9 x	1/10/12 1443	9	1	1	0.09	1.67	1.67	* 224.3		Start flow @ 11/10/12 1242		
2	9	16:23	18	1	2			3.33	125.5		1st Water to soil @ 1243		
3	9	18:03	27	1	3			5.00	97.9		Water to top of soil @ 1413 (90 min)		
4	9	19:43	36	1	4			6.67	54.9		First drip to frac coll. @ 1443		
5	9	21:23	45	1	5			8.33	41.0		start Frac coll →		
6	9	23:03	54	1	6			10.00	31.9		Pump speed = 0.10 mL/min		
7	9	1/11 0:43	63	1	7			11.67	31.7		Collect time = 100 min		
8	9	2:23	72	1	8			13.33	28.3		* pl. yellow hose to effluent bottle 1		
9	9	4:03	81	1	9			15.00	23.2		✓ frac collector misaligned tubes contain 8 mL, flow=9		
10	9	5:43	90	1	10			16.67	19.4				
11	9	7:23	99	1	11			18.33	16.5				
12	9	9:03	108	1	12			20.0	15.0		tube 2 → end are clear		
13	9	10:43	117	1	13			21.67	11.8				
14	9	12:23	126	1	14			23.33	11.2		1/7/13 PV calculated using volume		
15	9	14:03	135	1	15			25.0	10.1		in 1st tube. 90 min × 0.09 mL/min		
16	9	15:43	144	1	16			26.67	9.9		= 8.1 mL		
17	9	17:23	153	1	17			28.33	9.1				
18	9	19:03	162	1	18			30.0	8.3				
19	9	20:43	171	1	19			31.67	8.4				
20	9 ✓	22:23	180	1	20			33.33	7.3				
21	9 ✓	1/12 0:03	189	1	21			35.0	7.0				

Column 6 cont

	Tube#	Fluid in Tube (ml)	Tube Start Date/Time	Cum 3 Vol (ml)	1PV = 8.1mL AT ~~9 mL~~ 4 PV	Cum 5 PV	Flow Rate 6 ml/min	Collect Time 7 (hr)	Cum Collect 8 Time (hr)	U 9 (ug/L)	10	11	12	13
1	22	9 ✓	11/12 01:43	198	1	22	0.09	1.67	36.67	7.2				
2	23	9 ✓	3:23	207	1	23	↓	↓	38.33	6.7				
3	24	9 ✓	5:03	216	1	24			40.00	5.8				
4	25	9	6:43	225	1	25			41.67	5.5				
5	26	9	8:23	234	1	26			43.33	5.3				
6	27	9	10:03	243	1	27			45.00	5.0				
7	28	9	11:43	252	1	28			46.67	5.0				
8	29	9	13:23	261	1	29			48.33	5.0				
9	30	9	15:03	270	1	30			50.00	5.0				
10	31	9	16:43	279	1	31			51.67	5.3				
11	32	9	18:23	288	1	32			53.33	5.4				
12	33	9	20:03	297	1	33			55.00	5.2				
13	34	9	21:43	306	1	34			56.67	5.1				
14	35	9	23:23	315	1	35			58.33	4.7				
15	36	9	11/13 1:03	324	1	36			60.00	4.6				
16	37	9	2:43	333	1	37			61.67	4.3				
17	38	9	4:23	342	1	38			63.33	4.6				
18	39	9	6:03	351	1	39			65.00	4.4				
19	40	9	7:43	360	1	40			66.67	4.3				
20	41	9	9:23	369	1	41			68.33	4.3				
21	42	9	11:03	378	1	42			70.00	4.3				
22	43	9	12:43	387	1	43			71.67	4.3				
23	44	9	14:23	396	1	44	↓	↓	73.33	4.2				
	End	11/13/12 @16:												
25														
26														
27														
28														
29														
30														
31														

Riverton Col 7 T05-02 0-25

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/9/12 1	Fill Column Same setup as Col 1 25ml Omnifloss column										Flow bottom to top		
2		<2mm sieved fraction								11.5	*soil shift to 11.5 once filled		
3		Empty column		61.65g	62.05					~~11.5~~ ~~11.8~~	5		20.32
4		Col + full		91.56	96.80			Soil col. length =	11.8cm	Vol 11.8 ×	1.7671	=	20.85ml
5		Soil weight		29.91	34.75 × 0.5 =	17.37g		Density (dry)		29.91/20.32	=	1.47g/ml	
6					see note below	soil				34.75 ?		1.67g/mL ?	
7												1.71g/ml	
8	Fluid in	Time	Cum	1 PV = 20	Cum	Flow	Collect	Cum	u	Start flow @ 11/10/12 12:42			
9	Tube	Start	Vol	~~1.69~~ 5.8 AT		Rate	Time	Collect		1st Water to soil @		12:43	
Tube # 10	(ml)	date/time	(ml)	PV	PV	ml/min	(hr)	time (hr)	(ug/L)	Water to top of soil @			
1 11	9.0	11/12 11:10	9	~~1.69~~ 1.41	1.29 1.41	0.09	1.67	1.67	1590.5	First drip to frac coll @			
2 12	9	12:50	18	~~1.69~~ 1.41	2.57 2.81			3.33	307.8	Start frac. coll			
3 13	9	14:30	27	~~1.69~~ 1.41	3.86 4.22			5.00	191.9				
4 14	9	16:10	36	1.29 1.41	5.14 5.63			6.67	142.9		Pump speed = 0.12 ml/m		
5 15	9	17:50	45	1.29 1.41	6.43 7.03			8.33	133.5		Collect time = 100 min		
6 16	9	19:30	54	1.29 1.41	7.71 8.44			10.00	114.3				
7 17	9	21:10	63	1.29 1.41	9.00 9.84			11.67	122.4	Column "separated" at			
8 18	9	22:50	72	1.29 1.4	10.29 11.25			13.33	101.8	bottom (Soil col moved up)			
9 19	9	11/13 00:30	81	1.29 1.41	11.51 12.66			15.00	97.7	5mm. will need to subtract			
10 20	9	2:10	90	1.29 1.41	12.86 14.06			16.67	87.2	1.7671 × 0.5 = 0.8836 mL from			
11 21	9	3:50	99	1.29 1.41	14.14 15.47			18.33	78.4	PV calc.			
12 22	9	5:30	108	1.29 1.41	15.43 16.88			20.00	81.6	Flow stopped while column			
13 23	9	7:10	117	1.29 1.41	16.71 18.28			21.67	99.5	being filled (About ½ way full).			
14 24	9	8:50	126	1.29 1.41	18.0 19.69			23.33	75.0	11/12 Repack col 07 50/50 by weight			
15 25	9	10:30	135	1.29 1.41	19.29 21.09	V		25.00	82.9	of T05-02 0-2.5 and Unimin			
16 26	8.5	12:10	143.5	1.21 1.33	20.50 22.42	0.085		26.67	101.0	sand #2075.			
17 27	8.5	13:50	152	1.21 1.33	21.71 23.75	0.085		28.33	97.6	start flow 11/12/12 @ 9:32			
18 28	8	15:30	160	1.14 1.25	22.86 25.00	0.08		30.00	89.2	1st water 9:33			
19 29	8	17:10	168	1.14 1.25	24.0 26.25	0.08		31.67	88.1	Top soil @ 10:43 (Jerman)			
20 30	8	18:50	176	1.14 1.25	25.14 27.50	0.08		33.33	97.3	1st drip, start frac coll 11:10			
21 31	8	20:30	184	1.14 1.25	26.29 28.75	0.08		35.00	88.9	Pale yellow color tube 1, some brown ppt.			

Others are clear

Top of bed @ 10:37 (Jerman)

Rw. Col 7 cont. ~~64~~ 5.8mL at 1 PV = 7 mL

Tube #	Fluid in tube (mL)	Tube Start Date/Time	3 Vol (mL)	4 PV	5 PV	Flowrate (mL/min)	Time (hr)	Collect (hr)	9 (ug/L)	10 Cum PV	11	12	13
22 1	7.5	11/13 22:10	191.5	~~1.07~~ 1.17	27.36	0.075	~~3~~ 1.67	36.67	94.5	29.92			
23 2	7.5	23:50	199.0	~~1.07~~ 1.17	28.43	0.075	1.67	38.33	82.5	31.09			
24 3	7	11/14 1:30	206	~~1~~ 1.09	29.43	0.07	1.67	40.00	88.6	32.19			
25 4	7	3:10	213	~~1~~ 1.09	30.43	0.07	1.67	41.67	83.3	33.28			
26 5	7	4:50	220	~~1~~ 1.09	31.43	0.07	1.67	43.33	86.1	34.38			
27 6	7	6:30	227	~~1~~ 1.09	32.43	0.07	1.67	45.00	78.7	35.47	* pause collection ~2min to clear pump lines. No obstruction		
28 7	7 *	8:10	234	~~1~~ 1.09	33.43	0.07	1.67	46.67	128.1	36.56			
29 8	6.5	9:50	240.5	~~0.93~~ 1.02	34.36	0.065		48.33	94.7	37.58			
30 9	6.5	11:30	247	~~0.93~~ 1.02	35.29	0.065		50.00	83.4	38.59			
31 10	6	13:10	253	~~0.86~~ 0.94	36.14	0.06		51.67	90.7	39.53	1/7/13 PV calculated using volume in 1st tube.		
32 11	6	14:50	259	~~0.86~~ 0.94	37.0	0.06		53.33	88.6	40.47			
33 12	6	16:30	265	~~0.86~~ 0.94	37.86	0.06		55.00	78.1	41.41	Using column started 11/12		
34 13	5.5	18:10	270.5	~~0.79~~ 0.86	38.64	0.055		56.67	88.7	42.27	64min to fill.		
35 14	5.5	19:50	276	~~0.79~~ 0.86	39.43	0.055		58.33	76.0	43.13	64min x 0.09mL/min		
36 15	5.5	21:30	281.5	~~0.79~~ 0.86	40.21	0.055		60.00	77.0	43.98	= 5.8mL		
37 16	5.5	23:10	287	~~0.79~~ 0.86	41.0	0.055		61.67	81.0	44.84			
38 17	5.5	11/15 0:50	292.5	~~0.79~~ 0.86	41.79	0.055		63.33	81.0	45.70			
39 18	5	2:30	297.5	~~0.71~~ 0.78	42.5	0.05		65.00	81.7	46.48			
40 19	5	4:10	302.5	~~0.71~~ 0.78	43.21	0.05		66.67	75.3	47.27			
41 20	5	5:50	307.5	~~0.71~~ 0.78	43.93	0.05		68.33	73.6	48.05			
42 21	5	7:30	312.5	~~0.71~~ 0.78	44.64	0.05		70.00	69.8	48.83			
43 22	6	9:10	318.5	~~0.86~~ 0.94	45.50	0.06		71.67	63.2	49.77			
44 23	5	10:50	323.5	~~0.71~~ 0.78	46.21	0.05		73.33	63.7	50.55			
24	D/C flow 11/16/12 @ 12:30												
25													
26													
27													
28													
29													
30													
31													

Riverton Col 8 T05-02 @ 2.5-5'

1/12/12 Fill column. Same setup as Col 1. 25ml Omnifit glass column. Flow bottom to top.

<2mm sieved fraction

Empty col 62.54g

Col + fill 94.68g

Soil weight 32.14

Soil col length = 11.8cm ~~Vol~~ 11.8 x 1.7671 = 20.85 ml

Density (dry) 32.14 / 20.85 = 1.54 g/ml

Tube #	Fluid in Tube (ml)	Tube Start date/time	Cum Vol (ml)	1 PV = ~~7.8~~ 7.1 6.0mL AT PV	Cum PV	Flow Rate (ml/min)	Collect Time (hr)	Cum Collect Time (hr)	U (ug/L)
1	8.5	1/13 11:45	8.5	~~1.09~~ 1.20	1.09 1.20	0.085	1.67	1.67	1176.5 *
2	9	13:25	17.5	~~1.15~~ 1.27	2.24 2.46	0.09	↓	3.33	1509.0
3	9	15:05	26.5	~~1.15~~ 1.27	3.40 3.73	0.09		5.00	855.8
4	9	16:45	35.5	~~1.15~~ 1.27	4.55 5.0	0.09		6.67	463.8
5	9	18:25	44.5	~~1.15~~ 1.27	5.71 6.27	0.09		8.33	304.9
6	9	20:05	53.5	~~1.15~~ 1.27	6.86 7.54	0.09		10.00	205.1
7	9	21:45	62.5	~~1.15~~ 1.27	8.01 8.80	0.09		11.67	163.7
8	9	23:25	71.5	~~1.15~~ 1.27	9.17 10.07	0.09		13.33	124.1
9	9	1/14 1:05	80.5	~~1.15~~ 1.27	10.32 11.34	0.09		15.00	108.0
10	9	2:45	89.5	~~1.15~~ 1.27	11.47 12.61	0.09		16.67	95.5
11	9	4:25	98.5	~~1.15~~ 1.27	12.63 13.87	0.09		18.33	86.4
12	9	6:05	107.5	~~1.15~~ 1.27	13.78 15.14	0.09	↓	20.00	73.1
13	9	7:45	116.5	~~1.15~~ 1.27	14.93 16.40	0.09		21.67	69.9
14	9	9:25	125.5	1.27	16.09 17.68			23.33	61.4
15	9	11:05	134.5		17.24 18.94			25.00	59.8
16	9	12:45	143.5		18.40 20.21			26.67	54.3
17	9	14:25	152.5		19.55 21.48			28.33	52.1
18	9	16:05	161.5		20.71 22.75			30.00	49.7
19	9	17:45	170.5		21.86 24.01			31.67	45.1
20	9	19:25	179.5	↓	23.01 25.28	↓	↓	33.33	41.6
21	9	21:05	188.5		24.17 26.55			35.00	36.3

Start flow 10:05

1st water to soil 10:06

Top of column 11:24 (78 min)

Start frac coll. 11:45

* sample clear yellow. Subsequent samples are clear

Top of soil @ 1117 = 71 min

1/7/13 PV calculated using volume in 1st tube: 71 min x 0.085 mL/min = 6.0 mL

Col 8 cont

1+ 6.0 mL AT

Tube #	Fluid in tube (mL)	Start	Cum Vol (mL)	PV	Cum PV	Flowrate (mL/min)	Collect Time (h)	Cum Collect (h)	U ug/L	10	11	12	13
22 1	9	11/14 22:45	197.5	~~1.15~~ 1.27	25.32 27.80	29.09	1.67	36.67	32.3				
23 2	9	11/15 00:25	206.5		26.47 29.08			38.33	34.1				
24 3	9	2:05	215.5		27.63 30.33			40.00	28.3				
25 4	9	3:45	224.5		28.78 31.62			41.67	24.7				
26 5	9	5:25	233.5		29.94 32.89			43.33	23.8				
27 6	9	7:05	242.5		31.09 34.15			45.0	20.2				
28 7	9	8:45	251.5		32.24 35.42			46.67	20.7				
29 8	9	10:25	260.5		33.40 36.69			48.33	20.9				
30 9	9	12:05	269.5		34.55 37.96			50.00	18.7				
31 10	9	13:45	278.5		35.71 39.23			51.67	16.9				
32 11	9	15:25	287.5	1.27	40.49			53.33	17.5				
33 12	9	17:05	296.5		41.76			55.00	17.1				
34 13	9	18:45	305.5		43.03			56.67	16.4				
35 14	9	20:25	314.5		44.30			58.33	16.5				
36 15	9	22:05	323.5		45.56			60.00	15.9				
37 16	9	23:45	332.5		46.83			61.67	14.3				
38 17	9	11/16 01:25	341.5		48.10			63.33	13.9				
39 18	9	03:05	350.5		49.37			65.00	12.8				
40 19	9	04:45	359.5		50.63			66.67	11.5				
41 20	9	06:25	368.5		51.90			68.33	11.4				
42 21	9	08:05	377.5		53.17			70.00	10.5				
43 22	9	09:45	386.5		54.44			71.67	10.0				
44 23	9	11:25	395.5		55.70			73.33	10.4				
24	D/C flow 11/16/12 @												
25													
26													
27													
28													
29													
30													
31													

Riverton Col 9 T04-10 0-2.5

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/14/12 1	Fill column. Same setup as Col 1 25 mL Omnifit glass column. Flow bottom to top												
2		<2mm sieved fraction											
3		empty col	64.29 g										
4		Col. + soil	91.57 g			Soil Col. length 11.8 cm		Vol 11.8 x 17671 = 20.85 mL					
5		Soil weight	30.28 g			Density (dry) 30.28 / 1.7671 = 1.45 g/mL							
6													
7													
8	Fluid in	Tube	Cum	1 PV = 9.0 mL		Flow	Collect	Cum	U	Start flow @ 13:45	TOP SOIL or TOP COL.		
9	Tube	Start	Vol	~~8.9~~	Cum	Rate	Time	Coll. Time	(ug/L)	1st Water to col @ 13:46	79 ~~89~~		
Tube # 10	(mL)	Date/Time	mL	PV 8.0 mL	PV	(mL/min)	(hr)	(hr)		Water to top of soil 1505			
1 11	9 *	11/14 15:39	9	1.01	1.01	0.09	1.67	1.67	839.4	Water to top of col 15:15			
2 12	9	17:19	18	1.01	2.02			3.33	485.0	1st drip, Start frac coll @ 1539			
3 13	9	18:59	27	1.01	3.03			5.00	538.7	Med.			
4 14	9	20:39	36	1.01	4.04			6.67	949.7	* ~~pale~~ clear yellow tube 1			
5 15	9	22:19	45	1.01	5.06			8.33	907.7	subsequent samples are clear			
6 16	9	23:59	54	1.01	6.07			10.00	692.6				
7 17	9	11/15 1:39	63	1.01	7.08			11.67	396.3				
8 18	9	3:19	72	1.01	8.09			13.33	250.5	** Tubes had some decrease in volume.			
9 19	9	4:59	81	1.01	9.10			15.0	206.7	Fraction collector mis-aligned and missing			
10 20	9	6:39	90	1.01	10.11			16.67	208.1	tubes periodically. All volumes in these tubes			
11 21	9	8:19	99	1.01	11.12			18.33	224.5	were between 8-8.5 mL			
12 22	9	9:59	108	1.01	12.13			20.00	217.0				
13 23	9	11:39	117	1.01	13.15			21.67	225.7				
14 24	9	13:19	126	1.01	14.16			23.33	230.0	1/7/13 PV calculated using volume in			
15 25	9	14:59	135	1.01	15.17			25.00	212.5	1st tube. 89 min x 0.09 mL/min			
16 26	9.5	16:39	144.5	1.07	16.24	0.095		26.67	226.1	= 8.0 mL.			
17 27	9	18:19	153.5	1.01	17.25	0.09		28.33	217.6				
18 28	9	19:59	162.5	1.01	18.26			30.00	214.5				
19 29	9	21:39	171.5	1.01	19.27			31.67	134.4				
20 30	9	23:19	180.5	1.01	20.28			33.33	131.4				
21 31	9 **	11/16 0:59	189.5	1.01	21.29			35.0	144.6				

Rev Col 9 cont   T04-10 0-2.5

Tube #	Row	Fluid in Tube (mL)	Tube Start Date Time	Cum Vol (mL)	4 1PV=~~8.9~~ 8.0 AT PV	5 Cum PV	6 Flowrate (mL/min)	Collect Time (hr)	Cum Collect (hr)	U (µg/L)	10	11	12	13
22	1	9 **	11/16 2:39	198.5	1.01	22.30	0.09	1.67	36.67	138.1				
23	2	9 **	4:19	207.5		23.31			38.33	128.1				
24	3	9 **	5:59	216.5		24.33			40.00	103.1				
25	4	9	7:39	225.5		25.34			41.67	96.9				
26	5	9	9:19	234.5		26.35			43.33	105.1				
27	6	9	10:59	243.5		27.36			45.00	93.4				
28	7	9	12:39	252.5		28.37			46.67	84.4				
29	8	9	14:19	261.5	1.01	29.38			48.33	81.2				
30	9	9	15:59	270.5		30.39			50.00	87.8				
31	10	9	17:39	279.5		31.40			51.67	72.1				
32	11	9	19:19	288.5		32.42			53.33	70.4				
33	12	9	20:59	297.5		33.43			55.00	73.1				
34	13	9	22:39	306.5		34.44			56.67	78.6				
35	14	9	11/17 0:19	315.5		35.45			58.33	68.3				
36	15	9	1:59	324.5		36.46			60.00	65.0				
37	16	9	3:39	333.5		37.47			61.67	64.6				
38	17	9	5:19	342.5		38.48			63.33	63.0				
39	18	9	6:59	351.5		39.49			65.00	75.9				
40	19	8 **	8:39	360.5		40.51			66.67	61.4				
41	20	9	10:19	369.5		41.52			68.33	59.1				
42	21	9	11:59	378.5		42.53			~~65.00~~ 70.00	56.3				
43	22	9	13:39	387.5		43.54			~~66.67~~ 73.33	63.0				
44 (circled)	23	7.5 (circled)	15:19	396.5		44.55				100.4	?			
	24	D/C Flow 11/17/12 @ 17:00												

Note: During the run the fraction collector got off slightly and was missing tubes. After sample 28 finished fraction collector was reset and tubes were shifted putting tube 29 in position #1 and collector was restarted. While shifting the tubes the order of the tubes was messed up starting w/ tube 36. The order was noticed and corrected at the completion of the run. However because the order was wrong the final tube (#44) was in the wrong position and the fraction collector was dripping over an empty slot instead of tube 44. This was noticed and corrected but w/ only ~20 min left in the run. That is why tube 44 has very low volume. The run was still stopped at the appropriate time. We can probably assume that if tube 44 was in the right position it would have collected the 9mL that most of the rest of the tubes did. Tube 44 acidified w/ only 40µL HNO_3.

Riverton Col 10

T04-10 2.5-5

	1	2	3	4	5	6	7	8	9	10	11	12	13
11/13/12	1	Fill Column.	Same setup as Col 1			25 ml Omnifit glass col				Flow bottom to top			
	2		<2mm sieved fraction										
	3		empty col 63.88 g										
	4		col + fill 101.82 g			soil col. length = 11.8 cm		Vol 11.8 × 1.7671 = 20.85 ml					
	5		soil weight 37.94 g			Density (dry) = 37.94/20.85 = 1.82 g/mL							
	6												
	7												
	8	Fluid	Tube	Cum	PV = ~~5.5~~ 4.5	Cum	Flow	Collect	Cum	U		11/15/12	
	9	in tube	Start	Vol.			Rate	Time	Collect Time	(ug/L)	Start flow @	12:34	
Tube #	10	(mL)	Date/Time	(mL)	PV	PV	(mL/min)	(hr)	(hr)	~~449~~	1st water to soil @ 12:35		
1	11	9.5	11/15 13:45	9.5	~~1.79~~ 2.02	1.79 2.02	0.095	1.67	1.67	449.2	Water to top of soil @ 13:22	47 min	
2	12	9.5	15:25	19.0	2.02	4.04			3.33	501.8	Water to top of Col @ 13:27	53 min	
3	13	9.5	17:05	28.5		6.06			5.00	277.3	1st Drip, Start frac col. @ 13:4		
4	14	9.5	18:45	38		8.09			6.67	143.0			
5	15	9.5	20:25	47.5		10.11			8.33	93.1	1st sample Clear pale yellow		
6	16	9.5	22:05	~~57~~ 57		12.13			10.00	68.9	all others clear		
7	17	9.5	23:45	66.5		14.15			11.67	57.6			
8	18	9	11/16 1:25	75.5 ~~76.5~~	1.91	16.06	0.09		13.33	53.5			
9	19	9.5	3:05	85.0	2.02	18.09	0.095		15.00	47.2			
10	20	9.5	4:45	94.5		20.11			16.67	42.6	PV = 4.5	47 min × 0.095 mL/min	
11	21	9.5	6:25	104		22.13			18.33	41.3		= 4.5 mL	
12	22	9.5	8:05	113.5		24.15			20.00	36.0			
13	23	9.5	9:45	123		26.17			21.67	30.0			
14	24	9.5	11:25	132.5		28.19			23.33	28.7			
15	25	9	13:05	141.5	1.91	30.11	0.09		25.00	27.4			
16	26	9.5	14:45	151.0	2.02	32.13	0.095		26.67	28.7			
17	27	9.5	16:25	160.5	2.02	34.15	0.095		28.33	24.3			
18	28	10	18:05	170.5	2.13	36.28	0.1		30.00	22.8			
19	29	10	19:45	180.5	2.13	38.40	0.1		31.67	21.3			
20	30	10	21:25	190.5	2.13	40.53	0.1		33.33	21.6			
21	31	9.5	23:05	200	2.02	42.55	0.095		35.00	20.3			

Riv Col 10 cont

T04-10 @ 2.5-5

Valve #	Fluidics Tube (mL)	Date/Time	3 Vol (mL)	4 PV 4.5	5 PV	Flow Rate (mL/min)	Time (hr)	Collect. Time (hr)	Cum. As (ug/L)	10	11	12	13
22 1	9.5	11/17 0:45	209.5	2.02	44.57	0.095	1.67	36.67	18.5				
23 2	9.5	2:25	219.0		46.60			38.33	20.1				
24 3	9.5	4:05	228.5		48.62			40.00	19.5				
25 4	9.5	5:45	238		50.64			41.67	14.5				
26 5	9.5	7:25	247.5		52.64			43.33	13.8				
27 6	9.5	9:05	257		54.68			45.00	13.6				
28 7	9.5	10:45	266.5		56.70			46.67	13.0				
29 8	9.5	12:25	276		58.72			48.33	12.9				
30 9	9.5	14:05	285.5		60.74			50.00	12.0				
31 10	9.5	15:45	295		62.77			51.67	12.3				
32 11	9.5	17:25	304.5		64.79			53.33	12.5				
33 12	9.5	19:05	314		66.81			55.00	11.9				
34 13	9.5	20:45	323.5		68.83			56.67	11.9				
35 14	9.5	22:25	333		70.85			58.33	11.5				
36 15	9.5	11/18 0:05	342.5		72.87			60.00	10.9				
37 16	9.5	1:45	352		74.89			61.67	9.0	* 11/18	@ 12:29	Source tank	
38 17	9.5	3:25	361.5		76.91			63.33	8.8		switched		
39 18	9.5	5:05	371		78.94			65.00	9.2				
40 19	9.5	6:45	380.5		80.96			66.67	8.6				
41 20	9.5	8:25	390		82.98			68.33	8.5				
42 21	9.5	10:05	399.5		85.00			70.00	8.1				
43 22	9.5	11:45	409		87.02			71.67	8.0				
44 23	9.5	13:25	418.5	↓	89.04	↓	↓	73.33	7.3				
11/18	12 DC flow @ 15:05												
25													
26													
27													
28													
29													
30													
31													

Riverton Col 11

T03-10 0-2.5

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/15/12	1	Fill Column Same setup as Col 1 25ml omnifit glass column flow bottom to top											
	2	<2mm sieved fraction											
	3	empty column 62.23g											
	4	Col + soil 92.75g				Soil Col. length = 11.8cm Vol 11.8 x 1.7671 = 20.85ml							
	5	soil 30.52				Density (dry) = 30.52/20.85 = 1.46g/ml							
	6												
	7												
	8	Feed in	Tube	Cum	1PV=~~7.5~~ 6.6mL		Flow	Collect	Cum	U			
	9	tube	Start	Vol		Cum	Rate	Time	Col. Time	(ug/L)	Start flow @ 13:09		
Tube #	10	(mL)	Date/Time	mL	PV	PV	mL/min	(hr)	(hr)		1st Water to pail @ 13:11		> 73min
1	11	9	11/16 14:50	9	1.23	1.23	0.09	1.67	1.67	31.7	water to top, pail @ 14:24		
2	12	9	16:30	18		2.47			3.33	65.6	Water to Top, Col @ 14:30		
3	13	9	18:10	27		3.70			5.0	68.4	1st Drip, Start free Col @ 14:50		
4	14	9	19:50	36		4.93			6.67	50.7			
5	15	9	21:30	45		6.16			8.33	31.9	1st Sample Clear pale yellow		
6	16	9	23:10	54		7.40			10.00	25.1	2nd sample very pale yellow. The rest of		
7	17	9	11/17 0:50	63		8.63			11.67	21.0	the samples look colorless.		
8	18	9	2:30	72		9.86			13.33	18.0			
9	19	9	4:10	81		11.10			15.0	13.3			
10	20	9	5:50	90		12.33			16.67	12.2	11/13 PV calculated using volume		
11	21	9	7:30	99		13.56			18.33	11.2	in 1st tube. 73min x 0.09mL/min		
12	22	9	9:10	108		14.79			20.0	9.0	= 6.6mL		
13	23	9	10:50	117		16.03			21.67	8.0			
14	24	9	12:30	126		17.26			23.33	7.6			
15	25	9	14:10	135		18.49			25.0	7.2			
16	26	9	15:50	144		19.73			26.67	6.9			
17	27	9	17:30	153		20.96			28.33	6.0			
18	28	9	19:10	162		22.19			30.00	6.0			
19	29	9	20:50	171		23.42			31.67	6.2			
20	30	9	22:30	180		24.66			33.33	5.4			
21	31	9	11/18 0:10	189		25.89			35.0	5.2			

Riverton Cell 11 TO3-10C 0-25

Cont

Fluid in Tube Start Cum 1PV = ~~73~~ Cum Flow Rate Collect Cum Col. uL

Tube #	Tube (mL)	Date / Time	Vol (mL)	PV 6.0 AT	PV	mL/min	Time (hr)	Time (hr)	ug/L				
22 1	9	11/18 1:50	198	1.23	27.12	0.09	1.67	36.67	4.7				
23 2	9	3:30	207		28.36			38.33	4.5				
24 3	9	5:10	216		29.59			40.00	4.4				
25 4	9	6:50	225		30.82			41.67	4.3				
26 5	9	8:30	234		32.05			43.33	4.1				
27 6	9	10:10	243		33.29			45.0	3.6				
28 7	9	11:50	252		34.52			46.67	3.8				
29 8	9	13:30	261		35.75			48.33	3.5				
30 9	9	15:10	270		36.99			50.00	3.3				
31 10	9	16:50	279		38.22			51.67	3.3				
32 11	9	18:30	288		39.45			53.88	3.3				
33 12	9	20:10	297		40.68			55.00	3.1				
34 13	9	21:50	306		41.92			56.67	2.9				
35 14	9	23:30	315		43.15			58.33	~~3.4~~ 3.1				
36 15	9	11/19 1:10	324		44.38			60.00	3.1				
37 16	9	2:50	333		45.62			61.67	3.8				
38 17	9	4:30	342		46.85			63.33	2.9				
39 18	9	6:10	351		48.08			65.00	2.5				
40 19	9	7:50	360		49.32			66.67	2.5				
41 20	9	9:30	369		50.55			68.33	2.7				
42 21	9	11:10	378		51.78			70.00	2.7				
43 22	9	12:50	387		53.01			71.67	2.4				
44 23	9	14:30	396		54.25			73.33	2.2				
24	D/C flow to Column @ 16:10												
25													
26													
27													
28													
29													
30													
31													

Riverton Col 12 TO3-10 2.5-5

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/15/12 1	Fill	Column, Saree setup as Col 1				25 ml Omnifit glass column.				Flow bottom to top			
2		<2mm sieved fraction											
3		empty col = 61.69 g											
4		Col + fill 91.85				Soil Col. length = 11.8cm				Vol 11.8 x 1.7671 = 20.85 ml			
5		fill 30.16g				Density (Comp) = 30.16 / 20.85 = 1.45 g/ml							
6													
7													
8	fluid in tube	Tube Start	Cum Vol	1PV = 7.1 / 6.7	Cum	Flow Rate	Collect Time	Cum.	U				
9													
tube # 10	(ml)	Date/Time	(ml)	PV	PV	(ml/min)	(hr)	Col. Time (hr)	(ug/L)	Start flow @ 15:08			
1 11	9.5	11/18 16:44	9.5	1.3442	1.42	0.095	1.67	1.67	49.2	1st water to soil @ 15:10	> 71 min		
2 12	9.5	18:24	190	1.42	2.68 2.84			3.33	151.8	water to Top of soil @ 16:21	PV = 7+		
3 13	9.5	20:04	28.5		4.01 4.25			5.00	333.0	water to Top of col @ 16:27	6.7		
4 14	9.5	21:44	38		5.35 5.67			6.67	277.0	1st Drip, start fraction @			
5 15	9.5	23:24	47.5		6.69 7.09			8.33	177.4	1st sample clear med yellow			
6 16	9.5	11/19 1:04	57.0		8.03 8.51			10.00	129.6	subsequent samples clear			
7 17	9.5	2:44	66.5		9.37 9.93			11.67	89.8				
8 18	9.5	4:24	76		10.70 11.34			13.33	70.3				
9 19	9.5	6:04	85.5		12.04 12.76			15.00	56.4	PV = 71 min x 0.095 = 6.7 ml			
10 20	9.5	7:44	95		14.18			16.67	45.8				
11 21	9.5	9:24	104.5		15.60			18.33	38.6				
12 22	9.5	11:04	114.0		17.01			20.00	32.2				
13 23	9.5	12:44	123.5		18.43			21.67	27.8				
14 24	9.5	14:24	133		19.85			23.33	25.3				
15 25	9.5	16:04	142.5		21.27			25.00	22.6				
16 26	9.5	17:44	152.0		22.69			26.67	22.0				
17 27	9.5	19:24	161.5		24.10			28.33	21.0				
18 28	9.5	21:04	171		25.52			30.0	20.2				
19 29	9.5	22:44	180.5		26.94			31.67	18.0				
20 30	9.5	11/20 0:24	190.0		28.36			33.33	16.3				
21 31	9.5	2:04	199.5		29.78			35.00	16.4				

