

Office of Environmental Management – Grand Junction



Moab UMTRA Project
October 2010 Validation Data Package
for the Site-wide Ground Water
Sampling Event

January 2011



U.S. Department
of Energy

Office of Environmental Management

**Moab UMTRA Project
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the Site-wide Ground Water Sampling Event**

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Revision 0

Review and Approval

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1/25/11

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Revision History

Revision No.	Date	Reason/Basis for Revision
0	January 2011	Initial issue.

Table of Contents

Section	Page
Acronyms and Abbreviations.....	v
1.0 Introduction	1
1.1 Summary Criteria.....	1
1.2 Sampling Event Summary	5
1.3 Sampling and Analyses.....	11
2.0 Data Assessment Summary	11
2.1 Water Sampling Field Activities Verification	12
2.2 Laboratory Performance Assessment	12
2.3 Field Analyses/Activities.....	17
2.4 Certification	17
3.0 Data Presentation.....	17
3.1 Minimums and Maximums Report.....	17
3.2 Anomalous Data Review	18
3.3 Water Quality Data	18
3.4 Water Level Data.....	18
3.5 Blanks Report.....	18
3.6 Conclusions.....	18

Tables

Table 1. Ground Water Locations Sampled that Exceeded Selenium and Uranium Ground Water Standards.....	2
Table 2. Surface Water Uranium Concentrations Compared to the Uranium Ground Water Standard.....	2
Table 3. Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria	3
Table 4. Comparison of Sampling Results from the October 2010 Event to the January 2009 and October 2009 Site-wide Sampling Events	5
Table 5. Analytes and Methods.....	12
Table 6. Data Qualifiers	12
Table 7. Reason Codes for Data Flags.....	13

Figures

Figure 1. October 2010 Site-wide Ground Water Sampling Locations	4
Figure 2. Floodplain Wells Time Versus Ammonia Total (as N) Concentration Plot.....	7
Figure 3. Floodplain Wells Time Versus TDS Concentration Plot.....	8
Figure 4. Floodplain Wells Time Versus Uranium Concentration Plot.....	8
Figure 5. Floodplain Wells TP-17 and TP-19 Uranium Concentration Comparison to the UMTRA Standard.....	9
Figure 6. Wells 0453, ATP-2-S, and ATP-2-D Time Versus Ammonia Total (as N) Concentration Plot	10
Figure 7. Wells 0453, ATP-2-S, and ATP-2-D Time Versus TDS Concentration Plot.....	10
Figure 8. Wells 0453, ATP-2-S, and ATP-2-D Time Versus Uranium Concentration Plot.....	11

Appendices

Appendix A.	Water Sampling Field Activities Verification	A-1
Appendix B.	Minimums and Maximums Report	B-1
Appendix C.	Water Quality Data	C-1
Appendix D.	Water Level Data	D-1
Appendix E.	Blanks Report.....	E-1

Attachment

Attachment 1.	October 2010 Site-wide Sampling Event
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Acronyms and Abbreviations

bgs	below ground surface
CCB	continuing calibration blank
CCV	continuing calibration verification
CF	Configuration
cfs	cubic feet per second
COC	chain of custody
CRI	reporting limit verification
EB	equipment blank
EDD	electronic data deliverable
EPA	Environment Protection Agency
ft	feet
gpm	gallons per minute
IA	interim action
ICS	interference check sample
ICP	inductively coupled plasma
ICV	initial calibration verification
IDL	instrument detection limit
LCS	laboratory control samples
MB	method blank
MDL	method detection limit
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
r ²	coefficient correlation
RDL	required detection limit
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
RS	replicate sample
SD	serial dilution
SDG	sample data group
TDS	total dissolved solids
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 “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, the Minimums and Maximums Report table, and the Blanks 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 October 2010 site-wide sampling event that was completed between October 19 and November 2, 2010. Ground water and surface water samples were collected from various locations across the site. Samples were also collected from locations typically sampled during the routine sampling events. All samples were analyzed for the standard analyte suite of ammonia as N, total dissolved solids (TDS), uranium, and in some cases, selenium.

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 October 2010 site-wide sampling event.

1.1 Summary Criteria

Site: Moab, Utah

Sampling Period: October 19 through November 2, 2010

The purpose of the site-wide sampling event was to monitor any changes in the water chemistry across the site. The standard routine sampling event locations were also added to this sampling event to monitor the site during base-flow conditions of the Colorado River. A total of 47 monitoring wells were sampled during this event (with one location sampled from two different depths). Seven surface water locations were sampled. Including three duplicates and one equipment blank (EB), a total of 59 samples were collected during the sampling event.

1. As a result of this sampling round, is there any indication of unexpected contaminated ground water movement?

There is no indication of unexpected contaminated ground water movement along the bank of the Colorado River. As expected, contaminant concentrations in October 2010 in some instances

increased compared to the concentrations measured during the sampling event completed in May 2010, especially in areas of the site influenced by the relatively lower river stage. Wells that exceeded water quality standards are listed in Table 1.

All locations listed in Table 1 have historically exceeded the selenium or uranium standards.

Table 1. Ground Water Locations Sampled that Exceeded Selenium and Uranium Ground Water Standards

Analyte	Standard (mg/L)	Locations Exceeding Standards
Selenium	0.01	0401 (0.012), 0404 (0.014), 0412 (0.029), 0413 (0.14), 0414 (0.072), 0440 (0.037), 0456 (0.024), SMI-PZ3S (0.026), and TP-19 (0.029)
Uranium	0.044	0401 (2.2), 0403 (1.0), 0404 (1.0), 0407 (0.65), 0410 (1.1), 0411 (3.9), 0412 (4.1), 0413 (1.1), 0414 (4.9), 0453 (1.8), 0454 (2.4), 0492 (0.51), AMM-2 (1.9), AMM-3 (1.6), SMI-MW01 (5.6), SMI-PW03 (1.3), SMI-PZ2D (0.54), SMI-PZ2M2 (1.4), SMI-PZ3D2 (1.4), SMI-PZ3M (1.5), SMI-PZ3S (1.8), TP-01 (0.079), TP-02 (0.87), TP-22 (0.37), and TP-23 (3.0)

mg/L = milligrams per liter

2. Is there statistical evidence that contaminants related to the Moab UMTRA Project were detected in a surface body of water in greater concentrations than upstream ambient water quality?

Since the monitoring of the site began, site contaminants have periodically occurred in surface water locations at elevated concentrations, primarily in isolated pools or slow-moving backwater areas during periods of low river stage adjacent to and just downstream from the tailings. However, the results from this October 2010 event indicate contaminant concentrations in the backwater areas are indistinguishable from background concentrations in the main channel of the Colorado River.

Table 2 compares the surface water uranium concentrations to the UMTRA ground water standard of 0.044 milligrams per liter (mg/L). This standard was used for comparison purposes due to the fact that there is no applicable surface water standard for uranium. Of the surface water samples collected during this event, all samples were below this ground water standard.

Table 2. Surface Water Uranium Concentrations Compared to the Uranium Ground Water Standard

Loc	Date	Uranium (mg/L)	UMTRA Ground Water Standard (mg/L)
0201	11/1/10	0.0059	0.044
0218	10/27/10	0.0059	
0226	10/27/10	0.006	
0228	11/1/10	0.0062	
CR1	11/1/10	0.0052	
CR3	10/27/10	0.0081	
CR5	11/1/10	0.0058	

Loc = Location

Table 3 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. As shown in Table 3, the ammonia concentrations in all surface water samples collected during the October 2010 sampling event did not exceed the acute or chronic criteria.

Table 3. Surface Water Ammonia Concentrations and Comparisons to State of Utah and Federal Criteria

Loc	Date	Temp (°C)	pH	Ammonia as N (mg/L)	State/Federal AWQC-Acute Total as N (mg/L) ¹	State/Federal AWQC-Chronic Total as N (mg/L) ²
0201	11/1/10	9.3	7.96	0.18	5.62	2.43
0218	10/27/10	10.7	7.98	0.1	5.62	2.43
0226	10/27/10	11.6	8.18	0.18	3.83	1.79
0228	11/1/10	10.4	8.01	0.17	5.62	2.43
CR1	11/1/10	9.4	7.67	0.1	9.65	3.58
CR3	10/27/10	12.7	7.83	0.22	8.11	3.18
CR5	11/1/10	10.7	8.78	0.1	1.23	0.66

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

3. 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. There are two anomalous data points; however, they do not appear to be related to site operations or changes in the river flow.

4. Were all interim action (IA) well field pumps operating within the planned parameters?

Yes. Configuration (CF) 5 wells were actively extracting ground water during the time this event at a total rate of approximately 45 gallons per minute (gpm). Ground water extraction was limited to this rate in order to control the evaporation pond level. In addition, CF4 wells were injecting freshwater at a total of approximately 25 gpm.

5. Was the evaporation pond functioning properly?

Yes. The evaporation pond level ranged from 9.7 to 10.0 feet (ft) during this event.

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

No. Wells 0437, 0438, and 0439, all of which are located on top of the tailings pile, were not accessible due to excavation operations.

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

No.

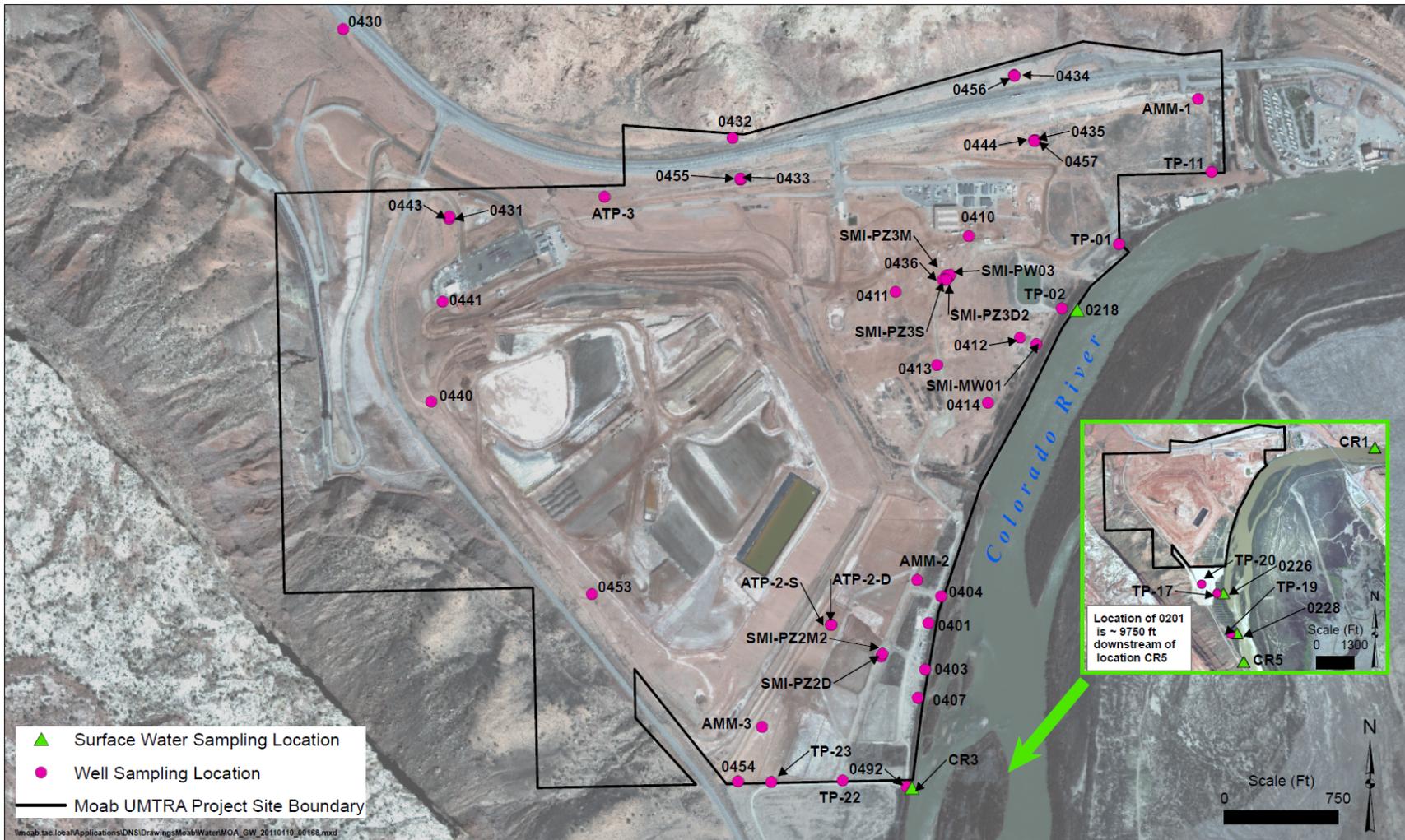


Figure 1. October 2010 Site-wide Ground Water Sampling Locations (may include locations not sampled)

1.2 Sampling Event Summary

This VDP presents the validated data associated with the ground water and surface water samples collected during the October 2010 site-wide 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). 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. 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 ammonia and uranium concentration trends based on the October 2010 data is provided. A total of 59 ground water and surface water samples were collected from 58 locations during this event (samples were collected from two depths at location AMM-1). Table 4 presents the results of this event in addition to the locations sampled as part of the October 2010 site-wide event.

