

Office of Environmental Management – Grand Junction



Moab UMTRA Project
June 2008 Validation Data Package for
Performance Assessment of the
Monthly Sampling for the Ground Water
Interim Action and for the Ground Water
and Surface Water Interaction
Investigation Sampling

February 2009



U.S. Department
of Energy

Office of Environmental Management

**Moab UMTRA Project
June 2008 Validation Data Package for Performance Assessment of
the Monthly Sampling for the Ground Water Interim Action and
for the Ground Water/Surface Water Interaction Investigation
Sampling Event**

February 2009

**Moab UMTRA Project
June 2008 Ground Water Sampling Events**

Revision 0

Review and Approval

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Revision History

Revision No.	Date	Reason/Basis for Revision
0	February 2009	Initial issue of Moab UMTRA Project June 2008 Ground Water Sampling Events.

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Acronyms and Abbreviations

AWQC	ambient water quality criteria
bgs	below ground surface
BL	baseline area
btoc	below top of casing
cfs	cubic feet per second
COC	chain of custody
DI	deionized
D.O.	dissolved oxygen
EB	equipment blank
EDD	electronic data deliverable
EPA	Environment Protection Agency
ft	feet
ICP	inductively coupled plasma
IDL	instrument detection limit
LCS	laboratory control samples
MDL	method detection limit
mg/L	milligram per liter
mL/m	milliliter per minute
MS	matrix spike
MSD	matrix spike duplicate
μmhos/cm	micro mhos per centimeter
μS/cm	micro siemens per centimeter
mV	millivolt
NTU	nephelometric turbidity unit
ORP	oxidation reduction potential
% meq/l	percent mil equivalent per liter
PQL	practical quantitation limit
RDL	required detection limit
RIN	report identification number
RPD	relative percent difference
RS	replicate sample
SDG	sample data group
Spec Cond	special conditions
SL	surface location
S.U.	standard unit
TDS	total dissolved solids
TS	treatment system
Turb.	turbidity
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey
VDP	validation data package
WL	well

Introduction

This purpose of this document is to summarize the results of the data validation process associated with ground water and/or surface water samples collected from the Moab Uranium Mill Tailings Remedial Action (UMTRA) site. This data validation follows the criteria according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006).

As part of the scope of this document, the complete results of this data validation process are provided. Section 1 presents the Sampling Event Summary, which includes an Executive Summary. Section 2 provides the Data Assessment Summaries, including the Field Activity Verification, Laboratory Performance Assessment, and Field Analyses/Activities description. All flagged data, and the reasons for the applicable flags, are also presented in Section 2. The Data Presentation is contained in Section 3, which includes a summary of the anomalous data generated by the validation process. Various Appendices contain the Water Quality Data, Water Level Data, Minimums and Maximums Report tables, and the Trip Reports. All Colorado River flow discussed in this document are measured from the U.S. Geological Survey (USGS) Cisco Gaging Station No. 09180500.

1.0 Sampling Event Summaries

This validation data package (VDP) presents the results of two June 2008 sampling events. A monthly sampling event was completed from June 9 through 11, 2008, in which ground water and surface water samples were collected from a variety of locations across the well field. From June 2 through 4, 2008, ground water and surface water locations were sampled as part of the third event associated with the ground water/surface water interaction investigation.

Section 1.0 contains the Summary Criteria with a sample location map (Section 1.1), Executive Summary (Section 1.2), and the Sampling and Analyses (Section 1.3) for both June 2008 sampling events.

1.1 Summary Criteria

1.1.1 Monthly Sampling Event

Sampling Period: June 9 through 11, 2008

The purpose of this sampling was to collect data that can be used to evaluate the performance of all configurations of the ground water Interim Action well field. All sampling locations are shown on Figure 1.

1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?

Yes. All anomalous data associated with this event can be attributed to the prolonged increased river flow during the 2008 spring runoff and the migration of surface water into the well field.

2. Were all Interim Action well-field pumps operating within the planned parameters?

No. All extraction wells were shut down between May 22 and June 19 due to the flooding potential and access issues in the well field.

3. Was the evaporation pond functioning properly?

Yes. The pond level decreased from 5.4 to 4.9 feet (ft) during this sampling event. The drop in the level can be attributed to the continued use of the sprinkler system while the well field was shut down.

4. Were all proposed well (ground water) and surface water locations sampled during this event?

No. A large number of locations could not be sampled due to the high river stage. All well points were submerged and not accessible. All extraction wells were shut down (due to the flood potential for the well field) and not sampled, and a number of the surface water locations were not accessible. Please refer to the Trip Report (Attachment 1) for a detailed list of locations that were not sampled during this event.

5. Were there any site activities that have impacted or may impact the Interim Action system?

No.

1.1.2 Ground Water/Surface Water Interaction Investigation Sampling Event

Sampling Period: June 2 through 4, 2008

The purpose of this sampling was to collect a third round of data for the ground water/surface water investigation, which was designed to determine the vertical and lateral migration of freshwater from the river into the well field aquifer during the 2008 spring runoff. The first sampling event occurred when the Colorado River flows were approximately 3,500 cubic feet per second (cfs), which represents river base-flow conditions. A second sampling event occurred during the early stages of the spring runoff, when the flows were approximately 13,000 cfs. This third event occurred near the peak of the spring runoff, when the flows ranged between 35,000 and 40,000 cfs. A series of surface water locations, well points, observation wells, and one extraction well from the Configuration 1 and the Baseline areas were sampled at varying depths and distances from the river channel. All sampling locations are shown on Figure 1.

1. As a result of this sampling event, is there any indication of anomalous data that may be related to well field pump rate changes, river flow, or other known causes?

Yes. All anomalous data associated with this event can be attributed to the prolonged increased river flow during the 2008 spring runoff and the migration of surface water into the well field.

2. Were all Interim Action well-field pumps operating within the planned parameters?

No. All extraction wells were shut down between May 22 and June 19 due to the flooding potential and access issues in the well field.

3. Was the evaporation pond functioning properly?

Yes. The pond level was between 6.1 and 5.8 ft during this sampling event. The drop in the level can be attributed to the continued use of the sprinkler system while the well field was shut down.

4. Were all proposed well (ground water) and surface water locations sampled during this event?

No. All well points were inaccessible due to the high river stage.

5. Were there any site activities that have impacted or may impact the Interim Action system?

No.

1.2 Executive Summary

1.2.1 Monthly Sampling Event

This VDP presents the validated data associated with the ground water collected during the June 2008 Interim Action monthly sampling event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Sections 2.2 and 2.2.1). Attachment 1 contains the Trip Report detailing the field events associated with this sampling event.

A list of flagged data is presented in Table 3 in Section 2.2.1. No data were rejected (flagged as “R”) as a result of this validation process. A Minimums and Maximums Report (presented in Section 3.1.) was generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Report, are presented in Section 3.2.

While independent of the data validation process, a brief summary of the most recent concentration trends based on the June 2008 data is provided for Configurations 3, 1, and 4 (listed from north to south) within the well field. Time versus concentration (ammonia, total dissolved solids [TDS], and uranium) plots for selected performance indicator monitoring wells located upgradient or downgradient within the Interim Action well field are presented to display historical trends exhibited by the data over the past 2 years. Colorado River flows over the same time frame are also plotted to determine whether the magnitude of river flows influences analyte concentrations.

Configuration 3

Samples were collected from 0683 (27 ft below ground surface [ft bgs]), 0687 (28 ft bgs), 0688 (31 ft bgs), and 0689 (46 ft bgs) during this past month. A review of the time versus concentration plots for these Configuration 3 locations suggests ammonia, TDS, and uranium concentrations (Figures 2, 3, and 4, respectively) for samples collected from wells screened less than 31 ft bgs have slightly decreased since the spring in response to the higher river stage, while the sample collected from 0689 either slightly increased or did not significantly change.

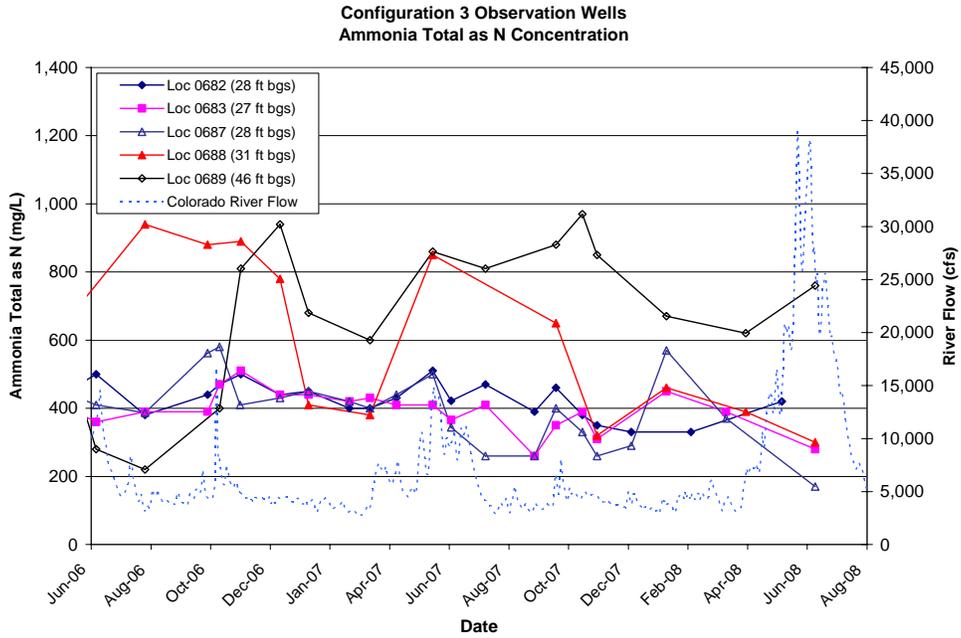


Figure 2. Configuration 3 Observation Wells Time versus Ammonia Total as N Concentration Plot

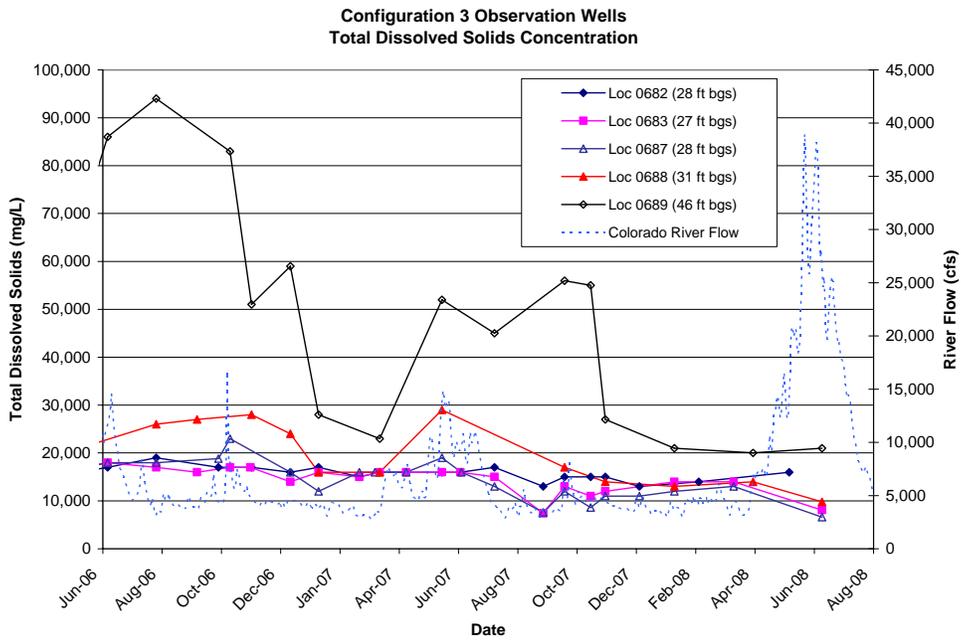


Figure 3. Configuration 3 Observation Wells Time versus TDS Concentration Plot

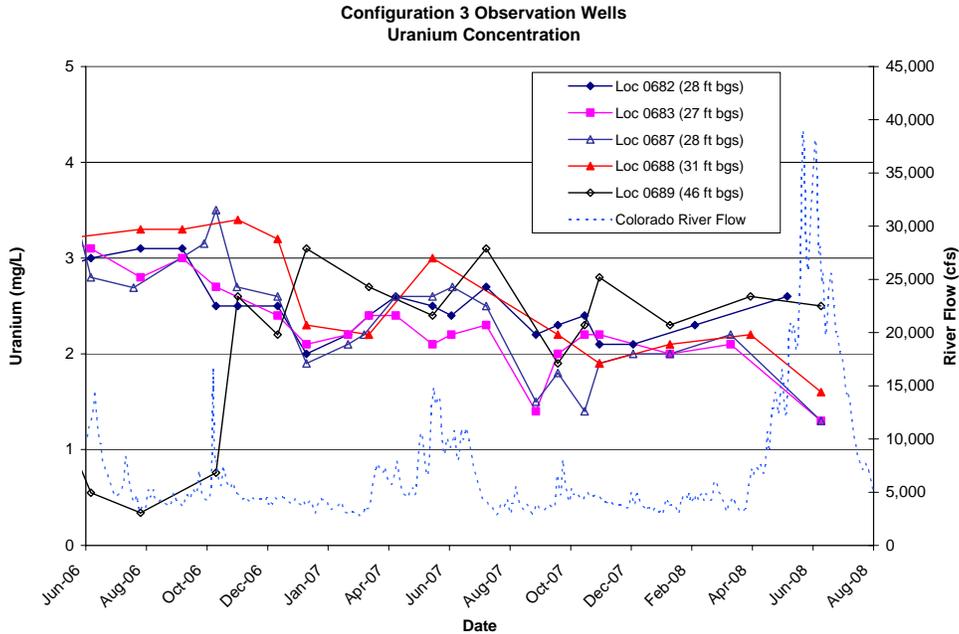


Figure 4. Configuration 3 Observation Wells Time versus Uranium Concentration Plot

Configuration 1

Samples were collected from 0483 (18 ft bgs), 0484 (28 ft bgs), and 0558 (36 ft bgs) during this past month. The time versus analyte concentration plots for these locations shows that ammonia (Figure 5) and TDS concentrations (Figure 6) for samples collected from above 36 ft bgs decreased in response to the high Colorado River stage. Uranium concentrations (Figure 7) in the samples collected from 36 ft bgs slightly increased while the more shallow samples decreased significantly since the spring.

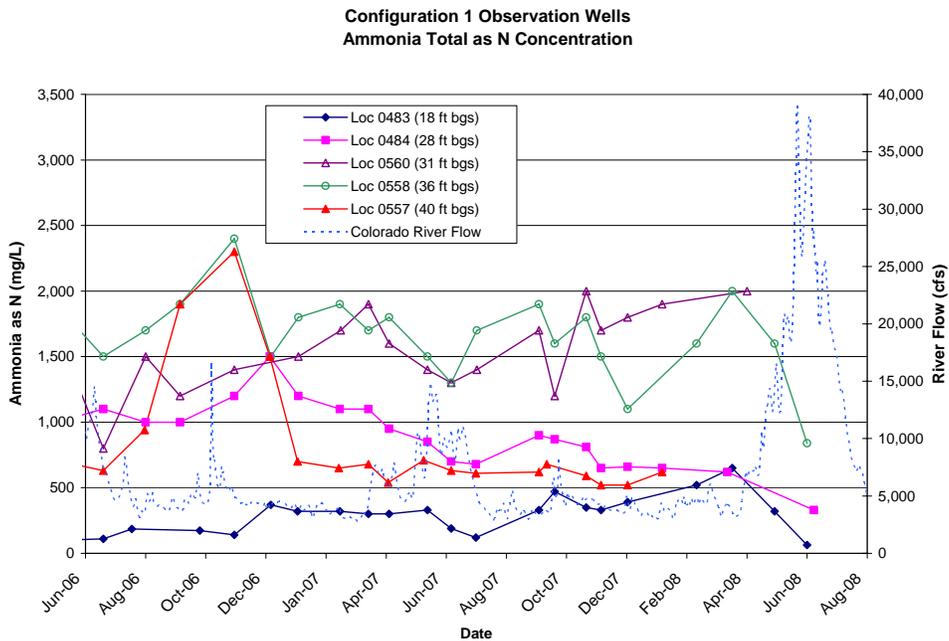


Figure 5. Configuration 1 Observation Wells Time versus Ammonia Total as N Concentration Plot

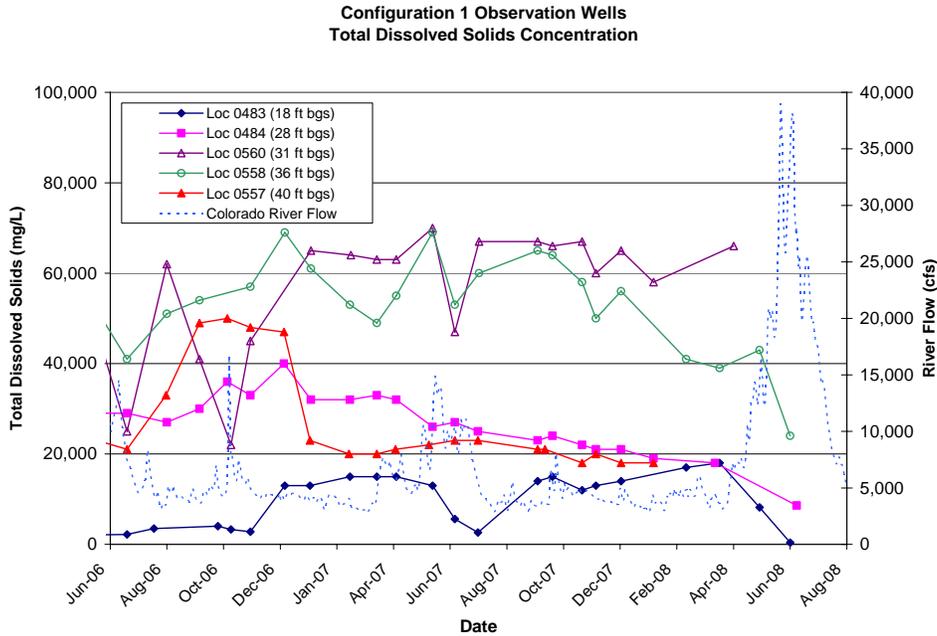


Figure 6. Configuration 1 Observation Wells Time versus TDS Concentration Plot

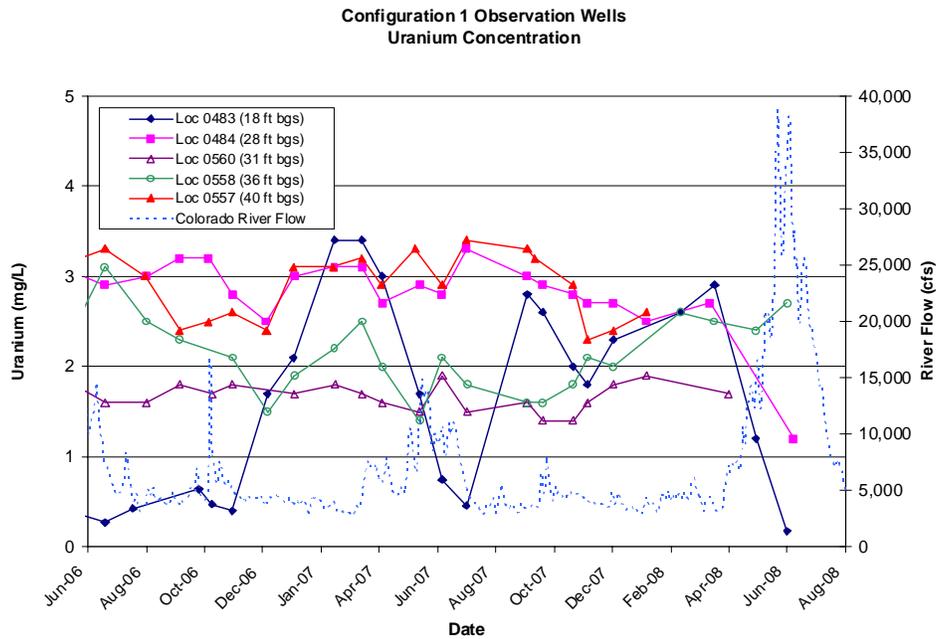


Figure 7. Configuration 1 Observation Wells Time versus Uranium Concentration Plot

Observation Wells 0403 and 0407

Samples were also collected from these locations, which are located on the river bank within Configuration 1, during the June 2008 sampling event. As shown in the time versus analyte concentration plots below, the high river stage impacted the ammonia, TDS, and uranium concentrations (Figures 8, 9, and 10, respectively).