Riverton Col 12

Cont T03-10 @ 2.5-5

	Tube #	Fluid in tube (ml)	Tube Start (Date/Time)	Cum Vol (ml)	PV (1 PV=6.7)	Cum PV	Flow Rate (ml/min)	Collect Time (hr)	Cum Col. Time (hr)	U (ug/L)	10	11	12	13
1	22	9.5	11/20 03:44	209.0	1.42	31.19	0.095	1.67	36.67	13.1				
2	23	9.5	05:24	218.5	↓	32.61	↓	↓	38.33	13.2				
3	24	9.5	7:04	228		34.03			40.00	12.3				
4	25	9.5	8:24	237.5		35.45			41.67	12.2				
5	26	9.5	10:24	247		36.87			43.33	11.6				
6	27	9.5	12:04	256.5		38.28			45.00	10.3				
7	28	9.5	13:44	266		39.70			46.67	10.0				
8	29	9.5	15:24	275.5		41.12			48.33	9.5				
9	30	9.5	17:04	285.0		42.54			50.00	9.5				
10	31	9.5	18:44	294.5		43.96			51.67	~~9.0~~ 8.4				
11	32	9.5	20:24	304		45.37			53.33	8.6				
12	33	9.5	22:04	313.5		46.79			55.00	8.4				
13	34	9.5	23:44	323		48.21			56.67	8.1				
14	35	9.5	11/21 1:24	332.5		49.63			58.33	7.7				
15	36	9.5	3:04	342		51.04			60.00	7.6				
16	37	9.5	4:44	351.5		52.46			61.67	7.4				
17	38	9.5	6:24	361		53.88			63.33	7.2				
18	39	9.5	8:04	370.5		55.30			65.00	6.5				
19	40	9.5	9:44	380		56.72			66.67	6.6				
20	41	9.5	11:24	389.5		58.13			68.33	6.3				
21	42	9.5	13:04	399		59.55			70.00	6.2				
22	43	9.5	14:44	408.5		60.97			71.67	5.8				
23	44	9.5	16:24	418	↓	62.39	↓	↓	73.33	5.3				
24		D/C flow to Column @ 18:04												
25														
26														
27														
28														
29														
30														
31														

Renton Col 13

T02-07 0-2.5

	1	2	3	4	5	6	7	8	9	10	11	12	13
12/19	1	All column, same setup as Col 1				25ml Omnifit glass column.				Flow bottom to top			
	2	<2mm sieved fraction											
	3	empty column = 63.11											
	4	col + soil = 97.00				Soil Col. length 11.8cm Vol = 11.8 × 1.7671 = 20.85 ml							
	5	soil = 33.89 g				Density (Dry) 33.89/20.85 = 1.63 g/ml							
	6												
	7												
	8	fluid in	Tube	Cum	PV = 7.1		Flow	Collect	Cum	U			
	9	tube	Start	Vol	5.6	Cum	Rate	Time	Coll.				
Tube #	10	(ml)	Date/Time	ml	PV	PV	(ml/min)	(hrs)	Time (hrs)	(ug/L)			
1	11	9.0	11/20 10:03	9.0	1.61	1.61	0.09	1.67	1.67	33.5	Start flow @ 8:35		
2	12	9	11:43	18		3.21			3.33	25.1	1st water to soil @ 8:37		>62mm
3	13	9	13:23	27		4.82			5.0	12.9	water to top of soil @ 9:39		
4	14	9	15:03	36		6.43			6.67	12.3	water to top of col @ 9:43		
5	15	9	16:43	45		8.04			8.33	9.2	1st Drop, start fraction col @ 10:03		
6	16	9	18:23	54		9.64			10.0	6.7	1st sample very pale yellow		
7	17	9	20:03	63		11.25			11.67	7.0			
8	18	9	21:43	72		12.86			13.33	6.3	PV 68 × 0.09 = 5.6		
9	19	9	23:23	81		14.46			15	6.1			
10	20	9	11/21 1:03	90		16.07			16.67	6.1			
11	21	9	2:43	99		17.68			18.33	5.9			
12	22	9	4:23	108		19.29			20.0	4.6			
13	23	9	6:03	117		20.89			21.67	4.5			
14	24	9	7:43	126		22.5			23.33	4.5			
15	25	9	9:23	135		24.11			25.00	4.6			
16	26	9	11:03	144		25.71			26.67	3.9			
17	27	9	12:43	153		27.32			28.33	3.3			
18	28	9	14:23	162		28.93			30.00	3.3			
19	29	9	16:03	171		30.54			31.67	3.2			
20	30	9	17:43	180		32.14			33.33	3.3			
21	31	9	19:23	189		33.75			35.00	3.0			

Ruerton Col 13

T02-07 0-2.5 Cont.

Fluid in Tube Start Cum 1PV = 5.6 cum Flow Collect Cum U

Tube #	Tube (mL)	Date/Time	3 Vol (mL)	4 PV	5 PV	Rate (mL/min)	Time	Col time	9 (ug/L)	10	11	12	13
22 1	9	11/21 21:03	198	1.61	35.36	0.09	1.67	36.67	2.8				
23 2	9	22:43	207		36.96			38.33	2.6				
24 3	9	11/22 0:23	216		38.57			40.00	2.6				
25 4	9	2:03	225		40.18			41.67	2.4				
26 5	9	3:43	234		41.79			43.33	2.4				
27 6	9	5:23	243		43.39			45.00	2.2				
28 7	9	7:03	252		45.0			46.67	2.3				
29 8	9	8:43	261		46.61			48.33	2.1				
30 9	9	10:23	270		48.21			50.0	1.9				
31 10	9	12:03	279		49.82			51.67	1.8				
32 11	9	13:43	288		51.43			53.33	1.9				
33 12	9	15:23	297		53.04			55.00	1.6				
34 13	9	17:03	306		54.64			56.67	1.5				
35 14	9	18:43	315		56.25			58.33	1.6				
36 15	9	20:23	324		57.86			60.0	1.6				
37 16	9	22:03	333		59.46			61.67	1.5				
38 17	9	23:43	342		61.07			63.33	1.6				
39 18	9	11/23 1:23	351		62.68			65.00	1.5				
40 19	9	3:03	360		64.29			66.67	1.4				
41 20	9	4:43	369		65.89			68.33	1.5				
42 21	9	6:23	378		67.50			70.0	1.4				
43 22	9	8:03	387		69.11			71.67	1.3				
44	9	9:43	396		70.71			73.33	1.2				
24	D/C flow to column @ 11:23												
25													
26													
27													
28													
29													
30													
31													

Riverton Col 14

T02-07 @ 2.5-5

1/19/12

Fill column, same setup as Col 1. 25ml Omnifit glass column Fill bottom to top

<2mm sieve fine

empty Col 61.49

Col + fill 96.63

fill 35.14

Soil col length = 11.8 cm Vol 11.8 x 1.7671 = 20.85 ml

Density (dry) = ~~35.14~~ 35.14 / 20.85 = 1.69 ml/cm

Tube #	Fluid in Tube (mL)	Tube Start Date/time	Cum Vol (mL)	1 PV = 4.5 PV	Cum PV	Flow Rate (mL/min)	Collect Time (hr)	Cum Col. Time	U ug/L
1	7.5	11/26 11:43	7.5	1.67	1.67	0.075	1.67	1.67	69.7
2	7.5	13:23	15	↓	3.33	↓	↓	3.33	39.6
3	7.5	15:03	22.5		5.0			5.00	33.9
4	7.5	16:43	30		6.67			6.67	28.2
5	7.5	18:23	37.5		8.33			8.33	27.1
6	7.5	20:03	45		10.0			10.00	21.3
7	7.5	21:43	52.5		11.67			11.67	16.0
8	7.5	23:23	60		13.33			13.33	14.2
9	7.5	11/27 1:03	67.5		15.0			15.00	11.0
10	7.5	2:43	75		16.67			16.67	10.1
11	7.5	4:23	8~~2.5~~		18.33			18.33	8.6
12	7.5	6:03	90		20.0			20.00	7.1
13	7.5	7:43	97.5		21.67			21.67	7.0
14	7.5	9:23	105		23.33			23.33	6.7
15	7.5	11:03	112.5		25.00			25.00	5.9
16	7.5	12:43	120		26.67			26.67	5.6
17	7.5	14:23	127.5		28.33			28.33	5.7
18	7.5	16:03	135		30.00			30.00	5.2
19	7.5	17:43	142.5		31.67			31.67	5.1
20	7.5	19:23	150.0		33.33			33.33	4.6
21	7.5	21:03	157.5	↓	35.0	↓	↓	35.00	4.6

Start flow at @ 10:07

1st water to soil @ 10:08 } 60 min

Water @ top of soil @ 11:08

Water to top of col @ 11:14

1st Drip start fraccol @ 11:43

1st Sample very pale clear yellow

Subsequent samples clear

PV = 0.075 x 60 min = 4.5

Riverton Col 14 cont

TO2-07 ~~[illegible]~~ 2.5-5

Tube #		Fraction Tube (ml)	Tube Start Date/time	3 Cum Vol ml	4 1PV=45 PV	5 Cum PV	Flow Rate ml/min	Collect Time (hr)	Cum Col time	9 U (ug/L)	10	11	12	13
22	1	7.5	11/27 22:43	165	1.67	36.67	0.075	1.67	36.67	4.3				
23	2	7.5	11/28 0:23	172.5	1.67	38.33	0.075	↓	38.33	4.0				
24	3	6.5	2:03	179	1.44	39.78	0.065	↓	40.00	3.8				
25	4	7.5	3:43	186.5	1.67	41.44	0.075	↓	41.67	3.7				
26	5	7.5	5:23	194	1.67	43.11	0.075	↓	43.33	3.3				
27	6	7.5	7:03	201.5	1.67	44.78	0.075	↓	45.0	3.2				
28	7	7.5	8:43	209	1.67	46.44	0.075	↓	46.67	3.0				
29	8	7.5	10:23	216.5	1.67	48.11	0.075	↓	48.33	2.9				
30	9	7.5	12:03	224	1.67	49.78	0.075	↓	50.0	2.8				
31	10	7.0	13:43	231	1.56	51.33	0.070	↓	51.67	2.7				
32	11	7.0	15:23	238	↓	52.89	0.070	↓	53.33	2.8				
33	12	7.0	17:03	245	↓	54.44	0.070	↓	55	2.7				
34	13	7.0	18:43	252	↓	56.00	0.070	↓	56.67	2.6				
35	14	7.0	20:23	259	↓	57.56	↓	↓	58.33	2.8				
36	15	7.0	22:03	266	↓	59.11	↓	↓	60	2.4		* Tubes 36-41 are short on vol due to frac collector mis-align		
37	16	7.0	23:43	273	↓	60.67	↓	↓	61.67	2.6				
38	17	7.0	11/29 1:23	280	↓	62.22	↓	↓	63.33	2.4				
39	18	7.0	3:03	287	↓	63.78	↓	↓	65	2.3				
40	19	7.0	4:43	294	↓	65.33	↓	↓	66.67	2.5				
41	20	7.0	6:23	301	↓	66.89	↓	↓	68.33	2.1				
42	21	7.0	8:03	308	↓	68.44	↓	↓	70	1.7				
43	22	7.0	9:43	315	↓	70.00	↓	↓	71.67	2.1				
44	23	7.0	11:23	322	↓	71.56	↓	↓	73.33	2.0				
	24	DC Col @ 13:03												
	25													
	26													
	27													
	28													
	29													
	30													
	31													

Riverton Col 15

TO1-05 0-2.5

	1	2	3	4	5	6	7	8	9	10	11	12	13
1/19/12	1	Full Column	Same setup as Col 1,			25ml	Minifit	glass	column	Flow bottom to top			
	2		<2mm sieved frac.										
	3		empty col	~~62.21~~ 63.12									
	4		Col + full	~~95.77~~ 96.74		Soil col. length 11.8cm			Vol 11.8 x 1.7671 = 20.85ml				
	5		full	33.62		Density (dry)		33.62/20.85	= 1.62 g/ml				
	6												
	7												
	8	Fluid in	Tube Start	Cum	1PV= 5.7	Cum	Flow	Collect	Cum	u			
	9	Tube		Vol			Rate	Time	Coll. Time				
Tube #	10	ml	Date/Time	ml	PV	PV	ml/min	hr	hr	(ug/L)			
1	11	9	11/26 12:04	9	1.58	1.58	0.09	1.67	1.67	435.8	Start flow @ 10:30		
2	12	9	13:44	18		3.16			3.33	168.3	1st water to soil @ 10:32		>63
3	13	9	15:24	27		4.74			5.0	116.8	Water to top of soil @ 11:35		
4	14	9	17:04	36		6.32			6.67	90.3	Water to top of col @ 11:41		
5	15	9	18:44	45		7.89			8.33	84.6	1st drip, start fraccol @ 12:04		
6	16	9	20:24	54		9.47			10.00	75.0	1st sample cloudy med yellow/brown		
7	17	9	22:04	63		11.05			11.67	63.9	Darkest sample had ↑ amt. roots		
8	18	9	23:44	72		12.63			13.33	61.1			
9	19	9	11/27 1:24	81		14.21			15.00	30.7			
10	20	9	3:04	90		15.79			16.67	39.2	$\Delta V = 0.09 \times 63 = 5.7$		
11	21	9	4:44	99		17.37			18.33	45.7			
12	22	9	6:24	108		18.95			20.0	50.9	PPT noticed in tubes 1→		
13	23	8.5	8:04	116.5	1.49	20.44	0.085		21.67	33.2			
14	24	8.5	9:44	125	1.49	21.93	0.085		23.33	31.6	↓ cloudiness thru tube 12		
15	25	9	11:24	134	1.58	23.51	0.09		25.0	31.1	clear 13→		
16	26	9	13:04	143		25.09			26.67	30.4			
17	27	9	14:44	152		26.67			28.33	26.9			
18	28	9	16:24	161		28.25			30.00	25.4			
19	29	9	18:04	170		29.82			31.67	23.3			
20	30	9	19:44	179		31.40			33.33	21.2			
21	31	9	21:24	188		32.98			35	22.0			

Riverton Col 15

T01-05 0-2.5

	Tube #	Fluid in tube	Tube start Date/time	Cum Vol ml	1PV=57 PV	Cum PV	Flow Rate ml/min	Collect Time (hr)	Cum Col Time (hr)	U (ug/L)	10	11	12	13
1	22	9	11/27 23:04	197	1.58	34.56	0.090	1.67	36.67	20.0				
2	23	8.5	11/28 0:44	205.5	1.49	36.05	0.085	↓	38.33	19.1				
3	24	8.0	2:24	213.5	1.40	37.46	0.08		40.0	18.4				
4	25	8.5	4:04	222	1.49	38.95	0.085		41.67	17.4				
5	26	8.0	5:44	230	1.40	40.35	0.08		43.33	17.4				
6	27	9	7:24	239	1.58	41.93	0.09		45.00	15.1				
7	28	9	9:04	248	1.58	43.51	0.09		46.67	13.8				
8	29	8.5	10:44	256.5	1.49	45.00	0.085		48.30	13.6				
9	30	8.5	12:24	265	1.49	46.49	0.085		50.00	13.5				
10	31	8.5	14:04	273.5	1.49	47.98	0.085		51.67	12.5				
11	32	8.5	15:44	282	1.49	49.47	0.085		53.33	13.3				
12	33	8.5	17:24	290.5	1.49	50.96	0.085		55.00	10.7				
13	34	8.5	19:04	299	1.49	52.46	0.085		56.67	10.2				
14	35	8	20:44	307	1.49	53.86	0.080		58.33	11.2				
15	36	8	22:24	315	1.49	55.26	0.080		60.00	10.6				
16	37	7.5	11/29 0:04	322.5	1.32	56.58	0.075		61.67	10.5				
17	38	6.5	1:44	329	1.14	57.72	0.065		63.33	10.5				
18	39	6.5	3:24	335.5	1.14	58.86	0.065		65.0	11.4				
19	40	6	5:04	341.5	1.05	59.91	0.060		66.67	11.2				
20	41	6	6:44	347.5	1.05	60.96	0.060		68.33	10.2				
21	42	6	8:24	353.5	1.05	62.02	0.060		70.00	9.3				
22	43	6	10:04	359.5	1.05	63.07	0.060		71.67	9.5				
23	44	6	11:44	365.5	1.05	64.12	0.060	↓	73.33	9.3				
24		DC flow to column 13:24												
25														
26														
27														
28														
29														
30														
31														

Riverton Col 16
TO1-05 2.5-5

	1	2	3	4	5	6	7	8	9	10	11	12	13
12/20/12	1	All Column, Same setup as Col 1		25 mL omnifit glass column. Flow bottom to top									
	2	<2mm sieved fine											
	3	empty col		62.30 g									
	4	col + soil		98.29 g		Soil Col Length = 11.8cm Vol = 11.8			X 1.7671 = 20.85 mL				
	5	soil		35.99 g		Density (g/mL)			35.99 / 20.85 = 1.73 g/mL				
	6												
	7												
	8	Feed in Tube	Tube Start Date/time	Cum Vol	1 PV = 5.1		Flow Rate	Collect Time	Cum. Col time	%			
	9	Tube				Cum							
Tube #	10	(mL)		(mL)	PV	PV	(mL/min)	hr	hr	Eq/0			
1	11	9.5	11/26 11:19	9.5	1.86	1.86	0.095	1.67	1.67	45.2	Start flow @ 10:00		
2	12	9.5	12:59	19.0		3.73			3.33	27.0	1st water to pad @ 10:03		> 54 min
3	13	9.5	14:39	28.5		5.59			5.00	15.2	Water to top of soil 10:57		
4	14	9.5	16:19	38		7.45			6.67	10.4	Water to top of col 11:01		
5	15	9.5	17:59	47.5		9.31			8.33	6.9	1st Drip, start fraction @ 11:19		
6	16	9.5	19:39	57		11.18			10.00	5.7	1st sample very pale clear yellow		
7	17	9.5	21:19	66.6		13.04			Pt. 11.67	4.3			
8	18	9.5	22:59	76		14.9			13.33	3.4	Subsequent samples clear		
9	19	9.5	11/27 0:39	85.5		16.76			15.0	2.6			
10	20	9.5	2:19	95		18.63			16.67	2.1	PV = 0.095 x 54 = 5.1		
11	21	9.5	3:59	104.5		20.49			18.33	1.9			
12	22	9.5	5:39	114		22.35			20.0	1.5			
13	23	9.5	7:19	123.5		24.22			21.67	1.3			
14	24	9.5	8:59	133		26.08			23.33	1.2			
15	25	9.5	10:39	142.5		27.94			25.00	1.3			
16	26	9.5	12:19	152.0		29.80			26.67	1.2			
17	27	9.5	13:59	161.5		31.67			28.33	1.1			
18	28	9.5	15:39	171.0		33.53			30.0	1.1			
19	29	9.5	17:19	180.5		35.39			31.67	1.1			
20	30	9.5	18:59	190		37.25			33.33	0.9			
21	31	9.5	20:39	199.5		39.12			35.00	0.9			

Riverton Col 16

T01-05 2.5-5

Tube #		Fluid in Tube	Start	Cum Vol ml	4 PV	5 PV	6 Rate	Collect Time hr	Cum Col Time	9 U (ug/L)	10	11	12	13
					IPV=5.1	Cum Flow								
22	1	9.5	11/27 22:19	209	1.86	40.98	0.095	1.67	36.67	0.7				
23	2	9.5	23:59	218.5		42.84	0.095		38.33	0.6				
24	3	9.5	11/28 1:39	228		44.71	0.095		40.00	0.6				
25	4	9.5	3:19	237.5		46.57	0.095		41.67	0.4				
26	5	9.5	4:59	247		48.43	0.095		43.33	0.5				
27	6	9.5	6:39	256.5		50.29	0.095		45.00	0.5				
28	7	9.5	8:19	266		52.16	0.095		46.67	0.5				
29	8	9.5	9:59	275.5		54.02	0.095		48.33	0.3				
30	9	9.5	11:39	285		55.88	0.095		50.00	0.5				
31	10	9.5	13:19	294.5	1.86	57.75	0.095		51.67	0.4				
32	11	9	14:59	303.5	1.76	59.51	0.090		53.33	0.5				
33	12	9	16:39	312.5	1.76	61.27	0.090		55.00	0.5				
34	13	9.5	18:19	322	1.86	63.14	0.095		56.67	0.6				
35	14	9.5	19:59	331.5		65.00	0.095		58.33	0.5				
36	15	9.5	21:39	341		66.86	0.095		60.00	0.5				
37	16	9.5	23:19	350.5		68.73	0.095		61.67	0.7				
38	17	9.5	11/29 0:59	360		70.59	0.095		63.33	0.4				
39	18	9.5	2:39	369.5		72.45	0.095		65.00	0.2				
40	19	9.5	4:19	379		74.31	0.095		66.67	0.3				
41	20	9.5	5:59	388.5		76.18	0.095		68.33	0.2				
42	21	9.5	7:39	398		78.04	0.095		70.00	0.4				
43	22	9.5	9:19	407.5		79.90	0.095		71.67	0.2				
44	23	9.5	10:59	417		81.76	0.095		73.33	<0.2				
	24	DC flow to column			12:39									
	25													
	26													
	27													
	28													
	29													
	30													
	31													

Riverton

	1	2	3	4	5	6	7	8	9	10	11	12	13
1													
8/30/12	Receive 65 soil samples from vadose zone obtained during Geoprobe												
3													
4	Sampling event @ Riverton.												
5													
8/31/12 6	Empty sample bags into 14g soil aluminum pans. Disaggregate large												
7	clods for ↑ surface area exposure. Record "wet" weights. and T.B's												
8	listed on sample bags.												
9													
10													
11													
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		1	2	3	4	5	6	7	8	9	10	11	12	13
9/13/12	1	Preparation of Synthetic Pore Fluid					SPF-RVTO1-6-2012.							
	2	Prepared new stock solutions of K_2CO_3, $NaHCO_3$, $CaSO_4 \cdot 2H_2O$, $MgSO_4 \cdot 7H_2O$, $CaCO_3$ and $MgCl_2 \cdot 6H_2O$												
	3	according to the recipe. $CaCO_3$ is a slurry.												
	4													
	5	2L of SPF were made and transfered to a 2L beaker.					pH meter calibrated @ pH 7 and 10.							
	6													
	7	Time	pH				7std = 6.98							
	8	14:15	7.30	without stirring			10std = 10.00							
	9	14:20	7.87	stirring										
	10	14:45	8.24	stirring										
	11	15:15	8.28	stirring										
	12	Added 100mL of 2% HNO_3												
	13	15:20	8.08	Stirring										
	14	15:~~45~~	8.05	Stirring										
	15	~~14:15~~		~~Stirring~~			D/C stirring @ 1600. Cover beaker							
	16													
10/14/12	17	09:30	Soln has been setting				7 std = 7.01							
	18	overnight. Observes white ppt					10 std = 10.01							
	19	(very thin coat) on bottom of beaker.					ck cal of pH meter							
	20													
	21	0930	begin stirring											
	22	0940	8.01											
	23	1015	8.10											
	24	1035	100 ml 2% HNO_3											
	25	1039	7.96											
	26	1107	8.06											
	27	1230	8.10											
	28	+ 100 ml 2% HNO_3												
	29	1250	8.06											
	30	1310	8.11											
	31	+100 ml 2% HNO_3												

		Time	pH	3	4	5	6	7	8	9	10	11	12	13
7/14/12	1	1315	7.94											
	2	1410	8.15		Cum 2% HNO_3									
	3	+200ul 2% HNO_3	=		600ul									
	4	1415	7.86											
	5	1455	8.12											
	6	1550	8.17											
	7	+200ul 2% HNO_3			800ul									
	8	1540	7.89											
	9	1625	8.08											
	10	1715	8.18			DC stir bar, lower, white ppt still present								
	11													
7/17	12	Ck pH Buffers 7=7.00 10=10.01.												
	13	poln. has been pitting, covered, over weekend. white ppt on bottom of beaker												
	14													
0845	15	initial pH = 7.69 increase to 8.04 @ 10"												
~~0940~~	16	0940	8.10											
	17	1105	8.09											
	18													
	19	1300 measure alkalinity on unfiltered sample. Titrated to 60 digits using 1.6N H_2SO_4 in 100mL sample.												
	20	After pH rebounded added 2-3 digit increments and allowed pH to stabilize (10-15min) after each addition.												
	21	Final pH = 4.81 Digits = 94 15:49 Alk = 94mg/L as $CaCO_3$												
	22													
	23	1550 measure alkalinity on a filtered (0.45 μm) sample. Titrated to 45 digits using 1.6N H_2SO_4 in 100mL sample.												
	24	After pH rebounded added 2-3 digit increments and allowed pH to stabilize (10-15min) after each addition.												
	25	Final pH = 4.71 Digits = 47 Alk = 47 mg/L as $CaCO_3$												
	26													
	27	This recipe will not be used because the Alk. and CO_3^{2-} concentrations will not be sufficient. A new recipe will be created by												
	28	S. Morrison and is called SPF-RVTOU-6-2012_ver2												
	29													
	30													
	31													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	SPF-RVT01-6-2012		Solids																		
2		mL per	mg per																		
3		L of	L of	Na	K	Ca	Mg	NH4	SO4	Cl	NO3	C	As	Cd	Mo	Pb	226Ra	Se	U	V	N3
4		Soln	Soln	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L	mg/L	mg/L
5	Liquid Components																				
6	V2O5, V=988mg/L, 2%HNO3	0.00									0.00									0.00	
7	V2O5, V=1000mg/L, 5%HNO3	0.00									0.00									0.00	
8	V2O5, V=1000mg/L, 1.4%HNO3	0.00									0.00									0.00	
9	V2O5, V=1000mg/L, 2%HNO3	0.00									0.00									0.00	
10	Na2MoO4.2H2O, Mo=925mg/L	0.00		0.00											0.00						
11	Na2MoO4.2H2O, Mo=1000 mg/L,	0.00		0.00											0.00						
12	(NH4)2MoO4, 1006 mg/L Mo	0.00						0.00							0.00						
13	U3O8, U=10000mg/L, 3.5%HNO3	0.00									0.00								0.00		
14	U3O8, U=10000mg/L, 5.2%HNO3	0.00									0.00								0.00		
15	U Std, U=1000mg/L, 2% HNO3	0.00									0.00								0.00		
16	Ra Std, Ra=68.7pCi/mL, 2% HNO3	0.00									0.00						0.00				
17	As Std, As=999mg/L, 5%HNO3	0.00									0.00		0.00								
18	As Std, As=1000mg/L, 1.4%HNO3	0.00									0.00		0.00								
19	Se =999 mg/L 5% HNO3 2L	0.00									0.00							0.00			
20	Cd Std = 1000mg/L, ~2% HNO3	0.00									0.00			0.00							
21																					
22	100g/L K2CO3	0.00	0.00		0.00							0.00									
23	10g/L K2CO3 0.6	0.30	3.00		1.70							0.26									
24	10g/L KCl	0.00	0.00		0.00					0.00											
25	50g/L NaHCO3 3.5	1.75	87.50	23.98								12.50									
26	100g/L Na2SO4.10H2O	0.00	0.00	0.00					0.00												
27	100g/L Na2SO4.(0.89 H2O)	0.00	0.00	0.00					0.00												
28	500g/L (NH4)2SO4	0.00	0.00					0.00	0.00												
29	1.5g/L CaSO4.2H2O 150	75.00	112.50			26.20			62.76												
30	1.2 g/L CaSO4	0.00	0.00			0.00			0.00												
31	200g/L MgSO4.7H2O 1.5	0.75	150.00				14.80		58.47												
32	100g/L K2SO4	0.00	0.00		0.00				0.00												
33	conc H2SO4(36N)	0.00							0.00												
34	927.2 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
35	92.72 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
36	10 g/L CaCO3 (slurry) 12	6.00	60.00			24.03						7.19									
37	300g/L NaCl	0.00	0.00	0.00						0.00											
38	100g/L MgCl2.6H2O 0.22	0.11	11.00				1.31			3.84											
39	100g/L NH4Cl	0.00	0.00					0.00		0.00											
40	100g/L NaNO3	0.00	0.00	0.00							0.00										
41	2% HNO3	0.00									0.00										
42	mL 1N NaOH needed to neutralize	0.00		0.00																	
43	65.67 g/L NaN3	0.00	0.00	0.00																	0
44																					
45																					
46																					
47	Totals (mg/L)	83.91		23.98	1.70	50.23	16.11	0.00	121.23	3.84	0.00	19.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	ACTUAL (mg/L)			24.00	1.70	48.00	16.00	?	120.00	3.80	?	27.80	?	?	?	?	?	?	?	?	?
49	Totals (mol/L)			1.04E-03	4.34E-05	1.25E-03	6.63E-04	0.00E+00	1.26E-03	1.08E-04	0.00E+00	1.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50																					
51	ACTUAL pH	7.99																			
52	Measured pH(no acid or base)	?																			
53	Measured pH (_____added)																				
54	ACTUAL Alk (mg/L CaCO3)	118.00																			
55	Measure Alk (no acid or base)	?																			
56	Measure Alk (_____added)																				
57	EQ Acid per Liter	0																			
58																					
59																					

		1	2	3	4	5	6	7	8	9	10	11	12	13
9/18/12	1	Preparation of new Synthetic Pore Fluid					SPF-RVT01-6-2012_ver2.			(SPF2)	See attached recipe.			
	2													
10:48	3	1L of SPF2 was made and transfered to a 1L beaker.						pH meter cal. checked						
	4													
	5	pH 7 = 7.01		pH 10 = 10.02										
	6													
	7	Pore fluid stirred while exposed to the atmosphere and pH readings taken.												
	8	Time	pH											
	9	1050	7.95											1.6N H_2SO_4
	10	1100	8.38		1105 Alk measured.		pH final = 4.81		Digits = 107		Alk = 107 mg/L as $CaCO_3$			100mL sample
	11	1130	8.37											
	12	1215 1230	8.43		1415 pH 8.42 Alk. measurment			100mL sample, 1.6N H_2SO_4						
	13	1300	8.43			pH final =		Digits = 103			Alk = 103 mg/L as $CaCO_3$			
	14	1400	8.45											
	15	1500												
	16	Adding Acid (2% HNO_3) to ~300mL of SPF2												
	17	Time	Acid Addition (uL)		pH									
	18	14:25	0	Cum	8.37									
	19	14:40	0	↓	8.45									
	20	14:41	50uL	50	8.19									
	21	14:46	50uL	100	7.94									
	22	14:52			7.97									
	23	15:48			8.30									
	24	16:15			8.36									
	25													
	26													
	27													
	28													
	29													
	30													
	31													

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	SPF-RVT01-8-2012		Solids																		
2		mL per	mg per																		
3		L of	L of	Na	K	Ca	Mg	NH4	SO4	Cl	NO3	C	As	Cd	Mo	Pb	226Ra	Se	U	V	N3
4		Soln	Soln	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L	mg/L	mg/L
5	Liquid Components																				
6	V2O5, V=998mg/L, 2%HNO3	0.00									0.00									0.00	
7	V2O5, V=1000mg/L, 5%HNO3	0.00									0.00									0.00	
8	V2O5, V=1000mg/L, 1.4%HNO3	0.00									0.00									0.00	
9	V2O5, V=1000mg/L, 2%HNO3	0.00									0.00									0.00	
10	Na2MoO4.2H2O, Mo=925mg/L	0.00		0.00											0.00						
11	Na2MoO4.2H2O, Mo=1000 mg/L,	0.00		0.00											0.00						
12	(NH4)2MoO4, 1006 mg/L Mo	0.00						0.00							0.00						
13	U3O8, U=10000mg/L, 3.5%HNO3	0.00									0.00								0.00		
14	U3O8, U=10000mg/L, 5.2%HNO3	0.00									0.00								0.00		
15	U Std, U=1000mg/L, 2% HNO3	0.00									0.00								0.00		
16	Ra Std, Ra=68.7pCi/mL, 2% HNO3	0.00									0.00						0.00				
17	As Std, As=999mg/L, 5%HNO3	0.00									0.00		0.00								
18	As Std, As=1000mg/L, 1.4%HNO3	0.00									0.00		0.00								
19	Se =999 mg/L 5% HNO3	0.00									0.00							0.00			
20	Cd Std = 1000mg/L, ~2% HNO3	0.00									0.00			0.00							
21																					
22	100g/L K2CO3	0.00	0.00		0.00							0.00									
23	10g/L K2CO3	0.30	3.00		1.70							0.26									
24	10g/L KCl	0.00	0.00		0.00					0.00											
25	50g/L NaHCO3	4.00	200.00	54.76								28.57									
26	100g/L Na2SO4.10H2O	0.00	0.00	0.00					0.00												
27	100g/L Na2SO4.(0.89 H2O)	0.00	0.00	0.00					0.00												
28	500g/L (NH4)2SO4	0.00	0.00					0.00	0.00												
29	1.5g/L CaSO4.2H2O	75.00	112.50			26.20			62.76												
30	1.2 g/L CaSO4	0.00	0.00			0.00			0.00												
31	200g/L MgSO4.7H2O	0.75	150.00				14.80		58.47												
32	100g/L K2SO4	0.00	0.00		0.00				0.00												
33	conc H2SO4(36N)	0.00							0.00												
34	927.2 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
35	92.72 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
36	10 g/L CaCO3 (slurry)	0.00	0.00			0.00						0.00									
37	300g/L NaCl	0.00	0.00	0.00						0.00											
38	100g/L MgCl2.6H2O	0.11	11.00				1.31			3.84											
39	100g/L NH4Cl	0.00	0.00					0.00		0.00											
40	100g/L NaNO3	0.00	0.00	0.00							0.00										
41	2% HNO3	0.00									0.00										
42	mL 1N NaOH needed to neutralize	0.00		0.00																	
43	66.67 g/L NaN3	0.00	0.00	0.00																	0
44																					
45																					
46																					
47	Totals (mg/L)	80.16		54.76	1.70	26.20	16.11	0.00	121.23	3.84	0.00	28.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	ACTUAL (mg/L)			24.00	1.70	48.00	16.00	?	120.00	3.80	?	27.80	?	?	?	?	?	?	?	?	?
49	Totals (mol/L)			2.38E-03	4.34E-05	6.54E-04	6.63E-04	0.00E+00	1.26E-03	1.08E-04	0.00E+00	2.40E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50																					
51	ACTUAL pH	7.99																			
52	Measured pH(no acid or base)	?																			
53	Measured pH (_____added)																				
54	ACTUAL Alk (mg/L CaCO3)	116.00																			
55	Measure Alk (no acid or base)	?																			
56	Measure Alk (_____added)																				
57	EQ Acid per Liter	0																			
58																					
59																					

Riverton Synthetic Pore Fluid

9/18/12 Preparation of new Synthetic Pore Fluid SPF-RVT01-6-2012-ver3 (SPF3). See attached recipe.

