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Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project September 2010 Validation Data Package for Performance Assessment of the Monthly Sampling for the Ground Water Interim Action

Revision 1

January 2011

U.S. Department of Energy

Office of Environmental Management

Prepared by the Technical Assistance Contractor under contract number DE-AC30-07CC60012 for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

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Moab UMTRA Project
September 2010 Monthly Ground Water Sampling Event

Revision 1

Review and Approval

1/6/11

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Date

1/6/11

Joseph D. Ritchey
TAC Senior Program Manager

Date

Revision History

Revision No.	Date	Reason/Basis for Revision
0	December 2010	Initial issue.
1	January 2011	Corrections made to Surface Water Sampling Results content in Section 1.2 and to Conclusions in Section 3.6.

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Acronyms and Abbreviations

°C	degrees Centigrade
CCB	continuing calibration blank
CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
IA	interim action
ICB	initial calibration blank
ICP	inductively coupled plasma
LCS	laboratory control sample
MDC	minimum detection limit
mg/L	milligrams per liter
MB	method blank
MDC	minimum detectable concentration
MS	matrix spike
MSD	matrix spike duplicate
RIN	report identification number
RL	reporting limit
RS	replicate sample
SD	serial dilution
SDG	sample data group
Th	thorium
TDS	total dissolved solids
TPU	total propagated uncertainty
U	uranium
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey
VDP	validation data package

1.0 Introduction

The 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 *Moab UMTRA Project Surface Water/Ground Water Sampling and Analysis Plan* (DOE-EM/GJTAC1830) and the "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 1.0 presents the Summary Criteria, the Sampling Event Summary, and the Sampling and Analysis. Section 2.0 provides the Data Assessment Summaries, including the Field Activity Verification, Laboratory Performance Assessment, Field Analyses/Activities description, and the Certification. All flagged data, and the reasons for the applicable flags, are also presented in Section 2.0. The Data Presentation is contained in Section 3.0, which includes a summary of the anomalous data generated by the validation process. Various appendices contain the Water Sampling Field Activities Verification, Water Quality Data, Water Level Data, and the Minimums and Maximums Report. Attachment 1 contains the trip report. All Colorado River flow discussed in this document is measured from the U.S. Geological Survey (USGS) Cisco gauging station number 09180500.

This validation data package (VDP) presents the results of the September 2010 sampling event that was completed between September 29 and October 1, 2010. Ground water samples were collected from the Configuration (CF) 5 extraction wells while they were actively pumping. These samples were collected to determine the impacts on air quality as this water is distributed through water evaporation enhancement equipment. As a result, the samples collected from the CF5 wells were analyzed for a variety of metals and radiological analytes in addition to the standard analytes of ammonia as N, total dissolved solids (TDS), and uranium.

In addition, CF4 surface water locations 0274, 0278, and 0279 were sampled near the end of the initial action (IA) activities in the habitat developed in this area. These samples were submitted for ammonia as N analysis exclusively.

Section 1.0 contains the Summary Criteria with a sample location map (Section 1.1), the Sampling Event Summary (Section 1.2), and the Sampling and Analyses (Section 1.3) for this September 2010 monthly sampling event.

1.1 Summary Criteria

Sampling Period: September 29 through October 1, 2010
The purpose of this sampling event was to collect data associated with the ground water extracted from the CF5 wells and monitor the surface water ammonia concentration in the side channel off CF4. The CF5 extraction well sampling locations are shown in Figure 1, and the CF4 surface water locations are shown in Figure 2.

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?**

   No. Based on the Minimums and Maximums Report, there were no anomalous data points associated with this sampling event.

2. **Were all IA well field pumps operating within the planned parameters?**

   Yes. The CF5 wells were extracting ground water at a combined rate of approximately 85 gallons per minute.

3. **Was the evaporation pond functioning properly?**

   Yes. The pond level was at 9.6 feet during this sampling event.

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

   Yes.

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

   Yes. The transfer of tailings pore water into the evaporation pond continued during this time, limiting the volume of ground water that can be stored in the pond.

1.2 Sampling Event Summary

This VDP presents the validated data associated with the samples collected during the September 2010 IA monthly sampling event at the former uranium tailings processing site in Moab, Utah. Included is 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). Attachment 1 contains the trip reports detailing the field events associated with these sampling events. In addition, time versus analyte concentration plots are provided where applicable.

A list of flagged data is presented in Table 3 in Section 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 applicable data are within a normal statistical range. Based on the results of the Minimums and Maximums Report, there are no anomalous data points associated with this sampling event (see Anomalous Data Review in Section 3.2).