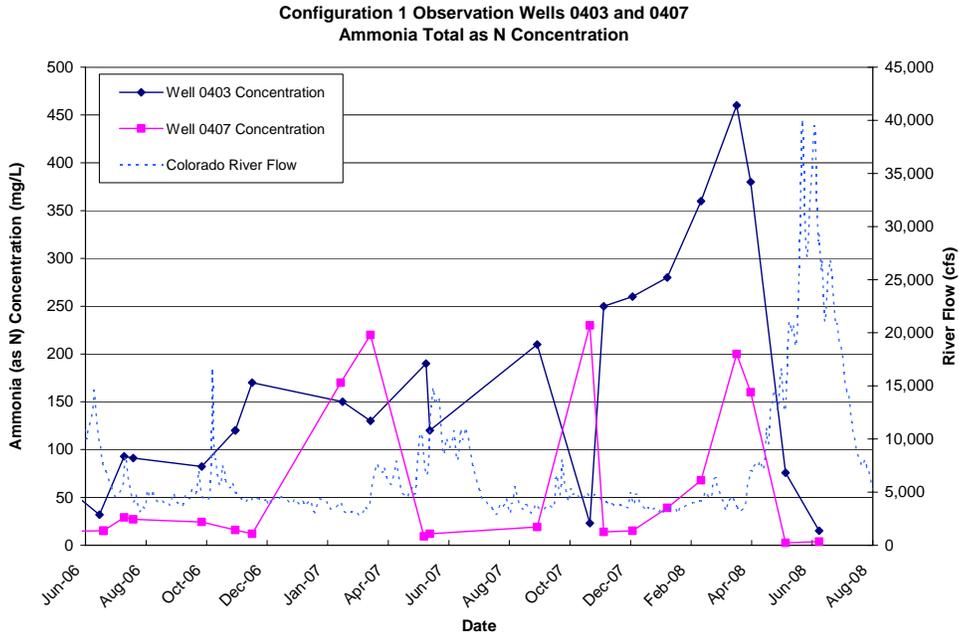


Figure 8. Configuration 1 Observation Wells 0403 and 0407 Time versus Ammonia Total as N Concentration Plot

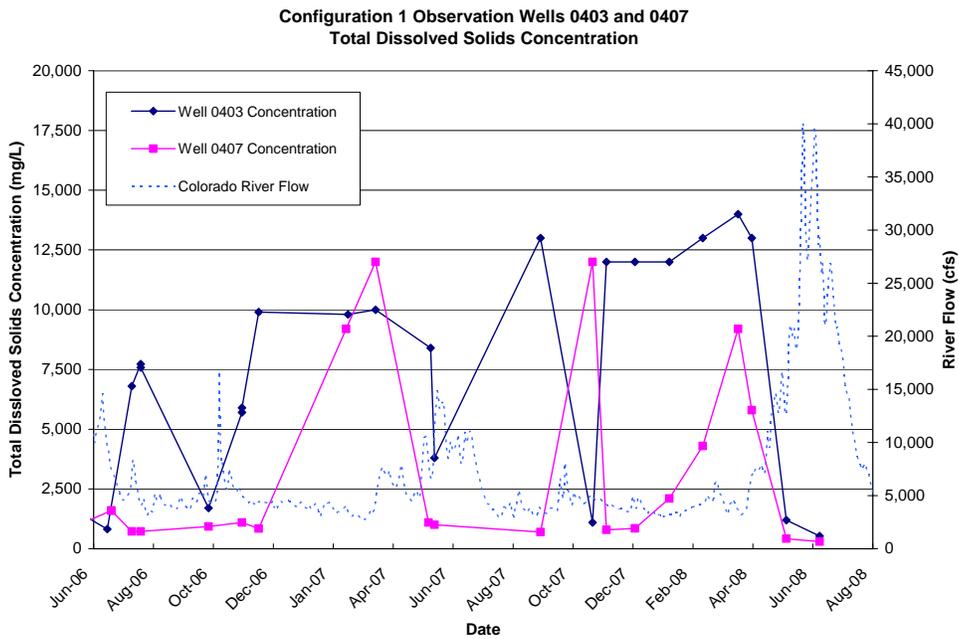


Figure 9. Configuration 1 Observation Wells 0403 and 0407 Time versus TDS Concentration Plot

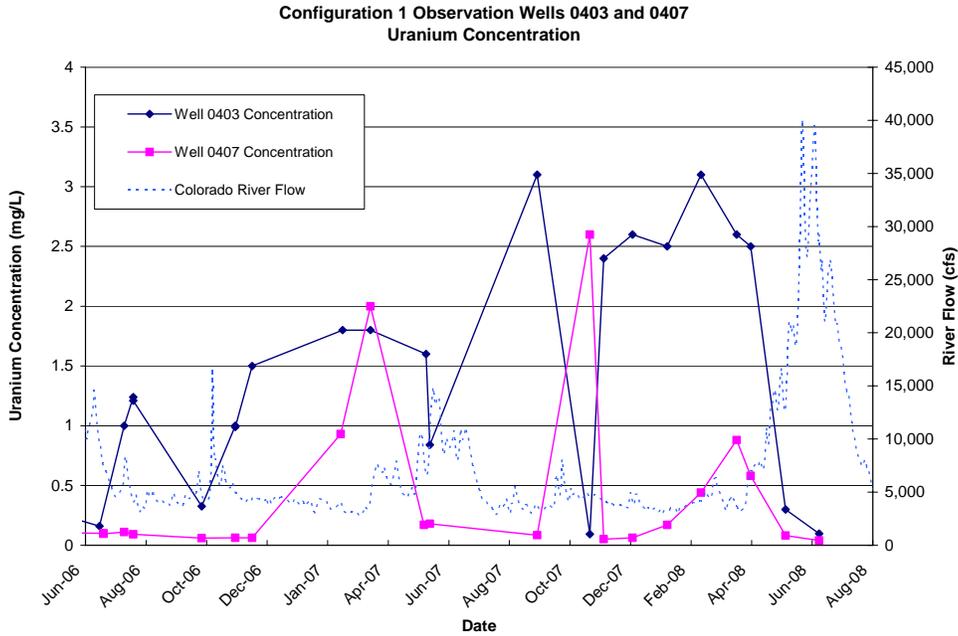


Figure 10. Configuration 1 Observation Wells 0403 and 0407 Time versus Uranium Concentration Plot

Configuration 4

Of the locations included in the time versus concentration plots for Configuration 4, only location 0780 (28 ft bgs) was sampled during this past month. As exhibited by the plots, ammonia, TDS, and uranium concentrations (Figures 11, 12, and 13, respectively) decreased significantly since the spring in response to the higher river stage.

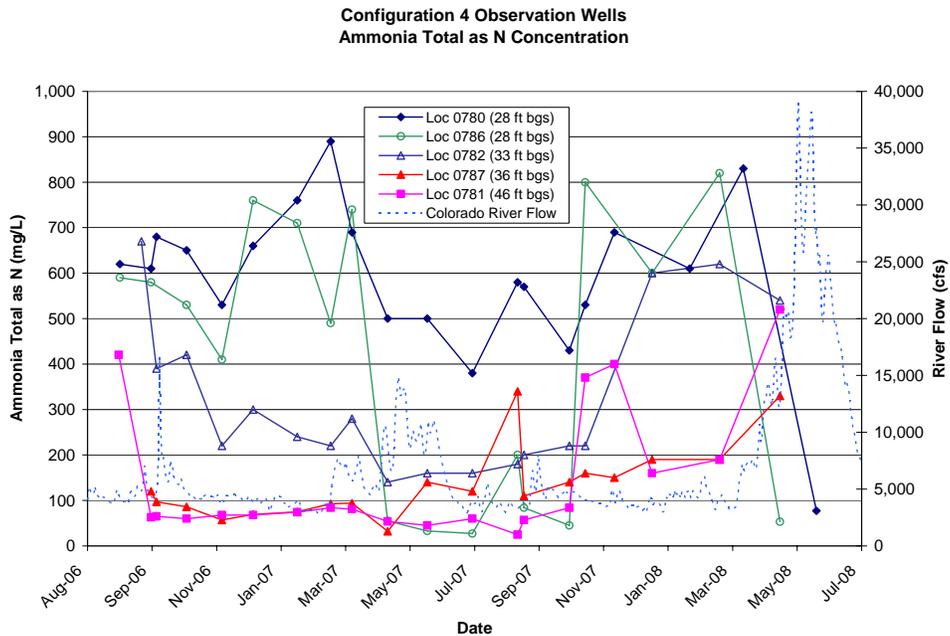


Figure 11. Configuration 4 Observation Wells Time versus Ammonia Total as N Concentration Plot

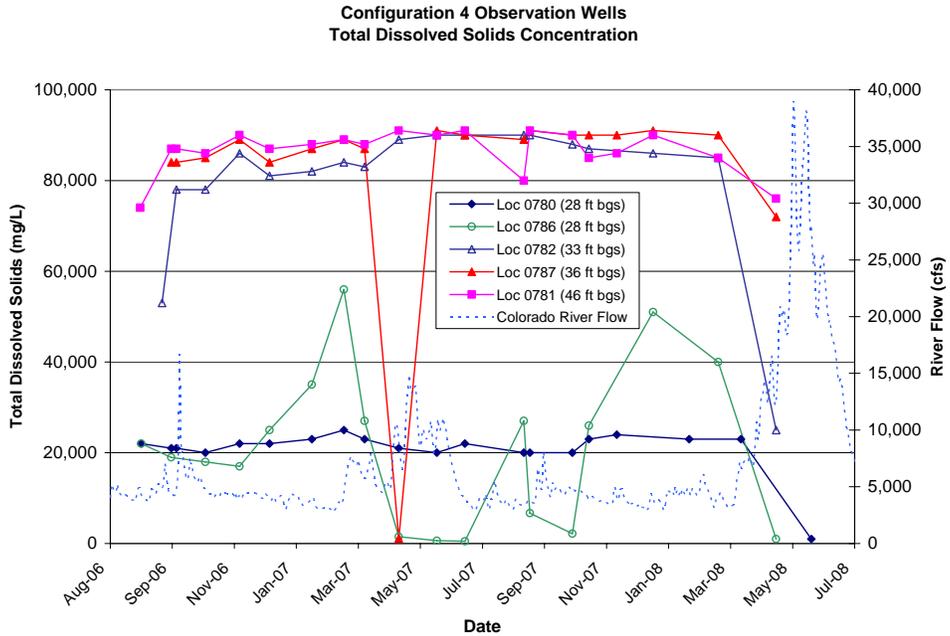


Figure 12. Configuration 4 Observation Wells Time versus TDS Concentration Plot

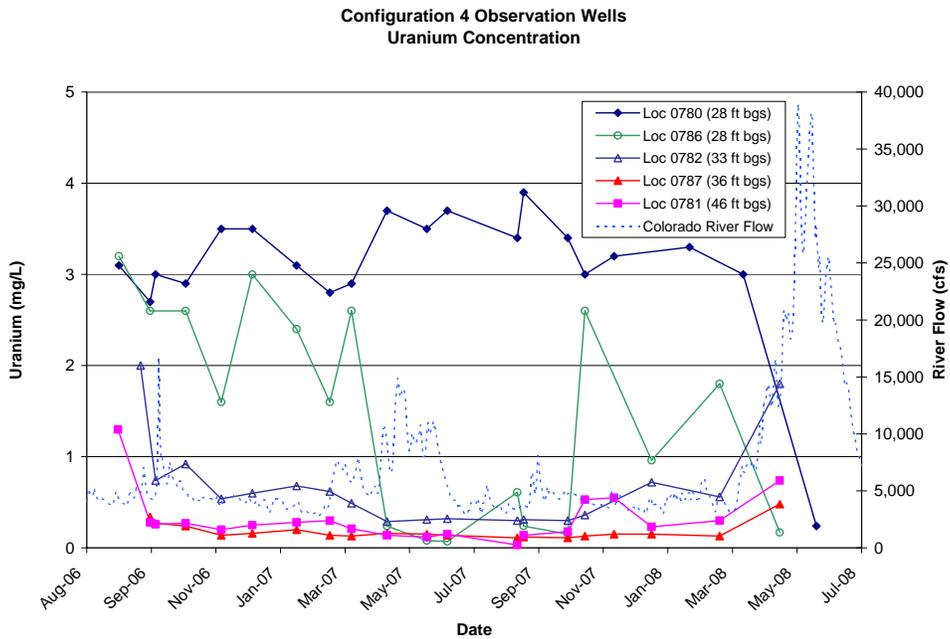


Figure 13. Configuration 4 Observation Wells Time versus Uranium Concentration Plot

Surface Water Sampling Results

Due to the high river stage, it was not possible to safely collect surface water samples from any of the designated locations during this sampling event.

1.2.2 Ground Water/Surface Water Interaction Investigation Sampling Event

This VDP presents the June 2008 validated data associated with the third round of ground water and surface water samples collected during the Ground Water/Surface Water Interaction Investigation Sampling Event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0 with a description of how these data are qualified based on field and laboratory verification assessments (Sections 2.1 and 2.2.2). Attachment 2 contains the Trip Report detailing the field events associated with this sampling event.

A list of flagged data is presented in Table 6 in Section 2.2.2. No data were rejected (flagged as “R”) as a result of this validation process. A Minimums and Maximums Report (presented in Section 3.1) was generated to determine if the data are within a normal statistical range. Any anomalous data, based on the results of the Minimums and Maximums Report, are presented in Section 3.2.

Trilinear diagrams are provided based on the water chemistry data collected in June 2008 from the Baseline Area and Configuration 1 location samples as part of this sampling event and are discussed below. For comparison purposes the diagrams generated using the investigation baseline data (collected in March 2008) are also provided.

Baseline Area

The trilinear diagram below (Figure 14) represents the March 2008 river base-flow conditions for the Baseline Area for the ground water/surface water interaction investigation. Based on the water chemistry results, all ground water samples were classified as sodium-sulfate-type water, with no clear distinction between the samples collected from the various depths. The surface water sample was classified as a mixed type of water on the trilinear diagram.

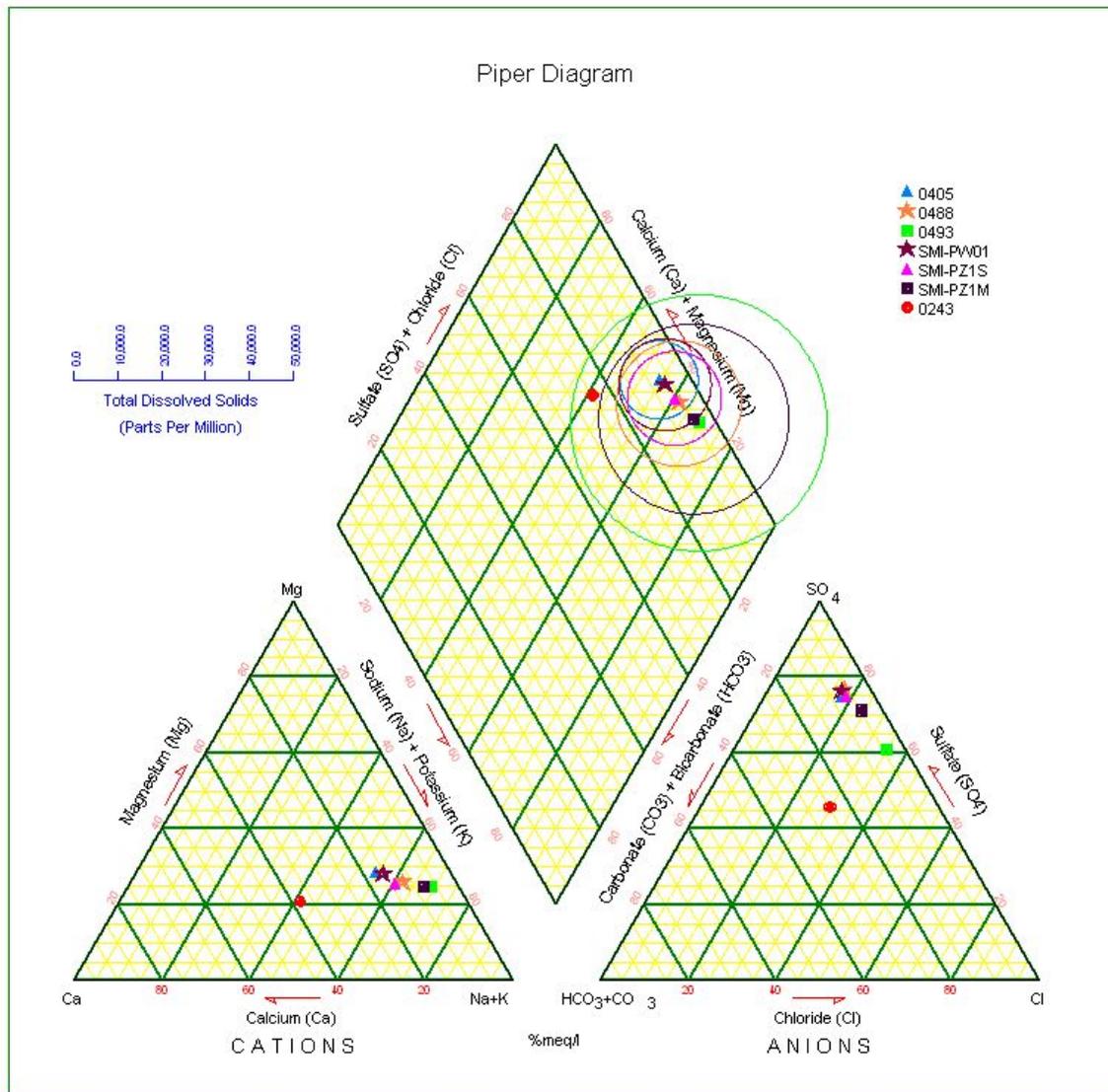


Figure 14. Baseline Area March 2008 (River Base-flow Conditions)

The following trilinear diagram (Figure 15), generated for the Baseline Area using the June 2008 water chemistry data, is similar to the low-flow winter conditions of the March 2008 data regarding the water chemistry of the observation wells. All ground water samples, regardless of the depth from which they were collected, can still be classified as sodium-sulfate-type water.

The main difference between the two plots is the chemistry of the surface water. Due to the high river stage (the flow was between 35,000 and 40,000 cfs during the time when the surface water sample was collected), it was not possible to collect a sample from location 0243 because this area was flooded. The only option in the vicinity of the Baseline Area was to collect a sample off the river bank, in the vicinity of location 0241, which was representative of the river water chemistry. As shown in the trilinear diagram below, the surface water in June 2008 was classified as calcium-bicarbonate-type water.