Table 4. Comparison of Sampling Results from the October 2010 Event to the January 2009 and October 2009 Site-wide Sampling Events

Location	Ammonia Data (mg/L)			Uranium Data (mg/L)		
	Oct 2010	Oct 2009	Jan 2009	Oct 2010	Oct 2009	Jan 2009
0410	undetected	undetected	0.1	1.1	0.64	0.73
0411	4.6			3.9		
0412	undetected			4.1		
0413	11	12	11	1.1	1.1	1.5
0414	15			4.9		
0430	undetected	undetected	0.1	0.01	0.011	0.012
0431	undetected	undetected	0.1	.001	0.011	0.01
0432	undetected	undetected	0.1	0.0018	0.002	0.002
0433	undetected	undetected	0.1	0.0018	0.002	0.002
0434	0.11	0.12	0.1	0.022	0.023	0.023
0435	1.9	1.9	2	0.021	0.025	0.022
0436	3.4	3.4	3.4	0.0076	0.011	0.007
0440	undetected	undetected	0.1	0.034	0.033	0.043
0441	undetected			0.033		
0443	undetected	undetected	0.1	0.011	0.012	0.012
0444	1.8	1.8	1.8	0.02	0.021	0.017
0453	510			1.8		
0454	610			2.4		
0455	0.22	undetected	0.1	0.0023	0.003	0.005

Table 4. Comparison of Sampling Results from the October 2010 Event to the January 2009 and October 2009 Site-wide Sampling Events (continued)

Location	Ammonia Data (mg/L)			Uranium Data (mg/L)		
	Oct 2010	Oct 2009	Jan 2009	Oct 2010	Oct 2009	Jan 2009
0456	undetected	undetected	0.1	0.024	0.024	0.027
0457	undetected	0.1	0.1	0.0018	0.022	0.002
AMM-1	undetected undetected		0.1 (15') 0.1 (53')	0.005 0.0049		0.005 (15') 0.005 (53')
AMM-2	890	500	660	1.9	2.2	2.1
AMM-3	220	230	240	1.6	1.8	1.7
ATP-2-D	430		3.6	0.021		0.001
ATP-2-S	440			0.0019		
ATP-3	undetected	undetected	0.1	0.0026	0.03	0.003
SMI-MW01	2.0	1.8	1.5	5.6	4.9	4.4
SMI-PW03	38	43	35	1.3	1.4	0.6
SMI-PZ2D	830	760	1200	0.54	0.63	0.55
SMI-PZ2M2	700	1200	1500	1.4	1.2	1.3
SMI-PZ3D2	410	450	510	1.4	1.7	1.9
SMI-PZ3M	64	74	67	1.5	1.7	1.9
SMI-PZ3S	3.3	3	3.8	1.8	2.4	1.7
TP-01	undetected	undetected	0.12	0.079	0.10	0.12
TP-02	0.21			0.87		
TP-11	.065	0.65	0.68	0.001	1.4	0.001
TP-20	3.3	2.9	3.3	0.012	0.023	0.005
TP-22	undetected			0.37		
TP-23	540			3.0		

In general, all concentrations were consistent with those measured in October and January 2009. The one exception would be the ammonia concentration measured in the sample collected from AMM-2, which increased from 500 mg/L in October 2009 to 890 mg/L 1 year later. Incidentally, the uranium concentration at this location remained consistent with the previous measurements.

In addition, time versus concentration (ammonia, TDS, and uranium) plots for selected routine sampling locations over the past 2 years are presented to display historical trends exhibited by the data. Colorado River flows over the same time frame are also plotted to determine the influences of the magnitude of river flows on analyte concentrations.

Flood Plain Wells

Time concentration plots were generated for wells TP-02, 0492, TP-17, and TP-19 (locations listed from north to south). These plots exhibit that samples collected from wells TP-02, TP-17, and TP-19 have historically contained low ammonia concentrations (Figure 2), while the concentration detected from well 0492 has fluctuated between approximately 10 and 90 mg/L over the past 2 years, exhibiting low concentrations in response to inflow of fresh water from the Colorado. In October 2010, location 0492 had an historic low ammonia concentration of 1.1 mg/L.

The TDS plot (Figure 3) graphically shows that locations TP-17 and TP-19 are screened within the brine, while locations TP-02 and 0492 are screened above the brine/freshwater interface.

Seasonal changes in the TDS concentration suggest freshwater inflow significantly lowers TDS concentrations in TP-17 during above average spring runoff river stages in the Colorado River. Well TP-02 has consistently contained less than 6,000 mg/L TDS.

Over the past 2 years, uranium concentrations have fluctuated in response to inflow of freshwater from the river in samples collected from 0492 and TP-02, and the samples collected in October 2010 continues this trend (Figure 4). As Figure 5 exhibits, uranium concentrations measured in samples collected from TP-17 have not been above the uranium standard (0.044 mg/L) over the past 2 years.