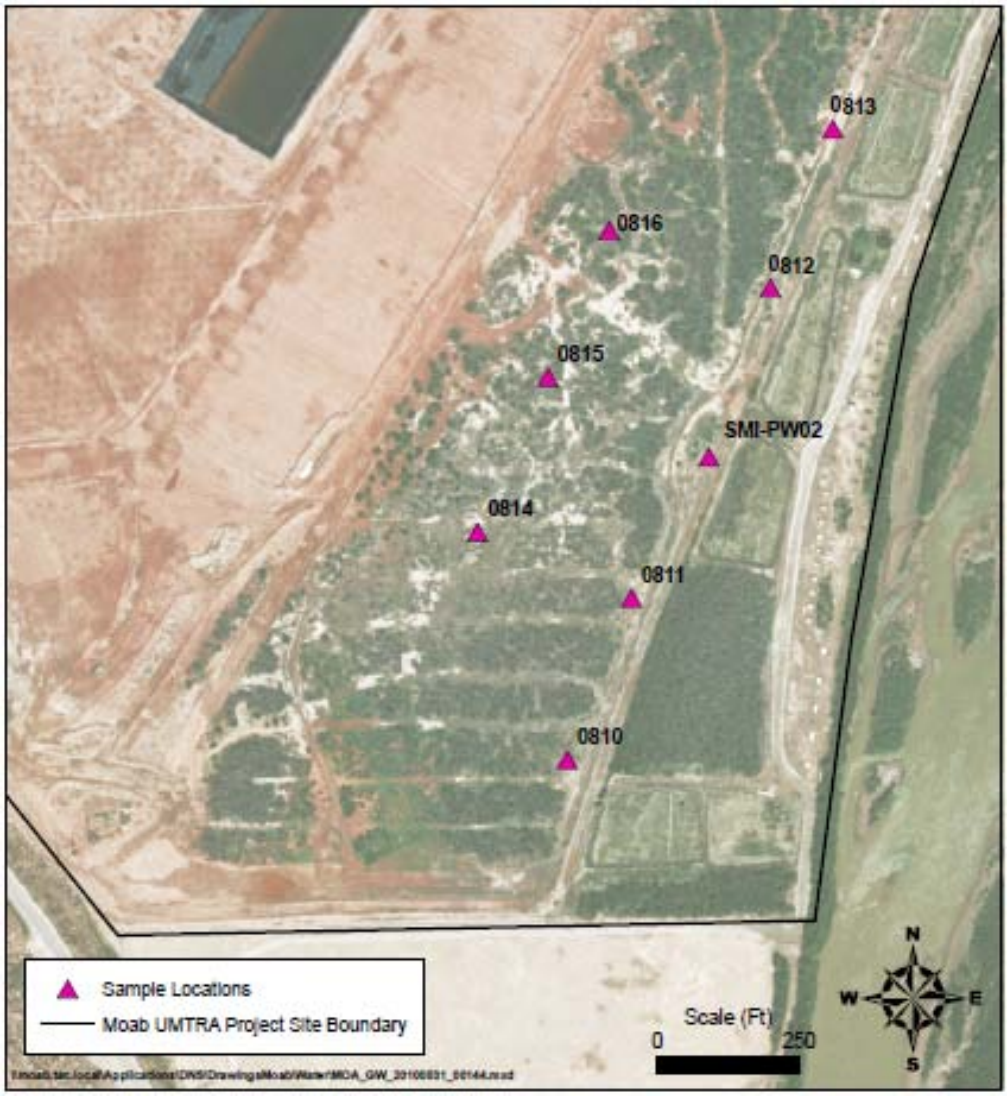

Figure 1. Map of CF5 Extraction Well Sample Locations

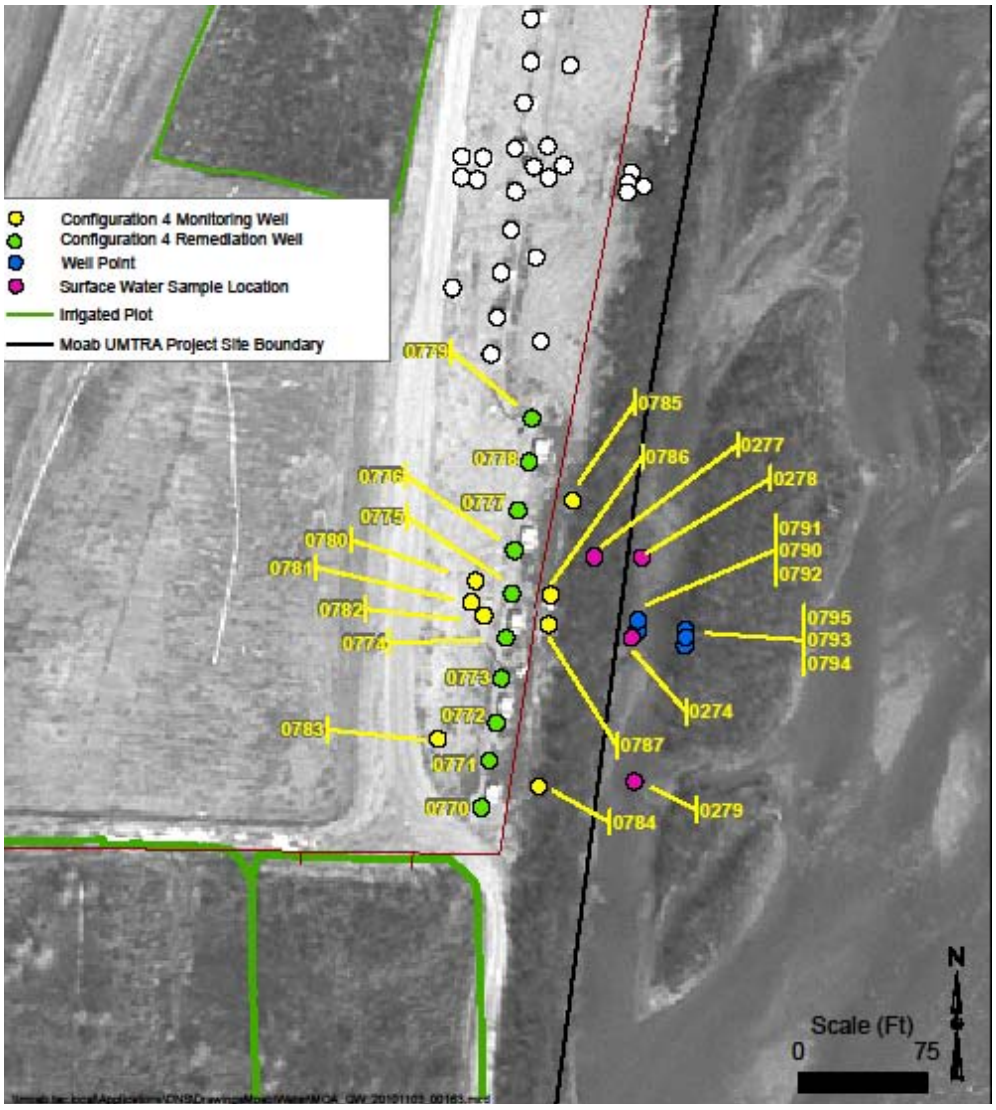

Figure 2. Map of CF4 Sample Locations (includes locations not sampled)

CF5 Extraction Wells 0810, 0811, PW02, 0812, and 0813

These locations are located along the southeastern edge of CF5, approximately 500 feet from the toe of the tailings pile (Figure 1). Time versus ammonia, TDS, and uranium time versus concentration plots are presented as Figures 3, 4, and 5, respectively. Ground water samples were collected from all locations while dedicated submersible pumps were operating during this sampling event. With the exception of well PW02, the samples collected during February and March 2010 were collected prior to the installation of the submersible pumps and represent the water chemistry from discrete depths within 5 feet of the submersible pump current intake depth. The samples from PW02 in 2010 were collected while the submersible pump was operating. As shown in the time versus concentrations plots, the analyte concentrations are generally similar to those measured during the previous sampling event.

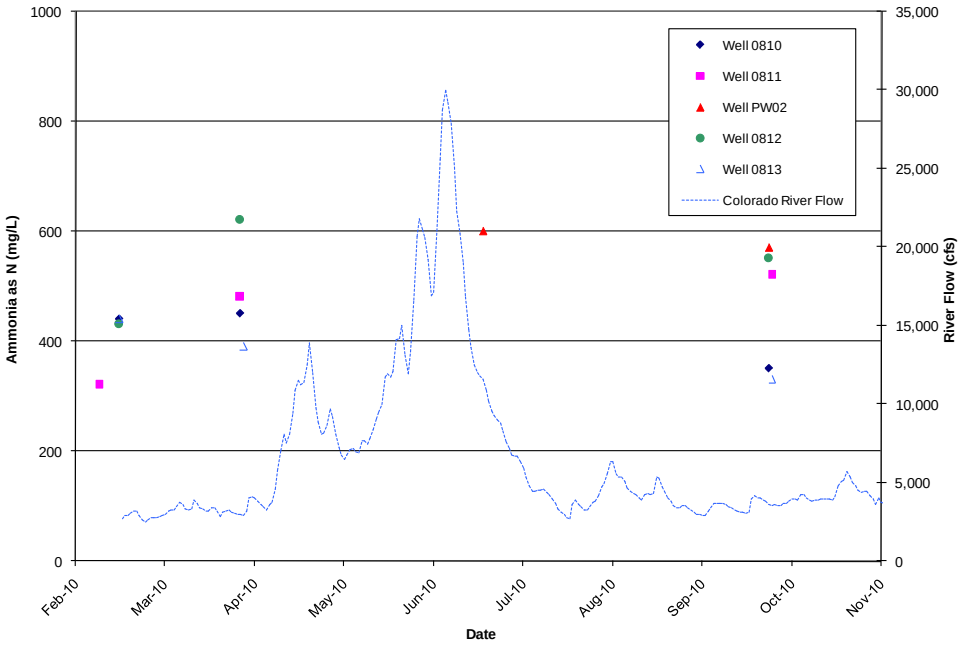

Figure 3. CF5 Extraction Wells 0810, 0811, PW02, 0812, and 0813
Time Versus Ammonia Total as N Concentration Plot

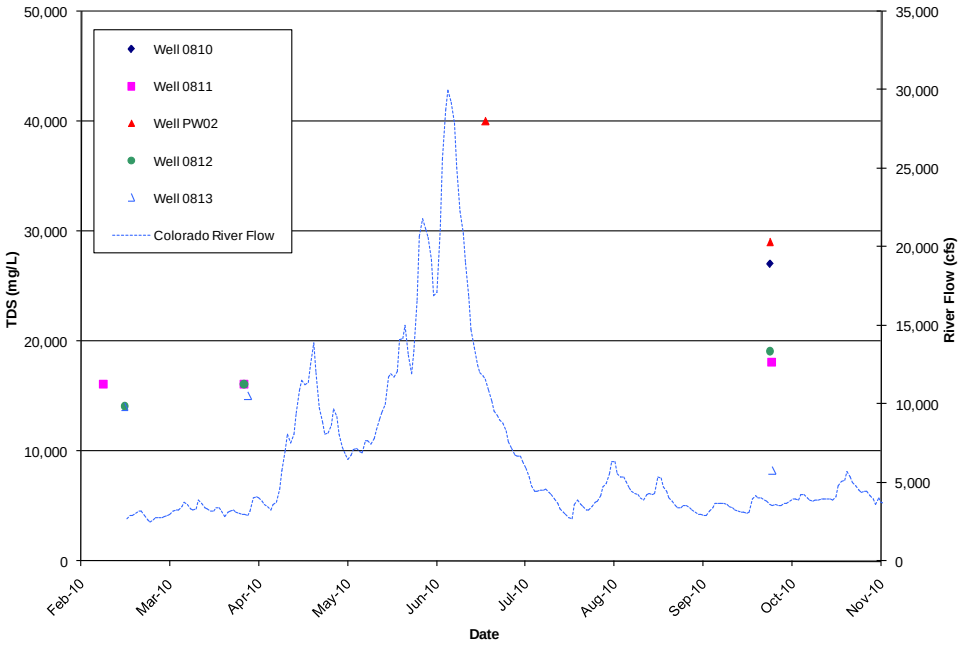

Figure 4. CF5 Extraction Wells 0810, 0811, PW02, 0812, and 0813 Time Versus TDS Concentration Plot

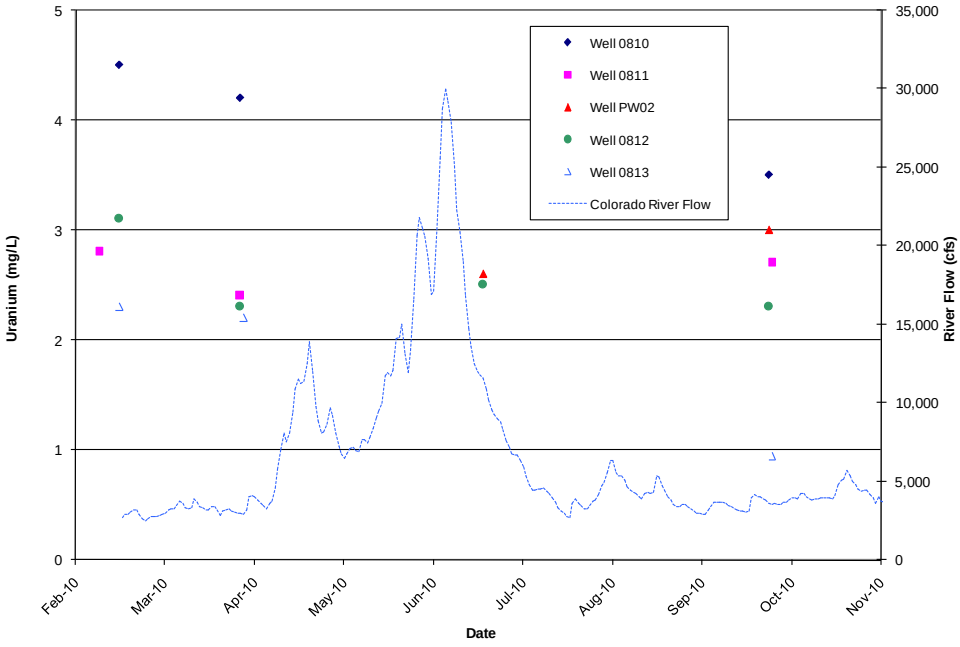

Figure 5. CF5 Extraction Wells 0810, 0811, PW02, 0812, and 0813 Time Versus Uranium Concentration Plot

CF5 Extraction Wells 0814, 0815, and 0816

Time versus ammonia, TDS, and uranium time versus concentration plots were also generated (presented as Figures 6, 7, and 8, respectively) for CF5 extraction wells 0814, 0815, and 0816. These wells (Figure 1) are all located approximately 200 feet from the toe of the pile. Similar to the other CF5 wells, ground water samples were collected from these locations while dedicated submersible pumps were operating during this sampling event. With the exception of well 0815, the samples taken during February and March 2010 were collected prior to the installation of the submersible pumps and represent the water chemistry from discrete depths within 5 feet of the submersible pump current intake depth. The sample from 0815 in June 2010 was also collected while the submersible pump was operating. As shown in the time versus concentrations plots, ammonia concentrations in samples from 0815 and 0816 have significantly increased, while the concentration measured in the sample collected from 0814 has decreased. TDS and uranium concentrations in then three wells have not changed significantly.