Premise: While working with SPF1 and SPF2, it appears the solution is equilibrating with the atmosphere driving pH to increase over time (to about 8.3). We could bubble CO_2 into it to bring pH down (w/o upsetting NO_3, Cl by adding acids continually) but as soon as the solution contacts the sediment, there will be equilibration with the mineral mass. Since our goal is to examine U removal, we decided to err on the high side for C, Ca, and pH, by increasing alk w/ $NaHCO_3$. This causes Na to be a bit high and Mg a bit low.

1700 Prepared new Pore Fluid SPF3. See attached recipie. 1L of SPF3 was made and transfered to a 1L beaker.

Alk measured and was approx, 135 mg/L as $CaCO_3$

9/19/12 0540 pH of SPF3 soln made yesterday @ 1700 was 7.42. Turned on stir rod.

0625 pH of SPF3 = 7.65

0630 check pH probe calibration pH7 = 7.11 pH10 = 10.11 pH 4 = 3.97

0635 Re-Cal pH probe @4,7 and 10 and check stds. 4 = 3.98 7 = 6.99 10 = 9.98

0645 pH of SPF3 = 7.61

0700 measure alk on SPF3 initial pH 7.70 final pH = 4.79 Digits = 137 Alk = 137 mg/L as $CaCO_3$

0802 pH = 7.8

803 Prepared new 1L batch of SPF-1 (to see if $CaCO_3$ will dissolve w/ addition of CO_2)

804 pH = 8.41

806 pH = 8.45

807 Bubbled CO_2 for an instant

808 pH = 7.74 Alk = 52 mg/L $CaCO_3$

827 pH = 7.38

8:29 pH = 7.52

8:56 pH = 8.02

		1	2	3	4	5	6	7	8	9	10	11	12	13
9/19/12	1	1125	Prepared 6L of SPF3 according to recipie. Made it in 3 2L batches and combined in a											
	2		10L LDPE cube w/ a spigot.											
	3													
	4	13:14	pH = 8.44											
	5	13:17	Bubbled very small amt of CO_2											
	6	13:19	pH = 7.79											
	7	13:22	pH = 7.71											
	8	13:32	pH = 7.53											
	9	15:07	pH = 7.75											
	10	15:20	measure alkalinity			Final pH = 4.78		Digits = 136		Alk. = 136 mg/L as $CaCO_3$				
	11	16:00	pH = 7.89											
	12	- Headspace pushed out of cube and cube sealed to sit overnight.												
	13													
	14	IC run	ran overnight. Sample measured for				Cl^-, NO_3^-, SO_4^{2-}.		Cl^- = 3.8 mg/L,	NO_3^- = <0.5 mg/L,		SO_4^{2-} = 122 mg/L		
	15													
9/20/12	16	0800	pH probe checked		4 std = 4.00		7 std = 7.01		10 std = 9.98					
	17													
	18	0805	SPF 3 uncapped and pH measured while stirring.						pH = 7.86					
	19	0815	Alk measured.		Final pH = 4.76		Digits = 132			Alk = 132 mg/L as $CaCO_3$				
	20	~~0830~~	~~pH =~~											
	21	0830	Begin Extractions		5 min, 15 min, 30 min, 1 hr, 2 hrs									
	22	1600	pH = 8.06											
	23	1605	Start the 16 hr extraction											
	24													
9/21/12	25	Check pH probe		4 = 4.01	7 = 7.02	10 = 9.97								
	26	0815	measure pH of SPF3.		pH = 8.15									
	27	0830	Begin the 4 and 8 hr extractions											
	28	0845	measure alkalinity		pH final = 4.74		Digits = 133			Alkalinity = 133 mg/L as $CaCO_3$				
	29													
	30													
9/27/12	31	Cation analysis on Acidified split of SPF3.					Mg = 2.21 mg/L		Ca = 49.1 mg/L	Na = 69.0 mg/L		K = 1.50 mg/L		

SPF-F 012_ver2.xls

SPF3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	SPF-RVT01-6-2012		Solids																		
2		mL per	mg per																		
3		L of	L of	Na	K	Ca	Mg	NH4	SO4	Cl	NO3	C	As	Cd	Mo	Pb	226Ra	Se	U	V	N3
4		Soln	Soln	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L	mg/L	mg/L
5	Liquid Components																				
6	V2O5, V=998mg/L, 2%HNO3	0.00									0.00									0.00	
7	V2O5, V=1000mg/L, 5%HNO3	0.00									0.00									0.00	
8	V2O5, V=1000mg/L, 1.4%HNO3	0.00									0.00									0.00	
9	V2O5, V=1000mg/L, 2%HNO3	0.00									0.00									0.00	
10	Na2MoO4.2H2O, Mo=925mg/L	0.00		0.00											0.00						
11	Na2MoO4.2H2O, Mo=1000 mg/L,	0.00		0.00											0.00						
12	(NH4)2MoO4, 1006 mg/L Mo	0.00						0.00							0.00						
13	U3O8, U=10000mg/L, 3.5%HNO3	0.00									0.00								0.00		
14	U3O8, U=10000mg/L, 5.2%HNO3	0.00									0.00								0.00		
15	U Std, U=1000mg/L, 2% HNO3	0.00									0.00								0.00		
16	Ra Std, Ra=68.7pCi/mL, 2% HNO3	0.00									0.00						0.00				
17	As Std, As=999mg/L, 5%HNO3	0.00									0.00		0.00								
18	As Std, As=1000mg/L, 1.4%HNO3	0.00									0.00		0.00								
19	Se =999 mg/L 5% HNO3	0.00									0.00							0.00			
20	Cd Std = 1000mg/L, ~2% HNO3	0.00									0.00			0.00							
21	2L																				
22	100g/L K2CO3	0.00	0.00		0.00							0.00									
23	10g/L K2CO3 0.6	0.30	3.00		1.70							0.26									
24	10g/L KCl	0.00	0.00		0.00					0.00											
25	50g/L NaHCO3 10	5.00	250.00	68.45								35.71									
26	100g/L Na2SO4.10H2O	0.00	0.00	0.00					0.00												
27	100g/L Na2SO4.(0.69 H2O)	0.00	0.00	0.00					0.00												
28	500g/L (NH4)2SO4	0.00	0.00					0.00	0.00												
29	1.5g/L CaSO4.2H2O 280	140.00	210.00			48.91			117.15												
30	1.2 g/L CaSO4	0.00	0.00			0.00			0.00												
31	200g/L MgSO4.7H2O 0.08	0.04	7.60				0.75		2.96												
32	100g/L K2SO4	0.00	0.00		0.00				0.00												
33	conc H2SO4(36N)	0.00							0.00												
34	927.2 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
35	92.72 g/L CaCl2.2H2O	0.00	0.00			0.00				0.00											
36	10 g/L CaCO3 (slurry)	0.00	0.00			0.00						0.00									
37	300g/L NaCl	0.00	0.00	0.00						0.00											
38	100g/L MgCl2.6H2O 0.22	0.11	11.00				1.31			3.84											
39	100g/L NH4Cl	0.00	0.00					0.00		0.00											
40	100g/L NaNO3	0.00	0.00	0.00							0.00										
41	2% HNO3	0.00									0.00										
42	mL 1N NaOH needed to neutralize	0.00		0.00																	
43	66.67 g/L NaN3	0.00	0.00	0.00																	0
44																					
45																					
46																					
47	Totals (mg/L)	145.45		68.45	1.70	48.91	2.06	0.00	120.12	3.84	0.00	35.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	ACTUAL (mg/L)			24.00	1.70	48.00	16.00	?	120.00	3.80	?	27.80	?	?	?	?	?	?	?	?	?
49	Totals (mol/L)			2.98E-03	4.34E-05	1.22E-03	8.49E-05	0.00E+00	1.25E-03	1.08E-04	0.00E+00	3.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
50																					
51	ACTUAL pH	7.99																			
52	Measured pH(no acid or base)	?																			
53	Measured pH (_____added)																				
54	ACTUAL Alk (mg/L CaCO3)	116.00																			
55	Measure Alk (no acid or base)	?																			
56	Measure Alk (_____added)																				
57	EQ Acid per Liter	0																			
58																					
59																					

Riverton Synthetic Pore Fluid

		1	2	3	4	5	6	7	8	9	10	11	12	13
10/2/12	1	Preparation of riverton synthetic pore fluid for Batch Tests. Pore fluid is SPF3 the same as used for the												
	2	kinetic tests. Prepared 16L of SPF3. Measured pH ~~and alkalinity~~ before any pH adjustments.												
	3													
	4	14:30	Check pH stds.		4 = 4.00		7 = 7.01		10 = 9.97					
	5	14:35	pH of SPF3 = 8.13											
	6	14:45	pH = 8.39											
	7	15:00	pH = 8.40											
	8	Bubble small amt of CO_2 into SPF3.												
	9	15:15	pH = 7.30											
	10	16:00	pH = 7.20											
	11	16:40	pH = 7.24											
	12	16:45	measure alkalinity.	Starting pH = 7.31			final pH = 4.80			Digits = 135	using 1.6N H_2SO_4			
	13													
	14		Alkalinity = 135 mg/L as $CaCO_3$											
	15	1700	pH = 7.24											
	16	Stir Plate off.												
	17													
10/3/12	18	0720 Stir plate on. pH = 7.41												
	19	0810	pH = 7.50											
	20	1015	pH = 7.70											
	21	1045	pH = 7.76											
	22	1135	pH = 7.84											
	23	Stopped Stir bar. Removed as much air from container as possible and sealed.												
	24	Measured SPF3 for Anions.	Cl = 3.9 mg/L		NO_3 = <0.5 mg/L		SO_4 = 124 mg/L							
	25													
10/4/12	26	Check pH stds.	4 = 4.03		7 = 7.02		10 = 9.98							
	27	0900	SPF3 pH = 7.83											
	28	Sealed back up. Will start batch tests on monday 10/8/12.												
	29	Took a 50mL split and acidified for Cation Analysis.												
	30													
	31	1630	Cation Analysis		Mg = ~~2.3~~ 2.25		Ca = 49.7		Na = 68.9		K = 1.57			

Rueton Syn. Pore Fluid

		1	2	3	4	5	6	7	8	9	10	11	12	13
10/8/12	1	Check pH stds.		4= 4.04		7= 7.01		10=						
	2	0845 measure pH of SPF3:												
	3	0945 pH = 7.99												
	4	Cube sealed and an alk. measurement made.												
	5	1.6N H_2SO_4 digits for 100mL sample = 133						Final pH = 4.79	Alk = 133 mg/L as $CaCO_3$					
	6													
	7	1130 Start 1st round of batch tests.												
	8													
10/15/12	9	Ck pH stds		4= 4.02		7= 7.04		10= 10.07						
	10													
	11	0820	Ck pH SPF3 = 7.96											
	12		alk = 124 mg/L as $CaCO_3$				@ 1.6N H_2SO_4, 100mL sample final pH 4.51							
	13													
	14	0845	Start round #2 of batch											
	15													
	16													
10/16/12	17	0905	check pH stds		4= 4.08		7= 7.04		10= 10.07					
	18													
	19	0910	check pH SPF3 = 8.03											
	20		alk = 131 mg/L as $CaCO_3$				1.6N H_2SO_4, 100mL sample			final pH = 4.79				
	21													
	22													
10/17/12	23	0800	check pH stds		4= 4.07		7= 7.02		10= 10.01					
	24													
	25	0805	check pH of SPF3 = 8.02											
	26		alk = 133 mg/L as $CaCO_3$				1.6N H_2SO_4, 100 mL sample			final pH = 4.82				
	27													
10/18	28	0830	check pH stds		4= 4.06		7= 7.01		10= 9.99					
	29													
	30	0835	Check pH of SPF3 = 8.04											
	31		alk = 131 mg/L as $CaCO_3$				1.6N H_2SO_4, 100mL sample			final pH = 4.78				

Riverton Syn Pore Fluid

	1	2	3	4	5	6	7	8	9	10	11	12	13
10/22/12	ck pH stds		4=	4.04	7=	7.06		10 = 10.09					
2													
3	pH SPF 3 = 8.05												
4	alk = 130 mg/L as CaCO3					1.6N H_2SO_4		100 ml sample	final pH =	4.65			
5													
6													
10/23/12	ck pH stds		4=4.09		7=7.05		10=10.08						
8													
9	pH SPF 3 = 8.00												
10	alk = 127 mg/L as CaCO3					1.6N H_2SO_4		100 ml sample	final pH =	4.60			
11													
12													
13													
14													
15													
16													
17													
18													
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21													
22													
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27													
28													
29													
30													
31													

9/7 Humidity 51% @ 1:15am
9/10 Humidity 44% @ 7:25am
9/13 Humidity 42% @ 8:15am
9/17 Humidity 36% @ 8:30am
9/18 Humidity 34% @ 9:00am
9/19 Humidity 35%
9/24 Humidity 46%

Riverton Soils LOD

DATE TIME

Sample		2	3 Tare	4	Gross Depth	7	8	9	10	11	12	13
1			14.0									
2				9/24	9/31	9/7	9/10	9/13	9/17	9/18		9/19
T01-05	0-2.5			—	1535.3	1505.0	1503.2	1503.2	1501.5	1500.8		1500.6
4	2.5-3.5			—	931.5	909.0	908.7	908.7	908.4	908.1	TD 3.5	908.1
5												
T01-06	0-2.5			1610.3	1632.9	1614.4	1613.2	1613.5	1611.8	1611.0	TD 3.6	1610.8
7	2.5-3.6			1333.7	1395.4	1335.3	1334.8	1334.7	1334.2	1334.0		1333.9
T01-08	0-2.5			1117.3	1231.2	1145.5	1131.1	1126.4	1120.9	1119.1	TD 2.2	1118.6
NS	2.5→5				—							
10												
11												
T02-07	0-2.5			2132.1	2157.0	2139.5	2137.2	2136.8	2134.5	2133.3	TD 3.3	2133.0
13	2.5-3.3			955.8	970.9	957.1	956.7	956.6	956.2	956.1		956.0
14												
T02-08	0-2.5			1272.9	1426.0	1316.7	1298.1	1287.0	1278.5	1276.2		1275.1
16	2.5-4.1			962.5	1209.6	1016.6	982.2	966.5	964.1	963.3	TD 4.1	963.1
17												
T02-09	0-2.5			1365.9	1414.6	1374.7	1371.4	1371.0	1368.1	1366.9	TD 5	1366.6
19	2.5-5			1317.7	1340.3	1319.8	1319.1	1319.1	1318.3	1317.9		1317.9
20												
T03-10	0-2.5			—	1384.8	1318.5	1309.0	1306.1	1301.3	1299.8		1299.3
22	2.5-5			—	879.8	811.5	800.1	799.2	796.1	795.2	TD 3.9	795.1
23												
T03-11	0-2.5			1717.4	1759.3	1729.7	1725.5	1724.6	1721.0	1719.4		1718.9
25	2.5-5			1171.2	1177.8	1172.5	1172.1	1172.0	1171.6	1171.3	TD 3.55'	1171.3
26												
T03-12	0-2.5			1224.3	1335.3	1258.6	1242.0	1234.4	1227.9	1226.2		1225.6
28	2.5-5			811.7	920.0	830.8	818.0	816.2	813.1	812.2	TD 4 inches	812.1
29												
30												
31					17							

Rw5

	1	2	3	4	5 [illegible] 8/31	6 9/7	7 9/10	8 9/13	9 9/17	10 TD	11 9/18	12 9/19	13 9/24
T04-08	0-2.5				1000.5	971.8	970.2	970.4	968.6		967.9	967.8	967.4
	2.5-5				1667.6	1653.1	1652.3	1652.3	1651.4	4.3	1650.9	1650.8	1650.4
T04-09	0-2.5				959.5	908.4	899.2	897.3	893.0		891.7	891.3	890.5
	2.5-5				1421.9	1391.5	1386.1	1384.7	1382.1	3.8	1381.1	1380.9	1380.2
T04-10	0-2.5				1464.5	1428.8	1424.6	1424.3	1421.0		1419.8	1419.2	1417.9
	2.5-5				868.5	863.2	862.8	862.7	862.4	3.1	862.2	862.2	862.0
										~~3.1~~			
T04-11	0-2.5				1441.6	1344.4	1321.5	1300.9	1285.1		1280.9	1278.4	1272.8
	2.5-5				1091.6	1020.9	1005.2	998.6	993.0	3.7	991.5	990.8	989.4
T04-12	0-2.5				1621.3	1499.5	1478.4	1469.9	1463.2	2.5	1461.5	1460.6	1459.1
	2.5-5				NS								
T05-1	0-2.5				1160.3	1133.0	1131.2	1131.2	1128.8		1128.0	1127.9	1127.3
	2.5-5				847.9	836.1	835.5	835.4	834.4	3.8	834.0	834.0	833.9
T05-2	0-2.5			—	1717.9	1546.4	1507.9	1463.6	1450.6		1446.9	1444.8	—
	2.5-5			—	613.9	598.6	598.1	598.1	597.6	2.9	597.3	597.3	—
T05-3	0-2.5				1111.6	1057.7	1048.5	1046.7	1041.9		1040.6	1040.3	1039.3
	2.5-5				1379.6	1284.5	1262.9	1247.5	1240.8	4.6	1238.5	1237.4	1234.7

15

Riverton

Sample		Tare 14	Gross Wet 8/31	9/7	9/10	9/13	TD	9/17	9/18	9/19	9/24
T06-08	0-2.5		1935.2	1924.5	1922.5	1922.5		1920.8	1920.0	1919.6	1918.9
	2.5-5		729.6	723.8	723.4	723.3		723.0	722.9	722.9	722.8
T06-09	0-2.5		1717.3	1708.3	1706.6	1706.7		1704.8	1704.0	1703.9	1703.2
	2.5-5		1200.6	1196.3	1196.1	1196.0	3.4	1195.9	1195.8	1195.8	1195.6
T06-10	0-2.5		1515.2	1505.5	1503.9	1504.0		1502.1	1501.4	1501.2	1500.8
	2.5-5		877.6	868.6	867.8	867.8	3.5	867.1	866.8	866.8	866.4
T06-11	0-2.5		1485.0	1377.9	1357.5	1349.4		1342.0	1340.1	1339.2	1337.3
	2.5-5		896.5	868.9	867.5	867.5	3.8	866.1	865.7	865.7	865.6
T06-12	0-2.5		1357.5	1293.2	1277.0	1266.9		1258.6	1256.6	1255.8	1254.5
	2.5-5		773.6	768.3	768.1	768.1	3.3	767.8	767.8	767.7	767.7
T06-13	0-2.5		1275.6	1244.9	1241.3	1241.2		1238.4	1237.4	1237.2	1236.7
	2.5-5		1388.8	1371.5	1370.2	1370.5	4.1	1368.7	1368.0	1367.9	1367.5

Riverton

Sample		2	3	4 Tare 14	5 9/24	6 Gross Wet 8/31	7 9/7	8 9/10	9 9/13	10 TD	11 9/17	12 9/18	13 9/19
TOT-03	0-2.5				1804.0	1825.4	1812.1	1809.5	1809.3		1806.6	1805.4	1805.0
3	2.5-5				1269.4	1278.0	1270.9	1270.4	1270.4	3.6	1269.9	1269.7	1269.7
4													
TOT-04	0-2.5				1787.8	1812.0	1797.0	1794.0	1793.4		1790.7	1789.4	1788.8
6	2.5-5				457.5	459.3	457.9	457.8	457.7	3.1	457.6	457.6	457.5
7													
TOT-05	0-2.5				1613.1	1649.6	1624.4	1620.4	1619.7		1616.4	1615.0	1614.3
9	2.5-5				1334.9	1347.9	1336.4	1336.0	1336.0	3.6	1335.4	1335.2	1335.1
10													
TOT-06	0-2.5				1645.1	1693.9	1662.7	1655.5	1653.0		1648.7	1647.0	1646.3
12	2.5-5				1506.1	1519.2	1508.4	1507.6	1507.6	4.0	1506.8	1506.5	1506.5
13													
TOT-07	0-2.5				2000.0	2023.2	2007.3	2004.8	2004.2		2002.1	2001.0	2000.6
15	2.5-5				442.5	449.8	443.0	442.9	442.8	2.9	442.7	442.6	442.6
16													
~~TOT-08~~													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													

9/24 ← (9/19)

Sample	Depth	3	Tare 14	9/19	Gross Wet 8/31	9/7	9/10	9/13	ID	9/17	9/18
T08-02	0-2.5		1086.9	1090.4	1273.7	1155.0	1128.0	1103.6		1094.6	1092.0
	2.5-5				N.S.						
T08-03	0-2.5		—	832.9	886.8	844.9	839.4	838.5		834.5	833.3
	2.5-5		—	1005.5	1046.7	1013.5	1009.8	1009.6		1006.7	1005.8
T08-04	0-2.5		1154.6	1156.5	1226.2	1181.1	1169.4	1165.5		1159.4	1157.3
	2.5-5		970.1	970.3	978.8	971.5	971.0	971.0	4.0	970.6	970.3
T08-05	0-2.5		1247.2	1249.3	1326.7	1271.4	1261.1	1258.0		1252.1	1250.2
	2.5-5		1787.6	1788.0	1809.4	1793.2	1790.5	1790.4	4.3	1788.7	1788.2
T08-06	0-2.5		952.5	953.3	1022.7	970.9	961.3	958.8		954.8	953.6
	2.5-5		1308.7	1309.6	1355.1	1321.0	1314.8	1313.7	4.1	1310.8	1309.8
T09-08	0-2.5		1228.3	1229.2	1292.0	1244.5	1236.3	1234.5		1230.8	1229.6
	2.5-5		1044.7	1045.1	1155.5	1064.9	1051.6	1049.3	4.1	1046.2	1045.3

9/19/12 Mettler PE16 Scale Check X12680

Weight set 5182	
100g	100.0
200g	200.0
500g	500.0
1000g	1000.0
2000g	2000.0
5000g	5000.1

Riverton Sieving Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13
9/19/12	Sieving the 8 soil samples that will be used for the kinetic tests. Sieving them +/- 2mm.												
	Plating samples on shaker for 5 min. No other disaggregation methods performed, unless noted												
				Tare(g)		Gross(g)		Net(g)	Comments				
Sample	T01-05	0-2.5							Many roots and plant materials. Large cobbles up to 1.5"				
	Sieve	#10 (2mm)		561.9		1361.9		800.0					
		Pan		358.6		1043.9		685.3					
	T01-05	2.5-5							Large cobbles up to 1.5"				
		#10		561.9		1246.8		684.9					
		Pan		358.6		567.8		209.2					
	T03-10	0-2.5							Some roots and sticks				
		#10		561.9		813.7		251.8					
		Pan		358.5		1391.1		1032.6					
	T03-10	2.5-5											
		#10		561.9		763.7		201.8					
		Pan		358.6		937.6		579.0					

Riverton

	1	2	3	4 Tare(g)	5	Gross(g) 7	Net(g)	Comments 10	11	12	13
9/19/12 1	TOS-02	0-2.5						Many roots. Very light disaggregation w/ motar +			
2								pestil.			
3	Sieve	#10		561.9		564.9	3.0				
4		Pan		358.6		1783.1	1424.5				
5											
6											
7	TOS-02	2.5-5						Large cobbles up to 2"			
8											
9		#10		561.9		1012.5	450.6				
10		Pan		358.6		491.3	132.7				
11											
12											
13	TOS-03	0-2.5						Many roots, a lot of plant material including the base of			
14								a grass plant. Organic soil clumps. Very light disaggrega			
15		#10		561.9		596.1	34.2	w/ motar and pestil.			
16		Pan		358.6		1138.4	779.8				
17											
18											
19	TOS-03	2.5-5						Many small root fragments			
20											
21		#10		561.9		562.4	0.5				
22		Pan		358.6		1347.6	989.0				
23											
24											
25											
26											
27											
28											
29											
30											
31											

Riverton Kinetic Tests

		1	2	3	4	5	6	7	8	9	10	11	12	13
9/20/12	1	Began series of kinetic tests. Tests involve placing 1g of soil that has been air dried and sieved <2mm into a												
	2	50 mL centrifuge tube. To this soil was added 50 mL of Synthetic Pore Fluid (SPF3). Samples placed on end-												
	3	over-end shaker for prescribed amount of time. Samples then centrifuged for 10 min @ 3500 rpm and												
	4	decanted into seperate 50mL centrifuge tubes. From these tubes samples were syringe filtered through 0.45 μm												
	5	nylon acrodisk filters into a third centrifuge tube. ~~Samples acidified w/ HNO3~~ If needed samples were brought to volume (50m												
	6	w/ SPF3. Samples then acidified w/ 100 μL conc. HNO_3 for a pH <2. Samples were												
	7													
	8	TO1-05 U		TO3-10 U		TO5-02 U		TO8-03 U						
	9	TO1-05 L		TO3-10 L		TO5-02 L		TO8-03 L						
	10													
	11	The U and L designations refer to upper and lower core samples. Holes were divided into two samples 0-2.5' and												
	12	2.5-5' of a specified TD. Upper refers to the 0-2.5' sample and Lower refers to the 2.5-5 or other TD sample.												
	13													
	14	Tests run today were the 5min, 15min, 30min, 1hr, 2hr tests and the 16hr test was started to run overnight and finish												
	15	tomorrow.												
	16													
9/22/12	17	The 16 hr test was completed. The 4 and 8 hr tests were started and completed. The 48 and 96 hr tests were												
	18	placed on the end-over-end shaker.												
	19													
9/23/12	20	The 48 hr test was removed, centrifuged, fitered and acidified.												
	21													
9/25/12	22	The 96 hr test was removed from the stir bar, centrifuged, filtered and acidified.												
	23													
	24	Note: DL measured on Riv. SPF3 at beginning and end of experiment (15min, 96hrs)												
	25	DL ~0.2 ug/L												
	26													
	27													
	28													
	29													
	30													
	31													

9/19/12 Riverton Kinetic Tests <2mm fraction 1g soil in 50mL SPF3

	1	2	3	4	Mass of Soil (g)	7	8	9	10	11	12	13
5min Tests		Sample		U (ug/L)		15min Tests		Sample		Mass of soil (g) U(ug/L)		
2												
3		T01-05	0-2.5	3.6	1.00			T01-05	0-2.5	4.2	1.00	
4		T01-05	2.5-5	0.3	1.00			T01-05	2.5-5	0.8	1.00	
5												
6		T03-10	0-2.5	0.7	1.00			T03-10	0-2.5	0.9	1.00	
7		T03-10	2.5-5	3.6	1.00			T03-10	2.5-5	4.5	1.00	
8												
9		T05-02	0-2.5	40.6	1.00			T05-02	0-2.5	47.0	1.00	
10		T05-02	2.5-5	16.4	1.00			T05-02	2.5-5	20.1	1.00	
11												
12		T08-03	0-2.5	19.6	1.00			T08-03	0-2.5	22.9	1.00	
13		T08-03	2.5-5	24.4	1.00			T08-03	2.5-5	27.5	1.00	
14												
15												
16												
0min Tests		Sample		U(ug/L)	Mass of Soil (g)	1hr Tests		Sample		Mass of U (ug/L)	Soil (g)	
18												
19		T01-05	0-2.5	4.8	1.00			T01-05	0-2.5	5.2	1.00	
20		T01-05	2.5-5	1.0	1.00			T01-05	2.5-5	<0.2	1.00	
21												
22		T03-10	0-2.5	1.1	1.00			T03-10	0-2.5	0.8	1.00	
23		T03-10	2.5-5	5.0	1.00			T03-10	2.5-5	5.3	1.00	
24												
25		T05-02	0-2.5	54.9	1.00			T05-02	0-2.5	57.3	1.00	
26		T05-02	2.5-5	22.1	1.00			T05-02	2.5-5	23.9	1.00	
27												
28		T08-03	0-2.5	25.6	1.00			T08-03	0-2.5	27.4	1.00	
29		T08-03	2.5-5	31.5	1.00			T08-03	2.5-5	34.1	1.00	
30												
31												

9/20/12 Riverton Kinetic Tests <2mm Fraction 1g soil in 50mL SPF3

9/19/12

	1	2	3	4	5	6	7	8	9	10	11	12	13
2	2hr Tests	Sample		u (ug/L)	Mass of Soil (g)		4hrs Tests	Sample		u (ug/L)	Mass of Soil (g)		
3		TO1-05	0-2.5	5.5	1.00			TO1-05	0-2.5	3.9	1.00		
4		TO1-05	2.5-5	0.3	1.00			TO1-05	2.5-5	0.3	1.00		
5													
6		TO3-10	0-2.5	1.5	1.00			TO3-10	0-2.5	2.3	1.00		
7		TO3-10	2.5-5	5.6	1.00			TO3-10	2.5-5	6.1	1.00		
8													
9		TO5-02	0-2.5	60.1	1.00			TO5-02	0-2.5	63.3	1.00		
10		TO5-02	2.5-5	26.9	1.00			TO5-02	2.5-5	26.4	1.00		
11													
12		TO8-03	0-2.5	29.8	1.00			TO8-03	0-2.5	31.3	1.00		
13		TO8-03	2.5-5	37.7	1.00			TO8-03	2.5-5	40.7	1.00		
14													
15													
16													
17	8hr Tests	Sample			Mass of Soil (g)		16hr Tests	Sample			Mass of Soil (g)		
18													
19		TO1-05	0-2.5	6.8	1.00			TO1-05	0-2.5	7.6	1.00		
20		TO1-05	2.5-5	0.3	1.00			TO1-05	2.5-5	0.5	1.00		
21													
22		TO3-10	0-2.5	1.7	1.00			TO3-10	0-2.5	1.6	1.00		
23		TO3-10	2.5-5	7.1	1.00			TO3-10	2.5-5	7.1	1.00		
24													
25		TO5-02	0-2.5	68.5	1.00			TO5-02	0-2.5	71.0	1.00		
26		TO5-02	2.5-5	34.2	1.00			TO5-02	2.5-5	32.3	1.00		
27													
28		TO8-03	0-2.5	32.7	1.00			TO8-03	0-2.5	36.3	1.00		
29		TO8-03	2.5-5	42.6	1.00			TO8-03	2.5-5	43.8	1.00		
30													
31													