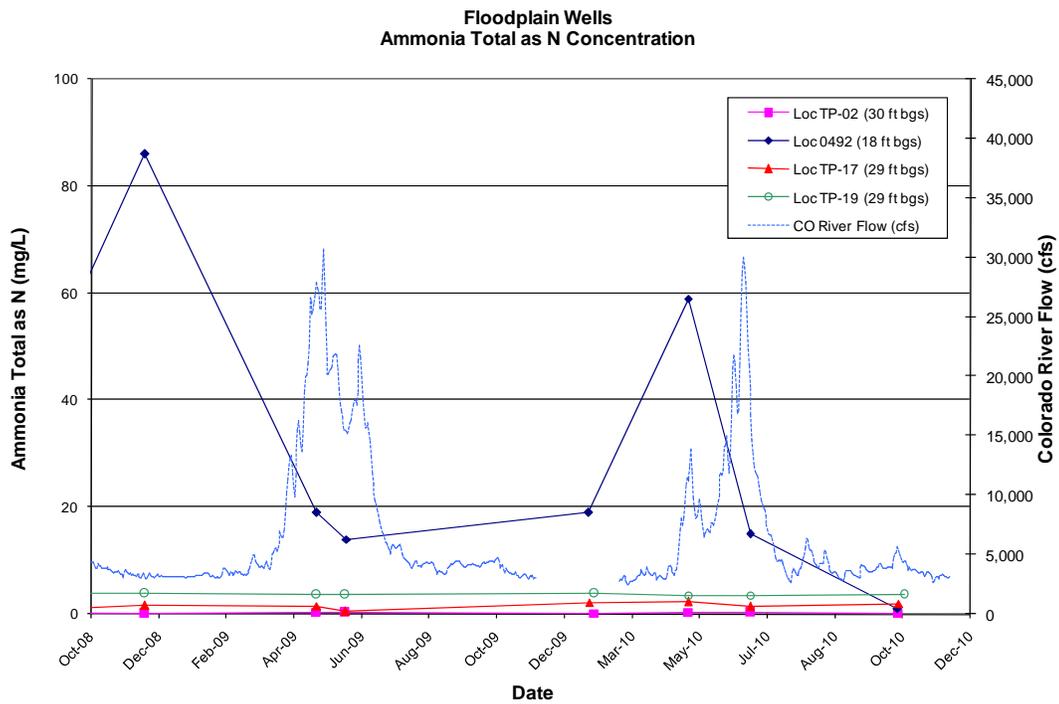


Figure 2. Floodplain Wells Time Versus Ammonia Total (as N) Concentration Plot

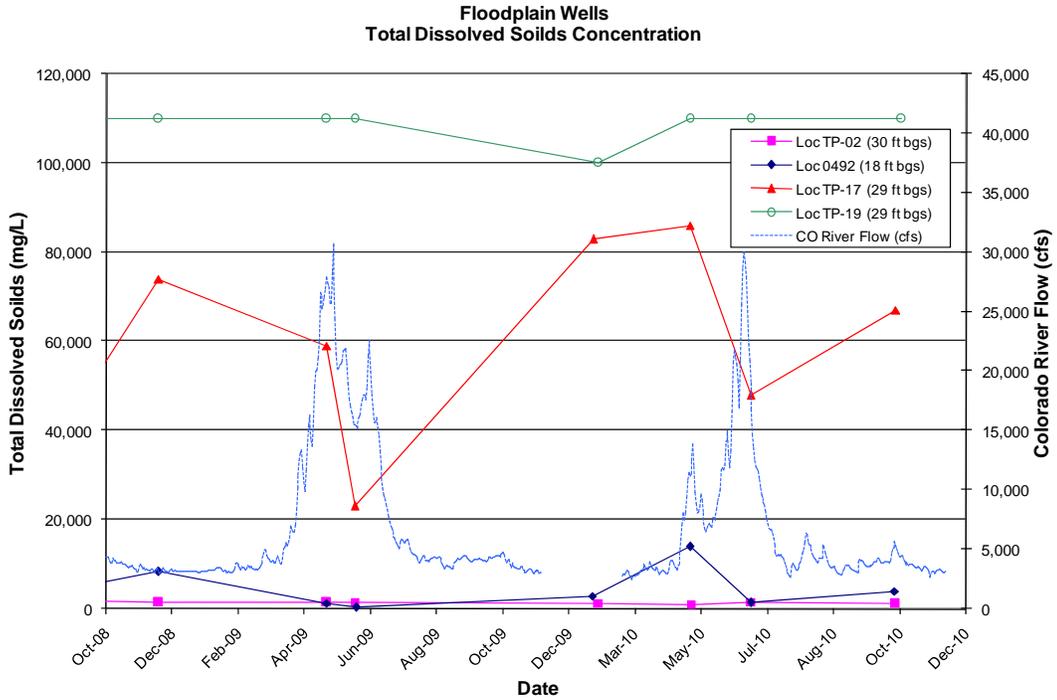


Figure 3. Floodplain Wells Time Versus TDS Concentration Plot

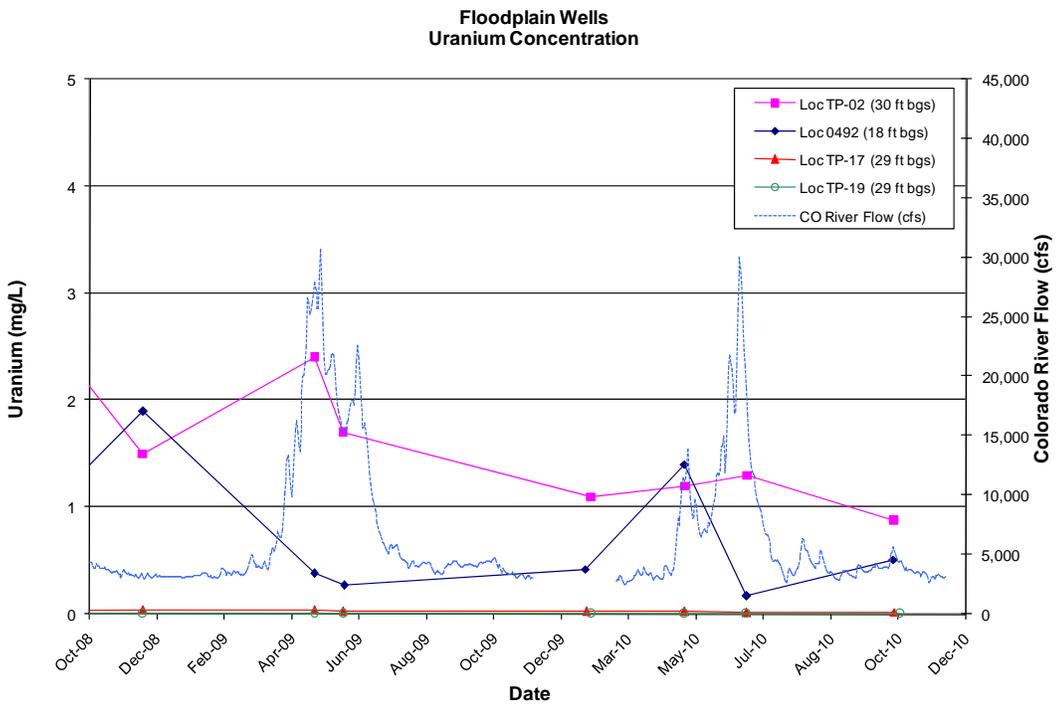


Figure 4. Floodplain Wells Time Versus Uranium Concentration Plot

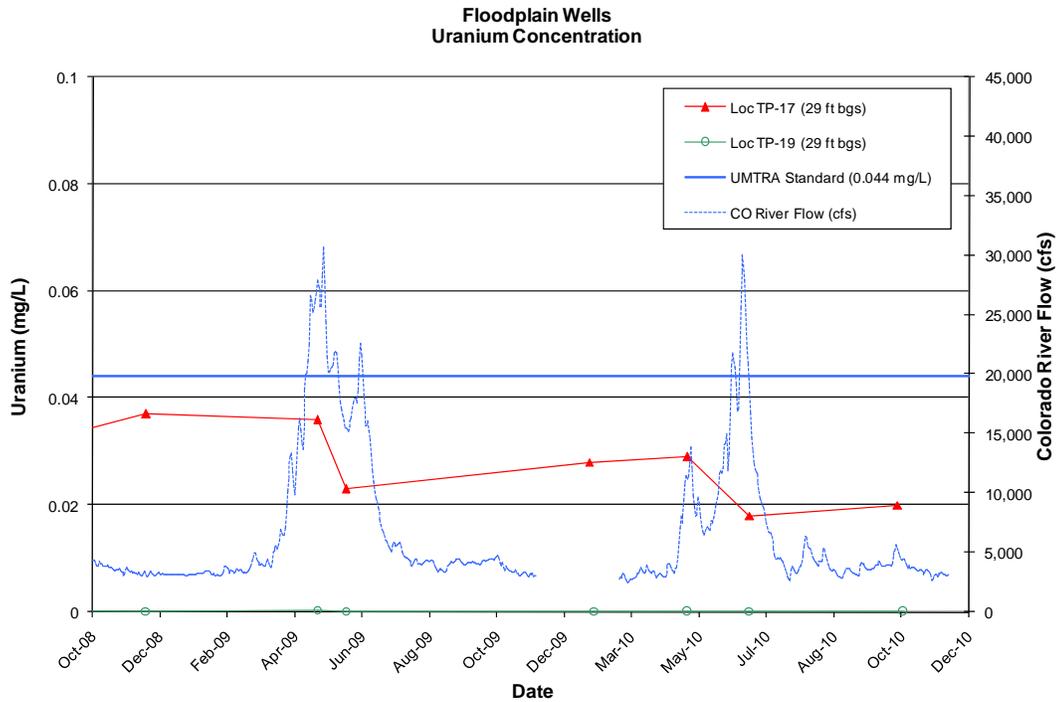


Figure 5. Floodplain Wells TP-17 and TP-19 Uranium Concentration Comparison to the UMTRA Standard

Tailings Pile Wells

The wells located on the tailings pile are screened within the alluvial material underlying the tailings. It was not possible to safely sample these locations due to the excavation activities on the pile in October 2010.

Monitoring Wells 0453, ATP-2-S, and ATP-2-D

Well 0453 is located along the southern boundary of the site and was sampled from a depth of 80 ft below ground surface (bgs). Wells ATP-2-S and ATP-2-D are located near the base of the tailings pile and were sampled from 38 and 88 ft bgs, respectively. Figures 6, 7, and 8 present the ammonia, TDS, and uranium time concentration plots for these locations. Ammonia concentrations in these wells decline with increasing river stage and rebound to previous levels during low river stage. The TDS concentrations (Figure 7) have remained consistent, with well ATP-2-D completed within the brine and the other wells screened above the brine interface. Uranium concentrations have remained low in the samples collected from ATP-2-S and ATP-2-D and appear to exhibit a rebound similar to that measured in the ammonia concentrations.

**Monitoring Wells 0453, ATP-2-S, and ATP-2-D
Ammonia Total as N Concentrations**

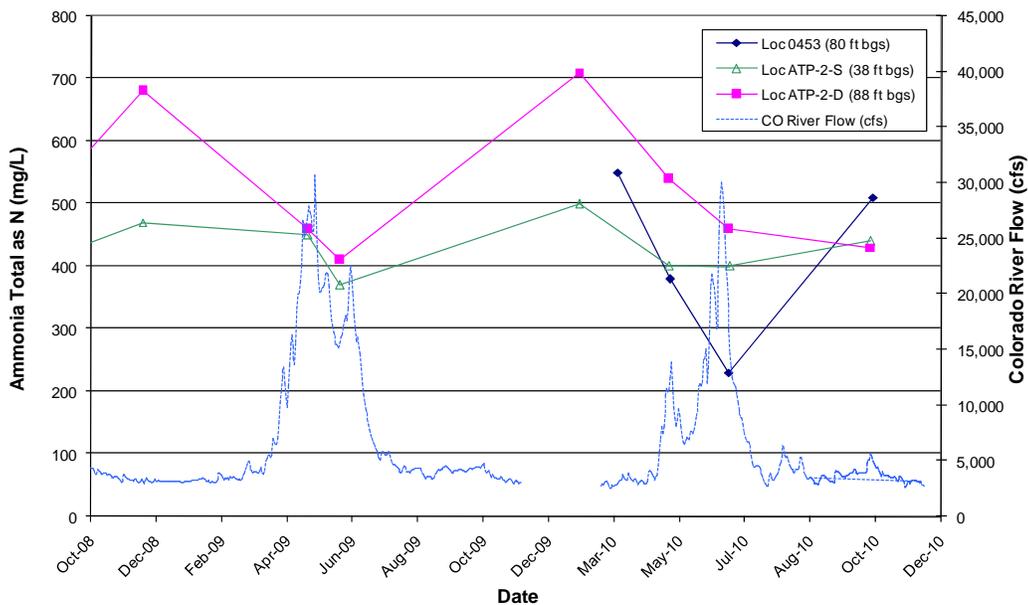


Figure 6. Wells 0453, ATP-2-S, and ATP-2-D Time Versus Ammonia Total (as N) Concentration Plot

**Monitoring Wells 0453, ATP-2-S, and ATP-2-D
Total Dissolved Solids Concentrations**

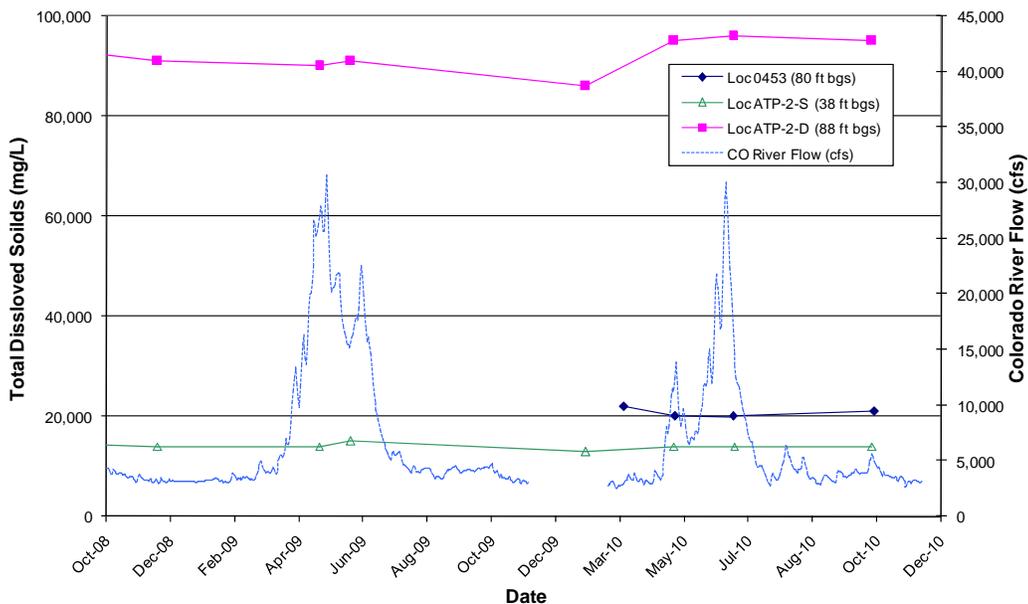


Figure 7. Wells 0453, ATP-2-S, and ATP-2-D Time Versus TDS Concentration Plot

**Monitoring Wells 0453, ATP-2-S, and ATP-2-D
Uranium Concentrations**

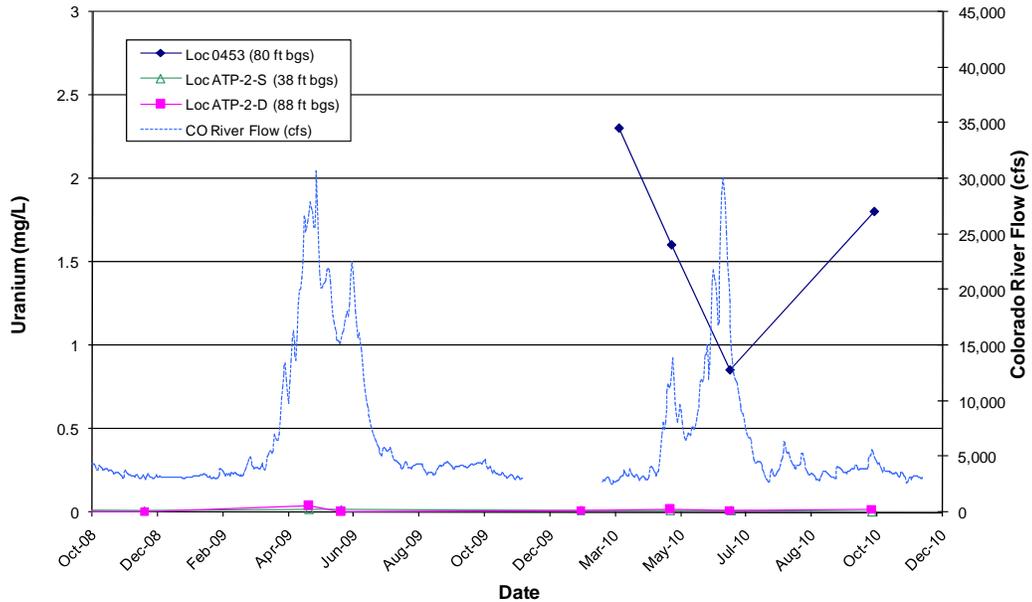


Figure 8. Wells 0453, ATP-2-S, and ATP-2-D Time Versus Uranium Concentration Plot

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 EBs and duplicates were collected. No significant discrepancies were noted regarding sample shipping and receiving, preservation and holding times, instrument calibration, method blanks, or matrix spikes (MSs), except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There were two locations with anomalous data points. Well 0492 had an historic low value for ammonia, and well ATP-2-S had an historic low value for uranium.

The mean daily Colorado River flow during the sampling period ranged from 3,870 to 5,670 cubic feet per second (cfs).

2.0 Data Assessment Summary

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 Verification

The field activities verification process for this sampling event was documented using the list provided in Appendix A. As the list exhibits, all sampling was conducted following the applicable procedures.

2.2 Laboratory Performance Assessment

General Information

Report Identification Number (RIN): 1010053
 Event: October 2010 IA Well Field Site-wide Sampling
 Site(s): Moab, Utah
 Laboratory: ALS Laboratory Group, Fort Collins, Colorado
 Sample Data Group (SDG) Number: 1010336, 1010467, 1011077
 Analysis: Metals and Inorganics
 Validator: Rachel Cowan
 Review Date: January 10, 2011

This validation was performed according to the *Moab UMTRA Project Surface Water/Ground Water Sampling and Analysis Plan* (DOE-EM/GJTAC1830) and “Standard Practice for Validation of Laboratory Data,” GT-9(P) (2006). The procedure was applied at Level 3, 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 5.