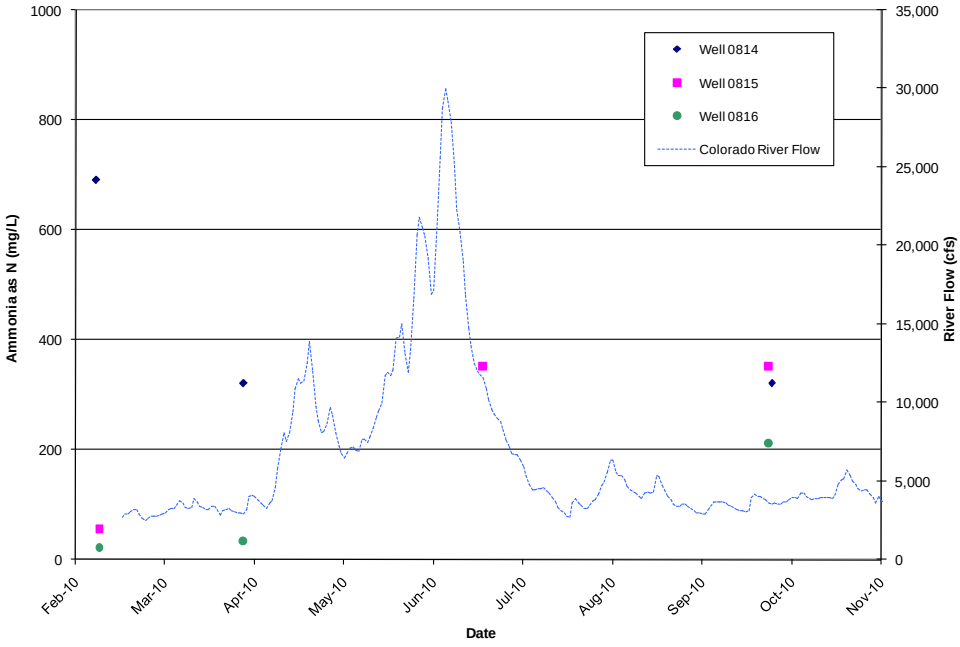

Figure 6. CF5 Extraction Wells 0814, 0815, and 0816
Time Versus Ammonia Total as N Concentration Plot

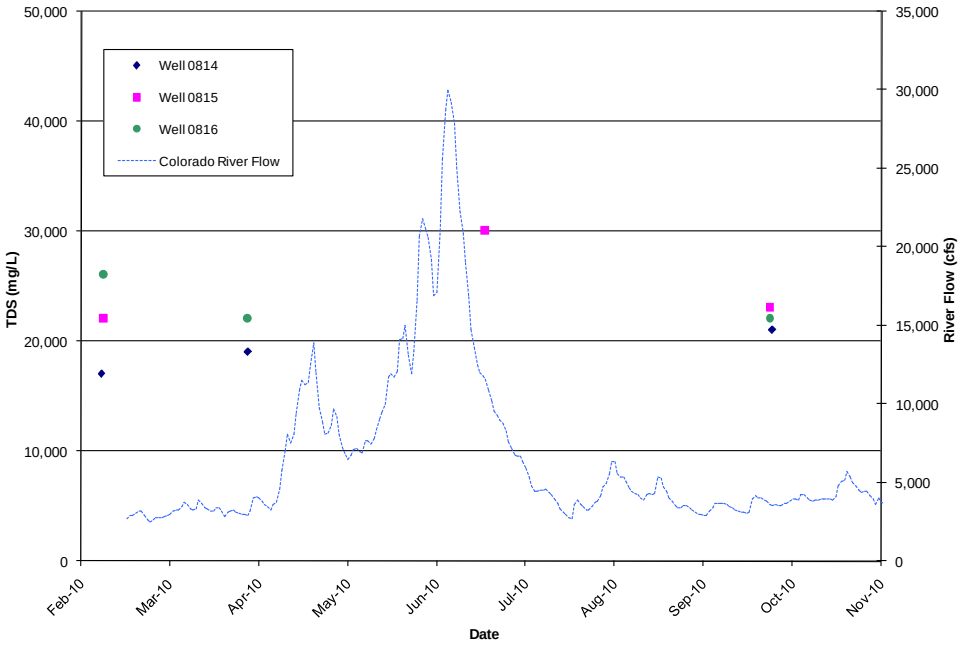

Figure 7. CF5 Extraction Wells 0814, 0815, and 0816
Time Versus TDS Concentration Plot

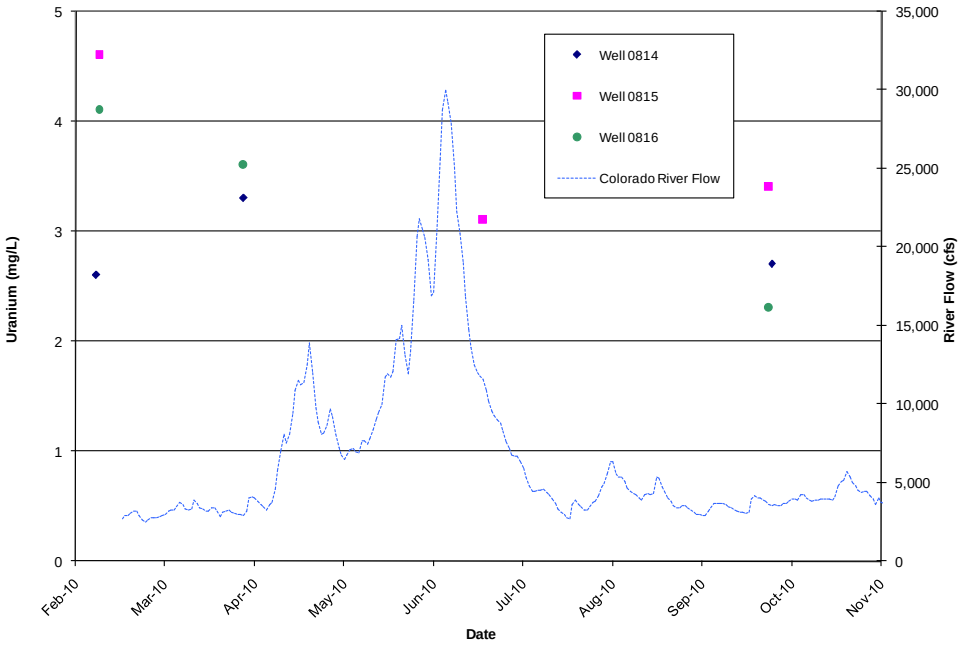

Figure 8. CF5 Extraction Wells 0814, 0815, and 0816
Time Versus Uranium Concentration Plot

Surface Water Sampling Results

A hand-held ammonia probe was used to collect surface water data at CF4 surface water locations while the IA system was running. This system applies diverted surface water into habitat areas that may be impacted by ground water discharge. On September 15, 2010, surface water location 0278 had an ammonia concentration of 2 milligrams per liter (mg/L), and location 0279 had an ammonia concentration of 0.8 mg/L. On September 21, location 0278 had an ammonia concentration of 2.83 mg/L.

On October 1, 2010, three surface water samples were collected for laboratory analysis as part of this sampling event, when the water in the channel was very shallow (approximately 3 to 4 inches deep) and discontinuous (stagnant) because of numerous gravel bars and silt deposits. These samples were collected after the time of year when the U.S. Fish and Wildlife Service considers these side channels as viable habitats for endangered fish and after the IA system was shut off for the season.

Sampling results are provided in Table 1. 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) is provided.

Table 1. October 2010 Sampling Event Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

Location	Date	Temp (^{o}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]
0274	10/1/10	16.02	7.6	4.4	11.4	3.61
0278	10/1/10	16.45	7.7	12	9.65	3.25
0279	10/1/10	16.77	7.61	18	11.4	3.61

Notes: 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, the samples collected from each of the three locations exceeded the chronic criteria, and the samples collected from locations 0278 and 0279 also exceeded the acute criteria. As previously discussed, these samples were collected after this side channel was considered to be a habitat for endangered fish, and the ammonia field probe data demonstrated that the Initial Action system was effective at reducing the ammonia concentrations while this area was considered to be a habitat.

1.3 Sampling and Analyses

Sampling and analyses were conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System,* September 2008 (DOE-EM/GJ1220). Please refer to the attached trip report (Attachment 1) for specific sampled locations.

The data validations indicate that the data meet the quality-control criteria specified for this project. An adequate number of duplicates were collected; and because all samples were

collected using dedicated equipment, it was not necessary to collect an equipment blank (EB). All samples were analyzed within their prescribed holding times, and no significant discrepancies were noted regarding chain of custody (COC), case narratives, presence of field and sample identifications, holding times, preservation, and cooler receipts, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

According to the USGS Cisco gauging station, the mean daily Colorado River flows ranged from 3,390 to 3,480 cubic feet per second (cfs) during these sampling events.

2.0 Data Assessment Summaries

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

2.1 Water Sampling Field Activities Verification

The field activities verification process for these sampling events was documented using the checklist in Appendix A. As the checklist exhibits, all sampling was conducted following the applicable procedures. Please see Appendix A for the field activities verification checklist.