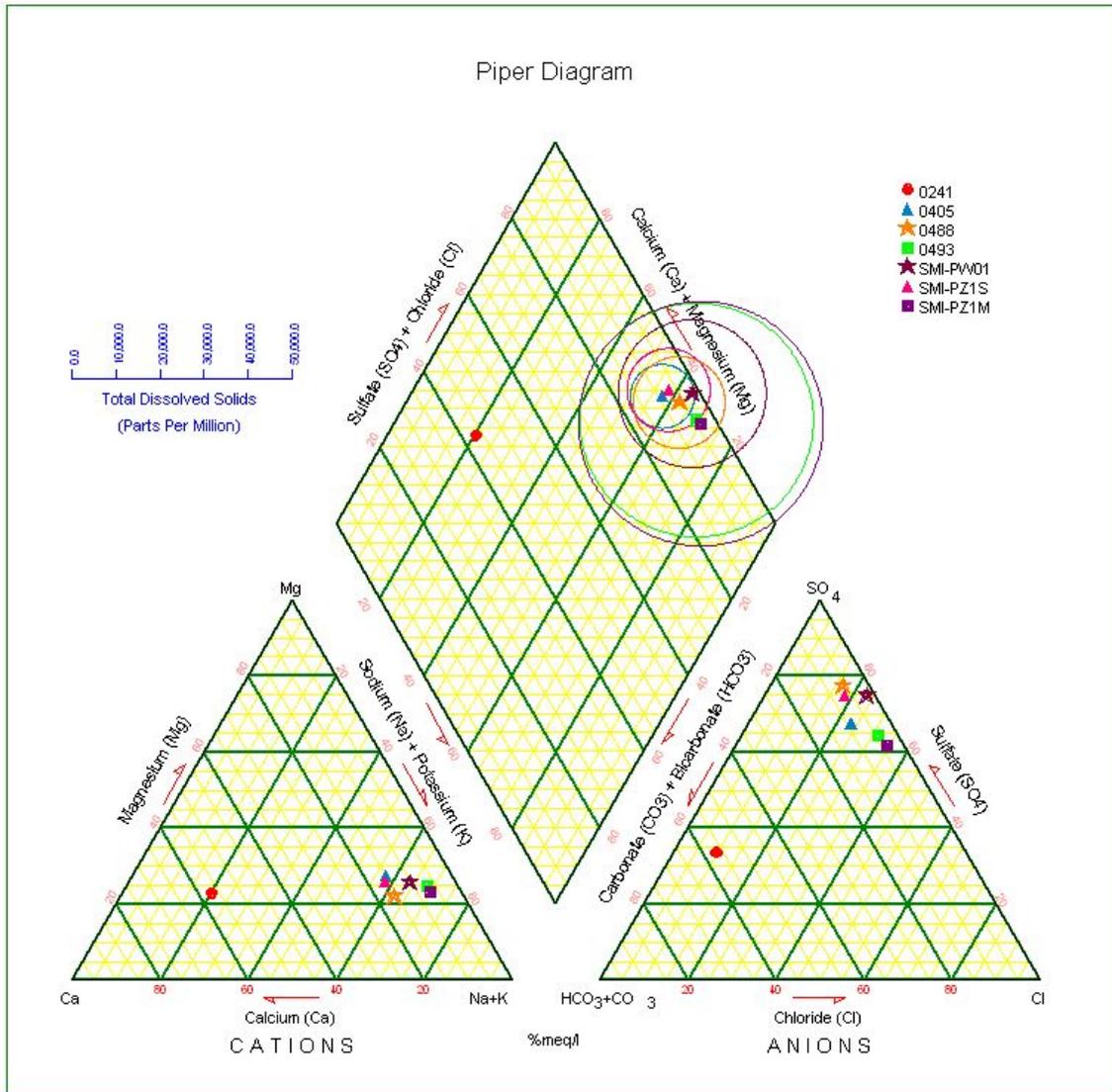


Figure 15. Baseline Area June 2008 (flow ~38,000 cfs)

Configuration 1

The river base-flow condition from the Configuration 1 Area March 2008 sampling is presented in the trilinear diagram below (Figure 16). Similar to the Baseline Area sampling, the surface water sample (0216) was a mixed ionic composition water. The surface water sample has a different ionic composition from the ground water samples. All ground water samples had the same dominant cation, sodium, but different proportions of the anion sulfate and chloride. Samples collected from the shallow depth (locations 0474, 0480, 0483, and 0559 were sampled from 18 ft bgs) and the upgradient intermediate depth (location 0557 sampled from 36 ft bgs) are classified as sodium-sulfate-type water. The remaining intermediate zone samples (locations 0558 and 0560 were sampled from 36 ft bgs) and those collected from the deep zone (locations 0482, 0485, and 0561 sampled from 55 ft bgs) are classified as sodium-chloride-type water, which is indicative of brine.

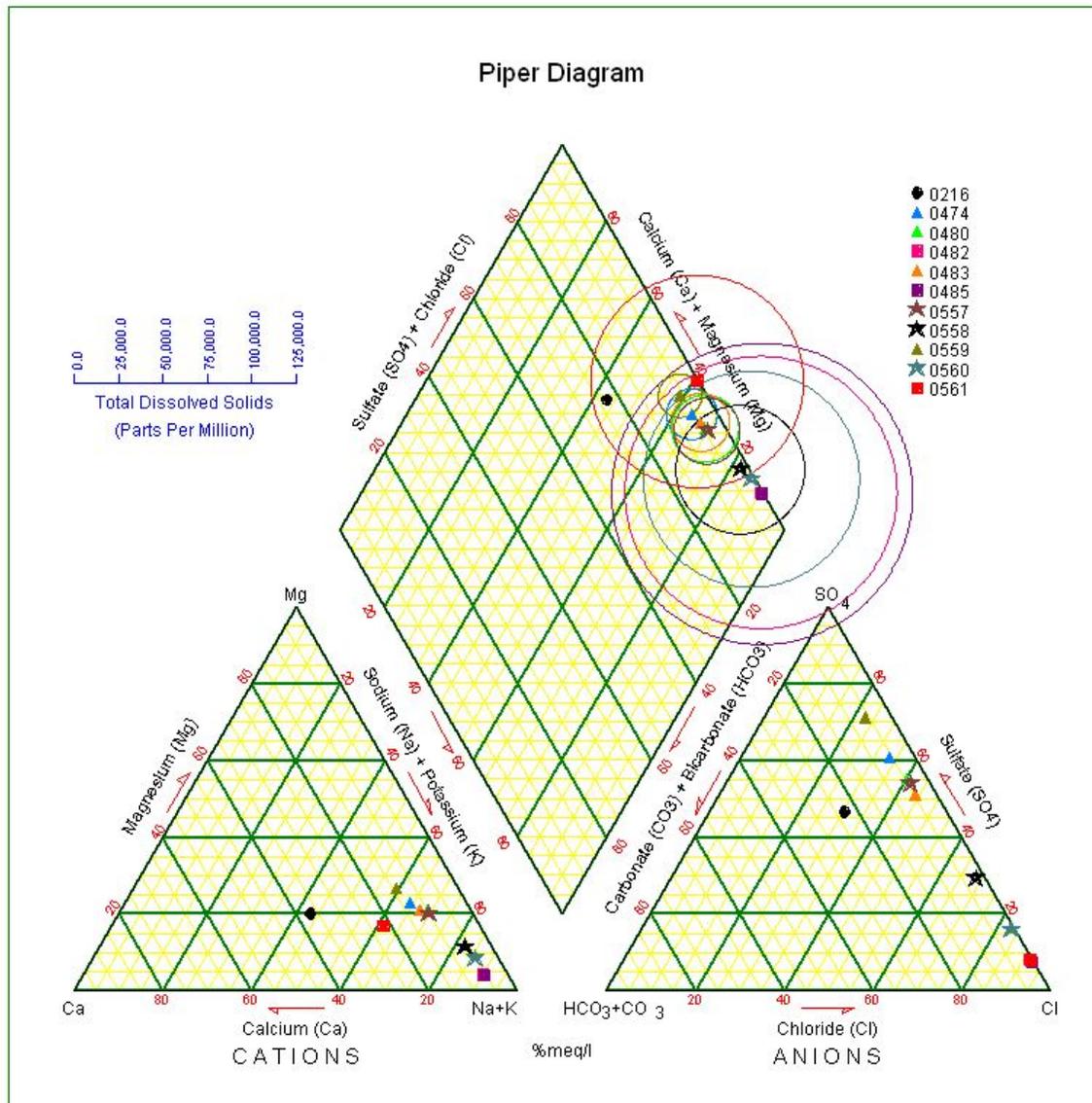


Figure 16. Configuration 1 March 2008 (River Base-flow Conditions)

The following trilinear diagram (Figure 17) for the Configuration 1 Area, generated using the June 2008 data, exhibits incipient changes in ground water samples compared to the March 2008 data. These changes are most likely related to increasing river stage, but may be the result of infiltration of irrigation water. Most notably, the relative proportions of carbonate and bicarbonate in the shallow ground water zone have increased.

In both the March and June 2008 cation plots, sodium is the dominant cation in the majority of the ground water samples. The surface water sample and the sample collected from extraction well 0474 were calcium-type waters. Similar to the Baseline Area surface water sample, the surface water collected off Configuration 1 is classified as a calcium-bicarbonate type water. This differs from the March 2008 sample results where the surface water sample is classified as a mixed-type water.

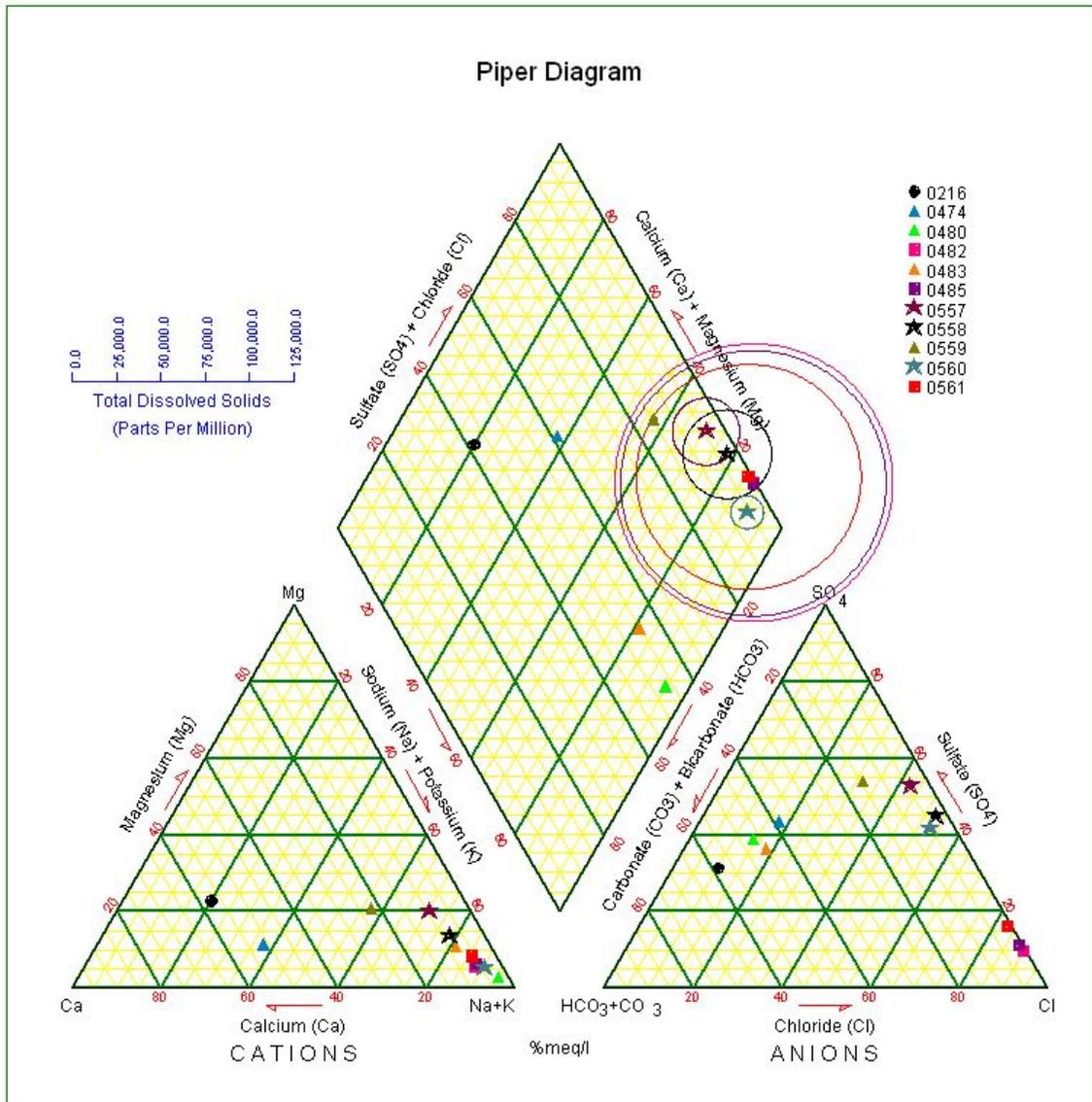


Figure 17. Configuration 1 June 2008 (flow ~38,000 cfs)

Surface Water Sampling Results

Table 1 presents a summary of the ammonia concentrations associated with the surface water samples collected during this sampling event. For comparison purposes, the applicable state of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are provided.

Table 1. Ground Water/Surface Water Interaction Investigation Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

Loc	Date	Temp (°C)	pH	Ammonia Total as N (mg/L)	State/Federal AWQC-Acute Total as N (mg/L) ¹	State/Federal AWQC-Chronic Total as N (mg/L) ²
0216	6/3/08	18.0	8.05	0.1	4.64	1.68
0242	6/3/08	17.6	8.09	0.1	4.64	1.68

Notes: Loc = Location, Temp = Temperature, AWQC = Ambient Water Quality Criteria

- (1) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 1-Hour Average (Acute) Concentration of Total Ammonia as N (mg/L)
- (2) State of Utah, Standards of Quality for Waters of the State (Effective May 1, 2008), Rule R317-2, Table 2.14.2, 30-Day Average (Chronic) Concentration of Total Ammonia as N (mg/L), Fish Early Life Stages Present

As shown in Table 1, neither of the two surface water samples collected during this sampling event exceeded the state or federal acute or chronic criteria.

1.3 Sampling and Analyses

1.3.1 Monthly Sampling Event

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2007*. Although not listed here, the normal set of locations were sampled. Please refer to the attached Trip Report (Attachment 1) for specific sampled locations and an explanation of why some locations were not sampled, such as dry conditions at specific surface water locations.

The data validations indicate that the data meet the quality-control criteria specified for this project. An inadequate number of equipment blanks (EBs) and duplicates were collected. All samples were analyzed within their prescribed holding times. No significant discrepancies were noted regarding sample shipping and receiving, preservation, holding times, instrument calibration, method blanks, or matrix spikes, except as qualified or noted in the Laboratory Performance Assessments (Section 2.2.1).

There were 10 locations with 38 anomalous data points (three in Configuration 1 [0403, 0484, and 0596], three in Configuration 2 [0584, 0587, and 0600], and four in Configuration 4 [0780, 0783, 0784, 0785]), all of which were historically lows. Impacts from the high river stage decreased the analyte concentrations. See the Anomalous Data Review (Section 3.2) for details.

According to the USGS Cisco Gaging Station, the mean daily Colorado River flow rates varied between 25,800 and 29,300 cfs during this sampling period.

1.3.2 Ground Water/Surface Water Interaction Investigation Sampling Event

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2007*. Although not listed here, the normal set of locations were sampled. Please refer to the attached Trip Report (Attachment 2) for specific sampled locations and an explanation of why some locations were not sampled.

The data validations indicate that the data meet the quality-control criteria specified for this project. An inadequate number of EBs and duplicates were collected; see the Water Sampling Field Activities Verification Checklist for details. No significant discrepancies were noted regarding sample shipping and receiving, preservation times, holding times, instrument calibration, method blanks, or matrix spikes, except as qualified or noted in the Laboratory Performance Assessments (Section 2.2.2).

There were six well locations (0474, 0480, 0483, 0485, 0559, and 0560, all of which are in Configuration 1) with a total of 22 anomalous data values. Twenty-one of these values were historic lows (the exception being the high uranium value measured in the sample collected from location 0485), and may have likely been impacted by the high stage of the Colorado River. See Section 3.2 for more information details.

According to the USGS Cisco Gaging Station, the mean daily Colorado River flow rates varied between 35,900 and 39,500 cfs during this sampling period.

2.0 Data Assessment Summaries

This section contains the Water Sampling Field Activities Verification (Section 2.1), the Laboratory Performance Assessments (Section 2.2), the Field Analyses/Activities (Section 2.3), and Certification (Section 2.4).

2.1 Water Sampling Field Activities Verifications

The field activities verification processes for these sampling events were documented. As the verification exhibits, all sampling was conducted following the applicable procedures. This verification is provided in Appendix A.

2.2 Laboratory Performance Assessments

2.2.1 Monthly Sampling Event

General Information

Report Identification No. (RIN):	0806016
Sample Event:	Interim Action Well Field Monthly Sampling Event, June 2008
Site(s):	Moab, UT
Laboratory:	Paragon Analytics, Fort Collins, CO
Sample Data Group (SDG) No.:	0806016
Analysis:	Metals and Inorganics

Validator: Rachel Cowan
 Review Date: September 16, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The Level 1 validation was performed on 100 percent of the samples, which included review of the chain of custody (COC), case narratives, field and sample identifications, holding times, and preservation, and cooler receipt. When the case narrative identified items of concern, these items were further investigated in a targeted Level 3 validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as N, NH ₃ -N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Bromide	MIS-A-038	SW-846 9056	SW-846 9056
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Copper	MET-A-020	SW-846 3005A	SW-846 6010
Manganese	GJO-17	SW-846 3005A	SW-846 6010
Selenium	GJO-14	SW-846 3005A	SW-846 6020
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids	WIC-A-033	MCAWW 160.1	MCAWW 160.1
Uranium	GJO-01	SW-846 3005A	SW-846 6020

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to Table 4 below for an explanation of the data qualifiers applied.

Table 3. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
0806097-9	0683	Selenium	J	MS-1, SD-1

Notes: J indicates results are estimated.

Table 4. Reason Codes for Data Flags

Reason Code	Explanation
MS-1	Results for the affected analyte(s) are regarded as estimated (J) because the matrix spike sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or equipment blank, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.
SD-1	Results for the affected analyte(s) are regarded as estimated (J) because the frequency requirements for serial dilution analysis were not met and the sample result is greater than or equal to 50 times the practical quantitation limit.

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 20 samples for RIN 0806016 on June 12, 2008, under UPS tracking number 1Z5W1Y510195453643. All samples were accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed on each form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC form and the sample tickets, had no errors or omissions, except for the following: one sample ticket had the sample location crossed off and the duplicate sample number incorrectly written in over it. The COC form corrected this problem, and Paragon Analytics used the proper location number during the analysis process.

Preservation and Holding Times

The sample shipment was received intact with the temperature within the cooler at 0.6 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Case Narratives

The case narratives were reviewed and all results were found to be within quality control procedures except for the following.

Matrix Spike and Replicate Analysis

Matrix spike (MS) sample analysis is performed as a measure of the ability to recover analytes in a particular matrix. If the native sample concentration is greater than four times the spike concentration, MS criteria do not apply. Replicate sample (RS) analysis consists of matrix spike duplicate (MSD) samples and field duplicates that are indicators of laboratory precision for each sample matrix

Method EPA 350.1, Ammonia as N

An ammonia MS and MSD check was made at the required frequency for the SDG 0806097 sample preparation batch. However, the native sample for the MS analyses had an ammonia concentration that was greater than four times the spike concentration, so MS criteria do not apply to these samples. In addition, the associated field duplicate sample passed validation criteria, so ammonia results were not J-flagged for failing the replicate check.

Method SW-846 9056, Chloride

A chloride MS and MSD check was made at the required frequency for the SDG 0806038 sample preparation batch. However, the native sample for the MS analyses had a chloride concentration that was greater than four times the spike concentration, so MS criteria do not apply to these samples. In addition, the associated field duplicate sample passed validation criteria, so chloride results were not J-flagged for failing the replicate check.

Method SW-846 6010, Selenium

Method SW6010 requires one MS per 20 samples. Although one sample was analyzed for selenium, there were no selenium MSs and MSDs. The sample 0806097-9 was qualified with a "J" flag for these reasons.

Method SW9056, Sulfate

A sulfate MS and MSD check was made at the required frequency for the SDG 0806097 sample preparation batch. However, the native sample for the MS analyses had a sulfate concentration that was greater than four times the spike concentration, so MS criteria do not apply to these samples. In addition, the associated field duplicate sample passed validation criteria, so sulfate results were not J-flagged for failing the replicate check.

Field Duplicate

Field duplicates are collected during actual sampling activities. They are labeled with a blind ID and submitted with the regular samples to be analyzed by Paragon Analytics. Sample 0806097-20 (2888) was the duplicate sample taken from location 0688-31. This sample passed the Environmental Protection Agency (EPA) criteria of ± 20 relative percent difference (RPD) for all analytes.

Laboratory Control Sample

A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per SDG) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception.

LCSs were not reported for copper, manganese, or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that were field-filtered and acidified, and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements provided by the National Environmental Laboratory Accreditation Conference, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

All analytes that did not have LCSs (copper, manganese, and uranium) had MSs that passed the appropriate criteria, so nothing was flagged for failing the LCS check.

Detection Limits/Dilutions

The required detection limit (RDL) for all analytes was achieved for all SDGs. Serial dilution samples were required for inductively coupled plasma (ICP) sample analysis (copper, manganese, selenium, and uranium). Serial dilutions were run for all ICP analyses, except selenium, so the corresponding selenium result was flagged.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Electronic Data Deliverable File

The Electronic Data Deliverable (EDD) files arrived on June 26, 2008. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package and that all and only the requested data were delivered.