9/21/12 Riverton Kinetic Tests <2mm Fraction 1g soil in 50mL SPF3

	1	2	3	4	5	6	7	8	9	10	11	12	13
48hr Tests	Sample		U (ug/L)	Mass of Soil (g)		96hr Tests		Sample		U (ug/L)	Mass of Soil (g)		
2													
3	T01-05	0-2.5	8.0	1.00				T01-05	0-2.5	8.3	1.00		
4	T01-05	2.5-5	0.7	1.00				T01-05	25-5	0.7	1.00		
5													
6	T03-10	0-2.5	2.0	1.00				T03-10	0-25	2.0	1.00		
7	T03-10	2.5-5	7.8	1.00				T03-10	25-5	8.2	1.00		
8													
9	T05-02	0-2.5	76.3	1.00				T05-02	0-2.5	76.9	1.00		
10	T05-02	2.5-5	32.7	1.00				T05-02	25-5	34.8	1.00		
11													
12	T08-03	0-2.5	39.6	1.00				T08-03	0-2.5	39.5	1.00		
13	T08-03	2.5-5	48.8	1.00				T08-03	2.5-5	48.2	1.00		
14													
15													
16													
17													
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20													
21													
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30													
31													

Riverton Sieve Analysis

	1	2	3	4	5	6	7	8	9	10	11	12
9/24/12	Begin Sieving the remaining soil samples. Sieving them +/- 2mm. Placing samples on shaker for 5-10min ~~5min~~. No other disaggregation methods performed, unless noted.											
Sample				Tare (g)		Gross (g)		Net (g)	Comments			
	T01-06	0-2.5							Few roots. Cobbles up to 1"			
	Sieve	#10 (2mm)		561.9		1276.8		714.9				
		Pan		358.6		1239.9		881.3				
	T01-06	2.5-5							Large cobbles up to 1.5"			
		#10		561.9		1525.3		963.4				
		Pan		358.6		714.7		356.1				
	T01-07	0-2.5							Many roots. Sample could be further manipulated to reduce +2mm fraction. Many Dirt clumps.			
		#10		~~358~~ 561.9		825.8		263.9				
		Pan		358.6		1197.6		839.0				
	T02-07	0-2.5							Many roots and other plant material. Cobbles up to 1.5"			
		#10		561.9		1606.1		1044.2				
		Pan		358.6		1432.1		1073.5				
	T02-07	2.5-~~10~~5							Large cobbles up to 1.5"			
		#10		561.9		1267.1		705.2				
		Pan		358.6		595.3		236.7				
	T02-08	0-2.5							A lot of roots, sticks and other plant debris. Large portion of +2mm is dirt ~~chunks~~ chunks. Could be further disaggregated.			
		#10		561.9		929.8		367.9				
		Pan		358.6		1250.0		891.4				
	T02-08	2.5-5							Entire +2mm fraction looks to be dirt clumps which could be further disaggregated. Dropped pan and spilled some (~31g) of soil from -2mm fraction.			
		#10		561.9		644.2		82.3				
		Pan		358.6		1192.2 (+~31g)		864.6				
	T02-09	0-2.5										
		#10		561.9		566.4		4.5	Some roots and plant debris.			
		Pan		358.6		1706.9		1348.3				
	T02-09	2.5-5							Few roots. Cobbles up to 1.5"			
		#10		561.9		1242.1		680.2				
		Pan		358.6		982.3		623.7				

Riverton Sieve Analysis

	1	2	3	4 Tare (g)	5	6 Gross (g)	7	8 Net (g)	Comments	10	11	12	13
Sample 1	T03-11	0-2.5							Many roots, sticks, plant debris. Cobbles up to 1"				
2		#10		561.9		911.9		350.0	Put on shaker another 5 min to break up a few dirt clu				
3		Pan		358.6		1713.3		1354.7	A few dirt dump remain in +2mm. Could be broken up.				
4	T03-11	2.5-5							Cobbles up to 2"				
5		#10		561.9		1424.0		862.1					
6		Pan		358.6		653.8		295.2					
7	T03-12	0-2.5							Some roots. Some of +2mm are dirt clumps that				
8		#10		561.9		823.3		261.4	could be further broken down, Majority looks to be shaley.				
9		Pan		358.6		1309.1		950.5					
10	T03-12	2.5-5							Few roots. Some of the +2mm is dirt clumps that				
11		#10		561.9		793.2		231.3	could be further broken down, most looks shaley.				
12		Pan		358.6		926.3		567.7					
13													
14	T04-08	0-2.5							A Lot of roots, sticks and other plant material				
15		#10		561.9		562.1		0.2					
16		Pan		358.6		1307.1		948.5					
17	T04-08	2.5-5							Very few roots. Cobbles up to 1.5"				
18		#10		561.9		1352.1		790.2					
19		Pan		358.6		1204.5		845.9					
20	T04-09	0-2.5							A lot of roots. Most of +2mm is dirt chunks that				
21		#10		561.9		625.2		63.3	could be further broken down.				
22		Pan		358.6		1170.8		812.2					
23	T04-09	2.5-5							Many roots. Cobbles up to 1"				
24		#10		561.9		1174.3		612.4					
25		Pan		358.6		1112.5		753.9					
26	T04-10	0-2.5							Some roots. Cobbles up to 1.5"				
27		#10		561.9		~~930.8~~	1033.3	471.4					
28		Pan		358.6		~~637.7~~	1291.3	932.7					
29	T04-10	2.5-5							Cobbles up to ~~1.5~~ 2"				
30		#10		561.9		1130.8		568.9					
31		Pan		358.6		637.7		279.1					

Sample	1	2	3	4 Tare (g)	5	6 Gross (g)	7	8 Net (g)	Comments	10	11	12	13
1	T04-11	0-2.5							Many roots and other plant debris. Most of +2mm				
2		#10		561.9		815.9		254.0	(99%) is dirt chunks that could be further broken down.				
3		Pan		358.6		1362.3		1003.7					
4	T04-11	2.5-5							Many roots. Cobbles up to 1". Some of +2mm				
5		#10		561.9		726.3		164.4	is dirt chunks that could be further broken down.				
6		Pan		358.6		1169.0		810.4					
7	T04-12	0-2.5							A lot of roots. Cobbles up to 1.5" Some of +2m				
8		#10		561.9		867.9		306.0	is dirt chunks that could be further broken down.				
9		Pan		358.6		1496.7		1138.1					
10	T04-12	2.5-5							No Sample				
11		#10		561.9									
12		Pan		358.6									
13													
14	T05-01	0-2.5							A lot of roots and plant material. Majority of +2mm				
15		#10		561.9		591.4		29.5	is dirt chunks that could be broken down further.				
16		Pan		358.6		1441.8		1083.2					
17	T05-01	2.5-5							Few roots				
18		#10		561.9		565.4		3.5					
19		Pan		358.6		1174.8		816.2					
20	T05-03	0-2.5							Many roots and other plant materials. Most if not all				
21		#10		561.9		637.4		~~3.075.5~~	+2mm fraction is dirt chunks that could be broken				
22		Pan		358.6		1307.5		~~+~~ 948.9	down further.				
23	T05-03	2.5-5											
24		#10		561.9		690.1		128.2	Some roots. Most of +2mm fraction is dirt chunks				
25		Pan		358.6		1451.1		1092.5	that could be further broken down.				
26													
27													
28													
29													
30													
31													

	1	2	3	Tare (g)	5	Gross (g)	7	Net (g)	Comments	10	11	12	13
Sample 1	T06-08	0-2.5							Some roots. Cobbles up to 1.5"				
2		#10		561.9		1562.9		1001.0					
3		Pan		358.6		1262.3		903.7					
4	T06-08	2.5-5							Cobbles up to 2".				
5		#10		561.9		1082.1		520.2					
6		Pan		358.6		547.3		188.7					
7	T06-09	0-2.5							Some roots and plant debris. Cobbles up to 1.5"				
8		#10		561.9		~~1495.9~~	1292.2	730.3					
9		Pan		358.6		~~606.1~~	1317.3	958.7					
10	T06-09	2.5-5							Cobbles up to 2"				
11		#10		561.9		1495.9		934.0					
12		Pan		358.6		606.1		247.5					
13	T06-10	0-2.5							Many roots and plant materials. Cobbles up to 1"				
14		#10		561.9		1281.8		719.9					
15		Pan		358.6		1124.7		766.1					
16	T06-10	2.5-5							Cobbles up to 2"				
17		#10		561.9		1176.4		614.5					
18		Pan		358.6		596.3		237.7					
19	T06-11	0-2.5							A LOT of roots. Some other plant material. Most if				
20		#10		561.9		691.8		129.9	not all of the +2mm fraction is dirt chunks that could be				
21		Pan		358.6		1540.5		1181.9	further broken down.				
22	T06-11	2.5-5							Few roots. Most of +2mm fraction is dirt chunks				
23		#10		561.9		618.8		56.9	that could be further broken down.				
24		Pan		358.6		1148.0		789.4					
25	T06-12	0-2.5							Some roots. Cobbles up to 1.5" Some of +2mm				
26		#10		561.9		973.4		411.5	is dirt chunks that could be further broken down.				
27		Pan		358.6		1179.3		820.7					
28	T06-12	2.5-5							Cobbles up to 1"				
29		#10		561.9		1108.3		546.4					
30		Pan		358.6		565.2		206.6					
31													

	1	2	3	4 Tare (g)	5	6 Gross (g)	7	8 Net (g)	9 Comments	10	11	12	13
Sample 1	T06-13	0-2.5							A LOT of roots and plant debris.				
2		#10		561.9		581.2		19.3					
3		Pan		358.6		1550.7		1192.1					
4	T06-13	2.5-5							Few roots. Cobbles up to 1.5"				
5		#10		561.9		778.8		216.9					
6		Pan		358.6		1489.2		1130.6					
7													
8	T07-03	0-2.5							Many roots and other plant debris. Cobbles up to				
9		#10		561.9		1182.8		620.9	1.5"				
10		Pan		358.6		1518.7		1160.1					
11	T07-03	2.5-5							Cobbles up to 1.5"				
12		#10		561.9		1432.2		870.3					
13		Pan		358.6		741.6		383.0					
14	T07-04	0-2.5							Some roots. Cobbles up to 2"				
15		#10		561.9		1372.1		810.2					
16		Pan		358.6		1313.9		955.3					
17	T07-04	2.5-5		~~561.9~~ ~~358.6~~		~~904.0~~			Cobbles up to 1.5"				
18		#10		~~358.6~~ 561.9		~~459.2~~ 904.0		342.1					
19		Pan		358.6		459.2		100.6					
20	T07-05	0-2.5							Many roots and other plant materials. Cobbles up to				
21		#10		561.9		1023.3		461.4	1.5"				
22		Pan		358.6		1485.0		1126.4					
23	T07-05	2.5-5							Cobbles up to 2"				
24		#10		561.9		1524.5		962.6					
25		Pan		358.6		714.6		356.0					
26	T07-06	0-2.5							A LOT of roots and plant debris. Cobbles up to 1"				
27		#10		561.9		827.0		265.1					
28		Pan		358.6		1711.3		1352.7					
29	T07-06	2.5-5							Cobbles up to 1.5"				
30		#10		561.9		1553.1		991.2					
31		Pan		358.6		856.8		498.2					

	1	2	3	4 Tare (g)	5	6 Gross (g)	7	8 Net (g)	Comments	10	11	12	13
Sample 1	T07-07	0-2.5							Some plant debris. Some is large and woody. Cobbles up to				
2		#10		561.9		1599.8		1037.9	1.5"				
3		Pan		358.6		1297.9		939.3					
4	T07-07	2.5-5							Cobbles up to 1.5"				
5		#10		561.9		881.3		319.4					
6		Pan		358.6		467.1		108.5					
7													
8	T08-02	0-2.5							Few roots. Most if not all +2mm fraction is				
9		#10		561.9		907.7		345.8	dirt chunks that could be further broken down.				
10		Pan		358.6		1072.6		714.0					
11	~~T08-02~~	~~2.5-5~~							No Sample				
12		#10											
13		Pan											
14	T08-04	0-2.5							Some roots. Cobbles up to 1"				
15		#10		561.9		717.2		155.3					
16		Pan		358.6		1333.3		974.7					
17	T08-04	2.5-5							Few roots				
18		#10		561.9		985.5		423.6					
19		Pan		358.6		889.3		530.7					
20	T08-05	0-2.5							A lot of roots. Most if not all +2mm is dirt				
21		#10		561.9		790.8		228.9	chunks that could be further broken down.				
22		Pan		358.6		1351.2		992.6					
23	T08-05	2.5-5							Some roots. Cobbles up to 1.5"				
24		#10		561.9		1680.4		1118.5					
25		Pan		358.6		1009.5		650.9					
26	T08-06	0-2.5							Many roots and other plant materials. Most if not				
27		#10		561.9		685.6		123.7	all +2mm could be further broken down.				
28		Pan		358.6		1161.4		802.8					
29	T08-06	2.5-5							Some roots and sticks. Cobbles up to 2"				
30		#10		561.9		946.6		384.7					
31		Pan		358.6		1262.8		904.2					

	1	2	3	4 Tare (g)	5	6 Gross (g)	7	8 Net (g)	9 Comments	10	11	12	13
Sample 1	T09-08	0-2.5							A lot of roots and other plant material. Most				
2		#10		561.9		589.5		27.6	if not all +2mm could be further broken down.				
3		Pan		358.6		1525.7		1167.1					
4	T09-08	2.5-5							Many roots. Most of +2mm is dirt chunks that				
5		#10		561.9		633.7		71.8	could be further broken down.				
6		Pan		358.6		1311.1		952.5					
7													
8													
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Riverton Batch Tests

10/8/12	Sample	2	Tube	4	Mass (g)	6	U (µg/L)	8	9	10	11	12	13
1													
2	T01-05	0-2.5	1-1		2.00		4.8						
3	T01-05	2.5-5	1-2		2.00		<0.4						
4	T01-06	0-2.5	1-3		2.00		<0.4						
5	T01-06	2.5-5	1-4		2.00		<0.4						
6	T01-07	0-2.5	1-5		2.00		33.2						
7	T02-07	0-2.5	1-6		2.00		<0.4						
8	T02-07	2.5-5	1-7		2.00		0.8						
9	T02-08	0-2.5	1-8		2.00		9.8						
10	T02-08	2.5-5	1-9		2.00		3.5						
11	T02-09	0-2.5	1-10		2.00		44.5						
12	T02-09	2.5-5	1-11		2.00		8.6						
13	T03-10	0-2.5	1-12		2.00		0.8						
14	T03-10	2.5-5	1-13		2.00		4.7						
15	T03-11	0-2.5	1-14		2.00		1.6						
16	T03-11	2.5-5	1-15		2.00		0.8						
17	T03-12	0-2.5	1-16		2.00		5.8						
18	T03-12	2.5-5	1-17		2.00		3.0						
19	T04-08	0-2.5	1-18		2.00		18.7						
20	T04-08	2.5-5	1-19, ~~20~~		2.00/~~2.00~~		3.2						
21	T04-08	2.5-5D	1-20D		2.00								
22	Start	11:30	1g of each	sample in	each of 2	tubes. 50mL SPF3	added to	each tube.	Put on	stir bar for	24 hrs.		
23													
10/9/12 24	1130 Samples off stir bar. Placed in centrifuge @ 3000 rpm for 20 min then decanted into 200mL volumetric flask. 50mL												
25	SPF added to each tube and placed back on stir bar for another 24 hrs.												
26													
27													
28													
29													
30													
31													

Riverton Batch Tests

10/10/12	Sample	2	3 Tube	4	5 Mass (g)	6	U (µg/L)	8	9	10	11	12	13
	T04-09	0-2.5	2-1		2.00		47.9						
	T04-09	2.5-5	2-2		2.00		21.2						
	T04-10	0-2.5	2-3		2.00		25.4						
	T04-10	2.5-5	2-4		2.00		5.1						
	T04-11	0-2.5	2-5		2.00		47.3						
	T04-11	2.5-5	2-6		2.00		33.5						
	T04-12	0-2.5	2-7		2.00		37.0						
	T05-01	0-2.5	2-8		2.00		10.7						
	T05-01	2.5-5	2-9		2.00		3.3						
	T05-02	0-2.5	2-10		2.00		38.0						
	T05-02	2.5-5	2-11		2.00		13.2						
	T05-03	0-2.5	2-12		2.00		24.8						
	T05-03	2.5-5	2-13		2.00		47.1						
	T06-08	0-2.5	2-14		2.00		5.2						
	T06-08	2.5-5	2-15		2.00		0.6						
	T06-09	0-2.5	2-16		2.00		12.6						
	T06-09	2.5-5	2-17		2.00		2.1						
	T06-10	0-2.5	2-18		2.00		17.9						
	T06-10	2.5-5	2-19, ~~20~~		2.00/~~2.00~~		2.2						
	T06-10	2.5-5	2-20		2.00		2.3						

10/15/12 Start @ 0845 after pH, alk ck w/ SPF3 Stir on End-over-End @ ~ 8 RPM
10/16/12 Remove from stir bar Cent 20" x 3KRPM. Decant into 200 mL Vol flask. Stopper flasks
Refill cent tubes w/ SPF3. Replace on stir bar @ 8RPM
10/17/12 Remove from stir bar Cent 20" x 3KRPM. Decant into above mentioned Vol flask
Fill to Vol. ume. Vac filter thru 0.45 um filter Acidify pH<2 c̄ Conc HNO_3
Analyze for U

Riverton Batch Tests

10/16/12	Sample	2	Tube	4	Mass (g)	6	U (µg/L)
1							
2	T06-11	0-2.5	3-1		2.00		30.5
3	T06-11	2.5-5	3-2		2.00		5.6
4	T06-12	0-2.5	3-3		2.00		29.5
5	T06-12	2.5-5	3-4		2.00		2.1
6	T06-13	0-2.5	3-5		2.00		37.9
7	T06-13	2.5-5	3-6		2.00		19.7
8	T07-03	0-2.5	3-7		2.00		9.3
9	T07-03	2.5-5	3-8		2.00		1.1
10	T07-04	0-2.5	3-9		2.00		12.1
11	T07-04	2.5-5	3-10		2.00		2.4
12	T07-05	0-2.5	3-11		2.00		22.7
13	T07-05	2.5-5	3-12		2.00		4.2
14	T07-06	0-2.5	3-13		2.00		35.2
15	T07-06	2.5-5	3-14		2.00		2.2
16	T07-07	0-2.5	3-15		2.00		10.9
17	T07-07	2.5-5	3-16		2.00		4.1
18	T08-02	0-2.5	3-17		2.00		21.5
19	T08-03	0-2.5	3-18		2.00		20.7
20	T08-03	2.5-5	3-19		2.00		25.8
21	T08-03	2.5-5	3-20		2.00		26.0
10/17/12 22	Start @ 820 after pH and alk check. END Cross-Ends at ~ 8 RPM						
23	T08-04	0-2.5	4-1		2.00		31.9
10/22/12 24	T08-04	2.5-5	4-2		2.00		37
25	T08-05	0-2.5	4-3		2.00		22.2
26	T08-05	2.5-5	4-4		2.00		20.7
27	T08-06	0-2.5	4-5		2.00		28.1
28	T08-06	2.5-5	4-6		2.00		25.5
29	T09-08	0-2.5	4-7		2.00		4.9
30	T09-08	2.5-5	4-8		2.00		3.0
31	T09-08	2.5-5	4-9		2.00		2.8

10/18/12 0830 Remove from stir bar. Cent 20" x 3K RPM. Decant into 200mL vol flask. Stopper flasks. Refill cent. tubes w/ 50mL SPF3. Replace on stir bar @ 8 RPM
10/19/12 Remove from stir bar, Cent 20" x 3K RPM. Decant into above mentioned flask. Fill to volume. Vac filter through 0.45 µM filter. Acidify pH<2 c̄ Conc HNO_3

10/24 Analyze for U

10/22 Start @ 9?? after SPF pH/alk ck
10/23 Remove from stir bar Cent 20" x 3K RPM, Decant into 200mL Vol flask. Stopper flasks. Refill cent tubes w/ 50mL SPF3. Replace on bar @ 8 RPM.
10/24 Remove from stir bar, Cent 20" x 3K RPM Decant into above mentioned flasks. Fill to Volume Vac filter thru 0.45 µm filter Acidify pH<2 c̄ Conc HNO_3