Table 5. Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia as N	WCH-A-005	EPA 350.1	EPA 350.1
Selenium	G14	SW-846 3005A	SW-846 6020A
Total Dissolved Solids	WIC-A-033	EPA 160.1	EPA 160.1
Uranium	G1	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

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

Table 6. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1011077-5, 15, 16	0413, SMI-PZ3S, TP-19	Selenium	J	LCS1, MS1, RS1, SD1
1010336-5 through -9; 1010467-3 through -9, -20; 1011077-4 through -9	0435, 0444, 0443, 0456, 0457; 0401, 0403, 0404, 0407, 0412, 0414, 0430, ATP-2-D; 0411, 0413, 0436, CR1, CR5	Ammonia	J	MS1
1010467-10 through -28	0440, 0441, 0453, 0454, 0455, 0492, AMM-2, AMM-3, ATP-2-D, ATP-2-S, CR3, SMI-MW01 TP-02, TP-17, TP-20, TP-22, TP-23	Ammonia	J	RS1
1010467-17; 1011077-1, -2	EB; 0201, 0228	Ammonia	U	B2

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

Table 7. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-Detects)	Explanation
B2	NA	U	If a blank value is greater than or equal to the instrument detection level or the method detection level, qualify all associated detects less than five times the blank concentration as "U."
LCS1	J	U	A laboratory control sample was not analyzed.
MS1	J	U	Results for the affected analyte(s) are regarded as estimated (J) because the MS sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or EB, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.
RS1	J	J or R	Results for the affected analyte(s) are regarded as estimated (J) because replicate samples were not analyzed at the frequency stated in the procedure.
SD1	J	N/A	Frequency requirements for serial dilution were not met.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received a total of 59 samples for RIN 1010053 in three shipments. SDG 1010336 of 15 samples arrived on October 22, 2010 (UPS tracking number 1Z5W1Y510197080453); SDG 1010467 of 28 samples arrived on October 29, 2010 (UPS tracking numbers 1Z5W1Y510195764067 and 1Z5W1Y510195402073); and SDG 1011077 of 16 samples arrived on November 5, 2010 (UPS tracking number 1Z5W1Y510194988176). Each SDG was accompanied by a chain of custody (COC) form. The COC forms were checked to confirm that all of the samples were listed on the forms 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

SDGs 1010336 (packed in one cooler), 1010467 (packed in two coolers), and 1011077 (packed in one cooler) were received intact with the temperatures within the coolers ranging from 0.4 to 1.4 degrees Centigrade, which comply 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.

Laboratory Instrument Calibration

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. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. Calibration standards were prepared from independent sources. In addition, for inductively coupled plasma (ICP) analytes (selenium and uranium), reporting limit verifications (CRIs) verify the linearity of the calibration curve near the reporting limit (RL).

For ICP-mass spectrometry analytes (selenium and uranium), instrument tuning and performance criteria are checked for mass calibration and resolution verifications. And also for ICP-mass spectrometry analytes selenium and uranium, internal standards are analyzed to indicated stability of the instruments.

Method SW-846 6020A, Selenium and Uranium

The calibrations for the uranium and selenium analyses was performed on October 27 (SDG 1010336), November 2 (SDG 1010467), and November 15 (SDG 1011077), 2010. All initial calibrations for both analytes were performed using eight calibration standards and one blank, resulting in calibration curves with correlation coefficient values (r^2) greater than 0.995. The absolute values of the calibration curve intercepts for selenium and uranium for all SDGs were positive and less than three times the instrument detection limit (IDL).

Initial calibration verification (ICV) and continuing calibration verification (CCV) checks were made at the required frequency for all SDGs. All calibration checks met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL for all SDGs.

The CRIs were within the acceptance criteria range for all SDGs. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure for all SDGs. Internal standard recoveries were stable and within acceptable ranges for all SDGs.

Method EPA 350.1, Ammonia as N

Initial calibrations for ammonia as N were performed using six calibration standards and a blank on November 2 (SDG 1010336), November 3 (SDG 1010467), and November 18 (SDG 1011077), 2010. The calibration curves had (r^2 values greater than 0.995 and intercepts less than three times the method detection limit (MDL). ICV and CCV checks were made at the required frequency. All calibration check results for all SDGs were within the acceptance criteria.

Method EPA 160.1, TDS

There is no initial or continuing calibration requirement associated with the determination of TDS.

Method and Calibration Blanks

Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Both initial calibration blanks 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 MDL or IDL (depending on method requirements) were “U”-qualified when the detections were less than five times the blank concentration. Nondetects were not qualified.

Three uranium CCB results in SDG 1010467 were greater than the uranium IDL. However, all associated uranium results were greater than five times the highest associated blank’s concentration, so no results needed to be qualified.

Two selenium CCBs in SDG 1010336 and two selenium CCBs in SDG 1010467 had results that were greater than the IDL; however, all associated selenium results were greater than five times the highest blank's concentration, so no results were qualified.

Two ammonia CCBs in SDG 1010336 and three ammonia CCBs in SDG 1011077 had results that were greater than the ammonia MDL. In SDG 1010467, one associated ammonia sample result was less than five times the highest blank's concentration, and so it was flagged "U" for reason B2. In SDG 1011077, two associated ammonia sample results were less than five times the highest associated blank's concentrations, so they were also flagged "U" for reason B2.

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.

Seven surface water samples were collected using non-dedicated equipment. One EB was collected and analyzed, so no surface water results from this location were "J"-qualified for this reason. Ammonia, selenium, and TDS results from the EB were non-detectable. Although the uranium EB result was above its IDL, the uranium EB result was less than five times its IDL, so no samples needed to be qualified for this reason.

ICP Interference Check Sample Analysis

ICP interference check samples (ICSA and ICSAB) are analyzed to verify the instrument inter-element and background correction factors.

For the uranium and selenium analyses, the ICSA values for calcium, magnesium, aluminum, and iron were not provided for verification of the instrument's inter-element and background correction factors. The percent recoveries of the ICSAB samples were provided and were acceptable for all uranium and selenium analyses.

MS Analysis

MS samples were prepared and analyzed for all analytes as a measure of method performance in the sample matrix. Laboratory spike standards are prepared from independent sources. The spike recoveries met the recovery and precision criteria for all analytes, with the following exceptions:

- There were not enough MSs for ammonia in each of the SDGs (one MS for 15 samples in SDG 1010336; one MS for 16 samples in SDG 1011077; and two MSs for 28 samples in SDG 1010467, although the method states that one MS must be analyzed per 10 field samples). Thus 19 total samples were qualified "J" for reason MS1 (see Table 2).
- One of the MSs in SDG 1010467 failed because the native concentration was too high. Per validation procedure, the samples were not flagged for MS1. However, because one of the alternate replicate samples (RSs) (field duplicate 1010467-16) also failed for ammonia, there were only two RS samples for 58 total samples, so 18 ammonia results were flagged "J" for reason RS1 (see Table 2).
- There was no selenium MS in SDG 1011077, so the selenium results from SDG 1011077 were qualified "J" for reason MS1.

Laboratory Replicate Analysis

The laboratory replicate results demonstrate acceptable laboratory precision. The relative percent difference (RPD) values for the reported laboratory replicate sample (for TDS), and the MS results for all other analytes were less than 20 percent for results greater than five times the RL with the following exception:

- There was no selenium RS is SDG 1011077, so those selenium results are qualified “J” for reason RS1.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory replicates, which measure only laboratory performance. Duplicate samples were collected from locations 0432 (1010336-10), 0401 (1010467-17), and surface water location CR1 (1011077-7) in the October 2010 sampling event. The duplicate results met the U.S. Environmental Protection Agency (EPA) recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than five times the RL, except for ammonia in sample 1010467-16, which had 42 RPD.

Laboratory Control Sample

Laboratory control samples (LCS) provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCS results were acceptable for all analyses with the following exception:

- LCSs were not reported for selenium or uranium. As a standard practice, ALS Laboratory does not prepare LCSs for samples that were field-filtered and acidified and run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements provided by the NELAC Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent. Therefore, no qualification was required because of lack of LCS results, because all of the MSs results for selenium and uranium were acceptable. However, there was no selenium MS in SDG 1011077, so these selenium results are qualified “J” for reason LCS1. See the MS Analysis section for required qualification.

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. ICP-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the RL. All evaluated SD data were acceptable with the following exception:

- There was no selenium SD sample from SDG 1011077 selected as the quality-control samples for the selenium analytical run. Therefore, the selenium results from this SDG were “J” flagged for reason SD1.

Detection Limits/Dilutions

Dilutions were prepared in a consistent and acceptable manner when dilutions were required. The required detection limits were achieved for all analytes.

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 November 1 (SDGs 1010336 and 1010467) and November 2 (SDG 1011077), 2010. The contents of the EDD files were manually examined to ensure all and only the requested data are delivered in compliance with requirements and that the sample results accurately reflect the data contained in the sample data package.

2.3 Field Analyses/Activities

The following information summarizes the field analyses and activities for the October 2010 sampling event.

Field Activities

All monitor wells were purged and sampled using the low-flow sampling method. There was one EB collected for the seven surface water samples collected using non-dedicated collection equipment. Three duplicate samples were also 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.

2.4 Certification

Results were reported in correct units for all analytes requested. Appropriate contract required laboratory qualifiers and target analyte lists were used. All minimum detection levels and IDLs 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*, 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 Report (Section 3.1), the Anomalous Data Review Check Sheet (Section 3.2), a table containing the Water Quality and Water Level Data (Sections 3.3 and 3.4, respectively), and the Blanks Report (Section 3.5).

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 report 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

Any results that are considered anomalous based on the Minimums and Maximums Report are listed below.

Loc. No.	Analyte	Type of Anomaly	Disposition
0492	Ammonia	Low	Will continue monitoring location
ATP-2-S	Uranium	Low	Will continue monitoring location

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

Seven samples were collected using non-dedicated equipment (all surface water samples) and, as a result, an EB was necessary; one was collected during this sampling event. The results are presented in Appendix E. One of the analytes, uranium, was detected in the EB, but at a concentration much lower than the RL. Following validation procedure, all uranium results from the seven samples were visually checked to see if the results were less than five times the concentration of uranium in the EB. Two of the uranium results were less than five times the concentration of uranium in the EB, so the uranium result from samples 1011077-1 and 1011077-2 (locations 0201 and 0228) were qualified with a "U."

3.6 Conclusions

This report discusses the data validation for the 59 samples collected during the October 2010 sampling event. Samples were collected from 47 monitoring wells and seven surface water locations across the site. Also included were the locations typically sampled during the routine sampling event.

Ground water samples collected from nine of the monitoring wells exceeded the selenium standard of 0.01 mg/L, and 25 of the ground water samples exceeded the UMTRA uranium ground water standard of 0.044 mg/L. Historically each location has exceeded one or the other of these standards, and no new locations were added to this list based on the analytical results associated with the October 2010 sampling event. In general, all concentrations were consistent with those measured in October 2009 and January 2009. The one exception would be the ammonia concentration measured in the sample collected from AMM-2, which increased from 500 mg/L in October 2009 to 890 mg/L 1 year later. Incidentally, the uranium concentration at this location remained consistent with the previous measurements.

Surface water sampling results indicated the samples collected from the seven locations did not exceed the state or federal ammonia acute or chronic criteria. In addition, none of the surface water samples exceeded the UMTRA ground water standard for uranium.

Appendix A.
Water Sampling Field Activities Verification

Appendix A. Water Sampling Field Activities Verification

Sampling Event / RIN	October 2010 Site Wide Event/1010053	Date(s) of Water Sampling	October 19 – November 2, 2010
Date(s) of Verification	January 10, 2011	Name of Verifier	Rachel Cowan
		Response (Yes, No, NA)	Comments
1.	Is the Sampling and Analysis Plan the primary document directing field procedures? List other documents, standard operating procedures, and instructions.	Yes	
2.	Were the sampling locations specified in the planning documents sampled?	No	Wells 0437, 0438, and 0439 could not be sampled due to excavation operations.
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?	Yes Yes	
5.	Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?	No	There were a few wells where field parameters could not be collected. Please see trip report for details.
6.	Was the category of the well documented?	No	The well category for location 0412 was not provided in the field notes.
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? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	Yes Yes Yes Yes Yes	
8.	Were the following conditions met when purging a Category II well: Was the flow rate less than 500 milliliters per minute? Was one pump/tubing volume removed prior to sampling?	Yes Yes	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	There were 59 samples and three field duplicates collected.

Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	October 2010 Site Wide Event/1010053	Date(s) of Water Sampling	October 19 – November 2, 2010
Date(s) of Verification	January 10, 2011	Name of Verifier	Rachel Cowan
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	Seven samples were collected with non-dedicated equipment; therefore, one EB was 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?	NA		
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?	NA		
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: 1010053

Comparison: All Historical Data

Report Date: 1/11/2011

Site Code	Location Code	Sample Date	Analyte	Result	Current Qualifiers		Historical Maximum Qualifiers		Historical Minimum Qualifiers		Count			
					Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect
MOA01	0226	10/27/2010	Total Dissolved Solids	810			790		J	200		9	0	
MOA01	0401	10/26/2010	Ammonia Total as N	770		J	730			1.4		F	44	0
MOA01	0412	10/27/2010	Selenium	0.029			0.1		F	0.051			7	0
MOA01	0412	10/27/2010	Total Dissolved Solids	1900			3910		F	2200			6	0
MOA01	0414	10/27/2010	Selenium	0.072			0.205		F	0.073			7	0
MOA01	0433	10/20/2010	Uranium	0.0018			0.0021		F	0.002		F	6	0
MOA01	0455	10/25/2010	Uranium	0.0023			0.0053			0.0024		FQ	5	0
MOA01	0456	10/20/2010	Total Dissolved Solids	5100			5530		F	5300			5	0
MOA01	0457	10/19/2010	Total Dissolved Solids	2900			3258		FQ	3100			5	0
MOA01	0492	10/26/2010	Ammonia Total as N	1.1		J	200		F	4		F	23	0
MOA01	AMM-2	10/26/2010	Uranium	1.9			29			1.95		F	40	0
MOA01	ATP-2-S	10/26/2010	Uranium	0.0019			28			0.0078			84	0
MOA01	SMI-PW03	11/02/2010	Total Dissolved Solids	5500			9200			5800			13	0
MOA01	SMI-PZ2D	11/02/2010	Uranium	0.54			3.03			0.55		J	9	0
MOA01	SMI-PZ3S	11/02/2010	Total Dissolved Solids	2900			3720		F	3200			9	0
MOA01	TP-01	10/19/2010	Total Dissolved Solids	4700			14800		F	5300			11	0
MOA01	TP-01	10/19/2010	Uranium	0.079			0.41			0.1			16	0
MOA01	TP-02	10/27/2010	Uranium	0.87			26			1			37	0

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

Appendix B. Minimums and Maximums Report (continued)