2.2.2 Ground Water/Surface Water Interaction Investigation Sampling Event

General Information

RIN: 0806015

Sample Event: Interim Action Well Field Ground Water/Surface Water Interaction Investigation Sampling Event, June 2008

Site(s): Moab, UT

Laboratory: Paragon Analytics, Fort Collins, CO

SDG No.: 0806038

Analysis: Metals and Inorganics

Validator: Rachel Cowan

Review Date: September 10, 2008

This validation was performed according to the *Environmental Procedures Catalog*, “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The Level 1 validation was performed on 100 percent of the samples, which included review of the COC, case narratives, field and sample identifications, holding times, and preservation, and cooler receipt. When the case narrative identified items of concern, these items were further investigated in a targeted Level 3 validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 5.

Table 5. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as N, NH ₃ -N	WCH-A-005	EPA 350.1	EPA 350.1
Bromide	MIS-A-038	SW-846 9056	SW-846 9056
Calcium	MET-A-020	SW-846 3005A	SW-846 6010
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Copper	MET-A-020	SW-846 3005A	SW-846 6010
Magnesium	MET-A-020	SW-846 3005A	SW-846 6010
Manganese	GJO-17	SW-846 3005A	SW-846 6010
Potassium	MET-A-020	SW-846 3005A	SW-846 6010
Selenium	GJO-14	SW-846 3005A	SW-846 6020
Sodium	MET-A-020	SW-846 3005A	SW-846 6010
Sulfate	MIS-A-044	SW-846 9056	SW9056
Total Dissolved Solids	WIC-A-033	EPA 160.1	EPA 160.1
Uranium	GJO-01	SW-846 3005A	SW-846 6020

Data Qualifier Summary

Analytical results were qualified as listed in Table 6. Refer to Table 7 below for an explanation of the data qualifiers applied.

Table 6. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
0806038-2 through 0806038-9, and 0806038-19	0241, 0405, 0474, 0480, 0482, 0483, 0485, 0488, SMI-PZ1S	Ammonia as N	J	MS1
All samples except 0806038-1 and -2	All locations except 0216, 0241	Ammonia as N	J	RS2
0806038-1, -2	0216, 0241	All	J	B1

Notes: J indicates results are estimated.

Table 7. Reason Codes for Data Flags

Reason Code	Explanation
B1	Results are considered estimated (J) because the blank frequency criteria were not met.
MS1	Results for the affected analyte(s) are regarded as estimated (J) because the matrix spike sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or equipment blank, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.
RS2	Results for the affected analyte(s) are regarded as estimated (J) because both the original result and replicate result are greater than or equal to five times the practical quantitation limit and the relative percent difference exceeds the appropriate control limits.

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received a total of 19 samples for RIN 0806015. on May 5, 2008, under UPS tracking number 1Z5W1Y510196240415. All samples were accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed on each form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC form and the sample tickets, had no errors or omissions, except for the following: one sample ticket had the sample location crossed off and the duplicate sample number incorrectly written in over it. The COC form corrected this problem, and Paragon Analytics used the proper location number during the analysis process.

Preservation and Holding Times

The sample shipments were received intact with the temperature within the cooler at 0.6 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Case Narratives

The case narratives were reviewed and all results met quality control requirements with the following exceptions.

Matrix Spike and Replicate Analysis

MS sample analysis is performed as a measure of the ability to recover analytes in a particular matrix. If the native sample concentration is greater than four times the spike concentration, MS criteria do not apply. RS analysis consists of MSD samples and field duplicates that are indicators of laboratory precision for each sample matrix.

Method EPA 350.1, Ammonia as N

Method 350.1 requires duplicates to be analyzed for at least 10 percent of the samples. For SDG 0806038, one duplicate was analyzed from the 19 samples submitted. Therefore ammonia results for samples 0806038-2 through 0806038-9 and 0806038-19 were “J” qualified.

Method SW-846 9056, Chloride

A chloride MS and MSD check was made at the required frequency for the SDG 0806038 sample preparation batch. However, the native samples for the MS analyses had a chloride concentration that was greater than four times the spike concentration, so MS criteria do not apply to these samples. In addition, the associated field duplicate sample passed validation criteria, so chloride results were not J-flagged for failing the replicate check.

Method SW-846 6010, Potassium

The potassium MS that analyzed for the 19 samples had a recovery of 124 percent, which is within the Validation Procedure used (75 to 125 percent). However, Paragon Analytics used a different recovery (80 to 120 percent), so their case narrative lists the potassium as failing the recovery rate. Since the procedure that Pro2Serve uses indicates that this potassium MS recovery is acceptable, no data was qualified for this reason.

Method SW-846 9056, Sulfate

A sulfate MS and MSD check was made at the required frequency for the SDG 0806038 sample preparation batch. However, the native samples for the MS analyses had a sulfate concentration that was greater than four times the spike concentration, so MS criteria do not apply to these samples. In addition, the associated field duplicate sample passed validation criteria, so sulfate results were not J-flagged for failing the replicate check.

Field Duplicate

Field duplicates are collected during actual sampling activities. They are labeled with a blind ID and submitted with the regular samples to be analyzed by Paragon Analytics. Sample 0806038-16 (2786) was the duplicate sample taken from location 0488. This sample passed the EPA criteria of ± 20 RPD for all analytes except ammonia, therefore a “J” qualifier was applied for all ammonia results that were five times the reporting level (RL).

Laboratory Control Sample

A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per SDG) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception.

LCSs were not reported for calcium, copper, magnesium, manganese, potassium, sodium, or uranium. As a standard practice, Paragon Analytics does not prepare LCSs for samples that were field-filtered and acidified, and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements provided by the National Environmental Laboratory Accreditation Conference, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

All analytes that did not have LCSs (calcium, copper, magnesium, manganese, potassium, sodium, and uranium) had MSs that passed the appropriate criteria, so nothing was flagged for failing the LCS check.

Detection Limits/Dilutions

The required detection limit (RDL) for all analytes was achieved for all SDGs. Serial dilution samples were required for inductively coupled plasma (ICP) sample analysis (calcium, copper, magnesium, manganese, potassium, selenium, sodium, and uranium). Serial dilutions were run for all ICP analyses.

Equipment Blanks

Equipment blanks (EBs) are samples of analyte-free media that have been used to rinse the nondedicated sampling equipment. EBs are collected to document adequate decontamination of nondedicated equipment. EBs are considered to be preparation blanks, and one EB should be prepared with each preparation batch.

Surface Water Samples

The only samples collected on nondedicated equipment were surface water samples from location 0216 and 0241. Since no EBs were collected, all analyses from these locations were “J” qualified for this reason.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

EDD File

The EDD files arrived on June 18, 2008. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package and that all and only the requested data were delivered.

2.3 Field Analyses/Activities

2.3.1 Monthly Sampling Event

The following information summarizes the field analyses and activities for the June 2008 monthly sampling event:

Field Activities

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. One equipment blank was collected for the nondedicated surface water collection equipment. Five duplicate samples were collected. There are no

established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of ± 20 RPD and are considered acceptable.

2.3.2 Ground Water/Surface Water Interaction Investigation Sampling Event

The following information summarizes the field analyses and activities for the June 2008 ground water/surface water interaction investigation sampling event:

Field Activities

All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. All ground water samples were collected on dedicated equipment. One duplicate sample was collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of ± 20 RPD and are considered acceptable, except for ammonia (25 percent), and all ammonia detects will be flagged accordingly.

2.4 Certification

Results were reported in correct units for all analytes requested. Appropriate contract required laboratory qualifiers and target analyte lists were used. The RDLs were met when possible, or an explanation of why they were not met was given in the laboratory case narrative. All analytical quality-control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the EPA *Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration*, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

3.0 Data Presentation

This section contains the Minimums and Maximums Reports (Section 3.1), the Anomalous Data Review Check Sheets (Section 3.2), a table containing the Water Quality Data and Water Level Data (Sections 3.3 and 3.4, respectively), and the Blanks Reports (Section 3.5).

3.1 Minimums and Maximums Reports

The Minimums and Maximums Reports (see Appendix B) are generated by the Sample Management System used to query the SEEPro database. The DataVal program compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the reports are further screened, and the results are not considered anomalous if: (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

3.2 Anomalous Data Review

As exhibited by the Minimums and Maximums Reports, there are three anomalous data points associated with each of the sampling events completed this month.

Monthly Sampling Event

Site: Moab UMTRA Site **Sampling Date:** June 9 through 11, 2008

Loc. No.	Analyte	Type of Anomaly	Disposition
0403	Chloride	Low	Analyte dilution in response to high Colorado River stage
0403	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0484	Manganese	Low	Analyte dilution in response to high Colorado River stage
0484	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0484	TDS	Low	Analyte dilution in response to high Colorado River stage
0584	Manganese	Low	Analyte dilution in response to high Colorado River stage
0587	Chloride	Low	Analyte dilution in response to high Colorado River stage
0587	Manganese	Low	Analyte dilution in response to high Colorado River stage
0596	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0596	Chloride	Low	Analyte dilution in response to high Colorado River stage
0596	Manganese	Low	Analyte dilution in response to high Colorado River stage
0596	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0596	TDS	Low	Analyte dilution in response to high Colorado River stage
0596	Uranium	Low	Analyte dilution in response to high Colorado River stage
0600	Ammonia	Low	Analyte dilution in response to high Colorado River stage

Loc. No.	Analyte	Type of Anomaly	Disposition
0600	Chloride	Low	Analyte dilution in response to high Colorado River stage
0600	Manganese	Low	Analyte dilution in response to high Colorado River stage
0600	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0600	TDS	Low	Analyte dilution in response to high Colorado River stage
0600	Uranium	Low	Analyte dilution in response to high Colorado River stage
0780	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0780	Chloride	Low	Analyte dilution in response to high Colorado River stage
0780	Manganese	Low	Analyte dilution in response to high Colorado River stage
0780	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0780	TDS	Low	Analyte dilution in response to high Colorado River stage
0780	Uranium	Low	Analyte dilution in response to high Colorado River stage
0783	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0783	Chloride	Low	Analyte dilution in response to high Colorado River stage
0783	Manganese	Low	Analyte dilution in response to high Colorado River stage
0783	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0783	TDS	Low	Analyte dilution in response to high Colorado River stage
0783	Uranium	Low	Analyte dilution in response to high Colorado River stage
0784	Chloride	Low	Analyte dilution in response to high Colorado River stage

Loc. No.	Analyte	Type of Anomaly	Disposition
0784	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0785	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0785	Chloride	Low	Analyte dilution in response to high Colorado River stage
0785	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0785	TDS	Low	Analyte dilution in response to high Colorado River stage

Ground Water/Surface Water Interaction Investigation Sampling Event

Site: Moab UMTRA Site **Sampling Date:** June 2 through 4, 2008

Loc. No.	Analyte	Type of Anomaly	Disposition
0474	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0474	Chloride	Low	Analyte dilution in response to high Colorado River stage
0474	Manganese	Low	Analyte dilution in response to high Colorado River stage
0474	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0474	TDS	Low	Analyte dilution in response to high Colorado River stage
0474	Uranium	Low	Analyte dilution in response to high Colorado River stage
0480	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0480	Chloride	Low	Analyte dilution in response to high Colorado River stage
0480	Manganese	Low	Analyte dilution in response to high Colorado River stage
0480	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0480	TDS	Low	Analyte dilution in response to high Colorado River stage
0480	Uranium	Low	Analyte dilution in response to high Colorado River stage
0483	Manganese	Low	Analyte dilution in response to high Colorado River stage
0483	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0483	TDS	Low	Analyte dilution in response to high Colorado River stage

Loc. No.	Analyte	Type of Anomaly	Disposition
0485	Uranium	High	Brine interface elevation impacted by high Colorado River stage
0559	Ammonia	Low	Analyte dilution in response to high Colorado River stage
0559	Manganese	Low	Analyte dilution in response to high Colorado River stage
0560	Chloride	Low	Analyte dilution in response to high Colorado River stage
0560	Manganese	Low	Analyte dilution in response to high Colorado River stage
0560	Sulfate	Low	Analyte dilution in response to high Colorado River stage
0560	TDS	Low	Analyte dilution in response to high Colorado River stage

3.3 Water Quality Data

All water quality data are presented in Appendix C.

3.4 Water Level Data

All water level data are presented in Appendix D.

3.5 Blanks Reports

During the June 2008 monthly sampling event all samples were collected using dedicated equipment; therefore an EB was not required. Only two surface water samples were collected during the surface water/ground water investigation using nondedicated equipment, and an EB was not collected.

Appendix A. Water Sampling Field Activities Verification

Sampling Event / RIN	<u>June 2008 / 0806016</u>	Date(s) of Water Sampling	<u>June 9-11, 2008</u>
Date(s) of Verification	<u>August 28, 2008</u>	Name of Verifier	<u>Rachel Cowan</u>
		Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, standard operating procedures, instructions.		<u>Yes</u>	
		<u>NA</u>	
2. Were the sampling locations specified in the planning documents sampled?		<u>No</u>	<u>See Section 1.1 for explanation.</u>
3. Was a pre-trip calibration conducted as specified in the aforementioned documents?		<u>Yes</u>	
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?		<u>Yes</u>	
		<u>Yes</u>	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?		<u>Yes</u>	
6. Was the category of the well documented?		<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 milliliters per minute (mL/min)? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?		<u>Yes</u>	
		<u>NA</u>	

Water Sampling Field Activities Verification (continued)

- | | | | |
|-----|---|-----|---|
| 8. | Were the following conditions met when purging a Category II well: | | |
| | Was the flow rate less than 500 mL/min? | Yes | |
| | Was one pump/tubing volume removed prior to sampling? | Yes | |
| 9. | Were duplicates taken at a frequency of one per 20 samples? | Yes | |
| 10. | Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | NA | All ground water samples are collected on dedicated equipment, and no surface water samples were collected. |
| 11. | Were trip blanks prepared and included with each shipment of volatile organic compound samples? | NA | |
| 12. | Were Quality Control samples assigned a fictitious site identification number? | Yes | |
| | Was the true identity of the samples recorded on the Quality Assurance Sample Log? | Yes | |
| 13. | Were samples collected in the containers specified? | Yes | |
| 14. | Were samples filtered and preserved as specified? | Yes | |
| 15. | Were the number and types of samples collected as specified? | Yes | |
| 16. | Were chain-of-custody (COC) records completed, and was sample custody maintained? | Yes | |
| 17. | Are field data sheets signed and dated by both team members? | Yes | |
| 18. | Was all other pertinent information documented on the field data sheets? | Yes | |
| 19. | Was the presence or absence of ice in the cooler documented at every sample location? | Yes | |
| 20. | Were water levels measured at the locations specified in the planning documents? | Yes | |

Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	June 2008GW SW Interaction / 0806015	Date(s) of Water Sampling	June 2-4, 2008
Date(s) of Verification	August 27, 2008	Name of Verifier	Rachel Cowan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, standard operating procedures, instructions.	Yes	
	NA	
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?	No	Daily calibration checks documentation was incorrectly filled out for the morning of 6/3/2008 with respect to the data, however, the operational check was conducted.
	Yes	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 milliliters per minute (mL/min)?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification (continued)

- | | | |
|-----|---|--|
| 8. | Were the following conditions met when purging a Category II well: | |
| | Was the flow rate less than 500 mL/min? | Yes
_____ |
| | Was one pump/tubing volume removed prior to sampling? | Yes
_____ |
| 9. | Were duplicates taken at a frequency of one per 20 samples? | Yes
Nineteen samples were collected, and 1 duplicate sample was collected.
_____ |
| 10. | Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment? | No
Although two surface water samples were collected, no equipment blank samples were collected.
_____ |
| 11. | Were trip blanks prepared and included with each shipment of volatile organic compound samples? | NA
_____ |
| 12. | Were Quality Control samples assigned a fictitious site identification number? | Yes
_____ |
| | Was the true identity of the samples recorded on the Quality Assurance Sample Log? | Yes
_____ |
| 13. | Were samples collected in the containers specified? | Yes
_____ |
| 14. | Were samples filtered and preserved as specified? | Yes
_____ |
| 15. | Were the number and types of samples collected as specified? | Yes
_____ |
| 16. | Were chain-of-custody (COC) records completed, and was sample custody maintained? | Yes
_____ |
| 17. | Are field data sheets signed and dated by both team members? | Yes
_____ |
| 18. | Was all other pertinent information documented on the field data sheets? | Yes
_____ |
| 19. | Was the presence or absence of ice in the cooler documented at every sample location? | Yes
_____ |
| 20. | Were water levels measured at the locations specified in the planning documents? | Yes
_____ |

Appendix B. Minimums and Maximums Reports

June 2008 Monthly Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0806016

Comparison: All Historical Data

Report Date: 8/25/2008

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum		Historical Minimum		Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect
MOA01	0401	06/10/2008	Manganese	2.4		5.4	J	4.1	J	6	0
MOA01	0403	06/09/2008	Ammonia Total as N	15		930		17		51	0
MOA01	0403	06/09/2008	Chloride	26		6973.2		93	F	52	0
MOA01	0403	06/09/2008	Sulfate	180		18802.3		390	F	52	0
MOA01	0403	06/09/2008	Total Dissolved Solids	530		19000	F	820	F	51	0
MOA01	0407	06/09/2008	Chloride	16		5400	F	20	F	52	0
MOA01	0407	06/09/2008	Sulfate	77		12601.1		120		52	0
MOA01	0407	06/09/2008	Total Dissolved Solids	300		19000	F	420		51	0
MOA01	0407	06/09/2008	Uranium	0.039		4.6316		0.051		52	0
MOA01	0484	06/09/2008	Ammonia Total as N	330		1600	F	620	J	40	0
MOA01	0484	06/09/2008	Chloride	2600		22000	F	3800	J	40	0
MOA01	0484	06/09/2008	Manganese	1.6		8	F	5.1		13	0
MOA01	0484	06/09/2008	Sulfate	3200		11000	F	8200	J	40	0
MOA01	0484	06/09/2008	Total Dissolved Solids	8600		41000	F	18000		40	0
MOA01	0484	06/09/2008	Uranium	1.2		3.3	J	2.3	F	40	0
MOA01	0584	06/10/2008	Manganese	1.1		5.6	J	4.1	J	11	0

Appendix B. Minimums and Maximums Reports

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0584	06/10/2008	Sulfate	1100		14000	F	1800	F	36	0		
MOA01	0587	06/10/2008	Ammonia Total as N	11		530	F	13		36	0		
MOA01	0587	06/10/2008	Chloride	26		2900	F	170	F	36	0		
MOA01	0587	06/10/2008	Manganese	0.66		4.4		1.7	J	13	0		
MOA01	0587	06/10/2008	Sulfate	520		8000	F	880	F	36	0		
MOA01	0587	06/10/2008	Total Dissolved Solids	1100		15000	F	2000	F	36	0		
MOA01	0587	06/10/2008	Uranium	0.14		3.9	J	0.24	F	36	0		
MOA01	0596	06/09/2008	Ammonia Total as N	11		770	F	100	F	17	0		
MOA01	0596	06/09/2008	Chloride	51		8900	F	510	F	17	0		
MOA01	0596	06/09/2008	Manganese	0.37		3.6	J	1.3		5	0		
MOA01	0596	06/09/2008	Sulfate	190		8000	F	940	F	17	0		
MOA01	0596	06/09/2008	Total Dissolved Solids	590		26000	F	2200	F	17	0		
MOA01	0596	06/09/2008	Uranium	0.1		2	F	0.31	F	17	0		
MOA01	0600	06/10/2008	Ammonia Total as N	170		960	J	370	F	16	0		
MOA01	0600	06/10/2008	Chloride	380		3400	F	1800	F	16	0		
MOA01	0600	06/10/2008	Manganese	0.78		5		3.8	F	6	0		
MOA01	0600	06/10/2008	Sulfate	1400		11000	F	8800	F	16	0		
MOA01	0600	06/10/2008	Total Dissolved Solids	2900		20000	F	16000	F	16	0		
MOA01	0600	06/10/2008	Uranium	0.52		4.9	F	2.1	F	16	0		
MOA01	0683	06/10/2008	Uranium	1.3		3.2	F	1.4	J	30	0		