Appendix G

Groundwater Quality Data – Enhanced Characterization

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CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	T01-01	BH	08/24/2012	0001			268		#	-	-
	mg/L	T01-02	BH	08/24/2012	0001			244		#	-	-
	mg/L	T01-03	BH	08/24/2012	0001			284		#	-	-
	mg/L	T01-04	BH	08/24/2012	0001			289		#	-	-
	mg/L	T01-05	BH	08/23/2012	0001			270		#	-	-
	mg/L	T01-06	BH	08/23/2012	0001			258		#	-	-
	mg/L	T01-07	BH	08/23/2012	0001			250		#	-	-
	mg/L	T01-08	BH	08/23/2012	0001			210		#	-	-
	mg/L	T01-09	BH	08/23/2012	0001			210		#	-	-
	mg/L	T02-01	BH	08/22/2012	0001			236		#	-	-
	mg/L	T02-02	BH	08/22/2012	0001			157		#	-	-
	mg/L	T02-03	BH	08/22/2012	0001			156		#	-	-
	mg/L	T02-04	BH	08/22/2012	0001			84		#	-	-
	mg/L	T02-05	BH	08/22/2012	0001			113		#	-	-
	mg/L	T02-06	BH	08/22/2012	0001			626		#	-	-
	mg/L	T02-07	BH	08/23/2012	0001			424		#	-	-
	mg/L	T02-08	BH	08/23/2012	0001			305		#	-	-
	mg/L	T02-09	BH	08/23/2012	0001			320		#	-	-
	mg/L	T02-10	BH	08/23/2012	0001			304		#	-	-
	mg/L	T02-11	BH	08/23/2012	0001			251		#	-	-
	mg/L	T02-12	BH	08/23/2012	0001			198		#	-	-
	mg/L	T02-13	BH	08/23/2012	0001			149		#	-	-
	mg/L	T02-14	BH	08/23/2012	0001			174		#	-	-
	mg/L	T02-15	BH	08/23/2012	0001			229		#	-	-
	mg/L	T03-01	BH	08/22/2012	0001			232		#	-	-
	mg/L	T03-02	BH	08/22/2012	0001			253		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	T03-08	BH	08/21/2012	0001			308		#	-	-
	mg/L	T03-09	BH	08/22/2012	0001			356		#	-	-
	mg/L	T03-10	BH	08/22/2012	0001			314		#	-	-
	mg/L	T03-11	BH	08/22/2012	0001			338		#	-	-
	mg/L	T03-12	BH	08/21/2012	0001			299		#	-	-
	mg/L	T03-13	BH	08/21/2012	0001			267		#	-	-
	mg/L	T03-14	BH	08/21/2012	0001			236		#	-	-
	mg/L	T03-15	BH	08/21/2012	0001			238		#	-	-
	mg/L	T03-16	BH	08/21/2012	N001			203		#	-	-
	mg/L	T03-17	BH	08/21/2012	0001			236		#	-	-
	mg/L	T03-18	BH	08/24/2012	0001			280		#	-	-
	mg/L	T03-19	BH	08/24/2012	0001			265		#	-	-
	mg/L	T03-20	BH	08/24/2012	0001			321		#	-	-
	mg/L	T03-21	BH	08/24/2012	0001			338		#	-	-
	mg/L	T04-03	BH	08/26/2012	0001			452		#	-	-
	mg/L	T04-04	BH	08/26/2012	0001			370		#	-	-
	mg/L	T04-05	BH	08/26/2012	0001			380		#	-	-
	mg/L	T04-06	BH	08/26/2012	0001			436		#	-	-
	mg/L	T04-07	BH	08/26/2012	0001			392		#	-	-
	mg/L	T04-08	BH	08/27/2012	0001			384		#	-	-
	mg/L	T04-09	BH	08/27/2012	0001			368		#	-	-
	mg/L	T04-10	BH	08/27/2012	0001			398		#	-	-
	mg/L	T04-11	BH	08/27/2012	0001			307		#	-	-
	mg/L	T04-12	BH	08/24/2012	0001			268		#	-	-
	mg/L	T04-15	BH	08/24/2012	0001			243		#	-	-
	mg/L	T04-16	BH	08/24/2012	0001			235		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	T04-17	BH	08/24/2012	0001			267		#	-	-
	mg/L	T05-01	BH	08/28/2012	0001			460		#	-	-
	mg/L	T05-02	BH	08/29/2012	0001			382		#	-	-
	mg/L	T05-03	BH	08/29/2012	0001			297		#	-	-
	mg/L	T06-01	BH	08/26/2012	0001			422		#	-	-
	mg/L	T06-02	BH	08/26/2012	0001			433		#	-	-
	mg/L	T06-03	BH	08/26/2012	0001			570		#	-	-
	mg/L	T06-04	BH	08/26/2012	0001			446		#	-	-
	mg/L	T06-05	BH	08/26/2012	0001			518		#	-	-
	mg/L	T06-06	BH	08/26/2012	0001			489		#	-	-
	mg/L	T06-07	BH	08/26/2012	0001			533		#	-	-
	mg/L	T06-08	BH	08/26/2012	0001			466		#	-	-
	mg/L	T06-09	BH	08/26/2012	0001			439		#	-	-
	mg/L	T06-10	BH	08/27/2012	0001			436		#	-	-
	mg/L	T06-11	BH	08/27/2012	0001			382		#	-	-
	mg/L	T06-12	BH	08/27/2012	0001			350		#	-	-
	mg/L	T06-13	BH	08/27/2012	0001			288		#	-	-
	mg/L	T06-14	BH	08/27/2012	0001			324		#	-	-
	mg/L	T06-15	BH	08/27/2012	0001			306		#	-	-
	mg/L	T06-16	BH	08/27/2012	0001			354		#	-	-
	mg/L	T06-17	BH	08/27/2012	0001			382		#	-	-
	mg/L	T06-21	BH	08/28/2012	0001			390		#	-	-
	mg/L	T07-01	BH	08/25/2012	0001			576		#	-	-
	mg/L	T07-02	BH	08/25/2012	0001			578		#	-	-
	mg/L	T07-03	BH	08/25/2012	0001			500		#	-	-
	mg/L	T07-04	BH	08/25/2012	0001			474		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3)	mg/L	T07-05	BH	08/25/2012	0001			424			#	-	-
	mg/L	T07-06	BH	08/28/2012	0001			425			#	-	-
	mg/L	T07-07	BH	08/29/2012	0001			334			#	-	-
	mg/L	T07-08	BH	08/28/2012	0001			270			#	-	-
	mg/L	T07-09	BH	08/28/2012	0001			309			#	-	-
	mg/L	T07-10	BH	08/28/2012	0001			320			#	-	-
	mg/L	T08-01	BH	08/25/2012	0001			591			#	-	-
	mg/L	T08-02	BH	08/25/2012	0001			588			#	-	-
	mg/L	T08-03	BH	08/25/2012	0001			503			#	-	-
	mg/L	T08-04	BH	08/25/2012	0001			427			#	-	-
	mg/L	T08-05	BH	08/25/2012	0001			368			#	-	-
	mg/L	T08-06	BH	08/25/2012	0001			349			#	-	-
	mg/L	T08-07	BH	08/27/2012	0001			387			#	-	-
	mg/L	T08-08	BH	08/28/2012	0001			374			#	-	-
	mg/L	T08-09	BH	08/28/2012	0001			350			#	-	-
	mg/L	T09-01	BH	08/25/2012	0001			194			#	-	-
	mg/L	T09-02	BH	08/25/2012	0001			221			#	-	-
	mg/L	T09-03	BH	08/25/2012	0001			271			#	-	-
	mg/L	T09-04	BH	08/25/2012	0001			281			#	-	-
	mg/L	T09-05	BH	08/25/2012	0001			391			#	-	-
	mg/L	T09-06	BH	08/28/2012	0001			366			#	-	-
	mg/L	T09-07	BH	08/28/2012	0001			375			#	-	-
	mg/L	T09-08	BH	08/28/2012	0001			314			#	-	-
	mg/L	T09-09	BH	08/28/2012	0001			288			#	-	-
	mg/L	T09-10	BH	08/28/2012	0001			328			#	-	-
Calcium	mg/L	T01-01	BH	08/24/2012	0001			140.000			#	0.06	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	T01-02	BH	08/24/2012	0001			96.000			#	0.012	-
	mg/L	T01-03	BH	08/24/2012	0001			100.000			#	0.012	-
	mg/L	T01-04	BH	08/24/2012	0001			93.000			#	0.012	-
	mg/L	T01-05	BH	08/23/2012	0001			130.000			#	0.012	-
	mg/L	T01-06	BH	08/23/2012	0001			120.000			#	0.012	-
	mg/L	T01-07	BH	08/23/2012	0001			95.000			#	0.012	-
	mg/L	T01-08	BH	08/23/2012	0001			85.000			#	0.012	-
	mg/L	T01-09	BH	08/23/2012	0001			66.000			#	0.012	-
	mg/L	T02-01	BH	08/22/2012	0001			330.000			#	0.06	-
	mg/L	T02-02	BH	08/22/2012	0001			73.000			#	0.06	-
	mg/L	T02-03	BH	08/22/2012	0001			190.000			#	0.06	-
	mg/L	T02-04	BH	08/22/2012	0001			320.000			#	0.06	-
	mg/L	T02-05	BH	08/22/2012	0001			330.000			#	0.06	-
	mg/L	T02-06	BH	08/22/2012	0001			49.000			#	0.12	-
	mg/L	T02-07	BH	08/23/2012	0001			360.000			#	0.06	-
	mg/L	T02-08	BH	08/23/2012	0001			210.000			#	0.06	-
	mg/L	T02-09	BH	08/23/2012	0001			180.000			#	0.012	-
	mg/L	T02-10	BH	08/23/2012	0001			170.000			#	0.012	-
	mg/L	T02-11	BH	08/23/2012	0001			130.000			#	0.012	-
	mg/L	T02-12	BH	08/23/2012	0001			86.000			#	0.012	-
	mg/L	T02-13	BH	08/23/2012	0001			48.000			#	0.012	-
	mg/L	T02-14	BH	08/23/2012	0001			59.000			#	0.012	-
	mg/L	T02-15	BH	08/23/2012	0001			57.000			#	0.012	-
	mg/L	T03-01	BH	08/22/2012	0001			110.000			#	0.012	-
	mg/L	T03-02	BH	08/22/2012	0001			150.000			#	0.012	-
	mg/L	T03-08	BH	08/21/2012	0001			500.000			#	0.12	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	T03-09	BH	08/22/2012	0001			380.000			#	0.12	-
	mg/L	T03-10	BH	08/22/2012	0001			250.000			#	0.12	-
	mg/L	T03-11	BH	08/22/2012	0001			230.000			#	0.06	-
	mg/L	T03-12	BH	08/21/2012	0001			140.000			#	0.012	-
	mg/L	T03-13	BH	08/21/2012	0001			120.000			#	0.012	-
	mg/L	T03-14	BH	08/21/2012	0001			96.000			#	0.012	-
	mg/L	T03-15	BH	08/21/2012	0001			64.000			#	0.012	-
	mg/L	T03-15	BH	08/21/2012	0002			67.000			#	0.012	-
	mg/L	T03-16	BH	08/21/2012	0001			69.000			#	0.012	-
	mg/L	T03-17	BH	08/21/2012	0001			67.000			#	0.012	-
	mg/L	T03-18	BH	08/24/2012	0001			110.000			#	0.012	-
	mg/L	T03-19	BH	08/24/2012	0001			95.000			#	0.012	-
	mg/L	T03-20	BH	08/24/2012	0001			110.000			#	0.012	-
	mg/L	T03-21	BH	08/24/2012	0001			120.000			#	0.012	-
	mg/L	T04-03	BH	08/26/2012	0001			180.000			#	0.06	-
	mg/L	T04-04	BH	08/26/2012	0001			190.000			#	0.06	-
	mg/L	T04-05	BH	08/26/2012	0001			370.000			#	0.06	-
	mg/L	T04-06	BH	08/26/2012	0001			420.000			#	0.12	-
	mg/L	T04-07	BH	08/26/2012	0001			380.000			#	0.12	-
	mg/L	T04-07	BH	08/26/2012	0002			390.000			#	0.12	-
	mg/L	T04-08	BH	08/27/2012	0001			430.000			#	0.12	-
	mg/L	T04-09	BH	08/27/2012	0001			470.000			#	0.12	-
	mg/L	T04-10	BH	08/27/2012	0001			350.000			#	0.06	-
	mg/L	T04-11	BH	08/27/2012	0001			260.000			#	0.06	-
	mg/L	T04-12	BH	08/24/2012	0001			78.000			#	0.012	-
	mg/L	T04-15	BH	08/24/2012	0001			86.000			#	0.012	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	T04-16	BH	08/24/2012	0001			94.000		#	0.012	-
	mg/L	T04-16	BH	08/24/2012	0002			93.000		#	0.012	-
	mg/L	T04-17	BH	08/24/2012	0001			95.000		#	0.012	-
	mg/L	T05-01	BH	08/28/2012	0001			550.000		#	0.12	-
	mg/L	T05-02	BH	08/29/2012	0001			320.000		#	0.06	-
	mg/L	T05-03	BH	08/29/2012	0001			280.000		#	0.06	-
	mg/L	T05-03	BH	08/29/2012	0002			280.000		#	0.06	-
	mg/L	T06-01	BH	08/26/2012	0001			270.000		#	0.06	-
	mg/L	T06-02	BH	08/26/2012	0001			340.000		#	0.06	-
	mg/L	T06-03	BH	08/26/2012	0001			280.000		#	0.06	-
	mg/L	T06-04	BH	08/26/2012	0001			230.000		#	0.06	-
	mg/L	T06-05	BH	08/26/2012	0001			320.000		#	0.12	-
	mg/L	T06-06	BH	08/26/2012	0001			410.000		#	0.12	-
	mg/L	T06-07	BH	08/26/2012	0001			450.000		#	0.12	-
	mg/L	T06-08	BH	08/26/2012	0001			530.000		#	0.12	-
	mg/L	T06-09	BH	08/26/2012	0001			480.000		#	0.12	-
	mg/L	T06-10	BH	08/27/2012	0001			440.000		#	0.12	-
	mg/L	T06-11	BH	08/27/2012	0001			490.000		#	0.12	-
	mg/L	T06-12	BH	08/27/2012	0001			310.000		#	0.06	-
	mg/L	T06-13	BH	08/27/2012	0001			360.000		#	0.06	-
	mg/L	T06-14	BH	08/27/2012	0001			240.000		#	0.012	-
	mg/L	T06-15	BH	08/27/2012	0001			160.000		#	0.012	-
	mg/L	T06-16	BH	08/27/2012	0001			98.000		#	0.012	-
	mg/L	T06-17	BH	08/27/2012	0001			180.000		#	0.06	-
	mg/L	T06-21	BH	08/28/2012	0001			140.000		#	0.012	-
	mg/L	T07-01	BH	08/25/2012	0001			490.000		#	0.24	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	T07-02	BH	08/25/2012	0001			480.000			#	0.24	-
	mg/L	T07-03	BH	08/25/2012	0001			470.000			#	0.24	-
	mg/L	T07-04	BH	08/25/2012	0001			460.000			#	0.12	-
	mg/L	T07-05	BH	08/25/2012	0001			450.000			#	0.12	-
	mg/L	T07-06	BH	08/28/2012	0001			480.000			#	0.06	-
	mg/L	T07-06	BH	08/28/2012	0002			470.000			#	0.06	-
	mg/L	T07-07	BH	08/29/2012	0001			330.000			#	0.06	-
	mg/L	T07-08	BH	08/28/2012	0001			330.000			#	0.06	-
	mg/L	T07-09	BH	08/28/2012	0001			140.000			#	0.012	-
	mg/L	T07-10	BH	08/28/2012	0001			110.000			#	0.012	-
	mg/L	T08-01	BH	08/25/2012	0001			760.000			#	0.24	-
	mg/L	T08-02	BH	08/25/2012	0001			570.000			#	0.24	-
	mg/L	T08-02	BH	08/25/2012	0002			560.000			#	0.6	-
	mg/L	T08-03	BH	08/25/2012	0001			450.000			#	0.24	-
	mg/L	T08-04	BH	08/25/2012	0001			500.000			#	0.12	-
	mg/L	T08-05	BH	08/25/2012	0001			480.000			#	0.012	-
	mg/L	T08-06	BH	08/25/2012	0001			480.000			#	0.06	-
	mg/L	T08-07	BH	08/27/2012	0001			420.000			#	0.06	-
	mg/L	T08-08	BH	08/28/2012	0001			130.000			#	0.012	-
	mg/L	T08-09	BH	08/28/2012	0001			110.000			#	0.012	-
	mg/L	T09-01	BH	08/25/2012	0001			72.000			#	0.012	-
	mg/L	T09-02	BH	08/25/2012	0001			100.000			#	0.012	-
	mg/L	T09-03	BH	08/25/2012	0001			170.000			#	0.06	-
	mg/L	T09-04	BH	08/25/2012	0001			210.000			#	0.06	-
	mg/L	T09-05	BH	08/25/2012	0001			400.000			#	0.06	-
	mg/L	T09-06	BH	08/28/2012	0001			160.000			#	0.06	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Calcium	mg/L	T09-07	BH	08/28/2012	0001			87.000		#	0.06	-
	mg/L	T09-08	BH	08/28/2012	0001			56.000		#	0.012	-
	mg/L	T09-09	BH	08/28/2012	0001			75.000		#	0.012	-
	mg/L	T09-10	BH	08/28/2012	0001			110.000		#	0.012	-
Chloride	mg/L	T01-01	BH	08/24/2012	0001			49		#	4	-
	mg/L	T01-02	BH	08/24/2012	0001			23		#	2	-
	mg/L	T01-03	BH	08/24/2012	0001			21		#	2	-
	mg/L	T01-04	BH	08/24/2012	0001			21		#	2	-
	mg/L	T01-05	BH	08/23/2012	0001			32		#	2	-
	mg/L	T01-06	BH	08/23/2012	0001			28		#	2	-
	mg/L	T01-07	BH	08/23/2012	0001			23		#	2	-
	mg/L	T01-08	BH	08/23/2012	0001			15		#	1	-
	mg/L	T01-09	BH	08/23/2012	0001			8.1		#	1	-
	mg/L	T02-01	BH	08/22/2012	0001			77		#	10	-
	mg/L	T02-02	BH	08/22/2012	0001			26		#	4	-
	mg/L	T02-03	BH	08/22/2012	0001			30		#	4	-
	mg/L	T02-04	BH	08/22/2012	0001			30		#	1	-
	mg/L	T02-05	BH	08/22/2012	0001			23		#	1	-
	mg/L	T02-06	BH	08/22/2012	0001			28		#	1	-
	mg/L	T02-07	BH	08/23/2012	0001			60		#	10	-
	mg/L	T02-08	BH	08/23/2012	0001			40		#	4	-
	mg/L	T02-09	BH	08/23/2012	0001			46		#	4	-
	mg/L	T02-10	BH	08/23/2012	0001			50		#	2	-
	mg/L	T02-11	BH	08/23/2012	0001			30		#	2	-
	mg/L	T02-12	BH	08/23/2012	0001			11		#	1	-
	mg/L	T02-13	BH	08/23/2012	0001			3.4		#	0.4	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	T02-14	BH	08/23/2012	0001			4.6			#	0.4	-
	mg/L	T02-15	BH	08/23/2012	0001			4.7			#	0.4	-
	mg/L	T03-01	BH	08/22/2012	0001			8.4			#	2	-
	mg/L	T03-02	BH	08/22/2012	0001			11			#	2	-
	mg/L	T03-08	BH	08/21/2012	0001			55			#	10	-
	mg/L	T03-09	BH	08/22/2012	0001			38			#	10	-
	mg/L	T03-10	BH	08/22/2012	0001			50			#	4	-
	mg/L	T03-11	BH	08/22/2012	0001			48			#	4	-
	mg/L	T03-12	BH	08/21/2012	0001			49			#	2	-
	mg/L	T03-13	BH	08/21/2012	0001			36			#	2	-
	mg/L	T03-14	BH	08/21/2012	0001			17			#	1	-
	mg/L	T03-15	BH	08/21/2012	0001			7.7			#	1	-
	mg/L	T03-15	BH	08/21/2012	0002			7.7			#	1	-
	mg/L	T03-16	BH	08/21/2012	0001			6.7			#	1	-
	mg/L	T03-17	BH	08/21/2012	0001			4.4			#	0.2	-
	mg/L	T03-18	BH	08/24/2012	0001			5.2			#	1	-
	mg/L	T03-19	BH	08/24/2012	0001			4.5			#	0.4	-
	mg/L	T03-20	BH	08/24/2012	0001			7.2			#	1	-
	mg/L	T03-21	BH	08/24/2012	0001			7.2			#	1	-
	mg/L	T04-03	BH	08/26/2012	0001			29			#	4	-
	mg/L	T04-04	BH	08/26/2012	0001			25			#	4	-
	mg/L	T04-05	BH	08/26/2012	0001			54			#	10	-
	mg/L	T04-06	BH	08/26/2012	0001			110			#	10	-
	mg/L	T04-07	BH	08/26/2012	0001			140			#	10	-
	mg/L	T04-07	BH	08/26/2012	0002			140			#	10	-
	mg/L	T04-08	BH	08/27/2012	0001			130			#	10	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	T04-09	BH	08/27/2012	0001			77		#	10	-
	mg/L	T04-10	BH	08/27/2012	0001			44		#	10	-
	mg/L	T04-11	BH	08/27/2012	0001			54		#	10	-
	mg/L	T04-12	BH	08/24/2012	0001			6.5		#	0.4	-
	mg/L	T04-15	BH	08/24/2012	0001			5.8		#	1	-
	mg/L	T04-16	BH	08/24/2012	0001			6.3		#	1	-
	mg/L	T04-16	BH	08/24/2012	0002			6.3		#	1	-
	mg/L	T04-17	BH	08/24/2012	0001			5.8		#	1	-
	mg/L	T05-01	BH	08/28/2012	0001			250		#	10	-
	mg/L	T05-02	BH	08/29/2012	0001			59		#	10	-
	mg/L	T05-03	BH	08/29/2012	0001			43		#	4	-
	mg/L	T05-03	BH	08/29/2012	0002			43		#	4	-
	mg/L	T06-01	BH	08/26/2012	0001			78		#	4	-
	mg/L	T06-02	BH	08/26/2012	0001			57		#	10	-
	mg/L	T06-03	BH	08/26/2012	0001			56		#	10	-
	mg/L	T06-04	BH	08/26/2012	0001			42		#	10	-
	mg/L	T06-05	BH	08/26/2012	0001			110		#	10	-
	mg/L	T06-06	BH	08/26/2012	0001			140		#	10	-
	mg/L	T06-07	BH	08/26/2012	0001			220		#	20	-
	mg/L	T06-08	BH	08/26/2012	0001			240		#	10	-
	mg/L	T06-09	BH	08/26/2012	0001			200		#	10	-
	mg/L	T06-10	BH	08/27/2012	0001			130		#	10	-
	mg/L	T06-11	BH	08/27/2012	0001			66		#	10	-
	mg/L	T06-12	BH	08/27/2012	0001			55		#	4	-
	mg/L	T06-13	BH	08/27/2012	0001			49		#	4	-
	mg/L	T06-14	BH	08/27/2012	0001			26		#	4	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	T06-15	BH	08/27/2012	0001			16			#	2	-
	mg/L	T06-16	BH	08/27/2012	0001			17			#	2	-
	mg/L	T06-17	BH	08/27/2012	0001			37			#	4	-
	mg/L	T06-21	BH	08/28/2012	0001			9.6			#	2	-
	mg/L	T07-01	BH	08/25/2012	0001			280			#	20	-
	mg/L	T07-02	BH	08/25/2012	0001			370			#	20	-
	mg/L	T07-03	BH	08/25/2012	0001			270			#	20	-
	mg/L	T07-04	BH	08/25/2012	0001			180			#	20	-
	mg/L	T07-05	BH	08/25/2012	0001			110			#	10	-
	mg/L	T07-06	BH	08/28/2012	0001			83			#	10	-
	mg/L	T07-06	BH	08/28/2012	0002			86			#	10	-
	mg/L	T07-07	BH	08/29/2012	0001			59			#	10	-
	mg/L	T07-08	BH	08/28/2012	0001			38			#	4	-
	mg/L	T07-09	BH	08/28/2012	0001			20			#	4	-
	mg/L	T07-10	BH	08/28/2012	0001			16			#	2	-
	mg/L	T08-01	BH	08/25/2012	0001			570			#	20	-
	mg/L	T08-02	BH	08/25/2012	0001			540			#	20	-
	mg/L	T08-02	BH	08/25/2012	0002			520			#	20	-
	mg/L	T08-03	BH	08/25/2012	0001			300			#	20	-
	mg/L	T08-04	BH	08/25/2012	0001			160			#	10	-
	mg/L	T08-05	BH	08/25/2012	0001			120			#	10	-
	mg/L	T08-06	BH	08/25/2012	0001			91			#	10	-
	mg/L	T08-07	BH	08/27/2012	0001			110			#	10	-
	mg/L	T08-08	BH	08/28/2012	0001			31			#	2	-
	mg/L	T08-09	BH	08/28/2012	0001			20			#	2	-
	mg/L	T09-01	BH	08/25/2012	0001			8.9			#	1	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Chloride	mg/L	T09-02	BH	08/25/2012	0001			17			#	2	-
	mg/L	T09-03	BH	08/25/2012	0001			26			#	4	-
	mg/L	T09-04	BH	08/25/2012	0001			59			#	4	-
	mg/L	T09-05	BH	08/25/2012	0001			160			#	10	-
	mg/L	T09-06	BH	08/28/2012	0001			37			#	4	-
	mg/L	T09-07	BH	08/28/2012	0001			32			#	4	-
	mg/L	T09-08	BH	08/28/2012	0001			10			#	1	-
	mg/L	T09-09	BH	08/28/2012	0001			8.9			#	1	-
	mg/L	T09-10	BH	08/28/2012	0001			12			#	1	-
Dissolved Oxygen	mg/L	T01-01	BH	08/24/2012	N001			0.70			#	-	-
	mg/L	T01-02	BH	08/24/2012	N001			0.65			#	-	-
	mg/L	T01-03	BH	08/24/2012	N001			0.68			#	-	-
	mg/L	T01-04	BH	08/24/2012	N001			0.71			#	-	-
	mg/L	T01-05	BH	08/23/2012	N001			0.73			#	-	-
	mg/L	T01-06	BH	08/23/2012	N001			0.66			#	-	-
	mg/L	T01-07	BH	08/23/2012	N001			1.31			#	-	-
	mg/L	T01-08	BH	08/23/2012	N001			1.04			#	-	-
	mg/L	T01-09	BH	08/23/2012	N001			1.96			#	-	-
	mg/L	T02-01	BH	08/22/2012	N001			1.31			#	-	-
	mg/L	T02-02	BH	08/22/2012	N001			1.63			#	-	-
	mg/L	T02-06	BH	08/22/2012	N001			0.68			#	-	-
	mg/L	T02-07	BH	08/23/2012	N001			1.39			#	-	-
	mg/L	T02-08	BH	08/23/2012	N001			1.50			#	-	-
	mg/L	T02-09	BH	08/23/2012	N001			0.68			#	-	-
	mg/L	T02-10	BH	08/23/2012	N001			1.04			#	-	-
	mg/L	T02-11	BH	08/23/2012	N001			0.74			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Dissolved Oxygen	mg/L	T02-12	BH	08/23/2012	N001			0.93			#	-	-
	mg/L	T02-13	BH	08/23/2012	N001			0.75			#	-	-
	mg/L	T02-14	BH	08/23/2012	N001			1.35			#	-	-
	mg/L	T02-15	BH	08/23/2012	N001			0.53			#	-	-
	mg/L	T03-01	BH	08/22/2012	N001			1.56			#	-	-
	mg/L	T03-02	BH	08/22/2012	N001			0.60			#	-	-
	mg/L	T03-18	BH	08/24/2012	N001			0.97			#	-	-
	mg/L	T03-19	BH	08/24/2012	N001			1.19			#	-	-
	mg/L	T03-20	BH	08/24/2012	N001			1.74			#	-	-
	mg/L	T03-21	BH	08/24/2012	N001			1.10			#	-	-
	mg/L	T04-03	BH	08/26/2012	N001			0.72			#	-	-
	mg/L	T04-04	BH	08/26/2012	N001			0.81			#	-	-
	mg/L	T04-05	BH	08/26/2012	N001			0.68			#	-	-
	mg/L	T04-06	BH	08/26/2012	N001			0.43			#	-	-
	mg/L	T04-07	BH	08/26/2012	N001			0.5			#	-	-
	mg/L	T04-08	BH	08/27/2012	N001			0.64			#	-	-
	mg/L	T04-09	BH	08/27/2012	N001			0.48			#	-	-
	mg/L	T04-10	BH	08/27/2012	N001			0.59			#	-	-
	mg/L	T04-11	BH	08/27/2012	N001			0.54			#	-	-
	mg/L	T04-12	BH	08/24/2012	N001			1.09			#	-	-
	mg/L	T04-15	BH	08/24/2012	N001			0.57			#	-	-
	mg/L	T04-16	BH	08/24/2012	N001			0.93			#	-	-
	mg/L	T04-17	BH	08/24/2012	N001			0.76			#	-	-
	mg/L	T05-01	BH	08/28/2012	N001			0.79			#	-	-
	mg/L	T05-02	BH	08/29/2012	N001			0.60			#	-	-
	mg/L	T05-03	BH	08/29/2012	N001			0.44			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Dissolved Oxygen	mg/L	T06-01	BH	08/26/2012	N001			0.62			#	-	-
	mg/L	T06-02	BH	08/26/2012	N001			0.47			#	-	-
	mg/L	T06-03	BH	08/26/2012	N001			0.41			#	-	-
	mg/L	T06-04	BH	08/26/2012	N001			0.56			#	-	-
	mg/L	T06-05	BH	08/26/2012	N001			1.88			#	-	-
	mg/L	T06-06	BH	08/26/2012	N001			1.34			#	-	-
	mg/L	T06-07	BH	08/26/2012	N001			0.65			#	-	-
	mg/L	T06-08	BH	08/26/2012	N001			0.62			#	-	-
	mg/L	T06-09	BH	08/26/2012	N001			0.78			#	-	-
	mg/L	T06-10	BH	08/27/2012	N001			0.4			#	-	-
	mg/L	T06-11	BH	08/27/2012	N001			0.70			#	-	-
	mg/L	T06-12	BH	08/27/2012	N001			0.78			#	-	-
	mg/L	T06-13	BH	08/27/2012	N001			0.75			#	-	-
	mg/L	T06-14	BH	08/27/2012	N001			0.50			#	-	-
	mg/L	T06-15	BH	08/27/2012	N001			0.65			#	-	-
	mg/L	T06-16	BH	08/27/2012	N001			0.92			#	-	-
	mg/L	T06-17	BH	08/27/2012	N001			0.74			#	-	-
	mg/L	T06-21	BH	08/28/2012	N001			0.63			#	-	-
	mg/L	T07-01	BH	08/25/2012	N001			0.48			#	-	-
	mg/L	T07-02	BH	08/25/2012	N001			0.65			#	-	-
	mg/L	T07-03	BH	08/25/2012	N001			0.59			#	-	-
	mg/L	T07-04	BH	08/25/2012	N001			0.79			#	-	-
	mg/L	T07-05	BH	08/25/2012	N001			0.48			#	-	-
	mg/L	T07-06	BH	08/28/2012	N001			0.65			#	-	-
	mg/L	T07-07	BH	08/29/2012	N001			0.54			#	-	-
	mg/L	T07-08	BH	08/28/2012	N001			0.62			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Dissolved Oxygen	mg/L	T07-09	BH	08/28/2012	N001			0.73			#	-	-
	mg/L	T07-10	BH	08/28/2012	N001			0.54			#	-	-
	mg/L	T08-01	BH	08/25/2012	N001			0.67			#	-	-
	mg/L	T08-02	BH	08/25/2012	N001			0.76			#	-	-
	mg/L	T08-03	BH	08/25/2012	N001			2.09			#	-	-
	mg/L	T08-04	BH	08/25/2012	N001			0.84			#	-	-
	mg/L	T08-05	BH	08/25/2012	N001			0.62			#	-	-
	mg/L	T08-06	BH	08/25/2012	N001			0.69			#	-	-
	mg/L	T08-07	BH	08/27/2012	N001			0.54			#	-	-
	mg/L	T08-08	BH	08/28/2012	N001			0.79			#	-	-
	mg/L	T08-09	BH	08/28/2012	N001			0.46			#	-	-
	mg/L	T09-01	BH	08/25/2012	N001			0.75			#	-	-
	mg/L	T09-02	BH	08/25/2012	N001			0.62			#	-	-
	mg/L	T09-03	BH	08/25/2012	N001			2.10			#	-	-
	mg/L	T09-04	BH	08/25/2012	N001			1.39			#	-	-
	mg/L	T09-05	BH	08/25/2012	N001			0.74			#	-	-
	mg/L	T09-06	BH	08/28/2012	N001			0.58			#	-	-
	mg/L	T09-07	BH	08/28/2012	N001			0.73			#	-	-
	mg/L	T09-08	BH	08/28/2012	N001			0.88			#	-	-
	mg/L	T09-09	BH	08/28/2012	N001			0.61			#	-	-
	mg/L	T09-10	BH	08/28/2012	N001			0.48			#	-	-
Magnesium	mg/L	T01-01	BH	08/24/2012	0001			37.000			#	0.065	-
	mg/L	T01-02	BH	08/24/2012	0001			22.000			#	0.013	-
	mg/L	T01-03	BH	08/24/2012	0001			22.000			#	0.013	-
	mg/L	T01-04	BH	08/24/2012	0001			22.000			#	0.013	-
	mg/L	T01-05	BH	08/23/2012	0001			32.000			#	0.013	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Magnesium	mg/L	T01-06	BH	08/23/2012	0001			30.000		#	0.013	-
	mg/L	T01-07	BH	08/23/2012	0001			25.000		#	0.013	-
	mg/L	T01-08	BH	08/23/2012	0001			20.000		#	0.013	-
	mg/L	T01-09	BH	08/23/2012	0001			14.000		#	0.013	-
	mg/L	T02-01	BH	08/22/2012	0001			67.000		#	0.065	-
	mg/L	T02-02	BH	08/22/2012	0001			8.700		#	0.065	-
	mg/L	T02-03	BH	08/22/2012	0001			18.000		#	0.065	-
	mg/L	T02-04	BH	08/22/2012	0001			19.000		#	0.065	-
	mg/L	T02-05	BH	08/22/2012	0001			19.000		#	0.065	-
	mg/L	T02-06	BH	08/22/2012	0001			30.000		#	0.13	-
	mg/L	T02-07	BH	08/23/2012	0001			56.000		#	0.065	-
	mg/L	T02-08	BH	08/23/2012	0001			27.000		#	0.065	-
	mg/L	T02-09	BH	08/23/2012	0001			46.000		#	0.013	-
	mg/L	T02-10	BH	08/23/2012	0001			42.000		#	0.013	-
	mg/L	T02-11	BH	08/23/2012	0001			30.000		#	0.013	-
	mg/L	T02-12	BH	08/23/2012	0001			19.000		#	0.013	-
	mg/L	T02-13	BH	08/23/2012	0001			10.000		#	0.013	-
	mg/L	T02-14	BH	08/23/2012	0001			12.000		#	0.013	-
	mg/L	T02-15	BH	08/23/2012	0001			12.000		#	0.013	-
	mg/L	T03-01	BH	08/22/2012	0001			25.000		#	0.013	-
	mg/L	T03-02	BH	08/22/2012	0001			36.000		#	0.013	-