2.2 Laboratory Performance Assessments

General Information

Report Identification Number (RIN):	1009052
Sample Event:	September 2010 IA Well Field Monthly Sampling
Site(s):	Moab, Utah
Laboratory:	ALS Laboratory, Fort Collins, Colorado
Sample Data Group (SDG) Number:	1010055
Analysis:	Gamma Spectroscopy, Inorganics, Isotopic Thorium, Isotopic Uranium, and Metals
Validator:	Rachel Cowan
Review Date:	December 17, 2010

This validation was performed according to the *Moab UMTRA Project Surface Water/Ground Water Sampling and Analysis Plan* (DOE-EM/GJTAC1830) and the "Standard Practice for Validation of Laboratory Data," GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination, on 100 percent of the samples. 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.

Data Qualifier Summary

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

Table 2. Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	WCH-A-005	EPA 350.1	EPA 350.1
Fluoride	WCH-A-018	SWA-846 9056	EPA 9056
Gamma Spectroscopy (Americium-241, Cerium-144, Cobalt-60, Cesium-134, Cesium-137, Europium-152; Europium-154, Potassium 40, Lead-212; Promethium-144; Promethium-146, Ruthenium-106, Antimony-125, Thorium-234	GAM-A-001	SOP 739 R10	SOP 713 R11
Isotopic Uranium	ASP-A-024	SOP 776 R11; SOP 778R13	SOP 714 R2
Mercury	G48	EPA 7470A	EPA 7470A
Metals (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc)	MET-A-019	SWA-846 6010B	EPA 6010B
Isotopic Thorium	ASP-A-008	SOP 776 R11; SOP 777 R9	SOP 714 R12
TDS	WIC-A-033	EPA 160.1	EPA 160.1
Uranium (Total)	G1	SW-846 3005A	EPA 6020A

Table 3. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1010055-4	0813	Americium-241	J	RQ5
101055-1, -3, -6, -7	0810, 0812, 0815, 0816	Europium-154	U	RQ4
1010055-9	SMI-PW02	Cerium-144	U	RQ4
1010055-1, -5, -6	0810, 0814, 0815	Potassium-40	J	RQ5
1010055-2, -4, -5, -7	0811, 0813, 0814, 0816	Thorium-232	J	RQ5
1010055-3, -6, -9	0812, 0815, SMI-PW02	Thorium-232	U	RQ3, RQ4
1010055-3, -4	0812, 0813	Thorium-234	J	RQ5
1010055-1, 5, 6, 9	0810, 0814, 0815, SMI-PW02	Uranium-235	J	RQ5
1010055-3	0812	Uranium-234, Uranium-235, Uranium-238	J	TR2

Notes: J indicates results are estimated and becomes a UJ for analytical results below the detection limit.

Table 4. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-Detects)	Explanation
RQ3	NA	U	The result is less than the 2-sigma TPU error range for result.
RQ4	NA	U	The result is less than the MDC.
RQ5	J	NA	The result is greater than or equal to the MDC but less than three times the MDC.
TR2	J	U	The recovery of a chemical or radioactive tracer is below 30 percent but above 20 percent.
MS1	J	UJ	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.
RS1	J	UJ	Replicate sample frequency criteria were not met.

MDC = minimum detection limit; TPU = total propagated uncertainty

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received a total of nine samples for RIN 1009052 in one shipment of three coolers. SDG 1010055 arrived on October 5, 2010 (UPS tracking numbers 1Z5W1Y514492244017, 1Z5W1Y514493420020, and 1Z5W1Y514492242439). The SDG was accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed on the 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 forms and the sample tickets, had no errors or omissions.

Preservation and Holding Times

SDG 1009052 was received intact with the temperatures inside the three coolers at 0.2 degrees Centigrade (°C), 0.4°, and 1.2°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 detects were found to be within quality-control procedures except for the following.

Laboratory Instrument Calibration and Quantification

Compliance requirements for satisfactory instrument calibration are established to ensure the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure the instrument continues to be capable of producing acceptable qualitative and quantitative data. Besides instrument calibration, initial calibration verification samples and continuing calibration verification samples are analyzed at a required frequency of one per 10 samples. Quantification evaluations allow assessment of very low-level results as to their validity.

In addition to laboratory instrument calibration standards, radiochemical analyses have required quantification standards. All radiochemical results reported are to include the calculated two-sigma total propagated uncertainty (TPU) and minimum detectable concentration (MDC) as quantification standards. Radiochemical results are qualified with a "J" flag (estimated) when the result is greater than the MDC, but less than three times the MDC. Radiochemical results are qualified with a "U" flag (not detected) when the result is less than the TPU and/or the MDC.

Isotopic Thorium (Thorium-232)
Some thorium (Th)-232 results did not meet quantification standards and were flagged accordingly (see Table 3; non-detects were flagged with "U" and detected results were flagged with "J").

Gamma Spectroscopy (Americium-241, Potassium-40, Th-234, and Uranium-235)
Gamma spectroscopy analytes americum-241, potassium-40, Th-234, and uranium (U)-235 results did not meet quantification standards for some samples, and the results from these samples were flagged "J" accordingly.

Gamma Spectroscopy (Cerium-144 and Europium-154)
For some sample results of Cerium-144 and Europium-154, sample results did not meet quantification standards and were flagged "U" accordingly.

Tracer Recovery/Radiochemical Analysis
Tracer recovery is an addition of a known quantity of radioactive or chemically similar material to a sample prior to chemical separation used to determine the amount of the analyte recovered.

Isotopic Uranium
Sample 1010055-3 had a tracer recovery of 28.9 percent when the recovery should ideally be between 30 and 110 percent. The low yield of the tracer recovery was due to high U activity in the sample and, according to validation procedure, the isotopic uranium results from 1010055-3 were flagged with a "J." ALS issued a non-conformance report as required.

Matrix Spike and Replicate Analysis
Matrix spike (MS) sample analysis, performed at a frequency of one per 20 samples unless otherwise noted, is a measure of the ability to recover analytes in a particular matrix. Replicate sample (RS) analysis consists of matrix spike duplicate (MSD) samples and field duplicates, analyzed at a frequency of one per 20 samples per method or procedural requirements. These RSs are indicators of laboratory precision for each sample matrix.

Method EPA 350.1, Ammonia as N
The ammonia MS sample selected for testing matrix-specific quality control had too high an ammonia concentration for the analytical range. As per procedure, the ammonia results were not flagged for MS1 and, although the MSD failed, there was an ammonia field duplicate, so no ammonia results were flagged for RS1.

Method EPA 7470A, Mercury
There was no quality-control sample selected for the mercury results. However, the mercury results were not flagged for MS1 or RS1, since all results were non-detects and all had been flagged "U" by ALS Laboratory Group.

Laboratory Control Sample
A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per 20 samples) 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 U. As a standard practice, ALS Laboratory Group does not prepare LCSs for samples that are field-filtered and acidified and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements, an MS may be used in place of an LCS provided the MS passes the LCS requirements.

The U MS passed the LCS requirements; the associated results were not flagged.

Method and Calibration Blanks
Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Initial calibration blanks (ICBs) and continuing calibration blanks (CCBs) are analyzed to assess instrument contamination prior to and during sample analysis. Detected sample results associated with blanks results greater than the method detection limit or instrument detection limit (depending on method requirements) were "J"-qualified when the detections were less than five times the associated blank concentration. Non-detects were not qualified. All blanks passed these criteria.

Metals Serial Dilution
Serial dilution (SD) samples were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Inductively-coupled plasma (ICP)-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the reporting limit (RL). ICP-atomic emission spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the RL. All SD samples passed criteria.

EBs
An EB is a sample of analyte-free media collected from a rinse of non-dedicated sampling equipment used to sample surface water. EBs are collected to document adequate decontamination of non-dedicated equipment. One EB should be prepared with each preparation batch.

All samples were collected using dedicated equipment. As a result, it was not necessary to collect any EBs.

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) file for RIN 1009052 arrived on November 23, 2010. The contents of the EDD file were manually examined to verify that the sample results accurately reflected the data contained in the sample data package and that all and only the requested data were delivered.

2.3 Field Analyses/Activities

The following information summarizes the field analyses and activities for the September 2010 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 duplicate and one EB were collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, U.S. Environmental Protection Agency (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 relative percent difference and are considered acceptable.

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 RLs were met. 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* (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 Report (Section 3.1), the Anomalous Data Review Check Sheet (Section 3.2) and tables containing the Water Quality and Water Level Data (Sections 3.3 and 3.4, respectively).

3.1 Minimums and Maximums Report

The Minimums and Maximums Report (see Appendix B) is 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 less or more than 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

3.2 Anomalous Data Review

There were no anomalous results associated with this sampling event based on the Minimums and Maximums Report (Appendix B).

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 Report

During this sampling event, all ground water and surface water samples were collected using dedicated equipment. As a result, it was not necessary to collect an EB.

3.6 Conclusions

This report discusses the data validation for samples collected during the September 2010 sampling event. Nine samples (including one duplicate) were collected from the CF5 wells while they were actively extracting ground water. Three surface water samples were collected from the side channel off CF4 after the IA system was shut down, when this area was no longer considered to be a viable habitat for endangered fish species.

With the exception of wells 0815 and PW02, the sampling of the CF5 wells represents the first time these locations were sampled while the submersible pumps were operative. In addition to the standard analyte list (ammonia as N, TDS, and U), these samples were submitted for a variety of metals and radiological analytes to determine the impact of running this ground water through the site water evaporation enhancement equipment. This data will also eventually be used to develop the air dispersion model for the site.

Ammonia probe data collected in September 2010 while the side channel flow conditions met the definition of a habitat suggests the IA system was effective in preventing surface water ammonia concentrations from reaching levels toxic to any exposed aquatic wildlife. Surface water samples at CF4 locations 0274, 0278, and 0279 were collected on October 1, 2010, during this sampling event. The analytical results indicate the ammonia concentrations measured in each of these samples exceeded state of Utah and federal ammonia chronic concentration criteria, and the samples collected from 0278 and 0279 exceeded the acute criteria. However, these samples were collected after the time of year when the U.S. Fish and Wildlife Service considers these side channels as viable habitats for endangered fish, and after the IA system was shut off for the season.