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: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
										Lab	Data	QA		
Ammonia Total as N	mg/L	0201	SL	11/01/2010	0001	0	-	0	0.18		U	#	0.1	
Ammonia Total as N	mg/L	0218	SL	10/27/2010	0001	0	-	0	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0226	SL	10/27/2010	0001	0	-	0	0.18			#	0.1	
Ammonia Total as N	mg/L	0228	SL	11/01/2010	0001	0	-	0	0.17		U	#	0.1	
Ammonia Total as N	mg/L	0401	WL	10/26/2010	0001	18	-	18	770		J	#	20	
Ammonia Total as N	mg/L	0401	WL	10/26/2010	0002	18	-	18	500		J	#	20	
Ammonia Total as N	mg/L	0403	WL	10/26/2010	0001	18	-	18	19		J	#	0.5	
Ammonia Total as N	mg/L	0404	WL	10/27/2010	0001	18	-	18	380		J	#	20	
Ammonia Total as N	mg/L	0407	WL	10/26/2010	0001	17	-	17	270		J	#	20	
Ammonia Total as N	mg/L	0410	WL	11/02/2010	0001	27	-	27	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0411	WL	11/02/2010	0001	9	-	9	4.6		J	#	0.1	
Ammonia Total as N	mg/L	0412	WL	10/27/2010	0001	11	-	11	0.1		U	J	#	0.1
Ammonia Total as N	mg/L	0413	WL	11/01/2010	0001	10.5	-	10.5	11		J	#	0.5	
Ammonia Total as N	mg/L	0414	WL	10/27/2010	0001	9	-	9	15		J	#	0.5	
Ammonia Total as N	mg/L	0430	WL	10/25/2010	0001	101	-	101	0.1		U	J	#	0.1
Ammonia Total as N	mg/L	0431	WL	10/20/2010	0001	91	-	91	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0432	WL	10/20/2010	0001	55	-	55	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0432	WL	10/20/2010	0002	55	-	55	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0433	WL	10/20/2010	0001	99	-	99	0.1		U	#	0.1	
Ammonia Total as N	mg/L	0434	WL	10/20/2010	0001	35	-	35	0.11			#	0.1	
Ammonia Total as N	mg/L	0435	WL	10/19/2010	0001	173	-	173	1.9		J	#	0.1	
Ammonia Total as N	mg/L	0436	WL	11/02/2010	0001	195	-	205	3.4		J	#	0.1	
Ammonia Total as N	mg/L	0440	WL	10/28/2010	0001	117	-	117	0.1		U	J	#	0.1
Ammonia Total as N	mg/L	0441	WL	10/25/2010	0001	53	-	53	0.1		U	J	#	0.1
Ammonia Total as N	mg/L	0443	WL	10/20/2010	0001	73	-	73	0.1		U	J	#	0.1
Ammonia Total as N	mg/L	0444	WL	10/19/2010	0001	116	-	116	1.8		J	#	0.1	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data		QA				
Ammonia Total as N	mg/L	0453	WL	10/28/2010	0001	80	- 80	510	J	#		20	
Ammonia Total as N	mg/L	0454	WL	10/25/2010	0001	13	- 13	610	J	#		20	
Ammonia Total as N	mg/L	0455	WL	10/25/2010	0001	46	- 46	0.22	J	#		0.1	
Ammonia Total as N	mg/L	0456	WL	10/20/2010	0001	53	- 53	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0457	WL	10/19/2010	0001	29	- 29	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0492	WL	10/26/2010	0001	18	- 18	1.1	J	#		0.1	
Ammonia Total as N	mg/L	AMM-1-19	WL	10/19/2010	0001	19	- 19	0.1	U		#	0.1	
Ammonia Total as N	mg/L	AMM-1-53	WL	10/19/2010	0001	53	- 53	0.1	U		#	0.1	
Ammonia Total as N	mg/L	AMM-2	WL	10/26/2010	0001	48	- 48	890	J	#		20	
Ammonia Total as N	mg/L	AMM-3	WL	10/26/2010	0001	48	- 48	220	J	#		20	
Ammonia Total as N	mg/L	ATP-2-D	WL	10/26/2010	0001	88	- 88	430	J	#		20	
Ammonia Total as N	mg/L	ATP-2-S	WL	10/26/2010	0001	38	- 38	440	J	#		20	
Ammonia Total as N	mg/L	ATP-3	WL	10/20/2010	0001	51	- 51	0.1	U		#	0.1	
Ammonia Total as N	mg/L	CR1	SL	11/01/2010	0001	0	- 0	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	CR1	SL	11/01/2010	0002	0	- 0	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	CR3	SL	10/27/2010	0001	0	- 0	0.22	J	#		0.1	
Ammonia Total as N	mg/L	CR5	SL	11/01/2010	0001	0	- 0	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	SMI-MW01	WL	10/27/2010	0001	16	- 16	2	J	#		0.1	
Ammonia Total as N	mg/L	SMI-PW03	WL	11/02/2010	0001	60	- 60	38		#		2	
Ammonia Total as N	mg/L	SMI-PZ2D	WL	11/02/2010	0001	75	- 75	830		#		20	
Ammonia Total as N	mg/L	SMI-PZ2M2	WL	11/02/2010	0001	56	- 56	700		#		20	
Ammonia Total as N	mg/L	SMI-PZ3D2	WL	11/02/2010	0001	78	- 78	410		#		20	
Ammonia Total as N	mg/L	SMI-PZ3M	WL	11/02/2010	0001	59	- 59	64		#		5	
Ammonia Total as N	mg/L	SMI-PZ3S	WL	11/02/2010	0001	21.94	- 26.94	3.3		#		0.1	
Ammonia Total as N	mg/L	TP-01	WL	10/19/2010	0001	22	- 22	0.1	U	#		0.1	
Ammonia Total as N	mg/L	TP-02	WL	10/27/2010	0001	30	- 30	0.21	J	#		0.1	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Ammonia Total as N	mg/L	TP-11	WL	10/19/2010	0001	30	-	30	0.65			#	0.1	
Ammonia Total as N	mg/L	TP-17	WL	10/27/2010	0001	28	-	28	2		J	#	0.1	
Ammonia Total as N	mg/L	TP-19	WL	11/01/2010	0001	29	-	29	3.7			#	0.1	
Ammonia Total as N	mg/L	TP-20	WL	10/26/2010	0001	32	-	32	3.3		J	#	0.1	
Ammonia Total as N	mg/L	TP-22	WL	10/26/2010	0001	17	-	17	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	TP-23	WL	10/25/2010	0001	25	-	25	540		J	#	20	
Dissolved Oxygen	mg/L	0201	SL	11/01/2010	0001	0	-	0	38			#		
Dissolved Oxygen	mg/L	0218	SL	10/27/2010	0001	0	-	0	9.85			#		
Dissolved Oxygen	mg/L	0226	SL	10/27/2010	0001	0	-	0	8.16			#		
Dissolved Oxygen	mg/L	0228	SL	11/01/2010	0001	0	-	0	12.06			#		
Dissolved Oxygen	mg/L	0401	WL	10/26/2010	0001	18	-	18	0.72			#		
Dissolved Oxygen	mg/L	0403	WL	10/26/2010	0001	18	-	18	0.66			#		
Dissolved Oxygen	mg/L	0404	WL	10/27/2010	0001	18	-	18	0.64			#		
Dissolved Oxygen	mg/L	0407	WL	10/26/2010	0001	17	-	17	0.69			#		
Dissolved Oxygen	mg/L	0410	WL	11/02/2010	0001	27	-	27	6.33			#		
Dissolved Oxygen	mg/L	0411	WL	11/02/2010	0001	9	-	9	7.13			#		
Dissolved Oxygen	mg/L	0412	WL	10/27/2010	0001	11	-	11	2.43			#		
Dissolved Oxygen	mg/L	0413	WL	11/01/2010	0001	10.5	-	10.5	2.32			#		
Dissolved Oxygen	mg/L	0414	WL	10/27/2010	0001	9	-	9	0.74			#		
Dissolved Oxygen	mg/L	0430	WL	10/25/2010	0001	101	-	101	0.41			#		
Dissolved Oxygen	mg/L	0431	WL	10/20/2010	0001	91	-	91	2.85			#		
Dissolved Oxygen	mg/L	0432	WL	10/20/2010	0001	55	-	55	6.08			#		
Dissolved Oxygen	mg/L	0433	WL	10/20/2010	0001	99	-	99	2.29			#		
Dissolved Oxygen	mg/L	0434	WL	10/20/2010	0001	35	-	35	3.32			#		
Dissolved Oxygen	mg/L	0435	WL	10/19/2010	0001	173	-	173	0.18			#		
Dissolved Oxygen	mg/L	0436	WL	11/02/2010	0001	195	-	205	0.13			#		
Dissolved Oxygen	mg/L	0440	WL	10/28/2010	0001	117	-	117	1.71			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	0441	WL	10/25/2010	0001	53	- 53	0.56		#		
Dissolved Oxygen	mg/L	0443	WL	10/20/2010	0001	73	- 73	2.76		#		
Dissolved Oxygen	mg/L	0444	WL	10/19/2010	0001	116	- 116	0.48		#		
Dissolved Oxygen	mg/L	0453	WL	10/28/2010	0001	80	- 80	0.59		#		
Dissolved Oxygen	mg/L	0454	WL	10/25/2010	0001	13	- 13	0.36		#		
Dissolved Oxygen	mg/L	0455	WL	10/25/2010	0001	46	- 46	0.42		#		
Dissolved Oxygen	mg/L	0456	WL	10/20/2010	0001	53	- 53	6.47		#		
Dissolved Oxygen	mg/L	0457	WL	10/19/2010	0001	29	- 29	0.32		#		
Dissolved Oxygen	mg/L	0492	WL	10/26/2010	0001	18	- 18	0.6		#		
Dissolved Oxygen	mg/L	AMM-1-19	WL	10/19/2010	0001	19	- 19	4.46		#		
Dissolved Oxygen	mg/L	AMM-1-53	WL	10/19/2010	0001	53	- 53	1.49		#		
Dissolved Oxygen	mg/L	AMM-2	WL	10/26/2010	0001	48	- 48	0.66		#		
Dissolved Oxygen	mg/L	AMM-3	WL	10/26/2010	0001	48	- 48	0.8		#		
Dissolved Oxygen	mg/L	ATP-2-D	WL	10/26/2010	0001	88	- 88	0.15		#		
Dissolved Oxygen	mg/L	ATP-2-S	WL	10/26/2010	0001	38	- 38	0.61		#		
Dissolved Oxygen	mg/L	ATP-3	WL	10/20/2010	0001	51	- 51	0.4		#		
Dissolved Oxygen	mg/L	CR1	SL	11/01/2010	0001	0	- 0	36.9		#		
Dissolved Oxygen	mg/L	CR3	SL	10/27/2010	0001	0	- 0	10.54		#		
Dissolved Oxygen	mg/L	CR5	SL	11/01/2010	0001	0	- 0	10.22		#		
Dissolved Oxygen	mg/L	SMI-MW01	WL	10/27/2010	0001	16	- 16	0.52		#		
Dissolved Oxygen	mg/L	SMI-PW03	WL	11/02/2010	0001	60	- 60	1.01		#		
Dissolved Oxygen	mg/L	SMI-PZ2D	WL	11/02/2010	0001	75	- 75	0.47		#		
Dissolved Oxygen	mg/L	SMI-PZ2M2	WL	11/02/2010	0001	56	- 56	0.56		#		
Dissolved Oxygen	mg/L	SMI-PZ3D2	WL	11/02/2010	0001	78	- 78	1.46		#		
Dissolved Oxygen	mg/L	SMI-PZ3M	WL	11/02/2010	0001	59	- 59	2.73		#		
Dissolved Oxygen	mg/L	SMI-PZ3S	WL	11/02/2010	0001	21.94	- 26.94	0.76		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	TP-01	WL	10/19/2010	0001	22	-	22	0.27		#		
Dissolved Oxygen	mg/L	TP-02	WL	10/27/2010	0001	30	-	30	0.44		#		
Dissolved Oxygen	mg/L	TP-11	WL	10/19/2010	0001	30	-	30	0.29		#		
Dissolved Oxygen	mg/L	TP-17	WL	10/27/2010	0001	28	-	28	0.17		#		
Dissolved Oxygen	mg/L	TP-19	WL	11/01/2010	0001	29	-	29	0.17		#		
Dissolved Oxygen	mg/L	TP-20	WL	10/26/2010	0001	32	-	32	0.25		#		
Dissolved Oxygen	mg/L	TP-22	WL	10/26/2010	0001	17	-	17	3.42		#		
Dissolved Oxygen	mg/L	TP-23	WL	10/25/2010	0001	25	-	25	4.89		#		
Oxidation Reduction Potential	mV	0201	SL	11/01/2010	0001	0	-	0	6.8		#		
Oxidation Reduction Potential	mV	0218	SL	10/27/2010	0001	0	-	0	-75.7		#		
Oxidation Reduction Potential	mV	0226	SL	10/27/2010	0001	0	-	0	-124.2		#		
Oxidation Reduction Potential	mV	0228	SL	11/01/2010	0001	0	-	0	-15.3		#		
Oxidation Reduction Potential	mV	0401	WL	10/26/2010	0001	18	-	18	-80.4		#		
Oxidation Reduction Potential	mV	0403	WL	10/26/2010	0001	18	-	18	-76		#		
Oxidation Reduction Potential	mV	0404	WL	10/27/2010	0001	18	-	18	-52.9		#		
Oxidation Reduction Potential	mV	0407	WL	10/26/2010	0001	17	-	17	-77.2		#		
Oxidation Reduction Potential	mV	0410	WL	11/02/2010	0001	27	-	27	4.5		#		
Oxidation Reduction Potential	mV	0411	WL	11/02/2010	0001	9	-	9	-49.3		#		
Oxidation Reduction Potential	mV	0412	WL	10/27/2010	0001	11	-	11	-77.9		#		
Oxidation Reduction Potential	mV	0413	WL	11/01/2010	0001	10.5	-	10.5	-45.9		#		
Oxidation Reduction Potential	mV	0414	WL	10/27/2010	0001	9	-	9	-91.1		#		
Oxidation Reduction Potential	mV	0430	WL	10/25/2010	0001	101	-	101	-122.7		#		
Oxidation Reduction Potential	mV	0431	WL	10/20/2010	0001	91	-	91	-79		#		
Oxidation Reduction Potential	mV	0432	WL	10/20/2010	0001	55	-	55	-107		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	0433	WL	10/20/2010	0001	99	-	99	17.7			#		
Oxidation Reduction Potential	mV	0434	WL	10/20/2010	0001	35	-	35	-114.3			#		
Oxidation Reduction Potential	mV	0435	WL	10/19/2010	0001	173	-	173	-189.5			#		
Oxidation Reduction Potential	mV	0436	WL	11/02/2010	0001	195	-	205	270.2			#		
Oxidation Reduction Potential	mV	0440	WL	10/28/2010	0001	117	-	117	-69			#		
Oxidation Reduction Potential	mV	0441	WL	10/25/2010	0001	53	-	53	-90.1			#		
Oxidation Reduction Potential	mV	0443	WL	10/20/2010	0001	73	-	73	-108.8			#		
Oxidation Reduction Potential	mV	0444	WL	10/19/2010	0001	116	-	116	-159.7			#		
Oxidation Reduction Potential	mV	0453	WL	10/28/2010	0001	80	-	80	-97.1			#		
Oxidation Reduction Potential	mV	0454	WL	10/25/2010	0001	13	-	13	-100			#		
Oxidation Reduction Potential	mV	0455	WL	10/25/2010	0001	46	-	46	-136.3			#		
Oxidation Reduction Potential	mV	0456	WL	10/20/2010	0001	53	-	53	-64.3			#		
Oxidation Reduction Potential	mV	0457	WL	10/19/2010	0001	29	-	29	-172.6			#		
Oxidation Reduction Potential	mV	0492	WL	10/26/2010	0001	18	-	18	-11.5			#		
Oxidation Reduction Potential	mV	AMM-1-19	WL	10/19/2010	0001	19	-	19	-42.3			#		
Oxidation Reduction Potential	mV	AMM-1-53	WL	10/19/2010	0001	53	-	53	-112.3			#		
Oxidation Reduction Potential	mV	AMM-2	WL	10/26/2010	0001	48	-	48	40.1			#		
Oxidation Reduction Potential	mV	AMM-3	WL	10/26/2010	0001	48	-	48	-118.6			#		
Oxidation Reduction Potential	mV	ATP-2-D	WL	10/26/2010	0001	88	-	88	-248.4			#		
Oxidation Reduction Potential	mV	ATP-2-S	WL	10/26/2010	0001	38	-	38	-218.7			#		
Oxidation Reduction Potential	mV	ATP-3	WL	10/20/2010	0001	51	-	51	-135.8			#		
Oxidation Reduction Potential	mV	CR1	SL	11/01/2010	0001	0	-	0	50.7			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	CR3	SL	10/27/2010	0001	0	-	0	-23.7			#		
Oxidation Reduction Potential	mV	CR5	SL	11/01/2010	0001	0	-	0	-209.9			#		
Oxidation Reduction Potential	mV	SMI-MW01	WL	10/27/2010	0001	16	-	16	-81.7			#		
Oxidation Reduction Potential	mV	SMI-PW03	WL	11/02/2010	0001	60	-	60	-71.8			#		
Oxidation Reduction Potential	mV	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	152			#		
Oxidation Reduction Potential	mV	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	952			#		
Oxidation Reduction Potential	mV	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	-18.2			#		
Oxidation Reduction Potential	mV	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	-82.7			#		
Oxidation Reduction Potential	mV	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	4.4			#		
Oxidation Reduction Potential	mV	TP-01	WL	10/19/2010	0001	22	-	22	-186.1			#		
Oxidation Reduction Potential	mV	TP-02	WL	10/27/2010	0001	30	-	30	-126.6			#		
Oxidation Reduction Potential	mV	TP-11	WL	10/19/2010	0001	30	-	30	-144.1			#		
Oxidation Reduction Potential	mV	TP-17	WL	10/27/2010	0001	28	-	28	-200.5			#		
Oxidation Reduction Potential	mV	TP-19	WL	11/01/2010	0001	29	-	29	294.3			#		
Oxidation Reduction Potential	mV	TP-20	WL	10/26/2010	0001	32	-	32	-256.7			#		
Oxidation Reduction Potential	mV	TP-22	WL	10/26/2010	0001	17	-	17	101.5			#		
Oxidation Reduction Potential	mV	TP-23	WL	10/25/2010	0001	25	-	25	-47.3			#		
pH	s.u.	0201	SL	11/01/2010	0001	0	-	0	7.96			#		
pH	s.u.	0218	SL	10/27/2010	0001	0	-	0	7.98			#		
pH	s.u.	0226	SL	10/27/2010	0001	0	-	0	8.18			#		
pH	s.u.	0228	SL	11/01/2010	0001	0	-	0	8.01			#		
pH	s.u.	0401	WL	10/26/2010	0001	18	-	18	6.7			#		
pH	s.u.	0403	WL	10/26/2010	0001	18	-	18	6.68			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
pH	s.u.	0404	WL	10/27/2010	0001	18	-	18	6.67		#		
pH	s.u.	0407	WL	10/26/2010	0001	17	-	17	6.84		#		
pH	s.u.	0410	WL	11/02/2010	0001	27	-	27	7.78		#		
pH	s.u.	0411	WL	11/02/2010	0001	9	-	9	7.7		#		
pH	s.u.	0412	WL	10/27/2010	0001	11	-	11	7.56		#		
pH	s.u.	0413	WL	11/01/2010	0001	10.5	-	10.5	7.33		#		
pH	s.u.	0414	WL	10/27/2010	0001	9	-	9	7.4		#		