	mg/L	T03-08	BH	08/21/2012	0001			54.000		#	0.13	-
	mg/L	T03-09	BH	08/22/2012	0001			49.000		#	0.13	-
	mg/L	T03-10	BH	08/22/2012	0001			46.000		#	0.13	-
	mg/L	T03-11	BH	08/22/2012	0001			45.000		#	0.065	-
	mg/L	T03-12	BH	08/21/2012	0001			35.000		#	0.013	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Magnesium	mg/L	T03-13	BH	08/21/2012	0001			29.000			#	0.013	-
	mg/L	T03-14	BH	08/21/2012	0001			26.000			#	0.013	-
	mg/L	T03-15	BH	08/21/2012	0001			17.000			#	0.013	-
	mg/L	T03-15	BH	08/21/2012	0002			17.000			#	0.013	-
	mg/L	T03-16	BH	08/21/2012	0001			17.000			#	0.013	-
	mg/L	T03-17	BH	08/21/2012	0001			16.000			#	0.013	-
	mg/L	T03-18	BH	08/24/2012	0001			22.000			#	0.013	-
	mg/L	T03-19	BH	08/24/2012	0001			20.000			#	0.013	-
	mg/L	T03-20	BH	08/24/2012	0001			29.000			#	0.013	-
	mg/L	T03-21	BH	08/24/2012	0001			30.000			#	0.013	-
	mg/L	T04-03	BH	08/26/2012	0001			48.000			#	0.065	-
	mg/L	T04-04	BH	08/26/2012	0001			45.000			#	0.065	-
	mg/L	T04-05	BH	08/26/2012	0001			99.000			#	0.065	-
	mg/L	T04-06	BH	08/26/2012	0001			120.000			#	0.13	-
	mg/L	T04-07	BH	08/26/2012	0001			110.000			#	0.13	-
	mg/L	T04-07	BH	08/26/2012	0002			110.000			#	0.13	-
	mg/L	T04-08	BH	08/27/2012	0001			98.000			#	0.13	-
	mg/L	T04-09	BH	08/27/2012	0001			76.000			#	0.13	-
	mg/L	T04-10	BH	08/27/2012	0001			63.000			#	0.065	-
	mg/L	T04-11	BH	08/27/2012	0001			46.000			#	0.065	-
	mg/L	T04-12	BH	08/24/2012	0001			7.700			#	0.013	-
	mg/L	T04-15	BH	08/24/2012	0001			19.000			#	0.013	-
	mg/L	T04-16	BH	08/24/2012	0001			22.000			#	0.013	-
	mg/L	T04-16	BH	08/24/2012	0002			21.000			#	0.013	-
	mg/L	T04-17	BH	08/24/2012	0001			24.000			#	0.013	-
	mg/L	T05-01	BH	08/28/2012	0001			160.000			#	0.13	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Magnesium	mg/L	T05-02	BH	08/29/2012	0001			80.000		#	0.065	-
	mg/L	T05-03	BH	08/29/2012	0001			41.000		#	0.065	-
	mg/L	T05-03	BH	08/29/2012	0002			40.000		#	0.065	-
	mg/L	T06-01	BH	08/26/2012	0001			70.000		#	0.065	-
	mg/L	T06-02	BH	08/26/2012	0001			98.000		#	0.065	-
	mg/L	T06-03	BH	08/26/2012	0001			85.000		#	0.065	-
	mg/L	T06-04	BH	08/26/2012	0001			67.000		#	0.065	-
	mg/L	T06-05	BH	08/26/2012	0001			150.000		#	0.13	-
	mg/L	T06-06	BH	08/26/2012	0001			160.000		#	0.13	-
	mg/L	T06-07	BH	08/26/2012	0001			200.000		#	0.13	-
	mg/L	T06-08	BH	08/26/2012	0001			180.000		#	0.13	-
	mg/L	T06-09	BH	08/26/2012	0001			180.000		#	0.13	-
	mg/L	T06-10	BH	08/27/2012	0001			220.000		#	0.13	-
	mg/L	T06-11	BH	08/27/2012	0001			99.000		#	0.13	-
	mg/L	T06-12	BH	08/27/2012	0001			54.000		#	0.065	-
	mg/L	T06-13	BH	08/27/2012	0001			69.000		#	0.065	-
	mg/L	T06-14	BH	08/27/2012	0001			45.000		#	0.013	-
	mg/L	T06-15	BH	08/27/2012	0001			34.000		#	0.013	-
	mg/L	T06-16	BH	08/27/2012	0001			35.000		#	0.013	-
	mg/L	T06-17	BH	08/27/2012	0001			56.000		#	0.065	-
	mg/L	T06-21	BH	08/28/2012	0001			32.000		#	0.013	-
	mg/L	T07-01	BH	08/25/2012	0001			240.000		#	0.26	-
	mg/L	T07-02	BH	08/25/2012	0001			310.000		#	0.26	-
	mg/L	T07-03	BH	08/25/2012	0001			240.000		#	0.26	-
	mg/L	T07-04	BH	08/25/2012	0001			220.000		#	0.13	-
	mg/L	T07-05	BH	08/25/2012	0001			170.000		#	0.13	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Magnesium	mg/L	T07-06	BH	08/28/2012	0001			140.000			#	0.065	-
	mg/L	T07-06	BH	08/28/2012	0002			130.000			#	0.065	-
	mg/L	T07-07	BH	08/29/2012	0001			67.000			#	0.065	-
	mg/L	T07-08	BH	08/28/2012	0001			74.000			#	0.065	-
	mg/L	T07-09	BH	08/28/2012	0001			41.000			#	0.013	-
	mg/L	T07-10	BH	08/28/2012	0001			29.000			#	0.013	-
	mg/L	T08-01	BH	08/25/2012	0001			360.000			#	0.26	-
	mg/L	T08-02	BH	08/25/2012	0001			390.000			#	0.26	-
	mg/L	T08-02	BH	08/25/2012	0002			370.000			#	0.65	-
	mg/L	T08-03	BH	08/25/2012	0001			320.000			#	0.26	-
	mg/L	T08-04	BH	08/25/2012	0001			200.000			#	0.13	-
	mg/L	T08-05	BH	08/25/2012	0001			170.000			#	0.013	-
	mg/L	T08-06	BH	08/25/2012	0001			120.000			#	0.065	-
	mg/L	T08-07	BH	08/27/2012	0001			120.000			#	0.065	-
	mg/L	T08-08	BH	08/28/2012	0001			50.000			#	0.013	-
	mg/L	T08-09	BH	08/28/2012	0001			39.000			#	0.013	-
	mg/L	T09-01	BH	08/25/2012	0001			25.000			#	0.013	-
	mg/L	T09-02	BH	08/25/2012	0001			40.000			#	0.013	-
	mg/L	T09-03	BH	08/25/2012	0001			59.000			#	0.065	-
	mg/L	T09-04	BH	08/25/2012	0001			110.000			#	0.065	-
	mg/L	T09-05	BH	08/25/2012	0001			140.000			#	0.065	-
	mg/L	T09-06	BH	08/28/2012	0001			57.000			#	0.065	-
	mg/L	T09-07	BH	08/28/2012	0001			34.000			#	0.065	-
	mg/L	T09-08	BH	08/28/2012	0001			21.000			#	0.013	-
	mg/L	T09-09	BH	08/28/2012	0001			22.000			#	0.013	-
	mg/L	T09-10	BH	08/28/2012	0001			29.000			#	0.013	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	T01-01	BH	08/24/2012	0001			0.110			#	0.00057	-
	mg/L	T01-02	BH	08/24/2012	0001			0.240			#	0.00011	-
	mg/L	T01-03	BH	08/24/2012	0001			0.350			#	0.00011	-
	mg/L	T01-04	BH	08/24/2012	0001			0.400			#	0.00011	-
	mg/L	T01-05	BH	08/23/2012	0001			0.530			#	0.00011	-
	mg/L	T01-06	BH	08/23/2012	0001			0.091			#	0.00011	-
	mg/L	T01-07	BH	08/23/2012	0001			0.022			#	0.00011	-
	mg/L	T01-08	BH	08/23/2012	0001			0.012			#	0.00011	-
	mg/L	T01-09	BH	08/23/2012	0001			0.034			#	0.00011	-
	mg/L	T02-01	BH	08/22/2012	0001			1.300			#	0.00057	-
	mg/L	T02-02	BH	08/22/2012	0001			0.270			#	0.00057	-
	mg/L	T02-03	BH	08/22/2012	0001			0.570			#	0.00057	-
	mg/L	T02-04	BH	08/22/2012	0001			2.200			#	0.00057	-
	mg/L	T02-05	BH	08/22/2012	0001			1.500			#	0.00057	-
	mg/L	T02-06	BH	08/22/2012	0001			0.160			#	0.0011	-
	mg/L	T02-07	BH	08/23/2012	0001			7.200			#	0.00057	-
	mg/L	T02-08	BH	08/23/2012	0001			0.570			#	0.00057	-
	mg/L	T02-09	BH	08/23/2012	0001			0.180			#	0.00011	-
	mg/L	T02-10	BH	08/23/2012	0001			0.040			#	0.00011	-
	mg/L	T02-11	BH	08/23/2012	0001			0.048			#	0.00011	-
	mg/L	T02-12	BH	08/23/2012	0001			0.017			#	0.00011	-
	mg/L	T02-13	BH	08/23/2012	0001			0.038			#	0.00011	-
	mg/L	T02-14	BH	08/23/2012	0001			0.040			#	0.00011	-
	mg/L	T02-15	BH	08/23/2012	0001			0.067			#	0.00011	-
	mg/L	T03-01	BH	08/22/2012	0001			0.660			#	0.00011	-
	mg/L	T03-02	BH	08/22/2012	0001			0.990			#	0.00011	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	T03-08	BH	08/21/2012	0001			2.100			#	0.0011	-
	mg/L	T03-09	BH	08/22/2012	0001			0.740			#	0.0011	-
	mg/L	T03-10	BH	08/22/2012	0001			0.360			#	0.0011	-
	mg/L	T03-11	BH	08/22/2012	0001			0.061			#	0.00057	-
	mg/L	T03-12	BH	08/21/2012	0001			0.016			#	0.00011	-
	mg/L	T03-13	BH	08/21/2012	0001			0.059			#	0.00011	-
	mg/L	T03-14	BH	08/21/2012	0001			0.095			#	0.00011	-
	mg/L	T03-15	BH	08/21/2012	0001			0.290			#	0.00011	-
	mg/L	T03-15	BH	08/21/2012	0002			0.300			#	0.00011	-
	mg/L	T03-16	BH	08/21/2012	0001			0.070			#	0.00011	-
	mg/L	T03-17	BH	08/21/2012	0001			0.150			#	0.00011	-
	mg/L	T03-18	BH	08/24/2012	0001			0.170			#	0.00011	-
	mg/L	T03-19	BH	08/24/2012	0001			0.098			#	0.00011	-
	mg/L	T03-20	BH	08/24/2012	0001			0.150	E	J	#	0.00011	-
	mg/L	T03-21	BH	08/24/2012	0001			0.210			#	0.00011	-
	mg/L	T04-03	BH	08/26/2012	0001			1.700			#	0.00057	-
	mg/L	T04-04	BH	08/26/2012	0001			1.400			#	0.00057	-
	mg/L	T04-05	BH	08/26/2012	0001			3.000			#	0.00057	-
	mg/L	T04-06	BH	08/26/2012	0001			4.100			#	0.0011	-
	mg/L	T04-07	BH	08/26/2012	0001			1.800			#	0.0011	-
	mg/L	T04-07	BH	08/26/2012	0002			1.800			#	0.0011	-
	mg/L	T04-08	BH	08/27/2012	0001			2.000			#	0.0011	-
	mg/L	T04-09	BH	08/27/2012	0001			2.000			#	0.0011	-
	mg/L	T04-10	BH	08/27/2012	0001			1.500			#	0.00057	-
	mg/L	T04-11	BH	08/27/2012	0001			0.660			#	0.00057	-
	mg/L	T04-12	BH	08/24/2012	0001			0.036			#	0.00011	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	T04-15	BH	08/24/2012	0001			0.096			#	0.00011	-
	mg/L	T04-16	BH	08/24/2012	0001			0.190			#	0.00011	-
	mg/L	T04-16	BH	08/24/2012	0002			0.180			#	0.00011	-
	mg/L	T04-17	BH	08/24/2012	0001			0.075			#	0.00011	-
	mg/L	T05-01	BH	08/28/2012	0001			1.300			#	0.0011	-
	mg/L	T05-02	BH	08/29/2012	0001			1.000			#	0.00057	-
	mg/L	T05-03	BH	08/29/2012	0001			0.760			#	0.00057	-
	mg/L	T05-03	BH	08/29/2012	0002			0.760			#	0.00057	-
	mg/L	T06-01	BH	08/26/2012	0001			1.200			#	0.00057	-
	mg/L	T06-02	BH	08/26/2012	0001			1.700			#	0.00057	-
	mg/L	T06-03	BH	08/26/2012	0001			1.400			#	0.00057	-
	mg/L	T06-04	BH	08/26/2012	0001			0.670			#	0.00057	-
	mg/L	T06-05	BH	08/26/2012	0001			0.170			#	0.0011	-
	mg/L	T06-06	BH	08/26/2012	0001			2.800			#	0.0011	-
	mg/L	T06-07	BH	08/26/2012	0001			1.700			#	0.0011	-
	mg/L	T06-08	BH	08/26/2012	0001			0.850			#	0.0011	-
	mg/L	T06-09	BH	08/26/2012	0001			0.640			#	0.0011	-
	mg/L	T06-10	BH	08/27/2012	0001			2.700			#	0.0011	-
	mg/L	T06-11	BH	08/27/2012	0001			1.400			#	0.0011	-
	mg/L	T06-12	BH	08/27/2012	0001			1.100			#	0.00057	-
	mg/L	T06-13	BH	08/27/2012	0001			2.200			#	0.00057	-
	mg/L	T06-14	BH	08/27/2012	0001			0.670			#	0.00011	-
	mg/L	T06-15	BH	08/27/2012	0001			0.700			#	0.00011	-
	mg/L	T06-16	BH	08/27/2012	0001			0.060			#	0.00011	-
	mg/L	T06-17	BH	08/27/2012	0001			0.180			#	0.00057	-
	mg/L	T06-21	BH	08/28/2012	0001			0.087			#	0.00011	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	T07-01	BH	08/25/2012	0001			0.700		#	0.0023	-
	mg/L	T07-02	BH	08/25/2012	0001			0.330		#	0.0023	-
	mg/L	T07-03	BH	08/25/2012	0001			0.190		#	0.0023	-
	mg/L	T07-04	BH	08/25/2012	0001			3.400		#	0.0011	-
	mg/L	T07-05	BH	08/25/2012	0001			2.100		#	0.0011	-
	mg/L	T07-06	BH	08/28/2012	0001			0.520		#	0.00057	-
	mg/L	T07-06	BH	08/28/2012	0002			0.520		#	0.00057	-
	mg/L	T07-07	BH	08/29/2012	0001			1.600		#	0.00057	-
	mg/L	T07-08	BH	08/28/2012	0001			1.600		#	0.00057	-
	mg/L	T07-09	BH	08/28/2012	0001			0.840		#	0.00011	-
	mg/L	T07-10	BH	08/28/2012	0001			0.800		#	0.00011	-
	mg/L	T08-01	BH	08/25/2012	0001			2.000		#	0.0023	-
	mg/L	T08-02	BH	08/25/2012	0001			1.200		#	0.0023	-
	mg/L	T08-02	BH	08/25/2012	0002			1.100		#	0.0057	-
	mg/L	T08-03	BH	08/25/2012	0001			1.100		#	0.0023	-
	mg/L	T08-04	BH	08/25/2012	0001			1.200		#	0.0011	-
	mg/L	T08-05	BH	08/25/2012	0001			1.600		#	0.00011	-
	mg/L	T08-06	BH	08/25/2012	0001			2.200		#	0.00057	-
	mg/L	T08-07	BH	08/27/2012	0001			2.900		#	0.00057	-
	mg/L	T08-08	BH	08/28/2012	0001			1.300		#	0.00011	-
	mg/L	T08-09	BH	08/28/2012	0001			0.360		#	0.00011	-
	mg/L	T09-01	BH	08/25/2012	0001			0.740		#	0.00011	-
	mg/L	T09-02	BH	08/25/2012	0001			0.930		#	0.00011	-
	mg/L	T09-03	BH	08/25/2012	0001			2.100		#	0.00057	-
	mg/L	T09-04	BH	08/25/2012	0001			2.300		#	0.00057	-
	mg/L	T09-05	BH	08/25/2012	0001			3.500		#	0.00057	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Manganese	mg/L	T09-06	BH	08/28/2012	0001			2.500		#	0.00057	-
	mg/L	T09-07	BH	08/28/2012	0001			0.440		#	0.00057	-
	mg/L	T09-08	BH	08/28/2012	0001			0.028		#	0.00011	-
	mg/L	T09-09	BH	08/28/2012	0001			0.075		#	0.00011	-
	mg/L	T09-10	BH	08/28/2012	0001			0.190		#	0.00011	-
Molybdenum	mg/L	T01-01	BH	08/24/2012	0001			0.0094		#	0.00032	-
	mg/L	T01-02	BH	08/24/2012	0001			0.0099		#	0.00032	-
	mg/L	T01-03	BH	08/24/2012	0001			0.0084		#	0.00032	-
	mg/L	T01-04	BH	08/24/2012	0001			0.0082		#	0.00032	-
	mg/L	T01-05	BH	08/23/2012	0001			0.0081		#	0.00032	-
	mg/L	T01-06	BH	08/23/2012	0001			0.0078		#	0.00032	-
	mg/L	T01-07	BH	08/23/2012	0001			0.0096		#	0.00032	-
	mg/L	T01-08	BH	08/23/2012	0001			0.0059		#	0.00032	-
	mg/L	T01-09	BH	08/23/2012	0001			0.011		#	0.00032	-
	mg/L	T02-01	BH	08/22/2012	0001			0.016		#	0.00032	-
	mg/L	T02-02	BH	08/22/2012	0001			0.016		#	0.00032	-
	mg/L	T02-03	BH	08/22/2012	0001			0.018		#	0.00032	-
	mg/L	T02-04	BH	08/22/2012	0001			0.016		#	0.00032	-
	mg/L	T02-05	BH	08/22/2012	0001			0.018		#	0.00032	-
	mg/L	T02-06	BH	08/22/2012	0001			0.032		#	0.00032	-
	mg/L	T02-07	BH	08/23/2012	0001			0.043		#	0.00032	-
	mg/L	T02-08	BH	08/23/2012	0001			0.052		#	0.00032	-
	mg/L	T02-09	BH	08/23/2012	0001			0.090		#	0.00032	-
	mg/L	T02-10	BH	08/23/2012	0001			0.031		#	0.00032	-
	mg/L	T02-11	BH	08/23/2012	0001			0.0077		#	0.00032	-
	mg/L	T02-12	BH	08/23/2012	0001			0.0062		#	0.00032	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	T02-13	BH	08/23/2012	0001			0.0052		#	0.00032	-
	mg/L	T02-14	BH	08/23/2012	0001			0.0051		#	0.00032	-
	mg/L	T02-15	BH	08/23/2012	0001			0.0067		#	0.00032	-
	mg/L	T03-01	BH	08/22/2012	0001			0.0058		#	0.00032	-
	mg/L	T03-02	BH	08/22/2012	0001			0.0047		#	0.00032	-
	mg/L	T03-08	BH	08/21/2012	0001			0.350		#	0.0032	-
	mg/L	T03-09	BH	08/22/2012	0001			0.940		#	0.00032	-
	mg/L	T03-10	BH	08/22/2012	0001			0.450		#	0.0016	-
	mg/L	T03-11	BH	08/22/2012	0001			0.200		#	0.00032	-
	mg/L	T03-12	BH	08/21/2012	0001			0.110		#	0.00032	-
	mg/L	T03-13	BH	08/21/2012	0001			0.067		#	0.00032	-
	mg/L	T03-14	BH	08/21/2012	0001			0.024		#	0.00032	-
	mg/L	T03-15	BH	08/21/2012	0001			0.025		#	0.00032	-
	mg/L	T03-15	BH	08/21/2012	0002			0.025		#	0.00032	-
	mg/L	T03-16	BH	08/21/2012	0001			0.016		#	0.00032	-
	mg/L	T03-17	BH	08/21/2012	0001			0.019		#	0.00032	-
	mg/L	T03-18	BH	08/24/2012	0001			0.0046		#	0.00032	-
	mg/L	T03-19	BH	08/24/2012	0001			0.004		#	0.00032	-
	mg/L	T03-20	BH	08/24/2012	0001			0.0072		#	0.00032	-
	mg/L	T03-21	BH	08/24/2012	0001			0.0062		#	0.00032	-
	mg/L	T04-03	BH	08/26/2012	0001			0.0085		#	0.00032	-
	mg/L	T04-04	BH	08/26/2012	0001			0.009		#	0.00032	-
	mg/L	T04-05	BH	08/26/2012	0001			0.027		#	0.00032	-
	mg/L	T04-06	BH	08/26/2012	0001			0.052		#	0.00032	-
	mg/L	T04-07	BH	08/26/2012	0001			0.097		#	0.00032	-
	mg/L	T04-07	BH	08/26/2012	0002			0.098		#	0.00032	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	T04-08	BH	08/27/2012	0001			0.210	#	0.0016	-
	mg/L	T04-09	BH	08/27/2012	0001			0.450	#	0.0032	-
	mg/L	T04-10	BH	08/27/2012	0001			1.100	#	0.0016	-
	mg/L	T04-11	BH	08/27/2012	0001			0.670	#	0.00032	-
	mg/L	T04-12	BH	08/24/2012	0001			0.150	#	0.00032	-
	mg/L	T04-15	BH	08/24/2012	0001			0.019	#	0.00032	-
	mg/L	T04-16	BH	08/24/2012	0001			0.009	#	0.00032	-
	mg/L	T04-16	BH	08/24/2012	0002			0.0091	#	0.00032	-
	mg/L	T04-17	BH	08/24/2012	0001			0.0089	#	0.00032	-
	mg/L	T05-01	BH	08/28/2012	0001			0.220	#	0.0032	-
	mg/L	T05-02	BH	08/29/2012	0001			0.970	#	0.0032	-
	mg/L	T05-03	BH	08/29/2012	0001			0.260	#	0.0032	-
	mg/L	T05-03	BH	08/29/2012	0002			0.260	#	0.0016	-
	mg/L	T06-01	BH	08/26/2012	0001			0.013	#	0.00032	-
	mg/L	T06-02	BH	08/26/2012	0001			0.0083	#	0.00032	-
	mg/L	T06-03	BH	08/26/2012	0001			0.012	#	0.00032	-
	mg/L	T06-04	BH	08/26/2012	0001			0.020	#	0.00032	-
	mg/L	T06-05	BH	08/26/2012	0001			0.083	#	0.00032	-
	mg/L	T06-06	BH	08/26/2012	0001			0.110	#	0.00032	-
	mg/L	T06-07	BH	08/26/2012	0001			0.170	#	0.0032	-
	mg/L	T06-08	BH	08/26/2012	0001			0.250	#	0.0032	-
	mg/L	T06-09	BH	08/26/2012	0001			0.310	#	0.0032	-
	mg/L	T06-10	BH	08/27/2012	0001			0.960	#	0.0032	-
	mg/L	T06-11	BH	08/27/2012	0001			0.970	#	0.0032	-
	mg/L	T06-12	BH	08/27/2012	0001			0.340	#	0.0032	-
	mg/L	T06-13	BH	08/27/2012	0001			0.075	#	0.0032	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	T06-14	BH	08/27/2012	0001			0.030			#	0.00032	-
	mg/L	T06-15	BH	08/27/2012	0001			0.014			#	0.00032	-
	mg/L	T06-16	BH	08/27/2012	0001			0.005			#	0.00032	-
	mg/L	T06-17	BH	08/27/2012	0001			0.0048			#	0.00032	-
	mg/L	T06-21	BH	08/28/2012	0001			0.0046			#	0.00032	-
	mg/L	T07-01	BH	08/25/2012	0001			0.150			#	0.0016	-
	mg/L	T07-02	BH	08/25/2012	0001			0.190			#	0.0032	-
	mg/L	T07-03	BH	08/25/2012	0001			0.400			#	0.0032	-
	mg/L	T07-04	BH	08/25/2012	0001			0.840			#	0.0032	-
	mg/L	T07-05	BH	08/25/2012	0001			0.930			#	0.0032	-
	mg/L	T07-06	BH	08/28/2012	0001			0.530			#	0.0032	-
	mg/L	T07-06	BH	08/28/2012	0002			0.530			#	0.0032	-
	mg/L	T07-07	BH	08/29/2012	0001			0.150			#	0.0032	-
	mg/L	T07-08	BH	08/28/2012	0001			0.032			#	0.0032	-
	mg/L	T07-09	BH	08/28/2012	0001			0.021			#	0.00032	-
	mg/L	T07-10	BH	08/28/2012	0001			0.0084			#	0.00032	-
	mg/L	T08-01	BH	08/25/2012	0001			0.150			#	0.0032	-
	mg/L	T08-02	BH	08/25/2012	0001			0.280			#	0.0032	-
	mg/L	T08-02	BH	08/25/2012	0002			0.300			#	0.0016	-
	mg/L	T08-03	BH	08/25/2012	0001			0.560			#	0.0064	-
	mg/L	T08-04	BH	08/25/2012	0001			0.980			#	0.0032	-
	mg/L	T08-05	BH	08/25/2012	0001			0.870			#	0.0032	-
	mg/L	T08-06	BH	08/25/2012	0001			0.360			#	0.0032	-
	mg/L	T08-07	BH	08/27/2012	0001			0.160			#	0.0032	-
	mg/L	T08-08	BH	08/28/2012	0001			0.0045			#	0.00032	-
	mg/L	T08-09	BH	08/28/2012	0001			0.0057			#	0.00032	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Molybdenum	mg/L	T09-01	BH	08/25/2012	0001			0.006			#	0.00032	-
	mg/L	T09-02	BH	08/25/2012	0001			0.0069			#	0.00032	-
	mg/L	T09-03	BH	08/25/2012	0001			0.0096			#	0.00032	-
	mg/L	T09-04	BH	08/25/2012	0001			0.0079			#	0.00032	-
	mg/L	T09-05	BH	08/25/2012	0001			0.016			#	0.00032	-
	mg/L	T09-06	BH	08/28/2012	0001			0.0071			#	0.00032	-
	mg/L	T09-07	BH	08/28/2012	0001			0.0097			#	0.00032	-
	mg/L	T09-08	BH	08/28/2012	0001			0.007			#	0.00032	-
	mg/L	T09-09	BH	08/28/2012	0001			0.0066			#	0.00032	-
	mg/L	T09-10	BH	08/28/2012	0001			0.0055			#	0.00032	-
Oxidation Reduction Potential	mV	T01-01	BH	08/24/2012	N001			-58.5			#	-	-
	mV	T01-02	BH	08/24/2012	N001			-68.1			#	-	-
	mV	T01-03	BH	08/24/2012	N001			-103.6			#	-	-
	mV	T01-04	BH	08/24/2012	N001			-80.0			#	-	-
	mV	T01-05	BH	08/23/2012	N001			-90.7			#	-	-
	mV	T01-06	BH	08/23/2012	N001			-45.9			#	-	-
	mV	T01-07	BH	08/23/2012	N001			-95.9			#	-	-
	mV	T01-08	BH	08/23/2012	N001			-69.4			#	-	-
	mV	T01-09	BH	08/23/2012	N001			-84.8			#	-	-
	mV	T02-01	BH	08/22/2012	N001			-106.8			#	-	-
	mV	T02-02	BH	08/22/2012	N001			-103.6			#	-	-
	mV	T02-03	BH	08/22/2012	N001			-135.8			#	-	-
	mV	T02-04	BH	08/22/2012	N001			-59.8			#	-	-
	mV	T02-05	BH	08/22/2012	N001			-95.7			#	-	-
	mV	T02-06	BH	08/22/2012	N001			-143.4			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	T02-07	BH	08/23/2012	N001			-34.6			#	-	-
	mV	T02-08	BH	08/23/2012	N001			-57.7			#	-	-
	mV	T02-09	BH	08/23/2012	N001			-38.9			#	-	-
	mV	T02-10	BH	08/23/2012	N001			-47.0			#	-	-
	mV	T02-11	BH	08/23/2012	N001			-24.3			#	-	-
	mV	T02-12	BH	08/23/2012	N001			-61.4			#	-	-
	mV	T02-13	BH	08/23/2012	N001			-74.8			#	-	-
	mV	T02-14	BH	08/23/2012	N001			-31.5			#	-	-
	mV	T02-15	BH	08/23/2012	N001			-28.7			#	-	-
	mV	T03-01	BH	08/22/2012	N001			-95.1			#	-	-
	mV	T03-02	BH	08/22/2012	N001			-67.2			#	-	-
	mV	T03-08	BH	08/21/2012	N001			-7.2			#	-	-
	mV	T03-09	BH	08/22/2012	N001			-2.1			#	-	-
	mV	T03-10	BH	08/22/2012	N001			-27.2			#	-	-
	mV	T03-11	BH	08/22/2012	N001			-43.5			#	-	-
	mV	T03-12	BH	08/21/2012	N001			-39.6			#	-	-
	mV	T03-13	BH	08/21/2012	N001			-46.2			#	-	-
	mV	T03-14	BH	08/21/2012	N001			-26.7			#	-	-
	mV	T03-15	BH	08/21/2012	N001			-82.8			#	-	-
	mV	T03-16	BH	08/21/2012	N001			-61.0			#	-	-
	mV	T03-17	BH	08/21/2012	N001			-89.5			#	-	-
	mV	T03-18	BH	08/24/2012	N001			-109.0			#	-	-
	mV	T03-19	BH	08/24/2012	N001			-95.0			#	-	-
	mV	T03-20	BH	08/24/2012	N001			-93.8			#	-	-
	mV	T03-21	BH	08/24/2012	N001			-69.5			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	T04-03	BH	08/26/2012	N001			-70.3		#	-	-
	mV	T04-04	BH	08/26/2012	N001			-55.5		#	-	-
	mV	T04-05	BH	08/26/2012	N001			-79.9		#	-	-
	mV	T04-06	BH	08/26/2012	N001			-85.7		#	-	-
	mV	T04-07	BH	08/26/2012	N001			-74.6		#	-	-
	mV	T04-08	BH	08/27/2012	N001			-23.9		#	-	-
	mV	T04-09	BH	08/27/2012	N001			-65.0		#	-	-
	mV	T04-10	BH	08/27/2012	N001			-66.4		#	-	-
	mV	T04-11	BH	08/27/2012	N001			-55.3		#	-	-
	mV	T04-12	BH	08/24/2012	N001			-61.8		#	-	-
	mV	T04-15	BH	08/24/2012	N001			-58.3		#	-	-
	mV	T04-16	BH	08/24/2012	N001			-82.9		#	-	-
	mV	T04-17	BH	08/24/2012	N001			-61.0		#	-	-
	mV	T05-01	BH	08/28/2012	N001			-91.1		#	-	-
	mV	T05-02	BH	08/29/2012	N001			-25.7		#	-	-
	mV	T05-03	BH	08/29/2012	N001			-57.5		#	-	-
	mV	T06-01	BH	08/26/2012	N001			-93.2		#	-	-
	mV	T06-02	BH	08/26/2012	N001			-72.0		#	-	-
	mV	T06-03	BH	08/26/2012	N001			-65.1		#	-	-
	mV	T06-04	BH	08/26/2012	N001			-52.7		#	-	-
	mV	T06-05	BH	08/26/2012	N001			-64.0		#	-	-
	mV	T06-06	BH	08/26/2012	N001			-69.6		#	-	-
	mV	T06-07	BH	08/26/2012	N001			-54.3		#	-	-
	mV	T06-08	BH	08/26/2012	N001			-36.2		#	-	-
	mV	T06-09	BH	08/26/2012	N001			-9.4		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	T06-10	BH	08/27/2012	N001			-40.1			#	-	-
	mV	T06-11	BH	08/27/2012	N001			-54.6			#	-	-
	mV	T06-12	BH	08/27/2012	N001			-63.8			#	-	-
	mV	T06-13	BH	08/27/2012	N001			-45.5			#	-	-
	mV	T06-14	BH	08/27/2012	N001			-58.0			#	-	-
	mV	T06-15	BH	08/27/2012	N001			-54.5			#	-	-
	mV	T06-16	BH	08/27/2012	N001			-100.5			#	-	-
	mV	T06-17	BH	08/27/2012	N001			-63.2			#	-	-
	mV	T06-21	BH	08/28/2012	N001			-63.3			#	-	-
	mV	T07-01	BH	08/25/2012	N001			-67.3			#	-	-
	mV	T07-02	BH	08/25/2012	N001			-50.3			#	-	-
	mV	T07-03	BH	08/25/2012	N001			-47.9			#	-	-
	mV	T07-04	BH	08/25/2012	N001			-48.9			#	-	-
	mV	T07-05	BH	08/25/2012	N001			-40.6			#	-	-
	mV	T07-06	BH	08/28/2012	N001			-44.1			#	-	-
	mV	T07-07	BH	08/29/2012	N001			-63.4			#	-	-
	mV	T07-08	BH	08/28/2012	N001			-36.7			#	-	-
	mV	T07-09	BH	08/28/2012	N001			-67.6			#	-	-
	mV	T07-10	BH	08/28/2012	N001			-81.2			#	-	-
	mV	T08-01	BH	08/25/2012	N001			-48.1			#	-	-
	mV	T08-02	BH	08/25/2012	N001			-39.6			#	-	-
	mV	T08-03	BH	08/25/2012	N001			-59.7			#	-	-
	mV	T08-04	BH	08/25/2012	N001			-33.1			#	-	-
	mV	T08-05	BH	08/25/2012	N001			-54.3			#	-	-
	mV	T08-06	BH	08/25/2012	N001			-43.3			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	T08-07	BH	08/27/2012	N001			-74.2		#	-	-
	mV	T08-08	BH	08/28/2012	N001			-56.0		#	-	-
	mV	T08-09	BH	08/28/2012	N001			-107.9		#	-	-
	mV	T09-01	BH	08/25/2012	N001			-12.4		#	-	-
	mV	T09-02	BH	08/25/2012	N001			-69.2		#	-	-
	mV	T09-03	BH	08/25/2012	N001			-70.7		#	-	-
	mV	T09-04	BH	08/25/2012	N001			-65.8		#	-	-
	mV	T09-05	BH	08/25/2012	N001			-36.8		#	-	-
	mV	T09-06	BH	08/28/2012	N001			-44.9		#	-	-
	mV	T09-07	BH	08/28/2012	N001			-16.1		#	-	-
	mV	T09-08	BH	08/28/2012	N001			-69.3		#	-	-
	mV	T09-09	BH	08/28/2012	N001			-65.1		#	-	-
	mV	T09-10	BH	08/28/2012	N001			-73.0		#	-	-
pH	s.u.	T01-01	BH	08/24/2012	N001			7.19		#	-	-
	s.u.	T01-02	BH	08/24/2012	N001			7.22		#	-	-
	s.u.	T01-03	BH	08/24/2012	N001			7.30		#	-	-
	s.u.	T01-04	BH	08/24/2012	N001			7.16		#	-	-
	s.u.	T01-05	BH	08/23/2012	N001			7.23		#	-	-
	s.u.	T01-06	BH	08/23/2012	N001			7.59		#	-	-
	s.u.	T01-07	BH	08/23/2012	N001			7.35		#	-	-
	s.u.	T01-08	BH	08/23/2012	N001			7.30		#	-	-
	s.u.	T01-09	BH	08/23/2012	N001			7.25		#	-	-
	s.u.	T02-01	BH	08/22/2012	N001			7.24		#	-	-
	s.u.	T02-02	BH	08/22/2012	N001			7.71		#	-	-