Appendix A.
Water Sampling Field Activities Verification

Appendix A. Water Sampling Field Activities Verification

Sampling Event / RIN	September 2010/RIN 1009052	**Date(s) of Water Sampling**	September 29 to October 1, 2010
Date(s) of Verification	December 17, 2010	**Name of Verifier**	Rachel Cowan

		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan the primary document directing field procedures?	Yes	
	List other documents, standard operating procedures, instructions.	NA	
2.	Were the sampling locations specified in the planning documents sampled?	Yes	See Section 1.1 for specific details.
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?	Yes	
	Did the operational checks meet criteria?	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?	Yes	
	If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	
8.	Were the following conditions met when purging a Category II well:		
	Was the flow rate less than 500 milliliters per minute?	Yes	
	Was one pump/tubing volume removed prior to sampling?	Yes	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	There were a total of 12 samples collected, including one duplicate.
10.	Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	All samples were collected using dedicated equipment; therefore, it was not necessary to collect an EB.

Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	September 2010/RIN 1009052	**Date(s) of Water Sampling**	September 29 to October 1, 2010
Date(s) of Verification	December 17, 2010	**Name of Verifier**	Rachel Cowan

	Response (Yes, No, NA)	Comments
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 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 Report

Appendix B. Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1009052
Comparison: All Historical Data
Report Date: 12/17/2010

				Current			Historical Maximum			Historical Minimum			Count	
					Qualifiers			Qualifiers			Qualifiers			
Site Code	Location Code	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect
MOA01	0810	09/29/2010	Manganese	5.5			5.4			4.4			6	0
MOA01	0811	09/30/2010	Ammonia Total as N	510			480		J	310			7	0
MOA01	0811	09/30/2010	Ammonia Total as N	520			480		J	310			7	0
MOA01	0811	09/30/2010	Total Dissolved Solids	18000			17000			16000			7	0
MOA01	0812	09/29/2010	Total Dissolved Solids	19000			16000			13000			7	0
MOA01	0813	09/30/2010	Ammonia Total as N	330			530			390			8	0
MOA01	0813	09/30/2010	Manganese	3.4			5.6			4.1			7	0
MOA01	0813	09/30/2010	Total Dissolved Solids	8200			15000			13000			8	0
MOA01	0813	09/30/2010	Uranium	0.94			2.3			1.8			8	0
MOA01	0814	09/30/2010	Total Dissolved Solids	21000			19000			15000			7	0
MOA01	0816	09/29/2010	Manganese	4.1			4			3.1			7	0

Analyte concentrations presented in blue text represent the historical value exceeded by the concentration presented in red, which is associated with this current sampling event.

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	Tentatively identified compound is a suspected aldol-condensation product.
B	Inorganic: Result is between the instrument detection limit and the contract-required detection limit. Organic: Analyte also found in method blank.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference; see case narrative.
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.
P	> 25% difference in detected pesticide or Aroclor concentrations between two 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 three 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

Appendix C. Water Quality Data

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	31	U		#	31	19
Actinium-228	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	31	U		#	31	18
Actinium-228	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	30	U		#	30	18
Actinium-228	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	29	U		#	29	17
Actinium-228	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	22	U		#	22	13
Actinium-228	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	29	U		#	29	17
Actinium-228	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	28	U		#	28	17
Actinium-228	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	28	U		#	28	16
Actinium-228	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	29	U		#	29	17
Aluminum	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.15	U		#	0.15	
Aluminum	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.15	U		#	0.15	
Aluminum	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.15	U		#	0.15	
Aluminum	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.15	U		#	0.15	
Aluminum	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.15	U		#	0.15	
Aluminum	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.15	U		#	0.15	
Aluminum	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.15	U		#	0.15	
Aluminum	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.15	U		#	0.15	
Aluminum	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.15	U		#	0.15	
Americium-241	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	34	U		#	34	20
Americium-241	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	36	U		#	36	22
Americium-241	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	34	U		#	34	21
Americium-241	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	51	U		#	51	31
Americium-241	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	261	TI	J	#	97	68
Americium-241	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	48	U		#	48	30
Americium-241	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	37	U		#	37	22
Americium-241	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	34	U		#	34	21

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Americium-241	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	36	U		#	36	22
Ammonia Total as N	mg/L	0274	SL	10/01/2010	0001	0	-	0	4.4			#	0.1	
Ammonia Total as N	mg/L	0278	SL	10/01/2010	0001	0	-	0	12			#	0.5	
Ammonia Total as N	mg/L	0279	SL	10/01/2010	0001	0	-	0	18			#	0.5	
Ammonia Total as N	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	350			#	20	
Ammonia Total as N	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	520			#	20	
Ammonia Total as N	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	510			#	20	
Ammonia Total as N	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	550			#	20	
Ammonia Total as N	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	330			#	20	
Ammonia Total as N	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	320			#	20	
Ammonia Total as N	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	350			#	20	
Ammonia Total as N	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	210			#	20	
Ammonia Total as N	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	570			#	20	
Antimony	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.037	B		#	0.03	
Antimony	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.03	U		#	0.03	
Antimony	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.03	U		#	0.03	
Antimony	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.03	U		#	0.03	
Antimony	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.03	U		#	0.03	
Antimony	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.038	B		#	0.03	
Antimony	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.03	U		#	0.03	
Antimony	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.046	B		#	0.03	
Antimony	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.03	U		#	0.03	
Antimony-125	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	14.2	U		#	14.2	8.1
Antimony-125	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	15.6	U		#	15.6	9
Antimony-125	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	14.4	U		#	14.4	8.4
Antimony-125	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	13.9	U		#	13.9	8
Antimony-125	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	10.3	U		#	10.3	6

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Antimony-125	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	14.5	U		#	14.5	8.9
Antimony-125	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	15.3	U		#	15.3	9
Antimony-125	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	14.5	U		#	14.5	8.2
Antimony-125	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	15.3	U		#	15.3	8.9
Arsenic	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.039	U		#	0.039	
Arsenic	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.039	U		#	0.039	
Arsenic	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.039	U		#	0.039	
Arsenic	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.039	U		#	0.039	
Arsenic	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.039	U		#	0.039	
Arsenic	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.039	U		#	0.039	
Arsenic	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.039	U		#	0.039	
Arsenic	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.039	U		#	0.039	
Arsenic	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.039	U		#	0.039	
Barium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0061	B		#	0.0019	
Barium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.011	B		#	0.0019	
Barium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0098	B		#	0.0019	
Barium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.01	B		#	0.0019	
Barium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0031	B		#	0.0019	
Barium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0091	B		#	0.0019	
Barium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.008	B		#	0.0019	
Barium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0071	B		#	0.0019	
Barium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.011	B		#	0.0019	
Beryllium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0018	U		#	0.0018	
Beryllium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0018	U		#	0.0018	
Beryllium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0018	U		#	0.0018	
Beryllium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0018	U		#	0.0018	
Beryllium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0018	U		#	0.0018	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Beryllium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0018	U		#	0.0018	
Beryllium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0018	U		#	0.0018	
Beryllium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0018	U		#	0.0018	
Beryllium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0018	U		#	0.0018	
Cadmium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0033	U		#	0.0033	
Cadmium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0033	U		#	0.0033	
Cadmium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0033	U		#	0.0033	
Cadmium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0033	U		#	0.0033	
Cadmium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0033	U		#	0.0033	
Cadmium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0033	U		#	0.0033	
Cadmium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0033	U		#	0.0033	
Cadmium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0033	U		#	0.0033	
Cadmium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0033	U		#	0.0033	
Calcium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	480			#	0.12	
Calcium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	480			#	0.12	
Calcium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	480			#	0.12	
Calcium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	450			#	0.12	
Calcium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	360			#	0.12	
Calcium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	480			#	0.12	
Calcium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	480			#	0.12	
Calcium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	500			#	0.12	
Calcium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	560			#	0.12	
Cerium-144	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	35	U		#	35	21
Cerium-144	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	37	U		#	37	23
Cerium-144	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	40	U		#	40	23
Cerium-144	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	38	U		#	38	22
Cerium-144	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	30	U		#	30	18