pH	s.u.	0430	WL	10/25/2010	0001	101	-	101	7.22		#		
pH	s.u.	0431	WL	10/20/2010	0001	91	-	91	7.1		#		
pH	s.u.	0432	WL	10/20/2010	0001	55	-	55	7.6		#		
pH	s.u.	0433	WL	10/20/2010	0001	99	-	99	7.18		#		
pH	s.u.	0434	WL	10/20/2010	0001	35	-	35	7.03		#		
pH	s.u.	0435	WL	10/19/2010	0001	173	-	173	7.04		#		
pH	s.u.	0436	WL	11/02/2010	0001	195	-	205	7.18		#		
pH	s.u.	0440	WL	10/28/2010	0001	117	-	117	6.77		#		
pH	s.u.	0441	WL	10/25/2010	0001	53	-	53	7.09		#		
pH	s.u.	0443	WL	10/20/2010	0001	73	-	73	7.2		#		
pH	s.u.	0444	WL	10/19/2010	0001	116	-	116	6.92		#		
pH	s.u.	0453	WL	10/28/2010	0001	80	-	80	6.93		#		
pH	s.u.	0454	WL	10/25/2010	0001	13	-	13	6.77		#		
pH	s.u.	0455	WL	10/25/2010	0001	46	-	46	8.04		#		
pH	s.u.	0456	WL	10/20/2010	0001	53	-	53	7.57		#		
pH	s.u.	0457	WL	10/19/2010	0001	29	-	29	7.84		#		
pH	s.u.	0492	WL	10/26/2010	0001	18	-	18	7.22		#		
pH	s.u.	AMM-1-19	WL	10/19/2010	0001	19	-	19	7.25		#		
pH	s.u.	AMM-1-53	WL	10/19/2010	0001	53	-	53	7.28		#		
pH	s.u.	AMM-2	WL	10/26/2010	0001	48	-	48	6.87		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
pH	s.u.	AMM-3	WL	10/26/2010	0001	48	-	48	6.91		#		
pH	s.u.	ATP-2-D	WL	10/26/2010	0001	88	-	88	7.68		#		
pH	s.u.	ATP-2-S	WL	10/26/2010	0001	38	-	38	8.8		#		
pH	s.u.	ATP-3	WL	10/20/2010	0001	51	-	51	7.47		#		
pH	s.u.	CR1	SL	11/01/2010	0001	0	-	0	7.67		#		
pH	s.u.	CR3	SL	10/27/2010	0001	0	-	0	7.83		#		
pH	s.u.	CR5	SL	11/01/2010	0001	0	-	0	8.78		#		
pH	s.u.	SMI-MW01	WL	10/27/2010	0001	16	-	16	7.14		#		
pH	s.u.	SMI-PW03	WL	11/02/2010	0001	60	-	60	7.34		#		
pH	s.u.	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	6.48		#		
pH	s.u.	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	6.58		#		
pH	s.u.	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	6.82		#		
pH	s.u.	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	7.17		#		
pH	s.u.	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	7.69		#		
pH	s.u.	TP-01	WL	10/19/2010	0001	22	-	22	7.46		#		
pH	s.u.	TP-02	WL	10/27/2010	0001	30	-	30	7.17		#		
pH	s.u.	TP-11	WL	10/19/2010	0001	30	-	30	7.03		#		
pH	s.u.	TP-17	WL	10/27/2010	0001	28	-	28	6.89		#		
pH	s.u.	TP-19	WL	11/01/2010	0001	29	-	29	6.61		#		
pH	s.u.	TP-20	WL	10/26/2010	0001	32	-	32	7.09		#		
pH	s.u.	TP-22	WL	10/26/2010	0001	17	-	17	6.95		#		
pH	s.u.	TP-23	WL	10/25/2010	0001	25	-	25	7.07		#		
Selenium	mg/L	0401	WL	10/26/2010	0001	18	-	18	0.012		#	0.00032	
Selenium	mg/L	0404	WL	10/27/2010	0001	18	-	18	0.014		#	0.00032	
Selenium	mg/L	0412	WL	10/27/2010	0001	11	-	11	0.029		#	0.00032	
Selenium	mg/L	0413	WL	11/01/2010	0001	10.5	-	10.5	0.14	J	#	0.0032	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Selenium	mg/L	0414	WL	10/27/2010	0001	9	-	9	0.072			#	0.00032	
Selenium	mg/L	0440	WL	10/28/2010	0001	117	-	117	0.037			#	0.00016	
Selenium	mg/L	0456	WL	10/20/2010	0001	53	-	53	0.024			#	0.00032	
Selenium	mg/L	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	0.026	J		#	0.0016	
Selenium	mg/L	TP-17	WL	10/27/2010	0001	28	-	28	0.0016			#	0.00016	
Selenium	mg/L	TP-19	WL	11/01/2010	0001	29	-	29	0.029	J		#	0.00032	
Specific Conductance	µmhos/cm	0201	SL	11/01/2010	0001	0	-	0	1440			#		
Specific Conductance	µmhos/cm	0218	SL	10/27/2010	0001	0	-	0	1468			#		
Specific Conductance	µmhos/cm	0226	SL	10/27/2010	0001	0	-	0	4278			#		
Specific Conductance	µmhos/cm	0228	SL	11/01/2010	0001	0	-	0	1420			#		
Specific Conductance	µmhos/cm	0401	WL	10/26/2010	0001	18	-	18	19133			#		
Specific Conductance	µmhos/cm	0403	WL	10/26/2010	0001	18	-	18	8666			#		
Specific Conductance	µmhos/cm	0404	WL	10/27/2010	0001	18	-	18	13089			#		
Specific Conductance	µmhos/cm	0407	WL	10/26/2010	0001	17	-	17	4841			#		
Specific Conductance	µmhos/cm	0410	WL	11/02/2010	0001	27	-	27	4150			#		
Specific Conductance	µmhos/cm	0411	WL	11/02/2010	0001	9	-	9	6565			#		
Specific Conductance	µmhos/cm	0412	WL	10/27/2010	0001	11	-	11	3519			#		
Specific Conductance	µmhos/cm	0413	WL	11/01/2010	0001	10.5	-	10.5	4020			#		
Specific Conductance	µmhos/cm	0414	WL	10/27/2010	0001	9	-	9	5192			#		
Specific Conductance	µmhos/cm	0430	WL	10/25/2010	0001	101	-	101	6763			#		
Specific Conductance	µmhos/cm	0431	WL	10/20/2010	0001	91	-	91	34662			#		
Specific Conductance	µmhos/cm	0432	WL	10/20/2010	0001	55	-	55	3223			#		
Specific Conductance	µmhos/cm	0433	WL	10/20/2010	0001	99	-	99	4902			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
										Lab	Data	QA		
Specific Conductance	µmhos/cm	0434	WL	10/20/2010	0001	35	-	35	46578			#		
Specific Conductance	µmhos/cm	0435	WL	10/19/2010	0001	173	-	173	124274			#		
Specific Conductance	µmhos/cm	0436	WL	11/02/2010	0001	195	-	205	132826			#		
Specific Conductance	µmhos/cm	0440	WL	10/28/2010	0001	117	-	117	9110			#		
Specific Conductance	µmhos/cm	0441	WL	10/25/2010	0001	53	-	53	6836			#		
Specific Conductance	µmhos/cm	0443	WL	10/20/2010	0001	73	-	73	5956			#		
Specific Conductance	µmhos/cm	0444	WL	10/19/2010	0001	116	-	116	120760			#		
Specific Conductance	µmhos/cm	0453	WL	10/28/2010	0001	80	-	80	29118			#		
Specific Conductance	µmhos/cm	0454	WL	10/25/2010	0001	13	-	13	57078			#		
Specific Conductance	µmhos/cm	0455	WL	10/25/2010	0001	46	-	46	2722			#		
Specific Conductance	µmhos/cm	0456	WL	10/20/2010	0001	53	-	53	8782			#		
Specific Conductance	µmhos/cm	0457	WL	10/19/2010	0001	29	-	29	5654			#		
Specific Conductance	µmhos/cm	0492	WL	10/26/2010	0001	18	-	18	6226			#		
Specific Conductance	µmhos/cm	AMM-1-19	WL	10/19/2010	0001	19	-	19	11876			#		
Specific Conductance	µmhos/cm	AMM-1-53	WL	10/19/2010	0001	53	-	53	11860			#		
Specific Conductance	µmhos/cm	AMM-2	WL	10/26/2010	0001	48	-	48	20794			#		
Specific Conductance	µmhos/cm	AMM-3	WL	10/26/2010	0001	48	-	48	19661			#		
Specific Conductance	µmhos/cm	ATP-2-D	WL	10/26/2010	0001	88	-	88	137729			#		
Specific Conductance	µmhos/cm	ATP-2-S	WL	10/26/2010	0001	38	-	38	20151			#		
Specific Conductance	µmhos/cm	ATP-3	WL	10/20/2010	0001	51	-	51	2509			#		
Specific Conductance	µmhos/cm	CR1	SL	11/01/2010	0001	0	-	0	1453			#		
Specific Conductance	µmhos/cm	CR3	SL	10/27/2010	0001	0	-	0	1510			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Specific Conductance	µmhos /cm	CR5	SL	11/01/2010	0001	0	-	0	1724			#		
Specific Conductance	µmhos /cm	SMI-MW01	WL	10/27/2010	0001	16	-	16	5936			#		
Specific Conductance	µmhos /cm	SMI-PW03	WL	11/02/2010	0001	60	-	60	9197			#		
Specific Conductance	µmhos /cm	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	120279			#		
Specific Conductance	µmhos /cm	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	86624			#		
Specific Conductance	µmhos /cm	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	22475			#		
Specific Conductance	µmhos /cm	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	10795			#		
Specific Conductance	µmhos /cm	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	5072			#		
Specific Conductance	µmhos /cm	TP-01	WL	10/19/2010	0001	22	-	22	7815			#		
Specific Conductance	µmhos /cm	TP-02	WL	10/27/2010	0001	30	-	30	2324			#		
Specific Conductance	µmhos /cm	TP-11	WL	10/19/2010	0001	30	-	30	22835			#		
Specific Conductance	µmhos /cm	TP-17	WL	10/27/2010	0001	28	-	28	101972			#		
Specific Conductance	µmhos /cm	TP-19	WL	11/01/2010	0001	29	-	29	149474			#		
Specific Conductance	µmhos /cm	TP-20	WL	10/26/2010	0001	32	-	32	147658			#		
Specific Conductance	µmhos /cm	TP-22	WL	10/26/2010	0001	17	-	17	26667			#		
Specific Conductance	µmhos /cm	TP-23	WL	10/25/2010	0001	25	-	25	51480			#		
Temperature	C	0201	SL	11/01/2010	0001	0	-	0	9.29			#		
Temperature	C	0218	SL	10/27/2010	0001	0	-	0	10.72			#		
Temperature	C	0226	SL	10/27/2010	0001	0	-	0	11.61			#		
Temperature	C	0228	SL	11/01/2010	0001	0	-	0	10.35			#		
Temperature	C	0401	WL	10/26/2010	0001	18	-	18	17.22			#		
Temperature	C	0403	WL	10/26/2010	0001	18	-	18	16.8			#		
Temperature	C	0404	WL	10/27/2010	0001	18	-	18	16.63			#		
Temperature	C	0407	WL	10/26/2010	0001	17	-	17	16.97			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Temperature	C	0410	WL	11/02/2010	0001	27	-	27	17.25		#		
Temperature	C	0411	WL	11/02/2010	0001	9	-	9	18.82		#		
Temperature	C	0412	WL	10/27/2010	0001	11	-	11	19.8		#		
Temperature	C	0413	WL	11/01/2010	0001	10.5	-	10.5	20.12		#		
Temperature	C	0414	WL	10/27/2010	0001	9	-	9	20.51		#		
Temperature	C	0430	WL	10/25/2010	0001	101	-	101	17.81		#		
Temperature	C	0431	WL	10/20/2010	0001	91	-	91	18.58		#		
Temperature	C	0432	WL	10/20/2010	0001	55	-	55	19.16		#		
Temperature	C	0433	WL	10/20/2010	0001	99	-	99	20		#		
Temperature	C	0434	WL	10/20/2010	0001	35	-	35	18.74		#		
Temperature	C	0435	WL	10/19/2010	0001	173	-	173	18.83		#		
Temperature	C	0436	WL	11/02/2010	0001	195	-	205	19.31		#		
Temperature	C	0440	WL	10/28/2010	0001	117	-	117	17.76		#		
Temperature	C	0441	WL	10/25/2010	0001	53	-	53	17.6		#		
Temperature	C	0443	WL	10/20/2010	0001	73	-	73	18.52		#		
Temperature	C	0444	WL	10/19/2010	0001	116	-	116	18.45		#		
Temperature	C	0453	WL	10/28/2010	0001	80	-	80	17.15		#		
Temperature	C	0454	WL	10/25/2010	0001	13	-	13	19.45		#		
Temperature	C	0455	WL	10/25/2010	0001	46	-	46	18.96		#		
Temperature	C	0456	WL	10/20/2010	0001	53	-	53	18.58		#		
Temperature	C	0457	WL	10/19/2010	0001	29	-	29	17.81		#		
Temperature	C	0492	WL	10/26/2010	0001	18	-	18	16.41		#		
Temperature	C	AMM-1-19	WL	10/19/2010	0001	19	-	19	18.4		#		
Temperature	C	AMM-1-53	WL	10/19/2010	0001	53	-	53	18.29		#		
Temperature	C	AMM-2	WL	10/26/2010	0001	48	-	48	15.57		#		
Temperature	C	AMM-3	WL	10/26/2010	0001	48	-	48	19.53		#		
Temperature	C	ATP-2-D	WL	10/26/2010	0001	88	-	88	18.23		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Temperature	C	ATP-2-S	WL	10/26/2010	0001	38	-	38	18.11		#		
Temperature	C	ATP-3	WL	10/20/2010	0001	51	-	51	19.24		#		
Temperature	C	CR1	SL	11/01/2010	0001	0	-	0	9.41		#		
Temperature	C	CR3	SL	10/27/2010	0001	0	-	0	12.7		#		
Temperature	C	CR5	SL	11/01/2010	0001	0	-	0	10.73		#		
Temperature	C	SMI-MW01	WL	10/27/2010	0001	16	-	16	17.61		#		
Temperature	C	SMI-PW03	WL	11/02/2010	0001	60	-	60	18.01		#		
Temperature	C	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	15.38		#		
Temperature	C	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	15.6		#		
Temperature	C	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	18.67		#		
Temperature	C	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	18.44		#		
Temperature	C	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	19.04		#		
Temperature	C	TP-01	WL	10/19/2010	0001	22	-	22	17.16		#		
Temperature	C	TP-02	WL	10/27/2010	0001	30	-	30	15.76		#		
Temperature	C	TP-11	WL	10/19/2010	0001	30	-	30	16.66		#		
Temperature	C	TP-17	WL	10/27/2010	0001	28	-	28	13.57		#		
Temperature	C	TP-19	WL	11/01/2010	0001	29	-	29	14.28		#		
Temperature	C	TP-20	WL	10/26/2010	0001	32	-	32	17.98		#		
Temperature	C	TP-22	WL	10/26/2010	0001	17	-	17	16.39		#		
Temperature	C	TP-23	WL	10/25/2010	0001	25	-	25	19.33		#		
Total Dissolved Solids	mg/L	0201	SL	11/01/2010	0001	0	-	0	760		#	40	
Total Dissolved Solids	mg/L	0218	SL	10/27/2010	0001	0	-	0	810		#	40	
Total Dissolved Solids	mg/L	0226	SL	10/27/2010	0001	0	-	0	810		#	40	
Total Dissolved Solids	mg/L	0228	SL	11/01/2010	0001	0	-	0	760		#	40	
Total Dissolved Solids	mg/L	0401	WL	10/26/2010	0001	18	-	18	14000		#	400	
Total Dissolved Solids	mg/L	0401	WL	10/26/2010	0002	18	-	18	14000		#	400	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	0403	WL	10/26/2010	0001	18	- 18	6400		#	200	
Total Dissolved Solids	mg/L	0404	WL	10/27/2010	0001	18	- 18	8800		#	200	
Total Dissolved Solids	mg/L	0407	WL	10/26/2010	0001	17	- 17	2600		#	200	
Total Dissolved Solids	mg/L	0410	WL	11/02/2010	0001	27	- 27	2000		#	80	
Total Dissolved Solids	mg/L	0412	WL	10/27/2010	0001	11	- 11	1900		#	80	
Total Dissolved Solids	mg/L	0413	WL	11/01/2010	0001	10.5	- 10.5	2200		#	80	
Total Dissolved Solids	mg/L	0414	WL	10/27/2010	0001	9	- 9	3000		#	80	
Total Dissolved Solids	mg/L	0430	WL	10/25/2010	0001	101	- 101	4100		#	200	
Total Dissolved Solids	mg/L	0431	WL	10/20/2010	0001	91	- 91	22000		#	1000	
Total Dissolved Solids	mg/L	0432	WL	10/20/2010	0001	55	- 55	1800		#	80	
Total Dissolved Solids	mg/L	0432	WL	10/20/2010	0002	55	- 55	1800		#	80	
Total Dissolved Solids	mg/L	0433	WL	10/20/2010	0001	99	- 99	2700		#	80	
Total Dissolved Solids	mg/L	0434	WL	10/20/2010	0001	35	- 35	30000		#	1000	
Total Dissolved Solids	mg/L	0435	WL	10/19/2010	0001	173	- 173	91000		#	2000	
Total Dissolved Solids	mg/L	0436	WL	11/02/2010	0001	195	- 205	100000		#	4000	
Total Dissolved Solids	mg/L	0440	WL	10/28/2010	0001	117	- 117	6200		#	200	
Total Dissolved Solids	mg/L	0441	WL	10/25/2010	0001	53	- 53	4600		#	200	
Total Dissolved Solids	mg/L	0443	WL	10/20/2010	0001	73	- 73	3400		#	200	
Total Dissolved Solids	mg/L	0444	WL	10/19/2010	0001	116	- 116	86000		#	2000	
Total Dissolved Solids	mg/L	0453	WL	10/28/2010	0001	80	- 80	21000		#	400	
Total Dissolved Solids	mg/L	0454	WL	10/25/2010	0001	13	- 13	42000		#	2000	
Total Dissolved Solids	mg/L	0455	WL	10/25/2010	0001	46	- 46	1700		#	80	
Total Dissolved Solids	mg/L	0456	WL	10/20/2010	0001	53	- 53	5100		#	200	
Total Dissolved Solids	mg/L	0457	WL	10/19/2010	0001	29	- 29	2900		#	200	
Total Dissolved Solids	mg/L	0492	WL	10/26/2010	0001	18	- 18	4000		#	80	
Total Dissolved Solids	mg/L	AMM-1-19	WL	10/19/2010	0001	19	- 19	6700		#	200	
Total Dissolved Solids	mg/L	AMM-1-53	WL	10/19/2010	0001	53	- 53	7000		#	200	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/11/2011