	s.u.	T02-03	BH	08/22/2012	N001			7.60		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	T02-04	BH	08/22/2012	N001			7.54			#	-	-
	s.u.	T02-05	BH	08/22/2012	N001			7.57			#	-	-
	s.u.	T02-06	BH	08/22/2012	N001			7.84			#	-	-
	s.u.	T02-07	BH	08/23/2012	N001			6.49			#	-	-
	s.u.	T02-08	BH	08/23/2012	N001			6.94			#	-	-
	s.u.	T02-09	BH	08/23/2012	N001			7.16			#	-	-
	s.u.	T02-10	BH	08/23/2012	N001			7.20			#	-	-
	s.u.	T02-11	BH	08/23/2012	N001			7.23			#	-	-
	s.u.	T02-12	BH	08/23/2012	N001			7.29			#	-	-
	s.u.	T02-13	BH	08/23/2012	N001			7.57			#	-	-
	s.u.	T02-14	BH	08/23/2012	N001			7.45			#	-	-
	s.u.	T02-15	BH	08/23/2012	N001			7.48			#	-	-
	s.u.	T03-01	BH	08/22/2012	N001			7.28			#	-	-
	s.u.	T03-02	BH	08/22/2012	N001			7.14			#	-	-
	s.u.	T03-08	BH	08/21/2012	N001			6.81			#	-	-
	s.u.	T03-09	BH	08/22/2012	N001			7.00			#	-	-
	s.u.	T03-10	BH	08/22/2012	N001			6.97			#	-	-
	s.u.	T03-11	BH	08/22/2012	N001			7.10			#	-	-
	s.u.	T03-12	BH	08/21/2012	N001			7.09			#	-	-
	s.u.	T03-13	BH	08/21/2012	N001			7.12			#	-	-
	s.u.	T03-14	BH	08/21/2012	N001			7.02			#	-	-
	s.u.	T03-15	BH	08/21/2012	N001			7.29			#	-	-
	s.u.	T03-16	BH	08/21/2012	N001			7.49			#	-	-
	s.u.	T03-17	BH	08/21/2012	N001			7.48			#	-	-
	s.u.	T03-18	BH	08/24/2012	N001			7.19			#	-	-
	s.u.	T03-19	BH	08/24/2012	N001			7.18			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	T03-20	BH	08/24/2012	N001			7.17			#	-	-
	s.u.	T03-21	BH	08/24/2012	N001			7.10			#	-	-
	s.u.	T04-03	BH	08/26/2012	N001			7.10			#	-	-
	s.u.	T04-04	BH	08/26/2012	N001			7.11			#	-	-
	s.u.	T04-05	BH	08/26/2012	N001			7.12			#	-	-
	s.u.	T04-06	BH	08/26/2012	N001			7.12			#	-	-
	s.u.	T04-07	BH	08/26/2012	N001			7.16			#	-	-
	s.u.	T04-08	BH	08/27/2012	N001			6.86			#	-	-
	s.u.	T04-09	BH	08/27/2012	N001			6.94			#	-	-
	s.u.	T04-10	BH	08/27/2012	N001			7.01			#	-	-
	s.u.	T04-11	BH	08/27/2012	N001			7.00			#	-	-
	s.u.	T04-12	BH	08/24/2012	N001			7.10			#	-	-
	s.u.	T04-15	BH	08/24/2012	N001			7.15			#	-	-
	s.u.	T04-16	BH	08/24/2012	N001			7.16			#	-	-
	s.u.	T04-17	BH	08/24/2012	N001			7.15			#	-	-
	s.u.	T05-01	BH	08/28/2012	N001			7.04			#	-	-
	s.u.	T05-02	BH	08/29/2012	N001			6.88			#	-	-
	s.u.	T05-03	BH	08/29/2012	N001			7.04			#	-	-
	s.u.	T06-01	BH	08/26/2012	N001			7.62			#	-	-
	s.u.	T06-02	BH	08/26/2012	N001			7.24			#	-	-
	s.u.	T06-03	BH	08/26/2012	N001			7.10			#	-	-
	s.u.	T06-04	BH	08/26/2012	N001			7.12			#	-	-
	s.u.	T06-05	BH	08/26/2012	N001			7.24			#	-	-
	s.u.	T06-06	BH	08/26/2012	N001			7.08			#	-	-
	s.u.	T06-07	BH	08/26/2012	N001			7.16			#	-	-
	s.u.	T06-08	BH	08/26/2012	N001			7.06			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	T06-09	BH	08/26/2012	N001			6.89			#	-	-
	s.u.	T06-10	BH	08/27/2012	N001			6.94			#	-	-
	s.u.	T06-11	BH	08/27/2012	N001			6.96			#	-	-
	s.u.	T06-12	BH	08/27/2012	N001			7.01			#	-	-
	s.u.	T06-13	BH	08/27/2012	N001			6.96			#	-	-
	s.u.	T06-14	BH	08/27/2012	N001			7.04			#	-	-
	s.u.	T06-15	BH	08/27/2012	N001			6.99			#	-	-
	s.u.	T06-16	BH	08/27/2012	N001			7.25			#	-	-
	s.u.	T06-17	BH	08/27/2012	N001			7.02			#	-	-
	s.u.	T06-21	BH	08/28/2012	N001			6.89			#	-	-
	s.u.	T07-01	BH	08/25/2012	N001			7.21			#	-	-
	s.u.	T07-02	BH	08/25/2012	N001			7.09			#	-	-
	s.u.	T07-03	BH	08/25/2012	N001			7.11			#	-	-
	s.u.	T07-04	BH	08/25/2012	N001			7.00			#	-	-
	s.u.	T07-05	BH	08/25/2012	N001			6.96			#	-	-
	s.u.	T07-06	BH	08/28/2012	N001			6.90			#	-	-
	s.u.	T07-07	BH	08/29/2012	N001			6.99			#	-	-
	s.u.	T07-08	BH	08/28/2012	N001			7.01			#	-	-
	s.u.	T07-09	BH	08/28/2012	N001			7.13			#	-	-
	s.u.	T07-10	BH	08/28/2012	N001			7.24			#	-	-
	s.u.	T08-01	BH	08/25/2012	N001			7.08			#	-	-
	s.u.	T08-02	BH	08/25/2012	N001			7.09			#	-	-
	s.u.	T08-03	BH	08/25/2012	N001			7.15			#	-	-
	s.u.	T08-04	BH	08/25/2012	N001			7.00			#	-	-
	s.u.	T08-05	BH	08/25/2012	N001			7.03			#	-	-
	s.u.	T08-06	BH	08/25/2012	N001			6.99			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	T08-07	BH	08/27/2012	N001			6.99			#	-	-
	s.u.	T08-08	BH	08/28/2012	N001			7.21			#	-	-
	s.u.	T08-09	BH	08/28/2012	N001			7.26			#	-	-
	s.u.	T09-01	BH	08/25/2012	N001			7.29			#	-	-
	s.u.	T09-02	BH	08/25/2012	N001			7.44			#	-	-
	s.u.	T09-03	BH	08/25/2012	N001			7.30			#	-	-
	s.u.	T09-04	BH	08/25/2012	N001			7.24			#	-	-
	s.u.	T09-05	BH	08/25/2012	N001			7.18			#	-	-
	s.u.	T09-06	BH	08/28/2012	N001			7.10			#	-	-
	s.u.	T09-07	BH	08/28/2012	N001			7.31			#	-	-
	s.u.	T09-08	BH	08/28/2012	N001			7.26			#	-	-
	s.u.	T09-09	BH	08/28/2012	N001			7.21			#	-	-
	s.u.	T09-10	BH	08/28/2012	N001			7.11			#	-	-
Potassium	mg/L	T01-01	BH	08/24/2012	0001			5.100			#	0.54	-
	mg/L	T01-02	BH	08/24/2012	0001			5.300			#	0.11	-
	mg/L	T01-03	BH	08/24/2012	0001			6.600			#	0.11	-
	mg/L	T01-04	BH	08/24/2012	0001			6.800			#	0.11	-
	mg/L	T01-05	BH	08/23/2012	0001			6.800			#	0.11	-
	mg/L	T01-06	BH	08/23/2012	0001			6.300			#	0.11	-
	mg/L	T01-07	BH	08/23/2012	0001			9.400			#	0.11	-
	mg/L	T01-08	BH	08/23/2012	0001			5.200			#	0.11	-
	mg/L	T01-09	BH	08/23/2012	0001			3.300			#	0.11	-
	mg/L	T02-01	BH	08/22/2012	0001			8.100			#	0.54	-
	mg/L	T02-02	BH	08/22/2012	0001			4.900	B		#	0.54	-
	mg/L	T02-03	BH	08/22/2012	0001			7.900			#	0.54	-
	mg/L	T02-04	BH	08/22/2012	0001			9.100			#	0.54	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Potassium	mg/L	T02-05	BH	08/22/2012	0001			9.700			#	0.54	-
	mg/L	T02-06	BH	08/22/2012	0001			12.000			#	1.1	-
	mg/L	T02-07	BH	08/23/2012	0001			11.000			#	0.54	-
	mg/L	T02-08	BH	08/23/2012	0001			7.100			#	0.54	-
	mg/L	T02-09	BH	08/23/2012	0001			6.700			#	0.11	-
	mg/L	T02-10	BH	08/23/2012	0001			6.500			#	0.11	-
	mg/L	T02-11	BH	08/23/2012	0001			4.900			#	0.11	-
	mg/L	T02-12	BH	08/23/2012	0001			3.500			#	0.11	-
	mg/L	T02-13	BH	08/23/2012	0001			2.600			#	0.11	-
	mg/L	T02-14	BH	08/23/2012	0001			3.100			#	0.11	-
	mg/L	T02-15	BH	08/23/2012	0001			3.500			#	0.11	-
	mg/L	T03-01	BH	08/22/2012	0001			5.100			#	0.11	-
	mg/L	T03-02	BH	08/22/2012	0001			5.400			#	0.11	-
	mg/L	T03-08	BH	08/21/2012	0001			11.000			#	1.1	-
	mg/L	T03-09	BH	08/22/2012	0001			12.000			#	1.1	-
	mg/L	T03-10	BH	08/22/2012	0001			5.600	B		#	1.1	-
	mg/L	T03-11	BH	08/22/2012	0001			6.600			#	0.54	-
	mg/L	T03-12	BH	08/21/2012	0001			5.500			#	0.11	-
	mg/L	T03-13	BH	08/21/2012	0001			5.500			#	0.11	-
	mg/L	T03-14	BH	08/21/2012	0001			5.200			#	0.11	-
	mg/L	T03-15	BH	08/21/2012	0001			3.900			#	0.11	-
	mg/L	T03-15	BH	08/21/2012	0002			4.300			#	0.11	-
	mg/L	T03-16	BH	08/21/2012	0001			3.600			#	0.11	-
	mg/L	T03-17	BH	08/21/2012	0001			4.900			#	0.11	-
	mg/L	T03-18	BH	08/24/2012	0001			4.000			#	0.11	-
	mg/L	T03-19	BH	08/24/2012	0001			3.800			#	0.11	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Potassium	mg/L	T03-20	BH	08/24/2012	0001			4.900			#	0.11	-
	mg/L	T03-21	BH	08/24/2012	0001			5.400			#	0.11	-
	mg/L	T04-03	BH	08/26/2012	0001			4.400	B	J	#	0.54	-
	mg/L	T04-04	BH	08/26/2012	0001			4.700	B	J	#	0.54	-
	mg/L	T04-05	BH	08/26/2012	0001			10.000			#	0.54	-
	mg/L	T04-06	BH	08/26/2012	0001			11.000			#	1.1	-
	mg/L	T04-07	BH	08/26/2012	0001			12.000			#	1.1	-
	mg/L	T04-07	BH	08/26/2012	0002			14.000			#	1.1	-
	mg/L	T04-08	BH	08/27/2012	0001			14.000			#	1.1	-
	mg/L	T04-09	BH	08/27/2012	0001			14.000			#	1.1	-
	mg/L	T04-10	BH	08/27/2012	0001			14.000			#	0.54	-
	mg/L	T04-11	BH	08/27/2012	0001			9.800			#	0.54	-
	mg/L	T04-12	BH	08/24/2012	0001			5.300			#	0.11	-
	mg/L	T04-15	BH	08/24/2012	0001			5.600			#	0.11	-
	mg/L	T04-16	BH	08/24/2012	0001			6.000			#	0.11	-
	mg/L	T04-16	BH	08/24/2012	0002			6.100			#	0.11	-
	mg/L	T04-17	BH	08/24/2012	0001			4.800			#	0.11	-
	mg/L	T05-01	BH	08/28/2012	0001			17.000			#	1.1	-
	mg/L	T05-02	BH	08/29/2012	0001			15.000			#	0.54	-
	mg/L	T05-03	BH	08/29/2012	0001			9.200			#	0.54	-
	mg/L	T05-03	BH	08/29/2012	0002			10.000			#	0.54	-
	mg/L	T06-01	BH	08/26/2012	0001			5.600			#	0.54	-
	mg/L	T06-02	BH	08/26/2012	0001			7.700			#	0.54	-
	mg/L	T06-03	BH	08/26/2012	0001			7.900			#	0.54	-
	mg/L	T06-04	BH	08/26/2012	0001			5.800			#	0.54	-
	mg/L	T06-05	BH	08/26/2012	0001			11.000			#	1.1	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Potassium	mg/L	T06-06	BH	08/26/2012	0001			12.000			#	1.1	-
	mg/L	T06-07	BH	08/26/2012	0001			18.000			#	1.1	-
	mg/L	T06-08	BH	08/26/2012	0001			16.000			#	1.1	-
	mg/L	T06-09	BH	08/26/2012	0001			18.000			#	1.1	-
	mg/L	T06-10	BH	08/27/2012	0001			17.000			#	1.1	-
	mg/L	T06-11	BH	08/27/2012	0001			13.000			#	1.1	-
	mg/L	T06-12	BH	08/27/2012	0001			11.000			#	0.54	-
	mg/L	T06-13	BH	08/27/2012	0001			12.000			#	0.54	-
	mg/L	T06-14	BH	08/27/2012	0001			13.000			#	0.11	-
	mg/L	T06-15	BH	08/27/2012	0001			7.800			#	0.11	-
	mg/L	T06-16	BH	08/27/2012	0001			6.900			#	0.11	-
	mg/L	T06-17	BH	08/27/2012	0001			6.100			#	0.54	-
	mg/L	T06-21	BH	08/28/2012	0001			7.900			#	0.11	-
	mg/L	T07-01	BH	08/25/2012	0001			12.000	B		#	2.2	-
	mg/L	T07-02	BH	08/25/2012	0001			17.000	B		#	2.2	-
	mg/L	T07-03	BH	08/25/2012	0001			16.000	B		#	2.2	-
	mg/L	T07-04	BH	08/25/2012	0001			16.000			#	1.1	-
	mg/L	T07-05	BH	08/25/2012	0001			15.000			#	1.1	-
	mg/L	T07-06	BH	08/28/2012	0001			15.000			#	0.54	-
	mg/L	T07-06	BH	08/28/2012	0002			16.000			#	0.54	-
	mg/L	T07-07	BH	08/29/2012	0001			13.000			#	0.54	-
	mg/L	T07-08	BH	08/28/2012	0001			11.000			#	0.54	-
	mg/L	T07-09	BH	08/28/2012	0001			7.500			#	0.11	-
	mg/L	T07-10	BH	08/28/2012	0001			7.800			#	0.11	-
	mg/L	T08-01	BH	08/25/2012	0001			14.000	B		#	2.2	-
	mg/L	T08-02	BH	08/25/2012	0001			19.000	B		#	2.2	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Potassium	mg/L	T08-02	BH	08/25/2012	0002			19.000	B		#	5.4	-
	mg/L	T08-03	BH	08/25/2012	0001			15.000	B		#	2.2	-
	mg/L	T08-04	BH	08/25/2012	0001			12.000			#	1.1	-
	mg/L	T08-05	BH	08/25/2012	0001			28.000			#	0.11	-
	mg/L	T08-06	BH	08/25/2012	0001			15.000			#	0.54	-
	mg/L	T08-07	BH	08/27/2012	0001			15.000			#	0.54	-
	mg/L	T08-08	BH	08/28/2012	0001			4.800			#	0.11	-
	mg/L	T08-09	BH	08/28/2012	0001			4.400			#	0.11	-
	mg/L	T09-01	BH	08/25/2012	0001			3.300			#	0.11	-
	mg/L	T09-02	BH	08/25/2012	0001			4.900			#	0.11	-
	mg/L	T09-03	BH	08/25/2012	0001			3.400	B		#	0.54	-
	mg/L	T09-04	BH	08/25/2012	0001			4.700	B		#	0.54	-
	mg/L	T09-05	BH	08/25/2012	0001			8.200			#	0.54	-
	mg/L	T09-06	BH	08/28/2012	0001			4.200	B		#	0.54	-
	mg/L	T09-07	BH	08/28/2012	0001			3.400	B		#	0.54	-
	mg/L	T09-08	BH	08/28/2012	0001			3.900			#	0.11	-
	mg/L	T09-09	BH	08/28/2012	0001			4.700			#	0.11	-
	mg/L	T09-10	BH	08/28/2012	0001			4.900			#	0.11	-
Sodium	mg/L	T01-01	BH	08/24/2012	0001			170.000			#	0.033	-
	mg/L	T01-02	BH	08/24/2012	0001			110.000			#	0.0066	-
	mg/L	T01-03	BH	08/24/2012	0001			87.000			#	0.0066	-
	mg/L	T01-04	BH	08/24/2012	0001			89.000			#	0.0066	-
	mg/L	T01-05	BH	08/23/2012	0001			110.000			#	0.0066	-
	mg/L	T01-06	BH	08/23/2012	0001			99.000			#	0.0066	-
	mg/L	T01-07	BH	08/23/2012	0001			100.000			#	0.0066	-
	mg/L	T01-08	BH	08/23/2012	0001			66.000			#	0.0066	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sodium	mg/L	T01-09	BH	08/23/2012	0001			56.000			#	0.0066	-
	mg/L	T02-01	BH	08/22/2012	0001			420.000			#	0.033	-
	mg/L	T02-02	BH	08/22/2012	0001			230.000			#	0.033	-
	mg/L	T02-03	BH	08/22/2012	0001			340.000			#	0.033	-
	mg/L	T02-04	BH	08/22/2012	0001			560.000			#	0.033	-
	mg/L	T02-05	BH	08/22/2012	0001			610.000			#	0.033	-
	mg/L	T02-06	BH	08/22/2012	0001			1500.000			#	0.066	-
	mg/L	T02-07	BH	08/23/2012	0001			570.000			#	0.033	-
	mg/L	T02-08	BH	08/23/2012	0001			140.000			#	0.033	-
	mg/L	T02-09	BH	08/23/2012	0001			140.000			#	0.0066	-
	mg/L	T02-10	BH	08/23/2012	0001			120.000			#	0.0066	-
	mg/L	T02-11	BH	08/23/2012	0001			79.000			#	0.0066	-
	mg/L	T02-12	BH	08/23/2012	0001			35.000			#	0.0066	-
	mg/L	T02-13	BH	08/23/2012	0001			16.000			#	0.0066	-
	mg/L	T02-14	BH	08/23/2012	0001			22.000			#	0.0066	-
	mg/L	T02-15	BH	08/23/2012	0001			27.000			#	0.0066	-
	mg/L	T03-01	BH	08/22/2012	0001			100.000			#	0.0066	-
	mg/L	T03-02	BH	08/22/2012	0001			95.000			#	0.0066	-
	mg/L	T03-08	BH	08/21/2012	0001			580.000			#	0.066	-
	mg/L	T03-09	BH	08/22/2012	0001			780.000			#	0.066	-
	mg/L	T03-10	BH	08/22/2012	0001			310.000			#	0.066	-
	mg/L	T03-11	BH	08/22/2012	0001			220.000			#	0.033	-
	mg/L	T03-12	BH	08/21/2012	0001			140.000			#	0.033	-
	mg/L	T03-13	BH	08/21/2012	0001			110.000			#	0.0066	-
	mg/L	T03-14	BH	08/21/2012	0001			73.000			#	0.0066	-
	mg/L	T03-15	BH	08/21/2012	0001			71.000			#	0.0066	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sodium	mg/L	T03-15	BH	08/21/2012	0002			72.000	E	J	#	0.0066	-
	mg/L	T03-16	BH	08/21/2012	0001			48.000			#	0.0066	-
	mg/L	T03-17	BH	08/21/2012	0001			32.000	E	J	#	0.0066	-
	mg/L	T03-18	BH	08/24/2012	0001			33.000	E	J	#	0.0066	-
	mg/L	T03-19	BH	08/24/2012	0001			26.000	E	J	#	0.0066	-
	mg/L	T03-20	BH	08/24/2012	0001			44.000	E	J	#	0.0066	-
	mg/L	T03-21	BH	08/24/2012	0001			42.000			#	0.0066	-
	mg/L	T04-03	BH	08/26/2012	0001			310.000			#	0.033	-
	mg/L	T04-04	BH	08/26/2012	0001			220.000			#	0.033	-
	mg/L	T04-05	BH	08/26/2012	0001			540.000			#	0.033	-
	mg/L	T04-06	BH	08/26/2012	0001			740.000			#	0.066	-
	mg/L	T04-07	BH	08/26/2012	0001			810.000			#	0.066	-
	mg/L	T04-07	BH	08/26/2012	0002			800.000			#	0.066	-
	mg/L	T04-08	BH	08/27/2012	0001			720.000			#	0.066	-
	mg/L	T04-09	BH	08/27/2012	0001			660.000			#	0.066	-
	mg/L	T04-10	BH	08/27/2012	0001			590.000			#	0.033	-
	mg/L	T04-11	BH	08/27/2012	0001			300.000			#	0.033	-
	mg/L	T04-12	BH	08/24/2012	0001			82.000			#	0.0066	-
	mg/L	T04-15	BH	08/24/2012	0001			28.000			#	0.0066	-
	mg/L	T04-16	BH	08/24/2012	0001			40.000			#	0.0066	-
	mg/L	T04-16	BH	08/24/2012	0002			40.000			#	0.0066	-
	mg/L	T04-17	BH	08/24/2012	0001			35.000			#	0.0066	-
	mg/L	T05-01	BH	08/28/2012	0001			1100.000			#	0.066	-
	mg/L	T05-02	BH	08/29/2012	0001			630.000			#	0.033	-
	mg/L	T05-03	BH	08/29/2012	0001			230.000			#	0.033	-
	mg/L	T05-03	BH	08/29/2012	0002			230.000			#	0.033	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sodium	mg/L	T06-01	BH	08/26/2012	0001			350.000			#	0.033	-
	mg/L	T06-02	BH	08/26/2012	0001			420.000			#	0.033	-
	mg/L	T06-03	BH	08/26/2012	0001			580.000			#	0.033	-
	mg/L	T06-04	BH	08/26/2012	0001			380.000			#	0.033	-
	mg/L	T06-05	BH	08/26/2012	0001			970.000			#	0.066	-
	mg/L	T06-06	BH	08/26/2012	0001			990.000			#	0.066	-
	mg/L	T06-07	BH	08/26/2012	0001			1400.000			#	0.066	-
	mg/L	T06-08	BH	08/26/2012	0001			1100.000			#	0.066	-
	mg/L	T06-09	BH	08/26/2012	0001			980.000			#	0.066	-
	mg/L	T06-10	BH	08/27/2012	0001			1200.000			#	0.066	-
	mg/L	T06-11	BH	08/27/2012	0001			550.000			#	0.066	-
	mg/L	T06-12	BH	08/27/2012	0001			300.000			#	0.033	-
	mg/L	T06-13	BH	08/27/2012	0001			190.000			#	0.033	-
	mg/L	T06-14	BH	08/27/2012	0001			120.000			#	0.0066	-
	mg/L	T06-15	BH	08/27/2012	0001			98.000			#	0.0066	-
	mg/L	T06-16	BH	08/27/2012	0001			150.000			#	0.0066	-
	mg/L	T06-17	BH	08/27/2012	0001			170.000			#	0.033	-
	mg/L	T06-21	BH	08/28/2012	0001			51.000			#	0.0066	-
	mg/L	T07-01	BH	08/25/2012	0001			1500.000			#	0.13	-
	mg/L	T07-02	BH	08/25/2012	0001			1700.000			#	0.13	-
	mg/L	T07-03	BH	08/25/2012	0001			1500.000			#	0.13	-
	mg/L	T07-04	BH	08/25/2012	0001			1300.000			#	0.066	-
	mg/L	T07-05	BH	08/25/2012	0001			900.000			#	0.066	-
	mg/L	T07-06	BH	08/28/2012	0001			490.000			#	0.033	-
	mg/L	T07-06	BH	08/28/2012	0002			470.000			#	0.033	-
	mg/L	T07-07	BH	08/29/2012	0001			290.000			#	0.033	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB DATA QA	DETECTION LIMIT	UN-CERTAINTY
Sodium	mg/L	T07-08	BH	08/28/2012	0001			190.000	#	0.033	-
	mg/L	T07-09	BH	08/28/2012	0001			130.000	#	0.0066	-
	mg/L	T07-10	BH	08/28/2012	0001			130.000	#	0.0066	-
	mg/L	T08-01	BH	08/25/2012	0001			1700.000	#	0.13	-
	mg/L	T08-02	BH	08/25/2012	0001			2000.000	#	0.13	-
	mg/L	T08-02	BH	08/25/2012	0002			1800.000	#	0.33	-
	mg/L	T08-03	BH	08/25/2012	0001			1700.000	#	0.13	-
	mg/L	T08-04	BH	08/25/2012	0001			1000.000	#	0.066	-
	mg/L	T08-05	BH	08/25/2012	0001			780.000	#	0.066	-
	mg/L	T08-06	BH	08/25/2012	0001			520.000	#	0.033	-
	mg/L	T08-07	BH	08/27/2012	0001			590.000	#	0.033	-
	mg/L	T08-08	BH	08/28/2012	0001			140.000	#	0.13	-
	mg/L	T08-09	BH	08/28/2012	0001			120.000	#	0.0066	-
	mg/L	T09-01	BH	08/25/2012	0001			65.000	#	0.0066	-
	mg/L	T09-02	BH	08/25/2012	0001			150.000	#	0.0066	-
	mg/L	T09-03	BH	08/25/2012	0001			170.000	#	0.033	-
	mg/L	T09-04	BH	08/25/2012	0001			320.000	#	0.033	-
	mg/L	T09-05	BH	08/25/2012	0001			630.000	#	0.033	-
	mg/L	T09-06	BH	08/28/2012	0001			170.000	#	0.033	-
	mg/L	T09-07	BH	08/28/2012	0001			260.000	#	0.033	-
	mg/L	T09-08	BH	08/28/2012	0001			120.000	#	0.0066	-
	mg/L	T09-09	BH	08/28/2012	0001			80.000	#	0.0066	-
	mg/L	T09-10	BH	08/28/2012	0001			84.000	#	0.0066	-
Specific Conductance	umhos/cm	T01-01	BH	08/24/2012	N001			1452	#	-	-
	umhos/cm	T01-02	BH	08/24/2012	N001			836	#	-	-
	umhos/cm	T01-03	BH	08/24/2012	N001			884	#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	T01-04	BH	08/24/2012	N001			870			#	-	-
	umhos/cm	T01-05	BH	08/23/2012	N001			1120			#	-	-
	umhos/cm	T01-06	BH	08/23/2012	N001			26			#	-	-
	umhos/cm	T01-07	BH	08/23/2012	N001			953			#	-	-
	umhos/cm	T01-08	BH	08/23/2012	N001			745			#	-	-
	umhos/cm	T01-09	BH	08/23/2012	N001			589			#	-	-
	umhos/cm	T02-01	BH	08/22/2012	N001			3114			#	-	-
	umhos/cm	T02-02	BH	08/22/2012	N001			1430			#	-	-
	umhos/cm	T02-03	BH	08/22/2012	N001			2279			#	-	-
	umhos/cm	T02-04	BH	08/22/2012	N001			3424			#	-	-
	umhos/cm	T02-05	BH	08/22/2012	N001			3566			#	-	-
	umhos/cm	T02-06	BH	08/22/2012	N001			6166			#	-	-
	umhos/cm	T02-07	BH	08/23/2012	N001			3611			#	-	-
	umhos/cm	T02-08	BH	08/23/2012	N001			1556			#	-	-
	umhos/cm	T02-09	BH	08/23/2012	N001			1423			#	-	-
	umhos/cm	T02-10	BH	08/23/2012	N001			1348			#	-	-
	umhos/cm	T02-11	BH	08/23/2012	N001			989			#	-	-
	umhos/cm	T02-12	BH	08/23/2012	N001			641			#	-	-
	umhos/cm	T02-13	BH	08/23/2012	N001			360			#	-	-
	umhos/cm	T02-14	BH	08/23/2012	N001			434			#	-	-
	umhos/cm	T02-15	BH	08/23/2012	N001			441			#	-	-
	umhos/cm	T03-01	BH	08/22/2012	N001			998			#	-	-
	umhos/cm	T03-02	BH	08/22/2012	N001			1036			#	-	-
	umhos/cm	T03-08	BH	08/21/2012	N001			4147			#	-	-
	umhos/cm	T03-09	BH	08/22/2012	N001			4467			#	-	-
	umhos/cm	T03-10	BH	08/22/2012	N001			2515			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	T03-11	BH	08/22/2012	N001			2031			#	-	-
	umhos/cm	T03-12	BH	08/21/2012	N001			1374			#	-	-
	umhos/cm	T03-13	BH	08/21/2012	N001			1111			#	-	-
	umhos/cm	T03-14	BH	08/21/2012	N001			843			#	-	-
	umhos/cm	T03-15	BH	08/21/2012	N001			669			#	-	-
	umhos/cm	T03-16	BH	08/21/2012	N001			598			#	-	-
	umhos/cm	T03-17	BH	08/21/2012	N001			516			#	-	-
	umhos/cm	T03-18	BH	08/24/2012	N001			713			#	-	-
	umhos/cm	T03-19	BH	08/24/2012	N001			627			#	-	-
	umhos/cm	T03-20	BH	08/24/2012	N001			781			#	-	-
	umhos/cm	T03-21	BH	08/24/2012	N001			822			#	-	-
	umhos/cm	T04-03	BH	08/26/2012	N001			2251			#	-	-
	umhos/cm	T04-04	BH	08/26/2012	N001			1950			#	-	-
	umhos/cm	T04-05	BH	08/26/2012	N001			3776			#	-	-
	umhos/cm	T04-06	BH	08/26/2012	N001			4874			#	-	-
	umhos/cm	T04-07	BH	08/26/2012	N001			4951			#	-	-
	umhos/cm	T04-08	BH	08/27/2012	N001			4649			#	-	-
	umhos/cm	T04-09	BH	08/27/2012	N001			4459			#	-	-
	umhos/cm	T04-10	BH	08/27/2012	N001			2377			#	-	-
	umhos/cm	T04-11	BH	08/27/2012	N001			2459			#	-	-
	umhos/cm	T04-12	BH	08/24/2012	N001			694			#	-	-
	umhos/cm	T04-15	BH	08/24/2012	N001			589			#	-	-
	umhos/cm	T04-16	BH	08/24/2012	N001			677			#	-	-
	umhos/cm	T04-17	BH	08/24/2012	N001			666			#	-	-
	umhos/cm	T05-01	BH	08/28/2012	N001			6419			#	-	-
	umhos/cm	T05-02	BH	08/29/2012	N001			3951			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	T05-03	BH	08/29/2012	N001			2174			#	-	-
	umhos/cm	T06-01	BH	08/26/2012	N001			2759			#	-	-
	umhos/cm	T06-02	BH	08/26/2012	N001			3187			#	-	-
	umhos/cm	T06-03	BH	08/26/2012	N001			3672			#	-	-
	umhos/cm	T06-04	BH	08/26/2012	N001			2750			#	-	-
	umhos/cm	T06-05	BH	08/26/2012	N001			4490			#	-	-
	umhos/cm	T06-06	BH	08/26/2012	N001			5732			#	-	-
	umhos/cm	T06-07	BH	08/26/2012	N001			7295			#	-	-
	umhos/cm	T06-08	BH	08/26/2012	N001			6414			#	-	-
	umhos/cm	T06-09	BH	08/26/2012	N001			5948			#	-	-
	umhos/cm	T06-10	BH	08/27/2012	N001			6494			#	-	-
	umhos/cm	T06-11	BH	08/27/2012	N001			3726			#	-	-
	umhos/cm	T06-12	BH	08/27/2012	N001			2537			#	-	-
	umhos/cm	T06-13	BH	08/27/2012	N001			2384			#	-	-
	umhos/cm	T06-14	BH	08/27/2012	N001			1521			#	-	-
	umhos/cm	T06-15	BH	08/27/2012	N001			1143			#	-	-
	umhos/cm	T06-16	BH	08/27/2012	N001			1077			#	-	-
	umhos/cm	T06-17	BH	08/27/2012	N001			1709			#	-	-
	umhos/cm	T06-21	BH	08/28/2012	N001			901			#	-	-
	umhos/cm	T07-01	BH	08/25/2012	N001			7977			#	-	-
	umhos/cm	T07-02	BH	08/25/2012	N001			8511			#	-	-
	umhos/cm	T07-03	BH	08/25/2012	N001			7727			#	-	-
	umhos/cm	T07-04	BH	08/25/2012	N001			7064			#	-	-
	umhos/cm	T07-05	BH	08/25/2012	N001			5570			#	-	-
	umhos/cm	T07-06	BH	08/28/2012	N001			1945			#	-	-
	umhos/cm	T07-07	BH	08/29/2012	N001			2635			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Specific Conductance	umhos/cm	T07-08	BH	08/28/2012	N001			2242		#	-	-
	umhos/cm	T07-09	BH	08/28/2012	N001			1267		#	-	-
	umhos/cm	T07-10	BH	08/28/2012	N001			1104		#	-	-
	umhos/cm	T08-01	BH	08/25/2012	N001			9744		#	-	-
	umhos/cm	T08-02	BH	08/25/2012	N001			10139		#	-	-
	umhos/cm	T08-03	BH	08/25/2012	N001			8644		#	-	-
	umhos/cm	T08-04	BH	08/25/2012	N001			6458		#	-	-
	umhos/cm	T08-05	BH	08/25/2012	N001			5299		#	-	-
	umhos/cm	T08-06	BH	08/25/2012	N001			4137		#	-	-
	umhos/cm	T08-07	BH	08/27/2012	N001			4133		#	-	-
	umhos/cm	T08-08	BH	08/28/2012	N001			1478		#	-	-
	umhos/cm	T08-09	BH	08/28/2012	N001			1195		#	-	-
	umhos/cm	T09-01	BH	08/25/2012	N001			718		#	-	-
	umhos/cm	T09-02	BH	08/25/2012	N001			1227		#	-	-
	umhos/cm	T09-03	BH	08/25/2012	N001			1694		#	-	-
	umhos/cm	T09-04	BH	08/25/2012	N001			2605		#	-	-
	umhos/cm	T09-05	BH	08/25/2012	N001			4317		#	-	-
	umhos/cm	T09-06	BH	08/28/2012	N001			1669		#	-	-
	umhos/cm	T09-07	BH	08/28/2012	N001			1635		#	-	-
	umhos/cm	T09-08	BH	08/28/2012	N001			846		#	-	-
	umhos/cm	T09-09	BH	08/28/2012	N001			779		#	-	-
	umhos/cm	T09-10	BH	08/28/2012	N001			999		#	-	-
Sulfate	mg/L	T01-01	BH	08/24/2012	0001			520		#	10	-
	mg/L	T01-02	BH	08/24/2012	0001			270		#	5	-