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cerium-144	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	39	U		#	39	23
Cerium-144	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	40	U		#	40	24
Cerium-144	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	37	U		#	37	22
Cerium-144	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	41	U	U	#	41	24
Cesium-134	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	9.5	U		#	9.5	5.6
Cesium-134	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	10	U		#	10	5.9
Cesium-134	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	8.1	U		#	8.1	5.3
Cesium-134	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	9.7	U		#	9.7	5.7
Cesium-134	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	7.6	U		#	7.6	4.5
Cesium-134	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	9.4	U		#	9.4	5.8
Cesium-134	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	9.9	U		#	9.9	6
Cesium-134	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	9.3	U		#	9.3	5.4
Cesium-134	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	10	U		#	10	5.7
Cesium-137	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	5.7	U		#	5.7	3.3
Cesium-137	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	6	U		#	6	3.5
Cesium-137	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	6	U		#	6	3.4
Cesium-137	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	5.7	U		#	5.7	3.3
Cesium-137	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	4.6	U		#	4.6	2.7
Cesium-137	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	6.2	U		#	6.2	3.6
Cesium-137	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	6.4	U		#	6.4	3.8
Cesium-137	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	5.9	U		#	5.9	3.4
Cesium-137	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	5.9	U		#	5.9	3.4
Chromium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0085	B		#	0.0051	
Chromium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.011	B		#	0.0051	
Chromium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0051	U		#	0.0051	
Chromium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0066	B		#	0.0051	
Chromium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0051	U		#	0.0051	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chromium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0054	B		#	0.0051	
Chromium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0064	B		#	0.0051	
Chromium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0051	U		#	0.0051	
Chromium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0051	U		#	0.0051	
Cobalt	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0069	B		#	0.0045	
Cobalt	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0045	U		#	0.0045	
Cobalt	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0045	U		#	0.0045	
Cobalt	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0045	U		#	0.0045	
Cobalt	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0045	U		#	0.0045	
Cobalt	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0055	B		#	0.0045	
Cobalt	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0059	B		#	0.0045	
Cobalt	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0045	U		#	0.0045	
Cobalt	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0052	B		#	0.0045	
Cobalt-60	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	6.6	U		#	6.6	3.9
Cobalt-60	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	7.6	U		#	7.6	4.4
Cobalt-60	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	7.3	U		#	7.3	4.1
Cobalt-60	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	6	U		#	6	3.6
Cobalt-60	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	4.8	U		#	4.8	2.8
Cobalt-60	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	8.1	U		#	8.1	4.5
Cobalt-60	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	7.9	U		#	7.9	4.5
Cobalt-60	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	7.2	U		#	7.2	4.1
Cobalt-60	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	7.2	U		#	7.2	4.1
Copper	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0097	U		#	0.0097	
Copper	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0097	U		#	0.0097	
Copper	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0097	U		#	0.0097	
Copper	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0097	U		#	0.0097	
Copper	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0097	U		#	0.0097	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Copper	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0097	U		#	0.0097	
Copper	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0097	U		#	0.0097	
Copper	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0097	U		#	0.0097	
Copper	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0097	U		#	0.0097	
Dissolved Oxygen	mg/L	0274	SL	10/01/2010	0001	0	-	0	13.66			#		
Dissolved Oxygen	mg/L	0278	SL	10/01/2010	0001	0	-	0	13.52			#		
Dissolved Oxygen	mg/L	0279	SL	10/01/2010	0001	0	-	0	13.47			#		
Dissolved Oxygen	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	7.02			#		
Dissolved Oxygen	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	7.12			#		
Dissolved Oxygen	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	7.2			#		
Dissolved Oxygen	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	7.47			#		
Dissolved Oxygen	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	6.75			#		
Dissolved Oxygen	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	6.36			#		
Dissolved Oxygen	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	7.78			#		
Dissolved Oxygen	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	6.49			#		
Europium-152	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	44	U		#	44	25
Europium-152	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	45	U		#	45	26
Europium-152	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	37	U		#	37	21
Europium-152	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	33	U		#	33	19
Europium-152	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	24	U		#	24	14
Europium-152	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	46	U		#	46	26
Europium-152	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	45	U		#	45	26
Europium-152	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	39	U		#	39	22
Europium-152	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	40	U		#	40	23
Europium-154	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	54	U	U	#	54	30
Europium-154	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	55	U		#	55	31
Europium-154	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	50	U		#	50	29

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Europium-154	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	50	U	U	#	50	27
Europium-154	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	38	U		#	38	22
Europium-154	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	54	U		#	54	31
Europium-154	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	65	U	U	#	65	36
Europium-154	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	55	U	U	#	55	30
Europium-154	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	49	U		#	49	30
Europium-155	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	19	U		#	19	11
Europium-155	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	16	U		#	16	9.8
Europium-155	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	19	U		#	19	12
Europium-155	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	21	U		#	21	12
Europium-155	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	15.8	U		#	15.8	9.3
Europium-155	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	21	U		#	21	12
Europium-155	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	22	U		#	22	13
Europium-155	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	20	U		#	20	12
Europium-155	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	14.6	U		#	14.6	9
Fluoride	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	2	U		#	2	
Fluoride	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	2	U		#	2	
Fluoride	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	2	U		#	2	
Fluoride	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	2	U		#	2	
Fluoride	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	2.3			#	1	
Fluoride	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	2	U		#	2	
Fluoride	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	2	U		#	2	
Fluoride	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	2	U		#	2	
Fluoride	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	2	U		#	2	
Iron	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.88	B		#	0.049	
Iron	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.86	B		#	0.049	
Iron	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.74	B		#	0.049	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Iron	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.79	B		#	0.049	
Iron	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.72	B		#	0.049	
Iron	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.77	B		#	0.049	
Iron	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.74	B		#	0.049	
Iron	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.73	B		#	0.049	
Iron	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.72	B		#	0.049	
Lead	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.013	U		#	0.013	
Lead	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.013	U		#	0.013	
Lead	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.013	U		#	0.013	
Lead	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.013	U		#	0.013	
Lead	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.013	U		#	0.013	
Lead	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.013	U		#	0.013	
Lead	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.013	U		#	0.013	
Lead	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.013	U		#	0.013	
Lead	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.013	U		#	0.013	
Lead-212	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	11.4	U		#	11.4	6.8
Lead-212	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	12.4	U		#	12.4	7.4
Lead-212	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	12.6	U		#	12.6	7.4
Lead-212	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	13.6	U		#	13.6	8.2
Lead-212	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	11.5	U		#	11.5	6.9
Lead-212	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	11.6	U		#	11.6	6.8
Lead-212	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	14	U		#	14	8.5
Lead-212	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	11.4	U		#	11.4	6.8
Lead-212	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	12	U		#	12	7.2
Magnesium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	940			#	0.13	
Magnesium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	720			#	0.13	
Magnesium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	730			#	0.13	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Magnesium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	620			#	0.13	
Magnesium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	350			#	0.13	
Magnesium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	660			#	0.13	
Magnesium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	700			#	0.13	
Magnesium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	680			#	0.13	
Magnesium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	710			#	0.13	
Manganese	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	5.5			#	0.0011	
Manganese	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	2.6			#	0.0011	
Manganese	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	2.7			#	0.0011	
Manganese	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	5.1			#	0.0011	
Manganese	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	3.4			#	0.0011	
Manganese	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	2.8			#	0.0011	
Manganese	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	4.2			#	0.0011	
Manganese	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	4.1			#	0.0011	
Manganese	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	5.2			#	0.0011	
Mercury	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	9.7E-006	U		#	9.7E-006	
Mercury	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	9.7E-006	U		#	9.7E-006	
Nickel	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.041	B		#	0.0093	
Nickel	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.03	B		#	0.0093	
Nickel	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.012	B		#	0.0093	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Nickel	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.022	B		#	0.0093	
Nickel	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.015	B		#	0.0093	
Nickel	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.034	B		#	0.0093	
Nickel	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.012	B		#	0.0093	
Nickel	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.018	B		#	0.0093	
Nickel	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0093	U		#	0.0093	
Oxidation Reduction Potential	mV	0274	SL	10/01/2010	0001	0	-	0	129			#		
Oxidation Reduction Potential	mV	0278	SL	10/01/2010	0001	0	-	0	129			#		
Oxidation Reduction Potential	mV	0279	SL	10/01/2010	0001	0	-	0	133			#		
Oxidation Reduction Potential	mV	0810	WL	09/29/2010	0001	10.4	-	40.4	220.5			#		
Oxidation Reduction Potential	mV	0811	WL	09/30/2010	0001	8.6	-	38.6	185			#		
Oxidation Reduction Potential	mV	0812	WL	09/29/2010	0001	14.2	-	44.2	184.7			#		
Oxidation Reduction Potential	mV	0813	WL	09/30/2010	0001	14.4	-	44.4	172.4			#		
Oxidation Reduction Potential	mV	0814	WL	09/30/2010	0001	12.4	-	42.4	169.1			#		
Oxidation Reduction Potential	mV	0815	WL	09/29/2010	0001	21.7	-	51.7	204			#		
Oxidation Reduction Potential	mV	0816	WL	09/29/2010	0001	20.9	-	50.9	233.5			#		
Oxidation Reduction Potential	mV	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	196.4			#		
pH	s.u.	0274	SL	10/01/2010	0001	0	-	0	7.6			#		
pH	s.u.	0278	SL	10/01/2010	0001	0	-	0	7.7			#		
pH	s.u.	0279	SL	10/01/2010	0001	0	-	0	7.61			#		
pH	s.u.	0810	WL	09/29/2010	0001	10.4	-	40.4	7.02			#		
pH	s.u.	0811	WL	09/30/2010	0001	8.6	-	38.6	7.22			#		
pH	s.u.	0812	WL	09/29/2010	0001	14.2	-	44.2	7.13			#		
pH	s.u.	0813	WL	09/30/2010	0001	14.4	-	44.4	7.34			#		
pH	s.u.	0814	WL	09/30/2010	0001	12.4	-	42.4	7.28			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	0815	WL	09/29/2010	0001	21.7	-	51.7	7.03			#		
pH	s.u.	0816	WL	09/29/2010	0001	20.9	-	50.9	7.28			#		
pH	s.u.	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	7.08			#		
Potassium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	350			#	1.1	
Potassium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	220			#	1.1	
Potassium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	220			#	1.1	
Potassium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	170			#	1.1	
Potassium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	85			#	1.1	
Potassium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	190			#	1.1	
Potassium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	180			#	1.1	
Potassium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	210			#	1.1	
Potassium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	310			#	1.1	
Potassium-40	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	250		J	#	114	81
Potassium-40	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	122	U		#	122	76
Potassium-40	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	118	U		#	118	73
Potassium-40	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	110	U		#	110	68
Potassium-40	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	96	U		#	96	58
Potassium-40	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	126		J	#	120	77
Potassium-40	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	134		J	#	122	78
Potassium-40	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	119	U		#	119	73
Potassium-40	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	122	U		#	122	77
Promethium-144	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	8.8	U		#	8.8	5.2
Promethium-144	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	11.5	U		#	11.5	6.7
Promethium-144	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	10.3	U		#	10.3	6.1
Promethium-144	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	5.6	U		#	5.6	3.3
Promethium-144	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	4.4	U		#	4.4	2.7
Promethium-144	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	11.6	U		#	11.6	6.8