Appendix B. Minimums and Maximums Reports

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0686	06/11/2008	Ammonia Total as N	0.1	U	164		F	0.13		F	19	0
MOA01	0687	06/10/2008	Ammonia Total as N	170		580		F	260		J	27	0
MOA01	0687	06/10/2008	Chloride	730		4900		F	890		J	27	0
MOA01	0687	06/10/2008	Manganese	1.6		7.4	N	F	2.2			20	0
MOA01	0687	06/10/2008	Sulfate	3400		11300		F	4300		J	27	0
MOA01	0687	06/10/2008	Total Dissolved Solids	6600		23000		F	7600			26	0
MOA01	0687	06/10/2008	Uranium	1.3		3.9	E	FJ	1.4		J	27	0
MOA01	0688	06/10/2008	Ammonia Total as N	300		960		F	320		J	35	0
MOA01	0688	06/10/2008	Ammonia Total as N	290		960		F	320		J	35	0
MOA01	0688	06/10/2008	Chloride	1200		32000		J	1500		J	35	0
MOA01	0688	06/10/2008	Manganese	2.5		6.1		F	3.7			17	0
MOA01	0688	06/10/2008	Sulfate	5200		59000		J	6100		J	35	0
MOA01	0688	06/10/2008	Sulfate	5300		59000		J	6100		J	35	0
MOA01	0688	06/10/2008	Total Dissolved Solids	9800		46000		F	13000			35	0
MOA01	0688	06/10/2008	Total Dissolved Solids	10000		46000		F	13000			35	0
MOA01	0688	06/10/2008	Uranium	1.6		4.1		F	1.9			35	0
MOA01	0780	06/09/2008	Ammonia Total as N	77		890		F	380			21	0
MOA01	0780	06/09/2008	Chloride	200		7000		F	2700		J	21	0
MOA01	0780	06/09/2008	Manganese	0.24		6.5		F	4.7			14	0
MOA01	0780	06/09/2008	Sulfate	410		13000		F	9300		F	21	0

Appendix B. Minimums and Maximums Reports

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0780	06/09/2008	Total Dissolved Solids	1000		25000	F	20000	F		21	0	
MOA01	0780	06/09/2008	Uranium	0.24		3.9	J	2.7	F		21	0	
MOA01	0783	06/09/2008	Ammonia Total as N	26		380	F	80			6	0	
MOA01	0783	06/09/2008	Chloride	22		3500	F	1000	J		6	0	
MOA01	0783	06/09/2008	Manganese	0.068		28		4.4			5	0	
MOA01	0783	06/09/2008	Sulfate	110		11000	F	3900	J		6	0	
MOA01	0783	06/09/2008	Total Dissolved Solids	330		23000	FJ	7900			6	0	
MOA01	0783	06/09/2008	Uranium	0.17		3.7	F	1.2			6	0	
MOA01	0784	06/09/2008	Chloride	17		3800	F	65	F		7	0	
MOA01	0784	06/09/2008	Sulfate	68		12000	F	160	F		7	0	
MOA01	0784	06/09/2008	Total Dissolved Solids	260		23000	FJ	410	F		7	0	
MOA01	0784	06/09/2008	Uranium	0.048		3.7	F	0.049			7	0	
MOA01	0785	06/09/2008	Ammonia Total as N	6.7		680	J	15			10	0	
MOA01	0785	06/09/2008	Chloride	19		60000	F	100			10	0	
MOA01	0785	06/09/2008	Manganese	0.39		7.4	J	0.64			8	0	
MOA01	0785	06/09/2008	Sulfate	67		8300	J	290	UJ		10	2	
MOA01	0785	06/09/2008	Total Dissolved Solids	320		89000	F	780			10	0	
MOA01	0785	06/09/2008	Uranium	0.034		3.2	F	0.053			10	0	

Appendix B. Minimums and Maximums Reports

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

* Replicate analysis not within control limits.
> Result above upper detection limit.
A TIC is a suspected aldol-condensation product.
B Inorganic: Result is between the IDL and CRDL. Organic: 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
N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U Analytical result below detection limit.
W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z Laboratory defined 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. 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

Appendix B. Minimums and Maximums Reports

June 2008 GW/SW Investigation - Data Validation Minimums and Maximums Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 0806015

Comparison: All Historical Data

Report Date: 8/25/2008

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0216	06/03/2008	Total Dissolved Solids	190		5100		250		41	0		
MOA01	0474	06/04/2008	Ammonia Total as N	26		1110		87		50	0		
MOA01	0474	06/04/2008	Chloride	75		8100	F	750		50	0		
MOA01	0474	06/04/2008	Manganese	0.046		4.4	F	0.83		12	0		
MOA01	0474	06/04/2008	Sulfate	250		9950		1100		50	0		
MOA01	0474	06/04/2008	Total Dissolved Solids	670		25000	F	3000		50	0		
MOA01	0474	06/04/2008	Uranium	0.17		4.2		0.39		50	0		
MOA01	0480	06/02/2008	Ammonia Total as N	50		1100	JF	270	F	34	0		
MOA01	0480	06/02/2008	Chloride	54		9400	F	1900	F	34	0		
MOA01	0480	06/02/2008	Manganese	0.031		5.6	F	4.6		15	0		
MOA01	0480	06/02/2008	Sulfate	200		11200		4500	F	34	0		
MOA01	0480	06/02/2008	Total Dissolved Solids	600		28000	F	11000	F	34	0		
MOA01	0480	06/02/2008	Uranium	0.31		4.18	FJ	2	F	34	0		
MOA01	0482	06/02/2008	Ammonia Total as N	900		690		500	F	24	0		
MOA01	0482	06/02/2008	Manganese	8.7		8.3	F	6.5		7	0		
MOA01	0483	06/02/2008	Bromide	0.2	U	5.1	U	0.32	FJ	26	20		

Appendix B. Minimums and Maximums Reports

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0483	06/02/2008	Manganese	0.085		5.6	F	0.258	F		21	0	
MOA01	0483	06/02/2008	Sulfate	150		11000	F	320			46	0	
MOA01	0483	06/02/2008	Total Dissolved Solids	390		34000	F	1000			46	0	
MOA01	0483	06/02/2008	Uranium	0.18		3.4	F	0.27	F		46	0	
MOA01	0485	06/02/2008	Ammonia Total as N	1100		740		420	F		23	0	
MOA01	0485	06/02/2008	Manganese	9		7.6		6.6	F		7	0	
MOA01	0485	06/02/2008	Sulfate	7500		6900	F	680	F		23	0	
MOA01	0485	06/02/2008	Total Dissolved Solids	74000		90000	F	81000	JF		23	0	
MOA01	0485	06/02/2008	Uranium	1.4		0.8	F	0.00020 2	B		23	0	
MOA01	0488	06/03/2008	Ammonia Total as N	390		900	J	500	J		52	0	
MOA01	0488	06/03/2008	Chloride	850		2100	F	1100	J		52	0	
MOA01	0488	06/03/2008	Chloride	1000		2100	F	1100	J		52	0	
MOA01	0488	06/03/2008	Manganese	3.5		7.59	N F	3.6			27	0	
MOA01	0488	06/03/2008	Manganese	3.3		7.59	N F	3.6			27	0	
MOA01	0488	06/03/2008	Sulfate	6300		12000	F	6500	J		52	0	
MOA01	0488	06/03/2008	Sulfate	5900		12000	F	6500	J		52	0	
MOA01	0488	06/03/2008	Total Dissolved Solids	9800		20000	F	12000			52	0	
MOA01	0488	06/03/2008	Uranium	1.5		3	F	1.8	F		52	0	
MOA01	0488	06/03/2008	Uranium	1.6		3	F	1.8	F		52	0	
MOA01	0558	06/02/2008	Ammonia Total as N	840		2400	F	1000	F		34	0	

Appendix B. Minimums and Maximums Reports

Site Code	Location Code	Sample Date	Analyte	Current		Historical Maximum			Historical Minimum			Count	
				Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	Result	Qualifiers Lab Data	N	N Below Detect		
MOA01	0558	06/02/2008	Manganese	4.9		12	J	7.8			14	0	
MOA01	0558	06/02/2008	Total Dissolved Solids	24000		80000	F	39000			34	0	
MOA01	0559	06/02/2008	Ammonia Total as N	0.87		800	F	12	F		46	0	
MOA01	0559	06/02/2008	Manganese	0.056		5.6	J	0.17			22	0	
MOA01	0560	06/02/2008	Ammonia Total as N	340		2400		650	F		46	0	
MOA01	0560	06/02/2008	Chloride	3000		56000	F	8300	F		46	0	
MOA01	0560	06/02/2008	Manganese	0.8		12	F	7.6	J		15	0	
MOA01	0560	06/02/2008	Sulfate	3200		11000	F	6800	F		46	0	
MOA01	0560	06/02/2008	Total Dissolved Solids	8700		75000	F	22000	F		46	0	
MOA01	0560	06/02/2008	Uranium	0.74		1.9	F	0.92	JF		46	0	
MOA01	0561	06/02/2008	Chloride	35000		55000	J	36000	F		20	0	
MOA01	0561	06/02/2008	Manganese	7.8		67	F	7.9			8	0	
MOA01	0561	06/02/2008	Sulfate	9300		8700	F	5600	F		20	0	
MOA01	0561	06/02/2008	Total Dissolved Solids	62000		87000		71000	F		20	0	
MOA01	0561	06/02/2008	Uranium	1.8		1.4	F	0.39	F		20	0	
MOA01	SMI-PZ1S	06/03/2008	Ammonia Total as N	230		565		240			20	0	

Appendix B. Minimums and Maximums Reports

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined 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. | Q | Qualitative result due to sampling technique. | R | Unusable result. |
| U | Parameter analyzed for but was not detected. | X | Location is undefined. | | |

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
										Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	0401	WL	06/10/2008	0001	18	-	18	150			0		
Alkalinity, Total (As CaCO3)	mg/L	0403	WL	06/09/2008	0001	18	-	18	220			0		
Alkalinity, Total (As CaCO3)	mg/L	0407	WL	06/09/2008	0001	17	-	17	190			0		
Alkalinity, Total (As CaCO3)	mg/L	0484	WL	06/09/2008	0001	28	-	28	490			0		
Alkalinity, Total (As CaCO3)	mg/L	0584	WL	06/10/2008	0001	18	-	18	240			0		
Alkalinity, Total (As CaCO3)	mg/L	0587	WL	06/10/2008	0001	18	-	18	280			0		
Alkalinity, Total (As CaCO3)	mg/L	0596	WL	06/09/2008	0001	24	-	24	230			0		
Alkalinity, Total (As CaCO3)	mg/L	0600	WL	06/10/2008	0001	28	-	28	470			0		
Alkalinity, Total (As CaCO3)	mg/L	0683	WL	06/10/2008	0001	27	-	27	530			0		
Alkalinity, Total (As CaCO3)	mg/L	0686	WL	06/11/2008	0001	18	-	18	230			0		
Alkalinity, Total (As CaCO3)	mg/L	0687	WL	06/10/2008	0001	28	-	28	570			0		
Alkalinity, Total (As CaCO3)	mg/L	0688	WL	06/10/2008	0001	31	-	31	640			0		
Alkalinity, Total (As CaCO3)	mg/L	0689	WL	06/10/2008	0001	46	-	46	920			0		
Alkalinity, Total (As CaCO3)	mg/L	0731	WL	06/11/2008	0001	18	-	18	320			0		
Alkalinity, Total (As CaCO3)	mg/L	0733	WL	06/11/2008	0001	18	-	18	280			0		
Alkalinity, Total (As CaCO3)	mg/L	0780	WL	06/09/2008	0001	28	-	28	320			0		
Alkalinity, Total (As CaCO3)	mg/L	0783	WL	06/09/2008	0001	18	-	18	230			0		
Alkalinity, Total (As CaCO3)	mg/L	0784	WL	06/09/2008	0001	18	-	18	220			0		
Alkalinity, Total (As CaCO3)	mg/L	0785	WL	06/09/2008	0001	18	-	18	240			0		
Ammonia Total as N	mg/L	0401	WL	06/10/2008	0001	18	-	18	84			0	5	
Ammonia Total as N	mg/L	0403	WL	06/09/2008	0001	18	-	18	15			0	2	
Ammonia Total as N	mg/L	0407	WL	06/09/2008	0001	17	-	17	3.9			0	0.1	
Ammonia Total as N	mg/L	0484	WL	06/09/2008	0001	28	-	28	330			0	20	
Ammonia Total as N	mg/L	0584	WL	06/10/2008	0001	18	-	18	71			0	5	

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range		Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab		Data	QA			
Ammonia Total as N	mg/L	0587	WL	06/10/2008	0001	18	-	18	11		0	0.5	
Ammonia Total as N	mg/L	0596	WL	06/09/2008	0001	24	-	24	11		0	0.5	
Ammonia Total as N	mg/L	0600	WL	06/10/2008	0001	28	-	28	170		0	20	
Ammonia Total as N	mg/L	0683	WL	06/10/2008	0001	27	-	27	280		0	20	
Ammonia Total as N	mg/L	0686	WL	06/11/2008	0001	18	-	18	0.1	U	0	0.1	
Ammonia Total as N	mg/L	0687	WL	06/10/2008	0001	28	-	28	170		0	20	
Ammonia Total as N	mg/L	0688	WL	06/10/2008	0001	31	-	31	300		0	20	
Ammonia Total as N	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	290		0	20	
Ammonia Total as N	mg/L	0689	WL	06/10/2008	0001	46	-	46	760		0	20	
Ammonia Total as N	mg/L	0731	WL	06/11/2008	0001	18	-	18	21		0	2	
Ammonia Total as N	mg/L	0733	WL	06/11/2008	0001	18	-	18	0.72		0	0.1	
Ammonia Total as N	mg/L	0780	WL	06/09/2008	0001	28	-	28	77		0	5	
Ammonia Total as N	mg/L	0783	WL	06/09/2008	0001	18	-	18	26		0	5	
Ammonia Total as N	mg/L	0784	WL	06/09/2008	0001	18	-	18	11		0	1	
Ammonia Total as N	mg/L	0785	WL	06/09/2008	0001	18	-	18	6.7		0	0.2	
Bromide	mg/L	0401	WL	06/10/2008	0001	18	-	18	1	U	0	1	
Bromide	mg/L	0403	WL	06/09/2008	0001	18	-	18	0.2	U	0	0.2	
Bromide	mg/L	0407	WL	06/09/2008	0001	17	-	17	0.2	U	0	0.2	
Bromide	mg/L	0484	WL	06/09/2008	0001	28	-	28	2	U	0	2	
Bromide	mg/L	0584	WL	06/10/2008	0001	18	-	18	1	U	0	1	
Bromide	mg/L	0587	WL	06/10/2008	0001	18	-	18	0.22		0	0.2	
Bromide	mg/L	0596	WL	06/09/2008	0001	24	-	24	0.2	U	0	0.2	
Bromide	mg/L	0600	WL	06/10/2008	0001	28	-	28	1	U	0	1	
Bromide	mg/L	0683	WL	06/10/2008	0001	27	-	27	2	U	0	2	
Bromide	mg/L	0686	WL	06/11/2008	0001	18	-	18	1	U	0	1	