	mg/L	T01-03	BH	08/24/2012	0001			200		#	5	-
	mg/L	T01-04	BH	08/24/2012	0001			170		#	5	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	T01-05	BH	08/23/2012	0001			340			#	5	-
	mg/L	T01-06	BH	08/23/2012	0001			310			#	5	-
	mg/L	T01-07	BH	08/23/2012	0001			260			#	5	-
	mg/L	T01-08	BH	08/23/2012	0001			190			#	2.5	-
	mg/L	T01-09	BH	08/23/2012	0001			110			#	2.5	-
	mg/L	T02-01	BH	08/22/2012	0001			1700			#	25	-
	mg/L	T02-02	BH	08/22/2012	0001			580			#	10	-
	mg/L	T02-03	BH	08/22/2012	0001			1200			#	10	-
	mg/L	T02-04	BH	08/22/2012	0001			2000			#	25	-
	mg/L	T02-05	BH	08/22/2012	0001			2200			#	25	-
	mg/L	T02-06	BH	08/22/2012	0001			3200			#	25	-
	mg/L	T02-07	BH	08/23/2012	0001			1900			#	25	-
	mg/L	T02-08	BH	08/23/2012	0001			590			#	10	-
	mg/L	T02-09	BH	08/23/2012	0001			500			#	10	-
	mg/L	T02-10	BH	08/23/2012	0001			460			#	5	-
	mg/L	T02-11	BH	08/23/2012	0001			280			#	5	-
	mg/L	T02-12	BH	08/23/2012	0001			140			#	2.5	-
	mg/L	T02-13	BH	08/23/2012	0001			39			#	1	-
	mg/L	T02-14	BH	08/23/2012	0001			69			#	1	-
	mg/L	T02-15	BH	08/23/2012	0001			66			#	1	-
	mg/L	T03-01	BH	08/22/2012	0001			320			#	5	-
	mg/L	T03-02	BH	08/22/2012	0001			430			#	5	-
	mg/L	T03-08	BH	08/21/2012	0001			2600			#	25	-
	mg/L	T03-09	BH	08/22/2012	0001			2600			#	25	-
	mg/L	T03-10	BH	08/22/2012	0001			1200			#	10	-
	mg/L	T03-11	BH	08/22/2012	0001			790			#	10	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	T03-12	BH	08/21/2012	0001			440		#	5	-
	mg/L	T03-13	BH	08/21/2012	0001			310		#	5	-
	mg/L	T03-14	BH	08/21/2012	0001			210		#	2.5	-
	mg/L	T03-15	BH	08/21/2012	0001			150		#	2.5	-
	mg/L	T03-15	BH	08/21/2012	0002			150		#	2.5	-
	mg/L	T03-16	BH	08/21/2012	0001			120		#	2.5	-
	mg/L	T03-17	BH	08/21/2012	0001			44		#	0.5	-
	mg/L	T03-18	BH	08/24/2012	0001			130		#	2.5	-
	mg/L	T03-19	BH	08/24/2012	0001			94		#	1	-
	mg/L	T03-20	BH	08/24/2012	0001			140		#	2.5	-
	mg/L	T03-21	BH	08/24/2012	0001			150		#	2.5	-
	mg/L	T04-03	BH	08/26/2012	0001			910		#	10	-
	mg/L	T04-04	BH	08/26/2012	0001			800		#	10	-
	mg/L	T04-05	BH	08/26/2012	0001			2000		#	25	-
	mg/L	T04-06	BH	08/26/2012	0001			2800		#	25	-
	mg/L	T04-07	BH	08/26/2012	0001			2700		#	25	-
	mg/L	T04-07	BH	08/26/2012	0002			2700		#	25	-
	mg/L	T04-08	BH	08/27/2012	0001			2600		#	25	-
	mg/L	T04-09	BH	08/27/2012	0001			2600		#	25	-
	mg/L	T04-10	BH	08/27/2012	0001			2000		#	25	-
	mg/L	T04-11	BH	08/27/2012	0001			1100		#	25	-
	mg/L	T04-12	BH	08/24/2012	0001			130		#	1	-
	mg/L	T04-15	BH	08/24/2012	0001			76		#	2.5	-
	mg/L	T04-16	BH	08/24/2012	0001			120		#	2.5	-
	mg/L	T04-16	BH	08/24/2012	0002			120		#	2.5	-
	mg/L	T04-17	BH	08/24/2012	0001			110		#	2.5	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	T05-01	BH	08/28/2012	0001			3700			#	25	-
	mg/L	T05-02	BH	08/29/2012	0001			2100			#	25	-
	mg/L	T05-03	BH	08/29/2012	0001			980			#	10	-
	mg/L	T05-03	BH	08/29/2012	0002			990			#	10	-
	mg/L	T06-01	BH	08/26/2012	0001			1200			#	10	-
	mg/L	T06-02	BH	08/26/2012	0001			1500			#	25	-
	mg/L	T06-03	BH	08/26/2012	0001			1700			#	25	-
	mg/L	T06-04	BH	08/26/2012	0001			1200			#	25	-
	mg/L	T06-05	BH	08/26/2012	0001			2900			#	25	-
	mg/L	T06-06	BH	08/26/2012	0001			3100			#	25	-
	mg/L	T06-07	BH	08/26/2012	0001			4100			#	50	-
	mg/L	T06-08	BH	08/26/2012	0001			3600			#	25	-
	mg/L	T06-09	BH	08/26/2012	0001			3400			#	25	-
	mg/L	T06-10	BH	08/27/2012	0001			3900			#	25	-
	mg/L	T06-11	BH	08/27/2012	0001			2300			#	25	-
	mg/L	T06-12	BH	08/27/2012	0001			1200			#	10	-
	mg/L	T06-13	BH	08/27/2012	0001			1200			#	10	-
	mg/L	T06-14	BH	08/27/2012	0001			600			#	10	-
	mg/L	T06-15	BH	08/27/2012	0001			350			#	5	-
	mg/L	T06-16	BH	08/27/2012	0001			310			#	5	-
	mg/L	T06-17	BH	08/27/2012	0001			580			#	10	-
	mg/L	T06-21	BH	08/28/2012	0001			120			#	5	-
	mg/L	T07-01	BH	08/25/2012	0001			4500			#	50	-
	mg/L	T07-02	BH	08/25/2012	0001			4800			#	50	-
	mg/L	T07-03	BH	08/25/2012	0001			4400			#	50	-
	mg/L	T07-04	BH	08/25/2012	0001			4000			#	50	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	T07-05	BH	08/25/2012	0001			3300			#	25	-
	mg/L	T07-06	BH	08/28/2012	0001			2300			#	25	-
	mg/L	T07-06	BH	08/28/2012	0002			2300			#	25	-
	mg/L	T07-07	BH	08/29/2012	0001			1200			#	25	-
	mg/L	T07-08	BH	08/28/2012	0001			1100			#	10	-
	mg/L	T07-09	BH	08/28/2012	0001			390			#	10	-
	mg/L	T07-10	BH	08/28/2012	0001			280			#	5	-
	mg/L	T08-01	BH	08/25/2012	0001			5800			#	50	-
	mg/L	T08-02	BH	08/25/2012	0001			5900			#	50	-
	mg/L	T08-02	BH	08/25/2012	0002			5800			#	50	-
	mg/L	T08-03	BH	08/25/2012	0001			5300			#	50	-
	mg/L	T08-04	BH	08/25/2012	0001			3900			#	25	-
	mg/L	T08-05	BH	08/25/2012	0001			3100			#	25	-
	mg/L	T08-06	BH	08/25/2012	0001			2400			#	25	-
	mg/L	T08-07	BH	08/27/2012	0001			2300			#	25	-
	mg/L	T08-08	BH	08/28/2012	0001			480			#	5	-
	mg/L	T08-09	BH	08/28/2012	0001			320			#	5	-
	mg/L	T09-01	BH	08/25/2012	0001			210			#	2.5	-
	mg/L	T09-02	BH	08/25/2012	0001			500			#	5	-
	mg/L	T09-03	BH	08/25/2012	0001			750			#	10	-
	mg/L	T09-04	BH	08/25/2012	0001			1300			#	10	-
	mg/L	T09-05	BH	08/25/2012	0001			2300			#	25	-
	mg/L	T09-06	BH	08/28/2012	0001			570			#	10	-
	mg/L	T09-07	BH	08/28/2012	0001			500			#	10	-
	mg/L	T09-08	BH	08/28/2012	0001			150			#	2.5	-
	mg/L	T09-09	BH	08/28/2012	0001			140			#	2.5	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	T09-10	BH	08/28/2012	0001			180			#	2.5	-
Temperature	C	T01-01	BH	08/24/2012	N001			14.87			#	-	-
	C	T01-02	BH	08/24/2012	N001			15.27			#	-	-
	C	T01-03	BH	08/24/2012	N001			17.66			#	-	-
	C	T01-04	BH	08/24/2012	N001			16.01			#	-	-
	C	T01-05	BH	08/23/2012	N001			18.27			#	-	-
	C	T01-06	BH	08/23/2012	N001			20.05			#	-	-
	C	T01-07	BH	08/23/2012	N001			17.63			#	-	-
	C	T01-08	BH	08/23/2012	N001			15.61			#	-	-
	C	T01-09	BH	08/23/2012	N001			18.12			#	-	-
	C	T02-01	BH	08/22/2012	N001			22.30			#	-	-
	C	T02-02	BH	08/22/2012	N001			22.34			#	-	-
	C	T02-03	BH	08/22/2012	N001			24.11			#	-	-
	C	T02-04	BH	08/22/2012	N001			18.42			#	-	-
	C	T02-05	BH	08/22/2012	N001			20.45			#	-	-
	C	T02-06	BH	08/22/2012	N001			19.90			#	-	-
	C	T02-07	BH	08/23/2012	N001			17.58			#	-	-
	C	T02-08	BH	08/23/2012	N001			17.03			#	-	-
	C	T02-09	BH	08/23/2012	N001			15.00			#	-	-
	C	T02-10	BH	08/23/2012	N001			13.34			#	-	-
	C	T02-11	BH	08/23/2012	N001			15.07			#	-	-
	C	T02-12	BH	08/23/2012	N001			15.49			#	-	-
	C	T02-13	BH	08/23/2012	N001			17.56			#	-	-
	C	T02-14	BH	08/23/2012	N001			16.76			#	-	-
	C	T02-15	BH	08/23/2012	N001			18.49			#	-	-
	C	T03-01	BH	08/22/2012	N001			16.66			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	T03-02	BH	08/22/2012	N001			14.90		#	-	-
	C	T03-08	BH	08/21/2012	N001			18.83		#	-	-
	C	T03-09	BH	08/22/2012	N001			16.70		#	-	-
	C	T03-10	BH	08/22/2012	N001			16.13		#	-	-
	C	T03-11	BH	08/22/2012	N001			18.72		#	-	-
	C	T03-12	BH	08/21/2012	N001			18.59		#	-	-
	C	T03-13	BH	08/21/2012	N001			18.89		#	-	-
	C	T03-14	BH	08/21/2012	N001			20.08		#	-	-
	C	T03-15	BH	08/21/2012	N001			19.26		#	-	-
	C	T03-16	BH	08/21/2012	N001			20.49		#	-	-
	C	T03-17	BH	08/21/2012	N001			19.55		#	-	-
	C	T03-18	BH	08/24/2012	N001			17.48		#	-	-
	C	T03-19	BH	08/24/2012	N001			16.43		#	-	-
	C	T03-20	BH	08/24/2012	N001			17.85		#	-	-
	C	T03-21	BH	08/24/2012	N001			13.25		#	-	-
	C	T04-03	BH	08/26/2012	N001			16.44		#	-	-
	C	T04-04	BH	08/26/2012	N001			16.80		#	-	-
	C	T04-05	BH	08/26/2012	N001			17.78		#	-	-
	C	T04-06	BH	08/26/2012	N001			18.45		#	-	-
	C	T04-07	BH	08/26/2012	N001			14.50		#	-	-
	C	T04-08	BH	08/27/2012	N001			13.44		#	-	-
	C	T04-09	BH	08/27/2012	N001			15.65		#	-	-
	C	T04-10	BH	08/27/2012	N001			17.29		#	-	-
	C	T04-11	BH	08/27/2012	N001			16.43		#	-	-
	C	T04-12	BH	08/24/2012	N001			16.92		#	-	-
	C	T04-15	BH	08/24/2012	N001			20.73		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	T04-16	BH	08/24/2012	N001			17.94		#	-	-
	C	T04-17	BH	08/24/2012	N001			15.62		#	-	-
	C	T05-01	BH	08/28/2012	N001			16.56		#	-	-
	C	T05-02	BH	08/29/2012	N001			13.59		#	-	-
	C	T05-03	BH	08/29/2012	N001			15.27		#	-	-
	C	T06-01	BH	08/26/2012	N001			12.03		#	-	-
	C	T06-02	BH	08/26/2012	N001			11.56		#	-	-
	C	T06-03	BH	08/26/2012	N001			14.90		#	-	-
	C	T06-04	BH	08/26/2012	N001			13.85		#	-	-
	C	T06-05	BH	08/26/2012	N001			14.71		#	-	-
	C	T06-06	BH	08/26/2012	N001			13.40		#	-	-
	C	T06-07	BH	08/26/2012	N001			14.01		#	-	-
	C	T06-08	BH	08/26/2012	N001			14.67		#	-	-
	C	T06-09	BH	08/26/2012	N001			14.84		#	-	-
	C	T06-10	BH	08/27/2012	N001			17.87		#	-	-
	C	T06-11	BH	08/27/2012	N001			15.23		#	-	-
	C	T06-12	BH	08/27/2012	N001			15.67		#	-	-
	C	T06-13	BH	08/27/2012	N001			14.51		#	-	-
	C	T06-14	BH	08/27/2012	N001			15.04		#	-	-
	C	T06-15	BH	08/27/2012	N001			15.00		#	-	-
	C	T06-16	BH	08/27/2012	N001			16.48		#	-	-
	C	T06-17	BH	08/27/2012	N001			15.58		#	-	-
	C	T06-21	BH	08/28/2012	N001			17.89		#	-	-
	C	T07-01	BH	08/25/2012	N001			12.60		#	-	-
	C	T07-02	BH	08/25/2012	N001			12.80		#	-	-
	C	T07-03	BH	08/25/2012	N001			15.09		#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Temperature	C	T07-04	BH	08/25/2012	N001			15.41			#	-	-
	C	T07-05	BH	08/25/2012	N001			14.93			#	-	-
	C	T07-06	BH	08/28/2012	N001			20.71			#	-	-
	C	T07-07	BH	08/29/2012	N001			15.49			#	-	-
	C	T07-08	BH	08/28/2012	N001			14.58			#	-	-
	C	T07-09	BH	08/28/2012	N001			17.39			#	-	-
	C	T07-10	BH	08/28/2012	N001			15.36			#	-	-
	C	T08-01	BH	08/25/2012	N001			13.14			#	-	-
	C	T08-02	BH	08/25/2012	N001			13.90			#	-	-
	C	T08-03	BH	08/25/2012	N001			15.16			#	-	-
	C	T08-04	BH	08/25/2012	N001			14.55			#	-	-
	C	T08-05	BH	08/25/2012	N001			15.44			#	-	-
	C	T08-06	BH	08/25/2012	N001			13.87			#	-	-
	C	T08-07	BH	08/27/2012	N001			13.03			#	-	-
	C	T08-08	BH	08/28/2012	N001			13.67			#	-	-
	C	T08-09	BH	08/28/2012	N001			13.94			#	-	-
	C	T09-01	BH	08/25/2012	N001			12.52			#	-	-
	C	T09-02	BH	08/25/2012	N001			10.37			#	-	-
	C	T09-03	BH	08/25/2012	N001			12.59			#	-	-
	C	T09-04	BH	08/25/2012	N001			11.53			#	-	-
	C	T09-05	BH	08/25/2012	N001			12.18			#	-	-
	C	T09-06	BH	08/28/2012	N001			11.66			#	-	-
	C	T09-07	BH	08/28/2012	N001			12.83			#	-	-
	C	T09-08	BH	08/28/2012	N001			13.93			#	-	-
	C	T09-09	BH	08/28/2012	N001			12.82			#	-	-
	C	T09-10	BH	08/28/2012	N001			13.52			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	T01-01	BH	08/24/2012	N001			108			#	-	-
	NTU	T01-02	BH	08/24/2012	N001			403			#	-	-
	NTU	T01-03	BH	08/24/2012	N001			178			#	-	-
	NTU	T01-04	BH	08/24/2012	N001			352			#	-	-
	NTU	T01-05	BH	08/23/2012	N001			1000		>	#	-	-
	NTU	T01-06	BH	08/23/2012	N001			103			#	-	-
	NTU	T01-07	BH	08/23/2012	N001			47.0			#	-	-
	NTU	T01-08	BH	08/23/2012	N001			75.3			#	-	-
	NTU	T01-09	BH	08/23/2012	N001			68.5			#	-	-
	NTU	T02-01	BH	08/22/2012	N001			1000		>	#	-	-
	NTU	T02-02	BH	08/22/2012	N001			474			#	-	-
	NTU	T02-03	BH	08/22/2012	N001			186			#	-	-
	NTU	T02-04	BH	08/22/2012	N001			266			#	-	-
	NTU	T02-05	BH	08/22/2012	N001			109			#	-	-
	NTU	T02-06	BH	08/22/2012	N001			141			#	-	-
	NTU	T02-07	BH	08/23/2012	N001			157			#	-	-
	NTU	T02-08	BH	08/23/2012	N001			155			#	-	-
	NTU	T02-09	BH	08/23/2012	N001			180			#	-	-
	NTU	T02-10	BH	08/23/2012	N001			357			#	-	-
	NTU	T02-11	BH	08/23/2012	N001			214			#	-	-
	NTU	T02-12	BH	08/23/2012	N001			668			#	-	-
	NTU	T02-13	BH	08/23/2012	N001			246			#	-	-
	NTU	T02-14	BH	08/23/2012	N001			346			#	-	-
	NTU	T02-15	BH	08/23/2012	N001			472			#	-	-
	NTU	T03-01	BH	08/22/2012	N001			320			#	-	-
	NTU	T03-02	BH	08/22/2012	N001			329			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	T03-08	BH	08/21/2012	N001			188			#	-	-
	NTU	T03-09	BH	08/22/2012	N001			103			#	-	-
	NTU	T03-10	BH	08/22/2012	N001			101			#	-	-
	NTU	T03-11	BH	08/22/2012	N001			887			#	-	-
	NTU	T03-12	BH	08/21/2012	N001			101			#	-	-
	NTU	T03-13	BH	08/21/2012	N001			336			#	-	-
	NTU	T03-14	BH	08/21/2012	N001			499			#	-	-
	NTU	T03-15	BH	08/21/2012	N001			690			#	-	-
	NTU	T03-16	BH	08/21/2012	N001			716			#	-	-
	NTU	T03-17	BH	08/21/2012	N001			1000	>		#	-	-
	NTU	T03-18	BH	08/24/2012	N001			526			#	-	-
	NTU	T03-19	BH	08/24/2012	N001			463			#	-	-
	NTU	T03-20	BH	08/24/2012	N001			1000	>		#	-	-
	NTU	T03-21	BH	08/24/2012	N001			1000	>		#	-	-
	NTU	T04-03	BH	08/26/2012	N001			186			#	-	-
	NTU	T04-04	BH	08/26/2012	N001			217			#	-	-
	NTU	T04-05	BH	08/26/2012	N001			217			#	-	-
	NTU	T04-06	BH	08/26/2012	N001			1000	>		#	-	-
	NTU	T04-07	BH	08/26/2012	N001			468			#	-	-
	NTU	T04-08	BH	08/27/2012	N001			900			#	-	-
	NTU	T04-09	BH	08/27/2012	N001			457			#	-	-
	NTU	T04-10	BH	08/27/2012	N001			306			#	-	-
	NTU	T04-11	BH	08/27/2012	N001			278			#	-	-
	NTU	T04-12	BH	08/24/2012	N001			177			#	-	-
	NTU	T04-15	BH	08/24/2012	N001			262			#	-	-
	NTU	T04-16	BH	08/24/2012	N001			297			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	T04-17	BH	08/24/2012	N001			255			#	-	-
	NTU	T05-01	BH	08/28/2012	N001			76.9			#	-	-
	NTU	T05-02	BH	08/29/2012	N001			1000		>	#	-	-
	NTU	T05-03	BH	08/29/2012	N001			680			#	-	-
	NTU	T06-01	BH	08/26/2012	N001			86.2			#	-	-
	NTU	T06-02	BH	08/26/2012	N001			343			#	-	-
	NTU	T06-03	BH	08/26/2012	N001			260			#	-	-
	NTU	T06-04	BH	08/26/2012	N001			161			#	-	-
	NTU	T06-05	BH	08/26/2012	N001			334			#	-	-
	NTU	T06-06	BH	08/26/2012	N001			192			#	-	-
	NTU	T06-07	BH	08/26/2012	N001			478			#	-	-
	NTU	T06-08	BH	08/26/2012	N001			160			#	-	-
	NTU	T06-09	BH	08/26/2012	N001			158			#	-	-
	NTU	T06-10	BH	08/27/2012	N001			679			#	-	-
	NTU	T06-11	BH	08/27/2012	N001			1000		>	#	-	-
	NTU	T06-12	BH	08/27/2012	N001			646			#	-	-
	NTU	T06-13	BH	08/27/2012	N001			1000		>	#	-	-
	NTU	T06-14	BH	08/27/2012	N001			1000		>	#	-	-
	NTU	T06-15	BH	08/27/2012	N001			260			#	-	-
	NTU	T06-16	BH	08/27/2012	N001			141			#	-	-
	NTU	T06-17	BH	08/27/2012	N001			18.5			#	-	-
	NTU	T06-21	BH	08/28/2012	N001			1000		>	#	-	-
	NTU	T07-01	BH	08/25/2012	N001			102			#	-	-
	NTU	T07-02	BH	08/25/2012	N001			138			#	-	-
	NTU	T07-03	BH	08/25/2012	N001			334			#	-	-
	NTU	T07-04	BH	08/25/2012	N001			319			#	-	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	T07-05	BH	08/25/2012	N001			917			#	-	-
	NTU	T07-06	BH	08/28/2012	N001			1000		>	#	-	-
	NTU	T07-07	BH	08/29/2012	N001			306			#	-	-
	NTU	T07-08	BH	08/28/2012	N001			573			#	-	-
	NTU	T07-09	BH	08/28/2012	N001			147			#	-	-
	NTU	T07-10	BH	08/28/2012	N001			720			#	-	-
	NTU	T08-01	BH	08/25/2012	N001			267			#	-	-
	NTU	T08-02	BH	08/25/2012	N001			236			#	-	-
	NTU	T08-03	BH	08/25/2012	N001			95.8			#	-	-
	NTU	T08-04	BH	08/25/2012	N001			220			#	-	-
	NTU	T08-05	BH	08/25/2012	N001			636			#	-	-
	NTU	T08-06	BH	08/25/2012	N001			56.8			#	-	-
	NTU	T08-07	BH	08/27/2012	N001			199			#	-	-
	NTU	T08-08	BH	08/28/2012	N001			264			#	-	-
	NTU	T08-09	BH	08/28/2012	N001			285			#	-	-
	NTU	T09-01	BH	08/25/2012	N001			435			#	-	-
	NTU	T09-02	BH	08/25/2012	N001			977			#	-	-
	NTU	T09-03	BH	08/25/2012	N001			947			#	-	-
	NTU	T09-04	BH	08/25/2012	N001			270			#	-	-
	NTU	T09-05	BH	08/25/2012	N001			790			#	-	-
	NTU	T09-06	BH	08/28/2012	N001			174			#	-	-
	NTU	T09-07	BH	08/28/2012	N001			393			#	-	-
	NTU	T09-08	BH	08/28/2012	N001			105			#	-	-
	NTU	T09-09	BH	08/28/2012	N001			316			#	-	-
	NTU	T09-10	BH	08/28/2012	N001			426			#	-	-
Uranium	mg/L	T01-01	BH	08/24/2012	0001			0.0069			#	2.9E-05	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	T01-02	BH	08/24/2012	0001			0.0053			#	2.9E-05	-
	mg/L	T01-03	BH	08/24/2012	0001			0.0039			#	2.9E-05	-
	mg/L	T01-04	BH	08/24/2012	0001			0.0062			#	2.9E-05	-
	mg/L	T01-05	BH	08/23/2012	0001			0.0068			#	2.9E-05	-
	mg/L	T01-06	BH	08/23/2012	0001			0.0068			#	2.9E-05	-
	mg/L	T01-07	BH	08/23/2012	0001			0.006			#	2.9E-05	-
	mg/L	T01-08	BH	08/23/2012	0001			0.0048			#	2.9E-05	-
	mg/L	T01-09	BH	08/23/2012	0001			0.017			#	2.9E-05	-
	mg/L	T02-01	BH	08/22/2012	0001			0.0055			#	2.9E-05	-
	mg/L	T02-02	BH	08/22/2012	0001			0.0029			#	2.9E-05	-
	mg/L	T02-03	BH	08/22/2012	0001			0.0025			#	2.9E-05	-
	mg/L	T02-04	BH	08/22/2012	0001			0.00081			#	2.9E-05	-
	mg/L	T02-05	BH	08/22/2012	0001			0.0011			#	2.9E-05	-
	mg/L	T02-06	BH	08/22/2012	0001			0.0044			#	2.9E-05	-
	mg/L	T02-07	BH	08/23/2012	0001			0.020			#	2.9E-05	-
	mg/L	T02-08	BH	08/23/2012	0001			0.084			#	2.9E-05	-
	mg/L	T02-09	BH	08/23/2012	0001			0.120			#	2.9E-05	-
	mg/L	T02-10	BH	08/23/2012	0001			0.062			#	2.9E-05	-
	mg/L	T02-11	BH	08/23/2012	0001			0.061			#	2.9E-05	-
	mg/L	T02-12	BH	08/23/2012	0001			0.037			#	2.9E-05	-
	mg/L	T02-13	BH	08/23/2012	0001			0.0049			#	2.9E-05	-
	mg/L	T02-14	BH	08/23/2012	0001			0.0085			#	2.9E-05	-
	mg/L	T02-15	BH	08/23/2012	0001			0.0079			#	2.9E-05	-
	mg/L	T03-01	BH	08/22/2012	0001			0.0028			#	2.9E-05	-
	mg/L	T03-02	BH	08/22/2012	0001			0.0074			#	2.9E-05	-
	mg/L	T03-08	BH	08/21/2012	0001			1.100			#	0.00029	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	T03-09	BH	08/22/2012	0001			0.430			#	2.9E-05	-
	mg/L	T03-10	BH	08/22/2012	0001			0.170			#	0.00015	-
	mg/L	T03-11	BH	08/22/2012	0001			0.220			#	2.9E-05	-
	mg/L	T03-12	BH	08/21/2012	0001			0.130			#	2.9E-05	-
	mg/L	T03-13	BH	08/21/2012	0001			0.130			#	2.9E-05	-
	mg/L	T03-14	BH	08/21/2012	0001			0.270			#	2.9E-05	-
	mg/L	T03-15	BH	08/21/2012	0001			0.024			#	2.9E-05	-
	mg/L	T03-15	BH	08/21/2012	0002			0.025			#	2.9E-05	-
	mg/L	T03-16	BH	08/21/2012	0001			0.014			#	2.9E-05	-
	mg/L	T03-17	BH	08/21/2012	0001			0.0051			#	2.9E-05	-
	mg/L	T03-18	BH	08/24/2012	0001			0.0054			#	2.9E-05	-
	mg/L	T03-19	BH	08/24/2012	0001			0.0057			#	2.9E-05	-
	mg/L	T03-20	BH	08/24/2012	0001			0.0086			#	2.9E-05	-
	mg/L	T03-21	BH	08/24/2012	0001			0.011			#	2.9E-05	-
	mg/L	T04-03	BH	08/26/2012	0001			0.0056			#	2.9E-05	-
	mg/L	T04-04	BH	08/26/2012	0001			0.013			#	2.9E-05	-
	mg/L	T04-05	BH	08/26/2012	0001			0.036			#	2.9E-05	-
	mg/L	T04-06	BH	08/26/2012	0001			0.070			#	2.9E-05	-
	mg/L	T04-07	BH	08/26/2012	0001			0.110			#	2.9E-05	-
	mg/L	T04-07	BH	08/26/2012	0002			0.110			#	2.9E-05	-
	mg/L	T04-08	BH	08/27/2012	0001			0.420			#	0.00015	-
	mg/L	T04-09	BH	08/27/2012	0001			0.710			#	0.00029	-
	mg/L	T04-10	BH	08/27/2012	0001			0.340			#	0.00015	-
	mg/L	T04-11	BH	08/27/2012	0001			0.240			#	2.9E-05	-
	mg/L	T04-12	BH	08/24/2012	0001			0.180			#	2.9E-05	-
	mg/L	T04-15	BH	08/24/2012	0001			0.032			#	2.9E-05	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	T04-16	BH	08/24/2012	0001			0.024			#	2.9E-05	-
	mg/L	T04-16	BH	08/24/2012	0002			0.024			#	2.9E-05	-
	mg/L	T04-17	BH	08/24/2012	0001			0.012			#	2.9E-05	-
	mg/L	T05-01	BH	08/28/2012	0001			0.480			#	0.00029	-
	mg/L	T05-02	BH	08/29/2012	0001			0.550			#	0.00029	-
	mg/L	T05-03	BH	08/29/2012	0001			0.490			#	0.00029	-
	mg/L	T05-03	BH	08/29/2012	0002			0.490			#	0.00015	-
	mg/L	T06-01	BH	08/26/2012	0001			0.051			#	2.9E-05	-
	mg/L	T06-02	BH	08/26/2012	0001			0.024			#	2.9E-05	-
	mg/L	T06-03	BH	08/26/2012	0001			0.020			#	2.9E-05	-
	mg/L	T06-04	BH	08/26/2012	0001			0.029			#	2.9E-05	-
	mg/L	T06-05	BH	08/26/2012	0001			0.170			#	2.9E-05	-
	mg/L	T06-06	BH	08/26/2012	0001			0.180			#	2.9E-05	-
	mg/L	T06-07	BH	08/26/2012	0001			0.300			#	0.00029	-
	mg/L	T06-08	BH	08/26/2012	0001			0.600			#	0.00029	-
	mg/L	T06-09	BH	08/26/2012	0001			0.960			#	0.00029	-
	mg/L	T06-10	BH	08/27/2012	0001			1.400			#	0.00029	-
	mg/L	T06-11	BH	08/27/2012	0001			0.580			#	0.00029	-
	mg/L	T06-12	BH	08/27/2012	0001			0.580			#	0.00029	-
	mg/L	T06-13	BH	08/27/2012	0001			0.660			#	0.00029	-
	mg/L	T06-14	BH	08/27/2012	0001			0.160			#	2.9E-05	-
	mg/L	T06-15	BH	08/27/2012	0001			0.075			#	2.9E-05	-
	mg/L	T06-16	BH	08/27/2012	0001			0.056			#	2.9E-05	-
	mg/L	T06-17	BH	08/27/2012	0001			0.055			#	2.9E-05	-
	mg/L	T06-21	BH	08/28/2012	0001			0.0096			#	2.9E-05	-
	mg/L	T07-01	BH	08/25/2012	0001			0.310			#	0.00015	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	T07-02	BH	08/25/2012	0001			0.670			#	0.00029	-
	mg/L	T07-03	BH	08/25/2012	0001			1.400			#	0.00029	-
	mg/L	T07-04	BH	08/25/2012	0001			1.500			#	0.00029	-
	mg/L	T07-05	BH	08/25/2012	0001			1.100			#	0.00029	-
	mg/L	T07-06	BH	08/28/2012	0001			0.890			#	0.00029	-
	mg/L	T07-06	BH	08/28/2012	0002			0.890			#	0.00029	-
	mg/L	T07-07	BH	08/29/2012	0001			0.760			#	0.00029	-
	mg/L	T07-08	BH	08/28/2012	0001			0.460			#	0.00029	-
	mg/L	T07-09	BH	08/28/2012	0001			0.120			#	2.9E-05	-
	mg/L	T07-10	BH	08/28/2012	0001			0.059			#	2.9E-05	-
	mg/L	T08-01	BH	08/25/2012	0001			0.550			#	0.00029	-
	mg/L	T08-02	BH	08/25/2012	0001			1.300			#	0.00029	-
	mg/L	T08-02	BH	08/25/2012	0002			1.400			#	0.00015	-
	mg/L	T08-03	BH	08/25/2012	0001			2.100			#	0.00058	-
	mg/L	T08-04	BH	08/25/2012	0001			1.200			#	0.00029	-
	mg/L	T08-05	BH	08/25/2012	0001			1.100			#	0.00029	-
	mg/L	T08-06	BH	08/25/2012	0001			1.000			#	0.00029	-
	mg/L	T08-07	BH	08/27/2012	0001			0.950			#	0.00029	-
	mg/L	T08-08	BH	08/28/2012	0001			0.066			#	2.9E-05	-
	mg/L	T08-09	BH	08/28/2012	0001			0.027			#	2.9E-05	-
	mg/L	T09-01	BH	08/25/2012	0001			0.0057			#	2.9E-05	-
	mg/L	T09-02	BH	08/25/2012	0001			0.0084			#	2.9E-05	-
	mg/L	T09-03	BH	08/25/2012	0001			0.018			#	2.9E-05	-
	mg/L	T09-04	BH	08/25/2012	0001			0.027			#	2.9E-05	-
	mg/L	T09-05	BH	08/25/2012	0001			0.058			#	2.9E-05	-
	mg/L	T09-06	BH	08/28/2012	0001			0.085			#	2.9E-05	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Uranium	mg/L	T09-07	BH	08/28/2012	0001			0.073			#	2.9E-05	-
	mg/L	T09-08	BH	08/28/2012	0001			0.018			#	2.9E-05	-
	mg/L	T09-09	BH	08/28/2012	0001			0.011			#	2.9E-05	-
	mg/L	T09-10	BH	08/28/2012	0001			0.024			#	2.9E-05	-

CLASSIC GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (USEE201) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 3/7/2013 2:03 pm

PARAMETER	UNITS	LOCATION CODE	LOCATION TYPE	SAMPLE: DATE	ID	ZONE COMPL	FLOW REL.	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='RVT01' AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #8/1/2012# and #8/30/2012#

SAMPLE ID CODES: 000X = Filtered sample. N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: BH BOREHOLE

ZONES OF COMPLETION: a zone of completion with a "-" is cross-screened and, therefore, has two zones of completion (1st zone - 2nd zone).

FLOW CODES:

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	N	Presumptive evidence that analyte is present. The analyte is "tentatively identified".	Q	Qualitative result due to sampling technique
R	Unusable result.	U	Parameter analyzed for but was not detected.	X	Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

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