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Promethium-144	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	12	U		#	12	7
Promethium-144	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	10.4	U		#	10.4	6.1
Promethium-144	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	10.7	U		#	10.7	6.3
Promethium-146	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	6.7	U		#	6.7	3.9
Promethium-146	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	7.3	U		#	7.3	4.3
Promethium-146	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	6.4	U		#	6.4	3.8
Promethium-146	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	6.4	U		#	6.4	3.8
Promethium-146	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	5.3	U		#	5.3	3.1
Promethium-146	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	6.9	U		#	6.9	3.9
Promethium-146	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	6.9	U		#	6.9	4.2
Promethium-146	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	7	U		#	7	4.1
Promethium-146	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	7	U		#	7	4.1
Ruthenium-106	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	55	U		#	55	33
Ruthenium-106	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	60	U		#	60	35
Ruthenium-106	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	61	U		#	61	35
Ruthenium-106	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	59	U		#	59	34
Ruthenium-106	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	44	U		#	44	26
Ruthenium-106	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	60	U		#	60	35
Ruthenium-106	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	64	U		#	64	36
Ruthenium-106	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	58	U		#	58	34
Ruthenium-106	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	61	U		#	61	34
Selenium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.058			#	0.027	
Selenium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.057			#	0.027	
Selenium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.027	U		#	0.027	
Selenium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.048	B		#	0.027	
Selenium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.027	U		#	0.027	
Selenium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.064			#	0.027	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.066			#	0.027	
Selenium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.048	B		#	0.027	
Selenium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.054			#	0.027	
Silver	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.011	U		#	0.011	
Silver	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.011	U		#	0.011	
Silver	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.011	U		#	0.011	
Silver	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.011	U		#	0.011	
Silver	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.011	U		#	0.011	
Silver	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.011	U		#	0.011	
Silver	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.011	U		#	0.011	
Silver	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.011	U		#	0.011	
Silver	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.011	U		#	0.011	
Sodium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	5100			#	0.33	
Sodium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	3200			#	0.33	
Sodium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	3200			#	0.33	
Sodium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	3600			#	0.33	
Sodium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	1300			#	0.066	
Sodium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	4300			#	0.33	
Sodium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	4700			#	0.33	
Sodium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	4800			#	0.33	
Sodium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	6700			#	0.33	
Specific Conductance	µmhos/cm	0274	SL	10/01/2010	0001	0	-	0	2054			#		
Specific Conductance	µmhos/cm	0278	SL	10/01/2010	0001	0	-	0	1720			#		
Specific Conductance	µmhos/cm	0279	SL	10/01/2010	0001	0	-	0	1775			#		
Specific Conductance	µmhos/cm	0810	WL	09/29/2010	0001	10.4	-	40.4	30472			#		

Specific Conductance	µmhos /cm	0811	WL	09/30/2010	0001	8.6	-	38.6	22218		#	
Specific Conductance	µmhos /cm	0812	WL	09/29/2010	0001	14.2	-	44.2	24093		#	
Specific Conductance	µmhos /cm	0813	WL	09/30/2010	0001	14.4	-	44.4	12410		#	
Specific Conductance	µmhos /cm	0814	WL	09/30/2010	0001	12.4	-	42.4	25967		#	
Specific Conductance	µmhos /cm	0815	WL	09/29/2010	0001	21.7	-	51.7	27115		#	
Specific Conductance	µmhos /cm	0816	WL	09/29/2010	0001	20.9	-	50.9	26289		#	
Specific Conductance	µmhos /cm	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	38297		#	
Temperature	C	0274	SL	10/01/2010	0001	0	-	0	16.02		#	
Temperature	C	0278	SL	10/01/2010	0001	0	-	0	16.45		#	
Temperature	C	0279	SL	10/01/2010	0001	0	-	0	16.77		#	
Temperature	C	0810	WL	09/29/2010	0001	10.4	-	40.4	17.33		#	
Temperature	C	0811	WL	09/30/2010	0001	8.6	-	38.6	16.95		#	
Temperature	C	0812	WL	09/29/2010	0001	14.2	-	44.2	18.23		#	
Temperature	C	0813	WL	09/30/2010	0001	14.4	-	44.4	19.39		#	
Temperature	C	0814	WL	09/30/2010	0001	12.4	-	42.4	18.18		#	
Temperature	C	0815	WL	09/29/2010	0001	21.7	-	51.7	19.55		#	
Temperature	C	0816	WL	09/29/2010	0001	20.9	-	50.9	19.36		#	
Temperature	C	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	17.8		#	
Thallium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.035	U	#	0.035
Thallium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.035	U	#	0.035
Thallium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.035	U	#	0.035
Thallium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.035	U	#	0.035
Thallium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.035	U	#	0.035
Thallium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.035	U	#	0.035
Thallium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.035	U	#	0.035
Thallium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.035	U	#	0.035

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thallium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04 - 60.04	0.035	U		#	0.035	
Thorium-228	pCi/L	0810	WL	09/29/2010	0001	10.4 - 40.4	0.99	U,M		#	0.99	0.55
Thorium-228	pCi/L	0811	WL	09/30/2010	0001	8.6 - 38.6	1.46	U,M		#	1.46	0.82
Thorium-228	pCi/L	0811	WL	09/30/2010	0002	8.6 - 38.6	1.9	U,M		#	1.9	1.1
Thorium-228	pCi/L	0812	WL	09/29/2010	0001	14.2 - 44.2	0.93	U,M		#	0.93	0.54
Thorium-228	pCi/L	0813	WL	09/30/2010	0001	14.4 - 44.4	0.68	U,M		#	0.68	0.4
Thorium-228	pCi/L	0814	WL	09/30/2010	0001	12.4 - 42.4	2.7	U,M		#	2.7	1.7
Thorium-228	pCi/L	0815	WL	09/29/2010	0001	21.7 - 51.7	2.2	U,M		#	2.2	1.2
Thorium-228	pCi/L	0816	WL	09/29/2010	0001	20.9 - 50.9	1.17	U,M		#	1.17	0.66
Thorium-228	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04 - 60.04	1.8	U,M		#	1.8	1.1
Thorium-230	pCi/L	0810	WL	09/29/2010	0001	10.4 - 40.4	1	U,M		#	1	0.61
Thorium-230	pCi/L	0811	WL	09/30/2010	0001	8.6 - 38.6	1.56	U,M		#	1.56	0.91
Thorium-230	pCi/L	0811	WL	09/30/2010	0002	8.6 - 38.6	1.69	U,M		#	1.69	0.9
Thorium-230	pCi/L	0812	WL	09/29/2010	0001	14.2 - 44.2	1.1	U,M		#	1.1	0.6
Thorium-230	pCi/L	0813	WL	09/30/2010	0001	14.4 - 44.4	0.82	U,M		#	0.82	0.44
Thorium-230	pCi/L	0814	WL	09/30/2010	0001	12.4 - 42.4	2.9	U,M		#	2.9	1.6
Thorium-230	pCi/L	0815	WL	09/29/2010	0001	21.7 - 51.7	2.7	U,M		#	2.7	1.5
Thorium-230	pCi/L	0816	WL	09/29/2010	0001	20.9 - 50.9	1.32	U,M		#	1.32	0.69
Thorium-230	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04 - 60.04	1.67	U,M		#	1.67	0.93
Thorium-232	pCi/L	0810	WL	09/29/2010	0001	10.4 - 40.4	0.29			#	0.07	0.17
Thorium-232	pCi/L	0811	WL	09/30/2010	0001	8.6 - 38.6	0.38	M3	J	#	0.28	0.27
Thorium-232	pCi/L	0811	WL	09/30/2010	0002	8.6 - 38.6	0.62	U,M	J	#	0.62	0.41
Thorium-232	pCi/L	0812	WL	09/29/2010	0001	14.2 - 44.2	0.26	U,M	U	#	0.26	0.15
Thorium-232	pCi/L	0813	WL	09/30/2010	0001	14.4 - 44.4	0.14	LT	J	#	0.06	0.11
Thorium-232	pCi/L	0814	WL	09/30/2010	0001	12.4 - 42.4	0.84	M3	J	#	0.56	0.57
Thorium-232	pCi/L	0815	WL	09/29/2010	0001	21.7 - 51.7	0.5	U,M	U	#	0.5	0.37

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Thorium-232	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.39	M3	J	#	0.29	0.28
Thorium-232	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.56	U,M	U	#	0.56	0.36
Thorium-234	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	445	LT		#	128	95
Thorium-234	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	460	LT		#	140	100
Thorium-234	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	680	LT		#	140	120
Thorium-234	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	390	LT,TI	J	#	140	100
Thorium-234	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	277	LT	J	#	122	83
Thorium-234	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	530	LT		#	140	110
Thorium-234	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	640	LT		#	150	120
Thorium-234	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	500	LT		#	140	100
Thorium-234	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	640	LT		#	140	120
Total Dissolved Solids	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	27000			#	400	
Total Dissolved Solids	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	18000			#	400	
Total Dissolved Solids	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	18000			#	400	
Total Dissolved Solids	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	19000			#	400	
Total Dissolved Solids	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	8200			#	400	
Total Dissolved Solids	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	21000			#	400	
Total Dissolved Solids	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	23000			#	400	
Total Dissolved Solids	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	22000			#	400	
Total Dissolved Solids	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	29000			#	400	
Turbidity	NTU	0810	WL	09/29/2010	0001	10.4	-	40.4	177			#		
Turbidity	NTU	0811	WL	09/30/2010	0001	8.6	-	38.6	26.4			#		
Turbidity	NTU	0812	WL	09/29/2010	0001	14.2	-	44.2	1.49			#		
Turbidity	NTU	0813	WL	09/30/2010	0001	14.4	-	44.4	12.2			#		
Turbidity	NTU	0814	WL	09/30/2010	0001	12.4	-	42.4	36.5			#		
Turbidity	NTU	0815	WL	09/29/2010	0001	21.7	-	51.7	2.08			#		
Turbidity	NTU	0816	WL	09/29/2010	0001	20.9	-	50.9	1.55			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	1.02			#		
Uranium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	3.5			#	0.00058	
Uranium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	2.7			#	0.00058	
Uranium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	2.5			#	0.00058	
Uranium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	2.3			#	0.00058	
Uranium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.94			#	0.00058	
Uranium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	2.7			#	0.00058	
Uranium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	3.4			#	0.00058	
Uranium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	2.3			#	0.00058	
Uranium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	3			#	0.00058	
Uranium-234	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	1000	M3		#	0	180
Uranium-234	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	830	M3		#	0	140
Uranium-234	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	910	M3		#	0	150
Uranium-234	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	850	Y2,M3	J	#	0	140
Uranium-234	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	386	M3		#	1	65
Uranium-234	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	1010	M3		#	0	170
Uranium-234	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	1130	M3		#	0	190
Uranium-234	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	860	M3		#	0	150
Uranium-234	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	1050	M3		#	0	180
Uranium-235	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	43.6	M3	J	#	0.9	9.6
Uranium-235	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	44	LT		#	39	20
Uranium-235	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	47	LT		#	44	20
Uranium-235	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	52.1	M3		#	0.8	10
Uranium-235	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	36	U		#	36	23
Uranium-235	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	43.4	M3		#	0.4	8.9
Uranium-235	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	34.4	Y2,M3	J	#	0.9	7