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
				Date	ID						Data	QA		
Bromide	mg/L	0687	WL	06/10/2008	0001	28	-	28	2	U	0	2		
Bromide	mg/L	0688	WL	06/10/2008	0001	31	-	31	2	U	0	2		
Bromide	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	2	U	0	2		
Bromide	mg/L	0689	WL	06/10/2008	0001	46	-	46	4	U	0	4		
Bromide	mg/L	0731	WL	06/11/2008	0001	18	-	18	1	U	0	1		
Bromide	mg/L	0733	WL	06/11/2008	0001	18	-	18	1	U	0	1		
Bromide	mg/L	0780	WL	06/09/2008	0001	28	-	28	0.4	U	0	0.4		
Bromide	mg/L	0783	WL	06/09/2008	0001	18	-	18	0.2	U	0	0.2		
Bromide	mg/L	0784	WL	06/09/2008	0001	18	-	18	0.2	U	0	0.2		
Bromide	mg/L	0785	WL	06/09/2008	0001	18	-	18	0.2	U	0	0.2		
Chloride	mg/L	0401	WL	06/10/2008	0001	18	-	18	550		0	10		
Chloride	mg/L	0403	WL	06/09/2008	0001	18	-	18	26		0	2		
Chloride	mg/L	0407	WL	06/09/2008	0001	17	-	17	16		0	0.2		
Chloride	mg/L	0484	WL	06/09/2008	0001	28	-	28	2600		0	40		
Chloride	mg/L	0584	WL	06/10/2008	0001	18	-	18	420		0	10		
Chloride	mg/L	0587	WL	06/10/2008	0001	18	-	18	26		0	4		
Chloride	mg/L	0596	WL	06/09/2008	0001	24	-	24	51		0	2		
Chloride	mg/L	0600	WL	06/10/2008	0001	28	-	28	380		0	10		
Chloride	mg/L	0683	WL	06/10/2008	0001	27	-	27	1100		0	20		
Chloride	mg/L	0686	WL	06/11/2008	0001	18	-	18	780		0	20		
Chloride	mg/L	0687	WL	06/10/2008	0001	28	-	28	730		0	20		
Chloride	mg/L	0688	WL	06/10/2008	0001	31	-	31	1200		0	20		
Chloride	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	1200		0	40		
Chloride	mg/L	0689	WL	06/10/2008	0001	46	-	46	3300		0	40		
Chloride	mg/L	0731	WL	06/11/2008	0001	18	-	18	230		0	10		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Chloride	mg/L	0733	WL	06/11/2008	0001	18	-	18	210			0	10	
Chloride	mg/L	0780	WL	06/09/2008	0001	28	-	28	200			0	4	
Chloride	mg/L	0783	WL	06/09/2008	0001	18	-	18	22			0	1	
Chloride	mg/L	0784	WL	06/09/2008	0001	18	-	18	17			0	0.2	
Chloride	mg/L	0785	WL	06/09/2008	0001	18	-	18	19			0	0.2	
Copper	mg/L	0785	WL	06/09/2008	0001	18	-	18	0.00059	U		0	0.00059	
Dissolved Oxygen	mg/L	0401	WL	06/10/2008	0001	18	-	18	0.51			0		
Dissolved Oxygen	mg/L	0403	WL	06/09/2008	0001	18	-	18	1.06			0		
Dissolved Oxygen	mg/L	0407	WL	06/09/2008	0001	17	-	17	1.33			0		
Dissolved Oxygen	mg/L	0484	WL	06/09/2008	0001	28	-	28	0.74			0		
Dissolved Oxygen	mg/L	0584	WL	06/10/2008	0001	18	-	18	6.62			0		
Dissolved Oxygen	mg/L	0587	WL	06/10/2008	0001	18	-	18	6.74			0		
Dissolved Oxygen	mg/L	0596	WL	06/09/2008	0001	24	-	24	1.07			0		
Dissolved Oxygen	mg/L	0600	WL	06/10/2008	0001	28	-	28	6.17			0		
Dissolved Oxygen	mg/L	0683	WL	06/10/2008	0001	27	-	27	4.09			0		
Dissolved Oxygen	mg/L	0686	WL	06/11/2008	0001	18	-	18	0.42			0		
Dissolved Oxygen	mg/L	0687	WL	06/10/2008	0001	28	-	28	0.55			0		
Dissolved Oxygen	mg/L	0688	WL	06/10/2008	0001	31	-	31	0.31			0		
Dissolved Oxygen	mg/L	0689	WL	06/10/2008	0001	46	-	46	0.37			0		
Dissolved Oxygen	mg/L	0731	WL	06/11/2008	0001	18	-	18	0.72			0		
Dissolved Oxygen	mg/L	0733	WL	06/11/2008	0001	18	-	18	0.36			0		
Dissolved Oxygen	mg/L	0780	WL	06/09/2008	0001	28	-	28	0.61			0		
Dissolved Oxygen	mg/L	0783	WL	06/09/2008	0001	18	-	18	0.3			0		
Dissolved Oxygen	mg/L	0784	WL	06/09/2008	0001	18	-	18	0.69			0		
Dissolved Oxygen	mg/L	0785	WL	06/09/2008	0001	18	-	18	0.54			0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Manganese	mg/L	0401	WL	06/10/2008	0001	18	-	18	2.4			0	0.00026	
Manganese	mg/L	0403	WL	06/09/2008	0001	18	-	18	0.56	N		0	0.00013	
Manganese	mg/L	0407	WL	06/09/2008	0001	17	-	17	0.18			0	0.00013	
Manganese	mg/L	0484	WL	06/09/2008	0001	28	-	28	1.6			0	0.00064	
Manganese	mg/L	0584	WL	06/10/2008	0001	18	-	18	1.1			0	0.00026	
Manganese	mg/L	0587	WL	06/10/2008	0001	18	-	18	0.66			0	0.00013	
Manganese	mg/L	0596	WL	06/09/2008	0001	24	-	24	0.37			0	0.00013	
Manganese	mg/L	0600	WL	06/10/2008	0001	28	-	28	0.78			0	0.00026	
Manganese	mg/L	0683	WL	06/10/2008	0001	27	-	27	2.6			0	0.00064	
Manganese	mg/L	0686	WL	06/11/2008	0001	18	-	18	1.9			0	0.00064	
Manganese	mg/L	0687	WL	06/10/2008	0001	28	-	28	1.6			0	0.00064	
Manganese	mg/L	0688	WL	06/10/2008	0001	31	-	31	2.5			0	0.00064	
Manganese	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	2.5			0	0.00064	
Manganese	mg/L	0689	WL	06/10/2008	0001	46	-	46	3.8			0	0.0013	
Manganese	mg/L	0731	WL	06/11/2008	0001	18	-	18	1.3			0	0.00026	
Manganese	mg/L	0733	WL	06/11/2008	0001	18	-	18	0.85			0	0.00026	
Manganese	mg/L	0780	WL	06/09/2008	0001	28	-	28	0.24			0	0.00013	
Manganese	mg/L	0783	WL	06/09/2008	0001	18	-	18	0.068			0	0.00013	
Manganese	mg/L	0784	WL	06/09/2008	0001	18	-	18	0.28			0	0.00013	
Manganese	mg/L	0785	WL	06/09/2008	0001	18	-	18	0.39			0	0.00013	
Oxidation Reduction Potential	mV	0401	WL	06/10/2008	0001	18	-	18	-43			0		
Oxidation Reduction Potential	mV	0403	WL	06/09/2008	0001	18	-	18	-23			0		
Oxidation Reduction Potential	mV	0407	WL	06/09/2008	0001	17	-	17	-127			0		
Oxidation Reduction Potential	mV	0484	WL	06/09/2008	0001	28	-	28	71			0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Oxidation Reduction Potential	mV	0584	WL	06/10/2008	0001	18	-	18	46		0		
Oxidation Reduction Potential	mV	0587	WL	06/10/2008	0001	18	-	18	-4		0		
Oxidation Reduction Potential	mV	0596	WL	06/09/2008	0001	24	-	24	9		0		
Oxidation Reduction Potential	mV	0600	WL	06/10/2008	0001	28	-	28	91		0		
Oxidation Reduction Potential	mV	0683	WL	06/10/2008	0001	27	-	27	-61		0		
Oxidation Reduction Potential	mV	0686	WL	06/11/2008	0001	18	-	18	-15		0		
Oxidation Reduction Potential	mV	0687	WL	06/10/2008	0001	28	-	28	-42		0		
Oxidation Reduction Potential	mV	0688	WL	06/10/2008	0001	31	-	31	-34		0		
Oxidation Reduction Potential	mV	0689	WL	06/10/2008	0001	46	-	46	-24		0		
Oxidation Reduction Potential	mV	0731	WL	06/11/2008	0001	18	-	18	-60		0		
Oxidation Reduction Potential	mV	0733	WL	06/11/2008	0001	18	-	18	-10		0		
Oxidation Reduction Potential	mV	0780	WL	06/09/2008	0001	28	-	28	33		0		
Oxidation Reduction Potential	mV	0783	WL	06/09/2008	0001	18	-	18	31		0		
Oxidation Reduction Potential	mV	0784	WL	06/09/2008	0001	18	-	18	41		0		
Oxidation Reduction Potential	mV	0785	WL	06/09/2008	0001	18	-	18	-18		0		
pH	s.u.	0401	WL	06/10/2008	0001	18	-	18	7.13		0		
pH	s.u.	0403	WL	06/09/2008	0001	18	-	18	7.22		0		
pH	s.u.	0407	WL	06/09/2008	0001	17	-	17	7.54		0		
pH	s.u.	0484	WL	06/09/2008	0001	28	-	28	7.25		0		
pH	s.u.	0584	WL	06/10/2008	0001	18	-	18	7.36		0		
pH	s.u.	0587	WL	06/10/2008	0001	18	-	18	7.31		0		
pH	s.u.	0596	WL	06/09/2008	0001	24	-	24	7.39		0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range		Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID	(Ft BLS)	Lab		Data	QA		
pH	s.u.	0600	WL	06/10/2008	0001	28	- 28	7.47		0		
pH	s.u.	0683	WL	06/10/2008	0001	27	- 27	7.08		0		
pH	s.u.	0686	WL	06/11/2008	0001	18	- 18	7.1		0		
pH	s.u.	0687	WL	06/10/2008	0001	28	- 28	7.2		0		
pH	s.u.	0688	WL	06/10/2008	0001	31	- 31	7.06		0		
pH	s.u.	0689	WL	06/10/2008	0001	46	- 46	7.03		0		
pH	s.u.	0731	WL	06/11/2008	0001	18	- 18	7.33		0		
pH	s.u.	0733	WL	06/11/2008	0001	18	- 18	7.24		0		
pH	s.u.	0780	WL	06/09/2008	0001	28	- 28	8.12		0		
pH	s.u.	0783	WL	06/09/2008	0001	18	- 18	8.54		0		
pH	s.u.	0784	WL	06/09/2008	0001	18	- 18	7.31		0		
pH	s.u.	0785	WL	06/09/2008	0001	18	- 18	7.47		0		
Selenium	mg/L	0683	WL	06/10/2008	0001	27	- 27	0.014		0	4.E-005	
Specific Conductance	umhos/cm	0401	WL	06/10/2008	0001	18	- 18	6110		0		
Specific Conductance	umhos/cm	0403	WL	06/09/2008	0001	18	- 18	876		0		
Specific Conductance	umhos/cm	0407	WL	06/09/2008	0001	17	- 17	567		0		
Specific Conductance	umhos/cm	0484	WL	06/09/2008	0001	28	- 28	14116		0		
Specific Conductance	umhos/cm	0584	WL	06/10/2008	0001	18	- 18	4203		0		
Specific Conductance	umhos/cm	0587	WL	06/10/2008	0001	18	- 18	1537		0		
Specific Conductance	umhos/cm	0596	WL	06/09/2008	0001	24	- 24	1019		0		
Specific Conductance	umhos/cm	0600	WL	06/10/2008	0001	28	- 28	5121		0		
Specific Conductance	umhos/cm	0683	WL	06/10/2008	0001	27	- 27	11442		0		
Specific Conductance	umhos/cm	0686	WL	06/11/2008	0001	18	- 18	8354		0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Specific Conductance	umhos /cm	0687	WL	06/10/2008	0001	28	-	28	9158			0		
Specific Conductance	umhos /cm	0688	WL	06/10/2008	0001	31	-	31	13128			0		
Specific Conductance	umhos /cm	0689	WL	06/10/2008	0001	46	-	46	26442			0		
Specific Conductance	umhos /cm	0731	WL	06/11/2008	0001	18	-	18	3730			0		
Specific Conductance	umhos /cm	0733	WL	06/11/2008	0001	18	-	18	3967			0		
Specific Conductance	umhos /cm	0780	WL	06/09/2008	0001	28	-	28	2183			0		
Specific Conductance	umhos /cm	0783	WL	06/09/2008	0001	18	-	18	710			0		
Specific Conductance	umhos /cm	0784	WL	06/09/2008	0001	18	-	18	557			0		
Specific Conductance	umhos /cm	0785	WL	06/09/2008	0001	18	-	18	586			0		
Sulfate	mg/L	0401	WL	06/10/2008	0001	18	-	18	2000			0	25	
Sulfate	mg/L	0403	WL	06/09/2008	0001	18	-	18	180			0	5	
Sulfate	mg/L	0407	WL	06/09/2008	0001	17	-	17	77			0	0.5	
Sulfate	mg/L	0484	WL	06/09/2008	0001	28	-	28	3200			0	100	
Sulfate	mg/L	0584	WL	06/10/2008	0001	18	-	18	1100			0	25	
Sulfate	mg/L	0587	WL	06/10/2008	0001	18	-	18	520			0	10	
Sulfate	mg/L	0596	WL	06/09/2008	0001	24	-	24	190			0	5	
Sulfate	mg/L	0600	WL	06/10/2008	0001	28	-	28	1400			0	25	
Sulfate	mg/L	0683	WL	06/10/2008	0001	27	-	27	4300			0	50	
Sulfate	mg/L	0686	WL	06/11/2008	0001	18	-	18	2500			0	50	
Sulfate	mg/L	0687	WL	06/10/2008	0001	28	-	28	3400			0	50	
Sulfate	mg/L	0688	WL	06/10/2008	0001	31	-	31	5300			0	50	
Sulfate	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	5200			0	100	
Sulfate	mg/L	0689	WL	06/10/2008	0001	46	-	46	10000			0	100	

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Sulfate	mg/L	0731	WL	06/11/2008	0001	18	-	18	1400		0	25	
Sulfate	mg/L	0733	WL	06/11/2008	0001	18	-	18	1600		0	25	
Sulfate	mg/L	0780	WL	06/09/2008	0001	28	-	28	410		0	10	
Sulfate	mg/L	0783	WL	06/09/2008	0001	18	-	18	110		0	2.5	
Sulfate	mg/L	0784	WL	06/09/2008	0001	18	-	18	68		0	0.5	
Sulfate	mg/L	0785	WL	06/09/2008	0001	18	-	18	67		0	0.5	
Temperature	C	0401	WL	06/10/2008	0001	18	-	18	15.9		0		
Temperature	C	0403	WL	06/09/2008	0001	18	-	18	14.35		0		
Temperature	C	0407	WL	06/09/2008	0001	17	-	17	14.8		0		
Temperature	C	0484	WL	06/09/2008	0001	28	-	28	16.12		0		
Temperature	C	0584	WL	06/10/2008	0001	18	-	18	14.91		0		
Temperature	C	0587	WL	06/10/2008	0001	18	-	18	14.64		0		
Temperature	C	0596	WL	06/09/2008	0001	24	-	24	14.17		0		
Temperature	C	0600	WL	06/10/2008	0001	28	-	28	15.9		0		
Temperature	C	0683	WL	06/10/2008	0001	27	-	27	17.06		0		
Temperature	C	0686	WL	06/11/2008	0001	18	-	18	13.59		0		
Temperature	C	0687	WL	06/10/2008	0001	28	-	28	16.29		0		
Temperature	C	0688	WL	06/10/2008	0001	31	-	31	18.11		0		
Temperature	C	0689	WL	06/10/2008	0001	46	-	46	18.68		0		
Temperature	C	0731	WL	06/11/2008	0001	18	-	18	14.01		0		
Temperature	C	0733	WL	06/11/2008	0001	18	-	18	16.63		0		
Temperature	C	0780	WL	06/09/2008	0001	28	-	28	13.57		0		
Temperature	C	0783	WL	06/09/2008	0001	18	-	18	13.53		0		
Temperature	C	0784	WL	06/09/2008	0001	18	-	18	13.24		0		
Temperature	C	0785	WL	06/09/2008	0001	18	-	18	13.61		0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Total Dissolved Solids	mg/L	0401	WL	06/10/2008	0001	18	-	18	4800		0	80	
Total Dissolved Solids	mg/L	0403	WL	06/09/2008	0001	18	-	18	530		0	20	
Total Dissolved Solids	mg/L	0407	WL	06/09/2008	0001	17	-	17	300		0	20	
Total Dissolved Solids	mg/L	0484	WL	06/09/2008	0001	28	-	28	8600		0	200	
Total Dissolved Solids	mg/L	0584	WL	06/10/2008	0001	18	-	18	2800		0	80	
Total Dissolved Solids	mg/L	0587	WL	06/10/2008	0001	18	-	18	1100		0	40	
Total Dissolved Solids	mg/L	0596	WL	06/09/2008	0001	24	-	24	590		0	20	
Total Dissolved Solids	mg/L	0600	WL	06/10/2008	0001	28	-	28	2900		0	80	
Total Dissolved Solids	mg/L	0683	WL	06/10/2008	0001	27	-	27	8100		0	200	
Total Dissolved Solids	mg/L	0686	WL	06/11/2008	0001	18	-	18	6200		0	200	
Total Dissolved Solids	mg/L	0687	WL	06/10/2008	0001	28	-	28	6600		0	200	
Total Dissolved Solids	mg/L	0688	WL	06/10/2008	0001	31	-	31	9800		0	200	
Total Dissolved Solids	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	10000		0	200	
Total Dissolved Solids	mg/L	0689	WL	06/10/2008	0001	46	-	46	20000		0	400	
Total Dissolved Solids	mg/L	0731	WL	06/11/2008	0001	18	-	18	2800		0	40	
Total Dissolved Solids	mg/L	0733	WL	06/11/2008	0001	18	-	18	3100		0	40	
Total Dissolved Solids	mg/L	0780	WL	06/09/2008	0001	28	-	28	1000		0	40	
Total Dissolved Solids	mg/L	0783	WL	06/09/2008	0001	18	-	18	330		0	20	
Total Dissolved Solids	mg/L	0784	WL	06/09/2008	0001	18	-	18	260		0	20	
Total Dissolved Solids	mg/L	0785	WL	06/09/2008	0001	18	-	18	320		0	20	
Turbidity	NTU	0401	WL	06/10/2008	0001	18	-	18	4.44		0		
Turbidity	NTU	0403	WL	06/09/2008	0001	18	-	18	4.51		0		
Turbidity	NTU	0407	WL	06/09/2008	0001	17	-	17	8.06		0		
Turbidity	NTU	0484	WL	06/09/2008	0001	28	-	28	7.95		0		
Turbidity	NTU	0584	WL	06/10/2008	0001	18	-	18	4		0		

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
										Lab	Data QA		
Turbidity	NTU	0587	WL	06/10/2008	0001	18	-	18	3.81		0		
Turbidity	NTU	0596	WL	06/09/2008	0001	24	-	24	4.89		0		
Turbidity	NTU	0600	WL	06/10/2008	0001	28	-	28	8.58		0		
Turbidity	NTU	0683	WL	06/10/2008	0001	27	-	27	7.69		0		
Turbidity	NTU	0686	WL	06/11/2008	0001	18	-	18	9.09		0		
Turbidity	NTU	0687	WL	06/10/2008	0001	28	-	28	9.77		0		
Turbidity	NTU	0688	WL	06/10/2008	0001	31	-	31	2.26		0		
Turbidity	NTU	0689	WL	06/10/2008	0001	46	-	46	1.68		0		
Turbidity	NTU	0731	WL	06/11/2008	0001	18	-	18	4.64		0		
Turbidity	NTU	0733	WL	06/11/2008	0001	18	-	18	3.34		0		
Turbidity	NTU	0780	WL	06/09/2008	0001	28	-	28	9.64		0		
Turbidity	NTU	0783	WL	06/09/2008	0001	18	-	18	6.28		0		
Turbidity	NTU	0784	WL	06/09/2008	0001	18	-	18	3.18		0		
Turbidity	NTU	0785	WL	06/09/2008	0001	18	-	18	5.09		0		
Uranium	mg/L	0401	WL	06/10/2008	0001	18	-	18	0.78		0	0.00018	
Uranium	mg/L	0403	WL	06/09/2008	0001	18	-	18	0.098		0	1.8E-005	
Uranium	mg/L	0407	WL	06/09/2008	0001	17	-	17	0.039		0	3.5E-006	
Uranium	mg/L	0484	WL	06/09/2008	0001	28	-	28	1.2		0	0.00018	
Uranium	mg/L	0584	WL	06/10/2008	0001	18	-	18	0.45		0	3.5E-005	
Uranium	mg/L	0587	WL	06/10/2008	0001	18	-	18	0.14		0	1.8E-005	
Uranium	mg/L	0596	WL	06/09/2008	0001	24	-	24	0.1		0	1.8E-005	
Uranium	mg/L	0600	WL	06/10/2008	0001	28	-	28	0.52		0	3.5E-005	
Uranium	mg/L	0683	WL	06/10/2008	0001	27	-	27	1.3		0	0.00018	
Uranium	mg/L	0686	WL	06/11/2008	0001	18	-	18	0.93		0	0.00018	
Uranium	mg/L	0687	WL	06/10/2008	0001	28	-	28	1.3		0	0.00018	

Appendix C. Water Quality Data

June 2008 Monthly General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Uranium	mg/L	0688	WL	06/10/2008	0001	31	-	31	1.6		0	0.00018	
Uranium	mg/L	0688	WL	06/10/2008	0002	30.6	-	40.6	1.6		0	0.00018	
Uranium	mg/L	0689	WL	06/10/2008	0001	46	-	46	2.5		0	0.00018	
Uranium	mg/L	0731	WL	06/11/2008	0001	18	-	18	0.56		0	3.5E-005	
Uranium	mg/L	0733	WL	06/11/2008	0001	18	-	18	0.48		0	3.5E-005	
Uranium	mg/L	0780	WL	06/09/2008	0001	28	-	28	0.24		0	3.5E-005	
Uranium	mg/L	0783	WL	06/09/2008	0001	18	-	18	0.17		0	1.8E-005	
Uranium	mg/L	0784	WL	06/09/2008	0001	18	-	18	0.048		0	3.5E-006	
Uranium	mg/L	0785	WL	06/09/2008	0001	18	-	18	0.034		0	3.5E-006	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	0216	SL	06/03/2008	0001	0	-	0	130		0		
Alkalinity, Total (As CaCO3)	mg/L	0241	SL	06/03/2008	0001	0	-	0	120		0		
Alkalinity, Total (As CaCO3)	mg/L	0405	WL	06/03/2008	0001	18	-	18	650		0		
Alkalinity, Total (As CaCO3)	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	281		0		
Alkalinity, Total (As CaCO3)	mg/L	0480	WL	06/02/2008	0001	18	-	18	305		0		
Alkalinity, Total (As CaCO3)	mg/L	0482	WL	06/02/2008	0001	55	-	55	299		0		
Alkalinity, Total (As CaCO3)	mg/L	0483	WL	06/02/2008	0001	18	-	18	236		0		
Alkalinity, Total (As CaCO3)	mg/L	0485	WL	06/02/2008	0001	55	-	55	440		0		
Alkalinity, Total (As CaCO3)	mg/L	0488	WL	06/03/2008	0001	36	-	36	630		0		
Alkalinity, Total (As CaCO3)	mg/L	0493	WL	06/03/2008	0001	55	-	55	1216		0		
Alkalinity, Total (As CaCO3)	mg/L	0557	WL	06/02/2008	0001	36	-	36	885		0		
Alkalinity, Total (As CaCO3)	mg/L	0558	WL	06/02/2008	0001	36	-	36	715		0		
Alkalinity, Total (As CaCO3)	mg/L	0559	WL	06/02/2008	0001	18	-	18	242		0		
Alkalinity, Total (As CaCO3)	mg/L	0560	WL	06/02/2008	0001	36	-	36	560		0		
Alkalinity, Total (As CaCO3)	mg/L	0561	WL	06/02/2008	0001	55	-	55	570		0		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	330		0		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	1130		0		
Alkalinity, Total (As CaCO3)	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	625		0		
Ammonia Total as N	mg/L	0216	SL	06/03/2008	0001	0	-	0	0.1	U	0	0.1	
Ammonia Total as N	mg/L	0241	SL	06/03/2008	0001	0	-	0	0.1	U	0	0.1	
Ammonia Total as N	mg/L	0405	WL	06/03/2008	0001	18	-	18	90		0	2	
Ammonia Total as N	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	26		0	2	
Ammonia Total as N	mg/L	0480	WL	06/02/2008	0001	18	-	18	50		0	2	
Ammonia Total as N	mg/L	0482	WL	06/02/2008	0001	55	-	55	900		0	20	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Ammonia Total as N	mg/L	0483	WL	06/02/2008	0001	18	-	18	63			0	2	
Ammonia Total as N	mg/L	0485	WL	06/02/2008	0001	55	-	55	1100			0	50	
Ammonia Total as N	mg/L	0488	WL	06/03/2008	0001	36	-	36	500			0	20	
Ammonia Total as N	mg/L	0488	WL	06/03/2008	0002	36	-	36	390			0	20	
Ammonia Total as N	mg/L	0493	WL	06/03/2008	0001	55	-	55	990			0	20	
Ammonia Total as N	mg/L	0557	WL	06/02/2008	0001	36	-	36	620			0	20	
Ammonia Total as N	mg/L	0558	WL	06/02/2008	0001	36	-	36	840			0	50	
Ammonia Total as N	mg/L	0559	WL	06/02/2008	0001	18	-	18	0.87			0	0.1	
Ammonia Total as N	mg/L	0560	WL	06/02/2008	0001	36	-	36	340			0	20	
Ammonia Total as N	mg/L	0561	WL	06/02/2008	0001	55	-	55	950			0	50	
Ammonia Total as N	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	440			0	20	
Ammonia Total as N	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	1200			0	50	
Ammonia Total as N	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	230			0	20	
Bromide	mg/L	0216	SL	06/03/2008	0001	0	-	0	0.2	U		0	0.2	
Bromide	mg/L	0241	SL	06/03/2008	0001	0	-	0	0.2	U		0	0.2	
Bromide	mg/L	0405	WL	06/03/2008	0001	18	-	18	2	U		0	2	
Bromide	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	0.2	U		0	0.2	
Bromide	mg/L	0480	WL	06/02/2008	0001	18	-	18	0.2	U		0	0.2	
Bromide	mg/L	0482	WL	06/02/2008	0001	55	-	55	40	U		0	40	
Bromide	mg/L	0483	WL	06/02/2008	0001	18	-	18	0.2	U		0	0.2	
Bromide	mg/L	0485	WL	06/02/2008	0001	55	-	55	20	U		0	20	
Bromide	mg/L	0488	WL	06/03/2008	0001	36	-	36	2	U		0	2	
Bromide	mg/L	0488	WL	06/03/2008	0002	36	-	36	2	U		0	2	
Bromide	mg/L	0493	WL	06/03/2008	0001	55	-	55	10	U		0	10	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)		Result	Lab	Qualifiers		Detection Limit	Uncertainty
				Date	ID					Data	QA		
Bromide	mg/L	0557	WL	06/02/2008	0001	36	- 36	10	U	0		10	
Bromide	mg/L	0558	WL	06/02/2008	0001	36	- 36	10	U	0		10	
Bromide	mg/L	0559	WL	06/02/2008	0001	18	- 18	1	U	0		1	
Bromide	mg/L	0560	WL	06/02/2008	0001	36	- 36	4	U	0		4	
Bromide	mg/L	0561	WL	06/02/2008	0001	55	- 55	20	U	0		20	
Bromide	mg/L	SMI-PW01	WL	06/03/2008	0001	36	- 36	4	U	0		4	
Bromide	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	- 55	10	U	0		10	
Bromide	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	- 18	2	U	0		2	
Calcium	mg/L	0216	SL	06/03/2008	0001	0	- 0	38		0		0.0038	
Calcium	mg/L	0241	SL	06/03/2008	0001	0	- 0	37		0		0.0038	
Calcium	mg/L	0405	WL	06/03/2008	0001	18	- 18	280		0		0.019	
Calcium	mg/L	0474	WL	06/04/2008	0001	10.3	- 19.7	110		0		0.0038	
Calcium	mg/L	0480	WL	06/02/2008	0001	18	- 18	3.6		0		0.0038	
Calcium	mg/L	0482	WL	06/02/2008	0001	55	- 55	1500		0		0.38	
Calcium	mg/L	0483	WL	06/02/2008	0001	18	- 18	9.5		0		0.0038	
Calcium	mg/L	0485	WL	06/02/2008	0001	55	- 55	1200		0		0.38	
Calcium	mg/L	0488	WL	06/03/2008	0001	36	- 36	390		0		0.0038	
Calcium	mg/L	0488	WL	06/03/2008	0002	36	- 36	370		0		0.019	
Calcium	mg/L	0493	WL	06/03/2008	0001	55	- 55	420		0		0.095	
Calcium	mg/L	0557	WL	06/02/2008	0001	36	- 36	450		0		0.095	
Calcium	mg/L	0558	WL	06/02/2008	0001	36	- 36	500		0		0.095	
Calcium	mg/L	0559	WL	06/02/2008	0001	18	- 18	130		0		0.0076	
Calcium	mg/L	0560	WL	06/02/2008	0001	36	- 36	95		0		0.038	
Calcium	mg/L	0561	WL	06/02/2008	0001	55	- 55	930		0		0.19	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Calcium	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	430			0	0.038	
Calcium	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	450			0	0.095	
Calcium	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	390			0	0.019	
Chloride	mg/L	0216	SL	06/03/2008	0001	0	-	0	13			0	0.2	
Chloride	mg/L	0241	SL	06/03/2008	0001	0	-	0	12			0	0.2	
Chloride	mg/L	0405	WL	06/03/2008	0001	18	-	18	970			0	20	
Chloride	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	75			0	2	
Chloride	mg/L	0480	WL	06/02/2008	0001	18	-	18	54			0	2	
Chloride	mg/L	0482	WL	06/02/2008	0001	55	-	55	45000			0	1000	
Chloride	mg/L	0483	WL	06/02/2008	0001	18	-	18	56			0	2	
Chloride	mg/L	0485	WL	06/02/2008	0001	55	-	55	43000			0	1000	
Chloride	mg/L	0488	WL	06/03/2008	0001	36	-	36	1000			0	100	
Chloride	mg/L	0488	WL	06/03/2008	0002	36	-	36	850			0	20	
Chloride	mg/L	0493	WL	06/03/2008	0001	55	-	55	5000			0	100	
Chloride	mg/L	0557	WL	06/02/2008	0001	36	-	36	4900			0	100	
Chloride	mg/L	0558	WL	06/02/2008	0001	36	-	36	8200			0	100	
Chloride	mg/L	0559	WL	06/02/2008	0001	18	-	18	300			0	10	
Chloride	mg/L	0560	WL	06/02/2008	0001	36	-	36	3000			0	40	
Chloride	mg/L	0561	WL	06/02/2008	0001	55	-	55	35000			0	400	
Chloride	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	2300			0	40	
Chloride	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	5800			0	100	
Chloride	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	970			0	20	
Copper	mg/L	0561	WL	06/02/2008	0001	55	-	55	0.082	B		0	0.03	
Dissolved Oxygen	mg/L	0216	SL	06/03/2008	0001	0	-	0	3.39			0		

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Dissolved Oxygen	mg/L	0241	SL	06/03/2008	0001	0	-	0	3.69			0		
Dissolved Oxygen	mg/L	0405	WL	06/03/2008	0001	18	-	18	0.19			0		
Dissolved Oxygen	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	0.51			0		
Dissolved Oxygen	mg/L	0480	WL	06/02/2008	0001	18	-	18	0.55			0		
Dissolved Oxygen	mg/L	0482	WL	06/02/2008	0001	55	-	55	0.7			0		
Dissolved Oxygen	mg/L	0483	WL	06/02/2008	0001	18	-	18	0.35			0		
Dissolved Oxygen	mg/L	0485	WL	06/02/2008	0001	55	-	55	0.23			0		
Dissolved Oxygen	mg/L	0488	WL	06/03/2008	0001	36	-	36	0.29			0		
Dissolved Oxygen	mg/L	0493	WL	06/03/2008	0001	55	-	55	0.2			0		
Dissolved Oxygen	mg/L	0557	WL	06/02/2008	0001	36	-	36	0.3			0		
Dissolved Oxygen	mg/L	0558	WL	06/02/2008	0001	36	-	36	0.76			0		
Dissolved Oxygen	mg/L	0559	WL	06/02/2008	0001	18	-	18	1.54			0		
Dissolved Oxygen	mg/L	0560	WL	06/02/2008	0001	36	-	36	0.09			0		
Dissolved Oxygen	mg/L	0561	WL	06/02/2008	0001	55	-	55	0.14			0		
Dissolved Oxygen	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	0.17			0		
Dissolved Oxygen	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	0.16			0		
Dissolved Oxygen	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	0.17			0		
Magnesium	mg/L	0216	SL	06/03/2008	0001	0	-	0	9.2			0	0.0047	
Magnesium	mg/L	0241	SL	06/03/2008	0001	0	-	0	9.1			0	0.0047	
Magnesium	mg/L	0405	WL	06/03/2008	0001	18	-	18	310			0	0.024	
Magnesium	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	15			0	0.0047	
Magnesium	mg/L	0480	WL	06/02/2008	0001	18	-	18	2.9			0	0.0047	
Magnesium	mg/L	0482	WL	06/02/2008	0001	55	-	55	800			0	0.47	
Magnesium	mg/L	0483	WL	06/02/2008	0001	18	-	18	7.8			0	0.0047	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
								Lab	Data	QA		
Magnesium	mg/L	0485	WL	06/02/2008	0001	55 - 55	830			0	0.47	
Magnesium	mg/L	0488	WL	06/03/2008	0001	36 - 36	320			0	0.0047	
Magnesium	mg/L	0488	WL	06/03/2008	0002	36 - 36	330			0	0.024	
Magnesium	mg/L	0493	WL	06/03/2008	0001	55 - 55	930			0	0.12	
Magnesium	mg/L	0557	WL	06/02/2008	0001	36 - 36	590			0	0.12	
Magnesium	mg/L	0558	WL	06/02/2008	0001	36 - 36	500			0	0.12	
Magnesium	mg/L	0559	WL	06/02/2008	0001	18 - 18	75			0	0.0094	
Magnesium	mg/L	0560	WL	06/02/2008	0001	36 - 36	72			0	0.047	
Magnesium	mg/L	0561	WL	06/02/2008	0001	55 - 55	850			0	0.24	
Magnesium	mg/L	SMI-PW01	WL	06/03/2008	0001	36 - 36	640			0	0.047	
Magnesium	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55 - 55	950			0	0.12	
Magnesium	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18 - 18	390			0	0.024	
Manganese	mg/L	0216	SL	06/03/2008	0001	0 - 0	0.0044	B		0	0.00013	
Manganese	mg/L	0241	SL	06/03/2008	0001	0 - 0	0.0034	B		0	0.00013	
Manganese	mg/L	0405	WL	06/03/2008	0001	18 - 18	3			0	0.00064	
Manganese	mg/L	0474	WL	06/04/2008	0001	10.3 - 19.7	0.046			0	0.00013	
Manganese	mg/L	0480	WL	06/02/2008	0001	18 - 18	0.031			0	0.00013	
Manganese	mg/L	0482	WL	06/02/2008	0001	55 - 55	8.7			0	0.013	
Manganese	mg/L	0483	WL	06/02/2008	0001	18 - 18	0.085			0	0.00013	
Manganese	mg/L	0485	WL	06/02/2008	0001	55 - 55	9			0	0.013	
Manganese	mg/L	0488	WL	06/03/2008	0001	36 - 36	3.3			0	0.00013	
Manganese	mg/L	0488	WL	06/03/2008	0002	36 - 36	3.5			0	0.00064	
Manganese	mg/L	0493	WL	06/03/2008	0001	55 - 55	7.9			0	0.0032	
Manganese	mg/L	0557	WL	06/02/2008	0001	36 - 36	4.8			0	0.0032	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Manganese	mg/L	0558	WL	06/02/2008	0001	36	-	36	4.9			0	0.0032	
Manganese	mg/L	0559	WL	06/02/2008	0001	18	-	18	0.056			0	0.00026	
Manganese	mg/L	0560	WL	06/02/2008	0001	36	-	36	0.8			0	0.0013	
Manganese	mg/L	0561	WL	06/02/2008	0001	55	-	55	7.8			0	0.0064	
Manganese	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	4.7			0	0.0013	
Manganese	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	8.1			0	0.0032	
Manganese	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	4.4			0	0.00064	
Oxidation Reduction Potential	mV	0216	SL	06/03/2008	0001	0	-	0	11.8			0		
Oxidation Reduction Potential	mV	0241	SL	06/03/2008	0001	0	-	0	36			0		
Oxidation Reduction Potential	mV	0405	WL	06/03/2008	0001	18	-	18	70			0		
Oxidation Reduction Potential	mV	0474	WL	06/04/2008	0001	10.3	-	19.7	57			0		
Oxidation Reduction Potential	mV	0480	WL	06/02/2008	0001	18	-	18	36.4			0		
Oxidation Reduction Potential	mV	0482	WL	06/02/2008	0001	55	-	55	120.1			0		
Oxidation Reduction Potential	mV	0483	WL	06/02/2008	0001	18	-	18	-46			0		
Oxidation Reduction Potential	mV	0485	WL	06/02/2008	0001	55	-	55	36			0		
Oxidation Reduction Potential	mV	0488	WL	06/03/2008	0001	36	-	36	95			0		
Oxidation Reduction Potential	mV	0493	WL	06/03/2008	0001	55	-	55	168			0		
Oxidation Reduction Potential	mV	0557	WL	06/02/2008	0001	36	-	36	100.8			0		
Oxidation Reduction Potential	mV	0558	WL	06/02/2008	0001	36	-	36	76.4			0		
Oxidation Reduction Potential	mV	0559	WL	06/02/2008	0001	18	-	18	7			0		
Oxidation Reduction Potential	mV	0560	WL	06/02/2008	0001	36	-	36	-27			0		

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Oxidation Reduction Potential	mV	0561	WL	06/02/2008	0001	55	-	55	-3			0		
Oxidation Reduction Potential	mV	SMI-PW01	WL	06/03/2008	0001	36	-	36	40			0		
Oxidation Reduction Potential	mV	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	46			0		
Oxidation Reduction Potential	mV	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	8			0		
pH	s.u.	0216	SL	06/03/2008	0001	0	-	0	8.05			0		
pH	s.u.	0241	SL	06/03/2008	0001	0	-	0	8.09			0		
pH	s.u.	0405	WL	06/03/2008	0001	18	-	18	7.16			0		
pH	s.u.	0474	WL	06/04/2008	0001	10.3	-	19.7	7.59			0		
pH	s.u.	0480	WL	06/02/2008	0001	18	-	18	8.41			0		
pH	s.u.	0482	WL	06/02/2008	0001	55	-	55	6.72			0		
pH	s.u.	0483	WL	06/02/2008	0001	18	-	18	8.47			0		
pH	s.u.	0485	WL	06/02/2008	0001	55	-	55	6.83			0		
pH	s.u.	0488	WL	06/03/2008	0001	36	-	36	7.15			0		
pH	s.u.	0493	WL	06/03/2008	0001	55	-	55	7			0		
pH	s.u.	0557	WL	06/02/2008	0001	36	-	36	6.77			0		
pH	s.u.	0558	WL	06/02/2008	0001	36	-	36	6.85			0		
pH	s.u.	0559	WL	06/02/2008	0001	18	-	18	7.68			0		
pH	s.u.	0560	WL	06/02/2008	0001	36	-	36	7.62			0		
pH	s.u.	0561	WL	06/02/2008	0001	55	-	55	6.95			0		
pH	s.u.	SMI-PW01	WL	06/03/2008	0001	36	-	36	7			0		
pH	s.u.	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	6.96			0		
pH	s.u.	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	7.02			0		
Potassium	mg/L	0216	SL	06/03/2008	0001	0	-	0	2	N		0	0.044	
Potassium	mg/L	0241	SL	06/03/2008	0001	0	-	0	1.9			0	0.044	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Potassium	mg/L	0405	WL	06/03/2008	0001	18	-	18	56			0	0.22	
Potassium	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	18			0	0.044	
Potassium	mg/L	0480	WL	06/02/2008	0001	18	-	18	15			0	0.044	
Potassium	mg/L	0482	WL	06/02/2008	0001	55	-	55	1200			0	4.4	
Potassium	mg/L	0483	WL	06/02/2008	0001	18	-	18	17			0	0.044	
Potassium	mg/L	0485	WL	06/02/2008	0001	55	-	55	1000			0	4.4	
Potassium	mg/L	0488	WL	06/03/2008	0001	36	-	36	130			0	0.044	
Potassium	mg/L	0488	WL	06/03/2008	0002	36	-	36	110			0	0.22	
Potassium	mg/L	0493	WL	06/03/2008	0001	55	-	55	300			0	1.1	
Potassium	mg/L	0557	WL	06/02/2008	0001	36	-	36	180			0	1.1	
Potassium	mg/L	0558	WL	06/02/2008	0001	36	-	36	460			0	1.1	
Potassium	mg/L	0559	WL	06/02/2008	0001	18	-	18	13			0	0.087	
Potassium	mg/L	0560	WL	06/02/2008	0001	36	-	36	170			0	0.44	
Potassium	mg/L	0561	WL	06/02/2008	0001	55	-	55	850			0	2.2	
Potassium	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	220			0	0.44	
Potassium	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	320			0	1.1	
Potassium	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	83			0	0.22	
Selenium	mg/L	0405	WL	06/03/2008	0001	18	-	18	0.012			0	0.0002	
Sodium	mg/L	0216	SL	06/03/2008	0001	0	-	0	14			0	0.0026	
Sodium	mg/L	0241	SL	06/03/2008	0001	0	-	0	14			0	0.0026	
Sodium	mg/L	0405	WL	06/03/2008	0001	18	-	18	1200			0	0.013	
Sodium	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	82			0	0.0026	
Sodium	mg/L	0480	WL	06/02/2008	0001	18	-	18	160			0	0.0026	
Sodium	mg/L	0482	WL	06/02/2008	0001	55	-	55	23000			0	1.3	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
								Lab	Data	QA		
Sodium	mg/L	0483	WL	06/02/2008	0001	18 - 18	100			0	0.0026	
Sodium	mg/L	0485	WL	06/02/2008	0001	55 - 55	21000			0	0.26	
Sodium	mg/L	0488	WL	06/03/2008	0001	36 - 36	1700			0	1.3	
Sodium	mg/L	0488	WL	06/03/2008	0002	36 - 36	1700			0	1.3	
Sodium	mg/L	0493	WL	06/03/2008	0001	55 - 55	4700			0	0.065	
Sodium	mg/L	0557	WL	06/02/2008	0001	36 - 36	3800			0	0.065	
Sodium	mg/L	0558	WL	06/02/2008	0001	36 - 36	5200			0	0.065	
Sodium	mg/L	0559	WL	06/02/2008	0001	18 - 18	380			0	0.0052	
Sodium	mg/L	0560	WL	06/02/2008	0001	36 - 36	2200			0	0.026	
Sodium	mg/L	0561	WL	06/02/2008	0001	55 - 55	16000			0	1.3	
Sodium	mg/L	SMI-PW01	WL	06/03/2008	0001	36 - 36	2900			0	0.13	
Sodium	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55 - 55	5200			0	0.065	
Sodium	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18 - 18	1600			0	0.13	
Specific Conductance	umhos/cm	0216	SL	06/03/2008	0001	0 - 0	352			0		
Specific Conductance	umhos/cm	0241	SL	06/03/2008	0001	0 - 0	378			0		
Specific Conductance	umhos/cm	0405	WL	06/03/2008	0001	18 - 18	9968			0		
Specific Conductance	umhos/cm	0474	WL	06/04/2008	0001	10.3 - 19.7	1237			0		
Specific Conductance	umhos/cm	0480	WL	06/02/2008	0001	18 - 18	1107			0		
Specific Conductance	umhos/cm	0482	WL	06/02/2008	0001	55 - 55	109848			0		
Specific Conductance	umhos/cm	0483	WL	06/02/2008	0001	18 - 18	1021			0		
Specific Conductance	umhos/cm	0485	WL	06/02/2008	0001	55 - 55	101678			0		
Specific Conductance	umhos/cm	0488	WL	06/03/2008	0001	36 - 36	12941			0		