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Uranium-235	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	39	U	J	#	39	24
Uranium-235	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	19.3	M3		#	0.5	4
Uranium-235	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	31	U		#	31	17
Uranium-235	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	37	LT	J	#	35	20
Uranium-235	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	50	M3	J	#	2	11
Uranium-235	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	46	LT	J	#	36	18
Uranium-235	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	54	M3	J	#	1	11
Uranium-235	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	38	U		#	38	22
Uranium-235	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	40.9	M3		#	0.4	8.6
Uranium-235	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	38	LT	J	#	37	21
Uranium-235	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	54	M3	J	#	1	11
Uranium-238	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	1030	M3		#	0	190
Uranium-238	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	820	M3		#	0	140
Uranium-238	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	880	M3		#	0	150
Uranium-238	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	820	Y2,M3	J	#	0	140
Uranium-238	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	392	M3		#	0	66
Uranium-238	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	1030	M3		#	0	170
Uranium-238	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	1090	M3		#	0	180
Uranium-238	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	810	M3		#	0	140
Uranium-238	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	1040	M3		#	0	180
Vanadium	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0053	U		#	0.0053	
Vanadium	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0053	U		#	0.0053	
Vanadium	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0053	U		#	0.0053	
Vanadium	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0053	U		#	0.0053	
Vanadium	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.016	B		#	0.0053	
Vanadium	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0078	B		#	0.0053	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Vanadium	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0053	U		#	0.0053	
Vanadium	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0053	U		#	0.0053	
Vanadium	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0053	U		#	0.0053	
Yttrium-88	pCi/L	0810	WL	09/29/2010	0001	10.4	-	40.4	8.7	U		#	8.7	5.1
Yttrium-88	pCi/L	0811	WL	09/30/2010	0001	8.6	-	38.6	8.9	U		#	8.9	5.4
Yttrium-88	pCi/L	0811	WL	09/30/2010	0002	8.6	-	38.6	9.2	U		#	9.2	5.3
Yttrium-88	pCi/L	0812	WL	09/29/2010	0001	14.2	-	44.2	8.6	U		#	8.6	5
Yttrium-88	pCi/L	0813	WL	09/30/2010	0001	14.4	-	44.4	7.6	U		#	7.6	4.6
Yttrium-88	pCi/L	0814	WL	09/30/2010	0001	12.4	-	42.4	9.5	U		#	9.5	5.6
Yttrium-88	pCi/L	0815	WL	09/29/2010	0001	21.7	-	51.7	9.6	U		#	9.6	5.7
Yttrium-88	pCi/L	0816	WL	09/29/2010	0001	20.9	-	50.9	8.8	U		#	8.8	5.1
Yttrium-88	pCi/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	9.5	U		#	9.5	5.5
Zinc	mg/L	0810	WL	09/29/2010	0001	10.4	-	40.4	0.0072	U		#	0.0072	
Zinc	mg/L	0811	WL	09/30/2010	0001	8.6	-	38.6	0.0072	U		#	0.0072	
Zinc	mg/L	0811	WL	09/30/2010	0002	8.6	-	38.6	0.0072	U		#	0.0072	
Zinc	mg/L	0812	WL	09/29/2010	0001	14.2	-	44.2	0.0072	U		#	0.0072	
Zinc	mg/L	0813	WL	09/30/2010	0001	14.4	-	44.4	0.0072	U		#	0.0072	
Zinc	mg/L	0814	WL	09/30/2010	0001	12.4	-	42.4	0.0072	U		#	0.0072	
Zinc	mg/L	0815	WL	09/29/2010	0001	21.7	-	51.7	0.0072	U		#	0.0072	
Zinc	mg/L	0816	WL	09/29/2010	0001	20.9	-	50.9	0.0072	U		#	0.0072	
Zinc	mg/L	SMI-PW02	WL	09/29/2010	0001	20.04	-	60.04	0.0072	U		#	0.0072	

BLS = below land surface; C = centigrade; µmhos/cm = micromhos per centimeter; mV = millivolt; NTU = nephelometric turbidity unit; SL = surface location; S.U. = standard unit; TS = treatment system; WL = well

Appendix C. Water Quality Data (continued)

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	Tentatively identified compound is a suspected aldol-condensation product.
B	Inorganic: Result is between the instrument detection limit and contract-required detection limit. Organic: Analyte also found in method blank.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference; see case narrative.
H	Holding time expired; value suspect.
I	Increased detection limit due to required dilution.
J	Estimated.
L3	Result is less than requested MDC, but greater than sample-specific MDC.
M	Requested MDC not met.
M3	Requested MDC not met, but reported activity greater than reported MDC.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound.
P	> 25% difference in detected pesticide or Aroclor concentrations between two columns.
T1	Gamma: Nuclide identification tentative.
U	Analytical result below detection limit.
W	Postdigestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier; see case narrative.
Y2	Chemical yield outside default limits.

DATA QUALIFIERS:

F	Low-flow sampling method used.	G	Possible grout contamination; pH > 9.	J	Estimated value.
L	Less than three 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 D.
Water Level Data

Appendix D. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 12/17/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0810		3961.88	09/29/2010		9.25	3952.63	
0812		3961.41	09/29/2010		9.4	3952.01	
0813		3963.44	09/30/2010		9.55	3953.89	
0814		3960.98	09/30/2010		12.9	3948.08	
0815		3963.14	09/29/2010		15.39	3947.75	
0816		3961.87	09/29/2010		18.95	3942.92	
SMI-PW02	O	3967.48	09/29/2010		16.25	3951.23	

Flow Codes: B = background; C = cross gradient; D = downgradient; O = on site; U = upgradient
Water Level Flags: D = dry

Attachment 1.
IA Well Field Monthly Sampling Trip Report

Attachment 1. IA Well Field Monthly Sampling Trip Report

Moab TAC Team

DATE: October 13, 2010

TO: K. Pill

FROM: James Ritchey

SUBJECT: September 2010 Monthly Sampling Trip Report

Site: Moab, Utah

Date of Sampling Event: September 29 – October 1, 2010

Team Members: Elizabeth Glowiak, Tyler Meadows, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 1009052.

Sample Shipment: All samples were shipped in three coolers overnight UPS to ALS Laboratory Group from Moab, Utah, on October 1, 2010 (Tracking Nos. 4492244017, 4493420020, and 4492242439).

September 2010 CF4 Sampling

Number of Locations Sampled: Three surface water locations (0274, 0278, and 0279) were sampled for ammonia analysis during the September 2010 sampling event.

Locations Not Sampled: None.

Field Variance: Samples were analyzed for ammonia only.

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

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0274	10/01/2010	08:13	0	Collected across channel, approximately 4 inches deep, while initial action was running
0278	10/01/2010	08:28	0	Collected while initial action was running
0279	10/01/2010	07:58	0	Collected while initial action was running

SW = surface water

Attachment 1. IA Well Field Monthly Sampling Trip Report (continued)

September 2010 CF5 Sampling

Number of Locations Sampled: Eight extraction wells (0810, 0811, 0812, 0813, 0814, 0815, 0816, and SMI-PW02) were sampled. Including one duplicate, a total of nine samples were collected during the September 2010 monthly sampling event.

Locations Not Sampled: None.

Field Variance: None.

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
2000	NA	Duplicate	Ground Water	SEP 007

ID = identification

Location-specific Information – Extraction Wells: Extraction wells were sampled using dedicated submersible pumps. Samples were collected into open containers and filtered using dedicated flexible tubing. Sample depths and water levels for each extraction well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Pump Intake (ft bgs)
0810	09/30/2010	14:35	9.25	35
0811	09/30/2010	14:55	NA	35
0812	09/29/2010	16:22	9.40	40
0813	09/30/2010	15:35	9.55	40
0814	09/30/2010	16:15	12.90	40
0815	09/29/2010	15:43	25.39	45
0816	09/29/2010	14:40	18.95	45
SMI-PW02	09/29/2010	16:05	16.25	55

ft bgs = feet below ground surface; ft btoc = feet below top of casing; NA = not available

Site Issues: According to the USGS Cisco gauging station (station number 09180500), the mean daily Colorado River flows during this sampling event were as follows.

Date	Daily Mean Flow (cfs)
09/29/2010	3,480
09/30/2010	3,400
10/01/2010	3,390

Equipment Issues: None.

Corrective Action Required/Taken: None.