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Specific Conductance	umhos /cm	0493	WL	06/03/2008	0001	55	-	55	33910			0		
Specific Conductance	umhos /cm	0557	WL	06/02/2008	0001	36	-	36	24911			0		
Specific Conductance	umhos /cm	0558	WL	06/02/2008	0001	36	-	36	34557			0		
Specific Conductance	umhos /cm	0559	WL	06/02/2008	0001	18	-	18	3066			0		
Specific Conductance	umhos /cm	0560	WL	06/02/2008	0001	36	-	36	14636			0		
Specific Conductance	umhos /cm	0561	WL	06/02/2008	0001	55	-	55	82700			0		
Specific Conductance	umhos /cm	SMI-PW01	WL	06/03/2008	0001	36	-	36	22198			0		
Specific Conductance	umhos /cm	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	33980			0		
Specific Conductance	umhos /cm	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	12621			0		
Sulfate	mg/L	0216	SL	06/03/2008	0001	0	-	0	55			0	0.5	
Sulfate	mg/L	0241	SL	06/03/2008	0001	0	-	0	56			0	0.5	
Sulfate	mg/L	0405	WL	06/03/2008	0001	18	-	18	3800			0	50	
Sulfate	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	250			0	5	
Sulfate	mg/L	0480	WL	06/02/2008	0001	18	-	18	200			0	5	
Sulfate	mg/L	0482	WL	06/02/2008	0001	55	-	55	6600			0	100	
Sulfate	mg/L	0483	WL	06/02/2008	0001	18	-	18	150			0	5	
Sulfate	mg/L	0485	WL	06/02/2008	0001	55	-	55	7500			0	50	
Sulfate	mg/L	0488	WL	06/03/2008	0001	36	-	36	6300			0	250	
Sulfate	mg/L	0488	WL	06/03/2008	0002	36	-	36	5900			0	50	
Sulfate	mg/L	0493	WL	06/03/2008	0001	55	-	55	14000			0	250	
Sulfate	mg/L	0557	WL	06/02/2008	0001	36	-	36	8200			0	250	
Sulfate	mg/L	0558	WL	06/02/2008	0001	36	-	36	9500			0	250	
Sulfate	mg/L	0559	WL	06/02/2008	0001	18	-	18	700			0	25	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID	Lab	Data	QA						
Sulfate	mg/L	0560	WL	06/02/2008	0001	36	-	36	3200			0	100	
Sulfate	mg/L	0561	WL	06/02/2008	0001	55	-	55	9300			0	50	
Sulfate	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	10000			0	100	
Sulfate	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	14000			0	250	
Sulfate	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	5400			0	50	
Temperature	C	0216	SL	06/03/2008	0001	0	-	0	18.04			0		
Temperature	C	0241	SL	06/03/2008	0001	0	-	0	17.61			0		
Temperature	C	0405	WL	06/03/2008	0001	18	-	18	15.78			0		
Temperature	C	0474	WL	06/04/2008	0001	10.3	-	19.7	13.21			0		
Temperature	C	0480	WL	06/02/2008	0001	18	-	18	15.98			0		
Temperature	C	0482	WL	06/02/2008	0001	55	-	55	17.67			0		
Temperature	C	0483	WL	06/02/2008	0001	18	-	18	15.47			0		
Temperature	C	0485	WL	06/02/2008	0001	55	-	55	17.51			0		
Temperature	C	0488	WL	06/03/2008	0001	36	-	36	16.25			0		
Temperature	C	0493	WL	06/03/2008	0001	55	-	55	15.94			0		
Temperature	C	0557	WL	06/02/2008	0001	36	-	36	18.02			0		
Temperature	C	0558	WL	06/02/2008	0001	36	-	36	20.64			0		
Temperature	C	0559	WL	06/02/2008	0001	18	-	18	15.41			0		
Temperature	C	0560	WL	06/02/2008	0001	36	-	36	16.89			0		
Temperature	C	0561	WL	06/02/2008	0001	55	-	55	17.55			0		
Temperature	C	SMI-PW01	WL	06/03/2008	0001	36	-	36	23.79			0		
Temperature	C	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	18.63			0		
Temperature	C	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	17.32			0		
Total Dissolved Solids	mg/L	0216	SL	06/03/2008	0001	0	-	0	190			0	20	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site

REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
								Lab	Data QA		
Total Dissolved Solids	mg/L	0241	SL	06/03/2008	0001	0 - 0	200		0	20	
Total Dissolved Solids	mg/L	0405	WL	06/03/2008	0001	18 - 18	7600		0	200	
Total Dissolved Solids	mg/L	0474	WL	06/04/2008	0001	10.3 - 19.7	670		0	40	
Total Dissolved Solids	mg/L	0480	WL	06/02/2008	0001	18 - 18	600		0	40	
Total Dissolved Solids	mg/L	0482	WL	06/02/2008	0001	55 - 55	83000		0	2000	
Total Dissolved Solids	mg/L	0483	WL	06/02/2008	0001	18 - 18	390		0	40	
Total Dissolved Solids	mg/L	0485	WL	06/02/2008	0001	55 - 55	74000		0	2000	
Total Dissolved Solids	mg/L	0488	WL	06/03/2008	0001	36 - 36	9800		0	200	
Total Dissolved Solids	mg/L	0488	WL	06/03/2008	0002	36 - 36	9800		0	200	
Total Dissolved Solids	mg/L	0493	WL	06/03/2008	0001	55 - 55	26000		0	1000	
Total Dissolved Solids	mg/L	0557	WL	06/02/2008	0001	36 - 36	19000		0	1000	
Total Dissolved Solids	mg/L	0558	WL	06/02/2008	0001	36 - 36	24000		0	1000	
Total Dissolved Solids	mg/L	0559	WL	06/02/2008	0001	18 - 18	2100		0	80	
Total Dissolved Solids	mg/L	0560	WL	06/02/2008	0001	36 - 36	8700		0	400	
Total Dissolved Solids	mg/L	0561	WL	06/02/2008	0001	55 - 55	62000		0	2000	
Total Dissolved Solids	mg/L	SMI-PW01	WL	06/03/2008	0001	36 - 36	17000		0	400	
Total Dissolved Solids	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55 - 55	27000		0	1000	
Total Dissolved Solids	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18 - 18	9600		0	200	
Turbidity	NTU	0216	SL	06/03/2008	0001	0 - 0	255		0		
Turbidity	NTU	0241	SL	06/03/2008	0001	0 - 0	243		0		
Turbidity	NTU	0405	WL	06/03/2008	0001	18 - 18	3.26		0		
Turbidity	NTU	0474	WL	06/04/2008	0001	10.3 - 19.7	4.17		0		
Turbidity	NTU	0480	WL	06/02/2008	0001	18 - 18	4.24		0		
Turbidity	NTU	0482	WL	06/02/2008	0001	55 - 55	6.16		0		

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Turbidity	NTU	0483	WL	06/02/2008	0001	18	-	18	4.36			0		
Turbidity	NTU	0485	WL	06/02/2008	0001	55	-	55	3.25			0		
Turbidity	NTU	0488	WL	06/03/2008	0001	36	-	36	2.33			0		
Turbidity	NTU	0493	WL	06/03/2008	0001	55	-	55	6.41			0		
Turbidity	NTU	0557	WL	06/02/2008	0001	36	-	36	4.58			0		
Turbidity	NTU	0558	WL	06/02/2008	0001	36	-	36	3.77			0		
Turbidity	NTU	0559	WL	06/02/2008	0001	18	-	18	5.96			0		
Turbidity	NTU	0560	WL	06/02/2008	0001	36	-	36	2.63			0		
Turbidity	NTU	0561	WL	06/02/2008	0001	55	-	55	9.23			0		
Turbidity	NTU	SMI-PW01	WL	06/03/2008	0001	36	-	36	6.53			0		
Turbidity	NTU	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	5.65			0		
Turbidity	NTU	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	3.38			0		
Uranium	mg/L	0216	SL	06/03/2008	0001	0	-	0	0.0015			0	3.5E-006	
Uranium	mg/L	0241	SL	06/03/2008	0001	0	-	0	0.0015			0	3.5E-006	
Uranium	mg/L	0405	WL	06/03/2008	0001	18	-	18	2.5			0	0.00018	
Uranium	mg/L	0474	WL	06/04/2008	0001	10.3	-	19.7	0.17			0	1.8E-005	
Uranium	mg/L	0480	WL	06/02/2008	0001	18	-	18	0.31			0	3.5E-005	
Uranium	mg/L	0482	WL	06/02/2008	0001	55	-	55	0.85			0	7.E-005	
Uranium	mg/L	0483	WL	06/02/2008	0001	18	-	18	0.18			0	1.8E-005	
Uranium	mg/L	0485	WL	06/02/2008	0001	55	-	55	1.4			0	7.E-005	
Uranium	mg/L	0488	WL	06/03/2008	0001	36	-	36	1.6			0	0.00018	
Uranium	mg/L	0488	WL	06/03/2008	0002	36	-	36	1.5			0	0.00018	
Uranium	mg/L	0493	WL	06/03/2008	0001	55	-	55	3.1			0	0.00018	
Uranium	mg/L	0557	WL	06/02/2008	0001	36	-	36	2.8			0	0.00018	

Appendix C. Water Quality Data

June 2008 GW/SW Investigation General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 8/25/2008

Parameter	Units	Location ID	Location Type	Sample		Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
				Date	ID					Lab	Data	QA		
Uranium	mg/L	0558	WL	06/02/2008	0001	36	-	36	2.7			0	0.00018	
Uranium	mg/L	0559	WL	06/02/2008	0001	18	-	18	0.45			0	3.5E-005	
Uranium	mg/L	0560	WL	06/02/2008	0001	36	-	36	0.74			0	3.5E-005	
Uranium	mg/L	0561	WL	06/02/2008	0001	55	-	55	1.8			0	0.00018	
Uranium	mg/L	SMI-PW01	WL	06/03/2008	0001	36	-	36	2.3			0	0.00018	
Uranium	mg/L	SMI-PZ1M	WL	06/03/2008	0001	55	-	55	3.1			0	0.00018	
Uranium	mg/L	SMI-PZ1S	WL	06/03/2008	0001	18	-	18	2			0	0.00018	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: 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
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

Appendix D. Water Level Data

June 2008 Monthly Event - STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 8/27/2008

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0401	O	3969.6	06/10/2008		8.35	3961.25	
0403	O	3968.95	06/09/2008		6.48	3962.47	
0407	O	3969.09	06/09/2008		7.61	3961.48	
0484		3969.19	06/09/2008		8.06	3961.13	
0492		3967.64	06/30/2008		8.73	3958.91	
0584		3969.13	06/10/2008		7.65	3961.48	
0587		3968.89	06/10/2008		7.22	3961.67	
0596		3968.76	06/09/2008		7.31	3961.45	
0600		3968.77	06/10/2008		7.54	3961.23	
0683		3970.73	06/10/2008		9.56	3961.17	
0686		3968.85	06/11/2008		8	3960.85	
0687		3969.09	06/10/2008		7.85	3961.24	
0688		3968.66	06/10/2008		7.51	3961.15	
0689		3968.66	06/10/2008		7.77	3960.89	
0731		3968.77	06/11/2008		7.89	3960.88	
0733		3968.5	06/11/2008		7.69	3960.81	
0780		3968.45	06/09/2008		7.22	3961.23	
0783		3968.82	06/09/2008		7.56	3961.26	
0784		3968.73	06/09/2008		7.26	3961.47	
0785		3969.24	06/09/2008		7.25	3961.99	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT O ON SITE
 U UPGRADIENT

WATER LEVEL FLAGS: D Dry

Appendix D. Water Level Data

**June 2008 SW/GW Investigation STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 8/27/2008**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0405	O	3968.47	06/03/2008		6.15	3962.32	
0474		3964.99	06/04/2008		15.7	3949.29	
0480		3968.65	06/02/2008		6.75	3961.9	
0482		3968.7	06/02/2008		9.6	3959.1	
0483		3968.9	06/02/2008		6.68	3962.22	
0485		3968.81	06/02/2008		7.07	3961.74	
0488		3968.48	06/03/2008		6.11	3962.37	
0493		3967.89	06/03/2008		5.91	3961.98	
0557		3968.85	06/02/2008		8.1	3960.75	
0558		3968.79	06/02/2008		7.85	3960.94	
0559		3969.92	06/02/2008		7.07	3962.85	
0560		3968.77	06/02/2008		7.07	3961.7	
0561		3968.56	06/02/2008		8.35	3960.21	
SMI-PW01	O	3968.45	06/03/2008		7.7	3960.75	
SMI-PZ1M	O	3968.29	06/03/2008		7.09	3961.2	
SMI-PZ1S	O	3969.13	06/03/2008		7.75	3961.38	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT O ON SITE
 U UPGRADIENT

WATER LEVEL FLAGS: D Dry

Attachment 1



DATE: June 23, 2008
TO: K. Pill, M. Mullis
FROM: E. Glowiak
SUBJECT: June 2008 Monthly Sampling Event Trip Report

Site: Moab – Interim Action Well Field

Date of Sampling Event: June 9-11, 2008

Team Members: Steve Back, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 0806016

Sample Shipment: All samples were shipped in a cooler overnight UPS to Paragon Analytics, Inc. from Moab, Utah, on June 11, 2008 (Tracking No. 195453643).

June 2008 Configuration 1 Sampling

Number of Locations Sampled: Four observation wells (0403, 0407, 0484, and 0596) were sampled during the June 2008 sampling event. A large number of the Configuration 1 observation wells, one extraction well, and one surface water location were sampled under RIN 0806016 in June 2008.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0471, 0473, 0475, 0477, 0479	Extraction Wells	Not running due to high river flow
0562, 0563, 0606, 0608, 0611, 0612, 0564, 0565, 0607	Well Points	Inaccessible due to high river flow
0216, 0245	Surface Water	Location 0216 was shipped with RIN 0806015 and 0245 was inaccessible
0547, 0548	Treatment System	The treatment system was not operable during this sampling event

Field Variance: None

Location Specific Information – Observation Wells: All observation wells were sampled

Attachment 1

using micro-purge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc*)	Sample Depth (ft bgs)
0403	06/09/2008	15:36	6.48	18
0407	06/09/2008	15:14	7.61	17
0484	06/09/2008	14:04	8.06	28
0596	06/09/2008	14:29	7.31	24

*Below top of casing

June 2008 Configuration 2 Sampling

Number of Locations Sampled: Four observation wells (0401, 0584, 0587, and 0600) were sampled during the June 2008 sampling event.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0571, 0573, 0575, 0577, 0579	Remediation Wells	Not running
0590, 0591, 0603, 0613, 0614, 0605, 0604, 0605, 0615, 0616	Well Points	Inaccessible due to high river flow
0236, 0239, 0240	Surface Water	Inaccessible due to high river flow

Field Variance: None

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0401	06/10/2008	13:44	8.35	18
0584	06/10/2008	08:54	7.65	18
0587	06/10/2008	09:27	7.22	18
0600	06/10/2008	08:34	7.54	28

June 2008 Configuration 3 Sampling

Number of Locations Sampled: Five observation wells (0683, 0686, 0687, 0688-31, and 0689-46), were sampled during the June 2008 sampling event.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

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Location No.	Type	Reason
0670, 0672, 0674, 0676, 0678	Remediation Wells	Not running due to high river flow
0690, 0691, 0692, 0693, 0694, 0695, 0696, 0697, 0698	Well Points	Inaccessible due to high river flow
0257, 0258, 0259	Surface Water	Inaccessible due to high river flow

Field Variance: None

Quality Control Sample Cross Reference: Following are the blind identifications assigned to the quality control samples:

Blind ID	True ID	Sample Type	Associated Matrix	Ticket Number
2888	0688-31	Duplicate from 31 ft bgs	Ground Water	NFC 689

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0683	06/10/2008	15:45	9.56	27
0686	06/11/2008	08:06	8.00	18
0687	06/10/2008	14:33	7.85	28
0688-31	06/10/2008	14:10	7.51	31
0689-46	06/10/2008	15:03	7.77	46

June 2008 Configuration 4 Sampling

Number of Locations Sampled: Four observation wells (0780, 0783, 0784, and 0785) were sampled during the June 2008 sampling event.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0771, 0773, 0775, 0777, 0779	Remediation Wells	Not running due to high river flow
0790, 0791, 0792, 0793, 0794, 0795	Well Points	Inaccessible due to high river flow
0274	Surface Water	Inaccessible due to high river flow

Field Variance: None.

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Attachment 1

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0780	06/09/2008	11:03	7.22	28
0783	06/09/2008	10:42	7.56	18
0784	06/09/2008	10:20	7.26	18
0785	06/09/2008	11:23	7.25	18

June 2008 Infiltration Trench Sampling

Number of Locations Sampled: Two observation wells (0731 and 0733) were sampled during the June 2008 sampling event.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0724, 0725, 0726	Well Points	Inaccessible due to high river flow

Field Variance: None.

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0731	06/11/2008	08:29	7.89	18
0733	06/11/2008	08:48	7.69	18

Well Inspection Summary: A well inspection was not conducted.

Site Issues: According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
06/09/2008	29,300
06/10/2008	27,400
06/11/2008	25,800

Equipment Issues: None.

Corrective Action Required/Taken: None.

Attachment 2



DATE: June 23, 2008
TO: K. Pill, M. Mullis
FROM: E. Glowiak
SUBJECT: June 2008 Ground Water/Surface Water Interaction Investigation Sampling Event Trip Report

Site: Moab – Interim Action Well Field

Date of Sampling Event: June 2-4, 2008

Team Members: Steve Back, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 0806015

Sample Shipment: All samples were shipped in a cooler overnight UPS to Paragon Analytics Inc. from Moab, Utah, on June 4, 2008 (Tracking No. 196240415).

Purpose: The purpose of this investigation is to determine whether the bank storage occurs on the Colorado River adjacent to the Moab UMTRA site during high river flows. Bank storage of river water could potentially dilute the site contaminants and would result in the ability to halt the interim action remedial system during high river stage. A series of surface water locations, well points, extraction wells, and observation wells from Configuration 1 and Baseline were sampled at varying depths and distances from the river channel.

June 2008 Configuration 1 Sampling

Number of Locations Sampled: One extraction well (0474), nine observation wells (0480, 0482, 0483, 0485, 0557, 0558, 0559, 0560, and 0561), and one surface water location (0216) were sampled during the June 2008 sampling event. A total of 11 samples were collected.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0606, 0562, 0563	Well Points	Inaccessible

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Field Variance: None.

Location Specific Information – Configuration 1 Extraction Wells: This extraction well was sampled with dedicated tubing and a peristaltic pump. The dedicated submersible pump was not running at this time due to the possibility of flooding of the well vaults.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0474	06/04/2008	09:30	15.70	18

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated downhole and pump-head tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0480	06/02/2008	09:59	6.75	18
0482	06/02/2008	10:25	9.60	55
0483	06/02/2008	14:19	6.68	18
0485	06/02/2008	13:56	9.07	55
0557	06/02/2008	09:35	8.10	36
0558	06/02/2008	10:52	7.85	36
0559	06/02/2008	15:49	7.07	18
0560	06/02/2008	15:25	7.07	36
0561	06/02/2008	14:57	8.35	55

Location-Specific Information- Surface Water Sampling: The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (in. below surface)	Characteristics
0216	06/03/2008	15:25	Unknown	Taken about 30 ft up-river from 0216, turbid, slow flow, flooded into walking path on slope.

June 2008 Baseline Sampling

Number of Locations Sampled: Six observation wells (SMI-PZ1M, SMI-PZ1S, SMI-PW01, 0405, 0488, and 0495), and one surface water location (0241) were sampled during the June 2008 sampling event. Including one duplicate, a total of eight samples were collected.

Locations Not Sampled: The following locations were not sampled during the June 2008 sampling event.

Location No.	Type	Reason
0494, 0495, 0597	Well Points	Inaccessible

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Field Variance: During the June Surface Water/Ground Water Investigation Sampling Event, surface water location 0241 was sampled off of the Baseline river bank due to the inaccessibility of locations 0242 and 0243. In March, surface water sample location 0243 was sampled. During April, this location was inaccessible, so surface water location 0242 was sampled in place of 0243.

Quality Control Sample Cross Reference: Following are the false identifications assigned to the quality control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2786	0488	Duplicate from 36 ft bgs	Ground Water	NFC 638

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc*)	Sample Depth (ft bgs)
SMI-PZ1M	06/03/2008	11:11	7.09	55
SMI-PZ1S	06/03/2008	14:14	7.75	18
SMI-PW01	06/03/2008	13:48	7.70	36
0405	06/03/2008	09:59	6.15	18
0488	06/03/2008	09:18	6.11	36
0493	06/03/2008	08:30	5.91	55

Location-Specific Information – Surface Water Sampling: The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (in. below surface)	Characteristics
0241	06/03/2008	10:25	Unknown	Collected off of river bank, water is stagnant and flooded up to the access path

Attachment 2



Configuration 1 Surface Water Location 0216



Baseline Surface Water Location 0241

Well Inspection Summary: A well inspection was not conducted.

Site Issues: According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

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Date	Daily Mean Flow (cfs)
06/02/2008	35,900
06/03/2008	37,700
06/04/2008	39,500

Equipment Issues: None.

Corrective Action Required/Taken: None.