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	AMM-2	WL	10/26/2010	0001	48	-	48	14000		#	1000	
Total Dissolved Solids	mg/L	AMM-3	WL	10/26/2010	0001	48	-	48	16000		#	1000	
Total Dissolved Solids	mg/L	ATP-2-D	WL	10/26/2010	0001	88	-	88	95000		#	4000	
Total Dissolved Solids	mg/L	ATP-2-S	WL	10/26/2010	0001	38	-	38	14000		#	400	
Total Dissolved Solids	mg/L	ATP-3	WL	10/20/2010	0001	51	-	51	1400		#	80	
Total Dissolved Solids	mg/L	CR1	SL	11/01/2010	0001	0	-	0	750		#	40	
Total Dissolved Solids	mg/L	CR1	SL	11/01/2010	0002	0	-	0	760		#	40	
Total Dissolved Solids	mg/L	CR3	SL	10/27/2010	0001	0	-	0	840		#	40	
Total Dissolved Solids	mg/L	CR5	SL	11/01/2010	0001	0	-	0	720		#	400	
Total Dissolved Solids	mg/L	SMI-MW01	WL	10/27/2010	0001	16	-	16	3700		#	80	
Total Dissolved Solids	mg/L	SMI-PW03	WL	11/02/2010	0001	60	-	60	5500		#	200	
Total Dissolved Solids	mg/L	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	89000		#	4000	
Total Dissolved Solids	mg/L	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	62000		#	4000	
Total Dissolved Solids	mg/L	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	16000		#	400	
Total Dissolved Solids	mg/L	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	7000		#	200	
Total Dissolved Solids	mg/L	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	2900		#	200	
Total Dissolved Solids	mg/L	TP-01	WL	10/19/2010	0001	22	-	22	4700		#	200	
Total Dissolved Solids	mg/L	TP-02	WL	10/27/2010	0001	30	-	30	1200		#	40	
Total Dissolved Solids	mg/L	TP-11	WL	10/19/2010	0001	30	-	30	15000		#	400	
Total Dissolved Solids	mg/L	TP-17	WL	10/27/2010	0001	28	-	28	67000		#	2000	
Total Dissolved Solids	mg/L	TP-19	WL	11/01/2010	0001	29	-	29	110000		#	4000	
Total Dissolved Solids	mg/L	TP-20	WL	10/26/2010	0001	32	-	32	100000		#	2000	
Total Dissolved Solids	mg/L	TP-22	WL	10/26/2010	0001	17	-	17	20000		#	400	
Total Dissolved Solids	mg/L	TP-23	WL	10/25/2010	0001	25	-	25	40000		#	2000	
Turbidity	NTU	0201	SL	11/01/2010	0001	0	-	0	314		#		
Turbidity	NTU	0228	SL	11/01/2010	0001	0	-	0	252		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Turbidity	NTU	0401	WL	10/26/2010	0001	18	-	18	2.94		#		
Turbidity	NTU	0403	WL	10/26/2010	0001	18	-	18	2.87		#		
Turbidity	NTU	0404	WL	10/27/2010	0001	18	-	18	2.11		#		
Turbidity	NTU	0407	WL	10/26/2010	0001	17	-	17	2.07		#		
Turbidity	NTU	0410	WL	11/02/2010	0001	27	-	27	60.4		#		
Turbidity	NTU	0411	WL	11/02/2010	0001	9	-	9	174		#		
Turbidity	NTU	0412	WL	10/27/2010	0001	11	-	11	2.8		#		
Turbidity	NTU	0413	WL	11/01/2010	0001	10.5	-	10.5	32.7		#		
Turbidity	NTU	0414	WL	10/27/2010	0001	9	-	9	3.45		#		
Turbidity	NTU	0430	WL	10/25/2010	0001	101	-	101	3.47		#		
Turbidity	NTU	0431	WL	10/20/2010	0001	91	-	91	1.79		#		
Turbidity	NTU	0432	WL	10/20/2010	0001	55	-	55	1.49		#		
Turbidity	NTU	0433	WL	10/20/2010	0001	99	-	99	6.63		#		
Turbidity	NTU	0434	WL	10/20/2010	0001	35	-	35	1.4		#		
Turbidity	NTU	0435	WL	10/19/2010	0001	173	-	173	6.71		#		
Turbidity	NTU	0436	WL	11/02/2010	0001	195	-	205	3.76		#		
Turbidity	NTU	0440	WL	10/28/2010	0001	117	-	117	125		#		
Turbidity	NTU	0441	WL	10/25/2010	0001	53	-	53	9.2		#		
Turbidity	NTU	0443	WL	10/20/2010	0001	73	-	73	4.19		#		
Turbidity	NTU	0444	WL	10/19/2010	0001	116	-	116	4.76		#		
Turbidity	NTU	0453	WL	10/28/2010	0001	80	-	80	3.32		#		
Turbidity	NTU	0454	WL	10/25/2010	0001	13	-	13	21.3		#		
Turbidity	NTU	0457	WL	10/19/2010	0001	29	-	29	3.65		#		
Turbidity	NTU	0492	WL	10/26/2010	0001	18	-	18	2.5		#		
Turbidity	NTU	AMM-1-19	WL	10/19/2010	0001	19	-	19	2.91		#		
Turbidity	NTU	AMM-1-53	WL	10/19/2010	0001	53	-	53	3.37		#		
Turbidity	NTU	AMM-2	WL	10/26/2010	0001	48	-	48	3.65		#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Turbidity	NTU	AMM-3	WL	10/26/2010	0001	48	-	48	17		#		
Turbidity	NTU	ATP-2-D	WL	10/26/2010	0001	88	-	88	20.2		#		
Turbidity	NTU	ATP-2-S	WL	10/26/2010	0001	38	-	38	7.82		#		
Turbidity	NTU	ATP-3	WL	10/20/2010	0001	51	-	51	1.98		#		
Turbidity	NTU	CR1	SL	11/01/2010	0001	0	-	0	277		#		
Turbidity	NTU	CR5	SL	11/01/2010	0001	0	-	0	164		#		
Turbidity	NTU	SMI-MW01	WL	10/27/2010	0001	16	-	16	2		#		
Turbidity	NTU	SMI-PW03	WL	11/02/2010	0001	60	-	60	28.1		#		
Turbidity	NTU	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	7.41		#		
Turbidity	NTU	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	1.87		#		
Turbidity	NTU	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	3.91		#		
Turbidity	NTU	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	8.53		#		
Turbidity	NTU	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	4.81		#		
Turbidity	NTU	TP-01	WL	10/19/2010	0001	22	-	22	6.5		#		
Turbidity	NTU	TP-02	WL	10/27/2010	0001	30	-	30	8.88		#		
Turbidity	NTU	TP-11	WL	10/19/2010	0001	30	-	30	9.77		#		
Turbidity	NTU	TP-17	WL	10/27/2010	0001	28	-	28	6.47		#		
Turbidity	NTU	TP-19	WL	11/01/2010	0001	29	-	29	5.46		#		
Turbidity	NTU	TP-20	WL	10/26/2010	0001	32	-	32	5.43		#		
Turbidity	NTU	TP-22	WL	10/26/2010	0001	17	-	17	736		#		
Turbidity	NTU	TP-23	WL	10/25/2010	0001	25	-	25	127		#		
Uranium	mg/L	0201	SL	11/01/2010	0001	0	-	0	0.0059		#	2.9E-005	
Uranium	mg/L	0218	SL	10/27/2010	0001	0	-	0	0.0059		#	2.9E-005	
Uranium	mg/L	0226	SL	10/27/2010	0001	0	-	0	0.006		#	2.9E-005	
Uranium	mg/L	0228	SL	11/01/2010	0001	0	-	0	0.0062		#	2.9E-005	
Uranium	mg/L	0401	WL	10/26/2010	0001	18	-	18	2.2		#	0.00029	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data	QA					
Uranium	mg/L	0401	WL	10/26/2010	0002	18	-	18	2.1		#	0.00029	
Uranium	mg/L	0403	WL	10/26/2010	0001	18	-	18	1		#	0.00029	
Uranium	mg/L	0404	WL	10/27/2010	0001	18	-	18	1		#	0.00015	
Uranium	mg/L	0407	WL	10/26/2010	0001	17	-	17	0.65		#	0.00029	
Uranium	mg/L	0410	WL	11/02/2010	0001	27	-	27	1.1		#	0.00029	
Uranium	mg/L	0411	WL	11/02/2010	0001	9	-	9	3.9		#	0.00058	
Uranium	mg/L	0412	WL	10/27/2010	0001	11	-	11	4.1		#	0.00058	
Uranium	mg/L	0413	WL	11/01/2010	0001	10.5	-	10.5	1.1		#	0.00029	
Uranium	mg/L	0414	WL	10/27/2010	0001	9	-	9	4.9		#	0.00058	
Uranium	mg/L	0430	WL	10/25/2010	0001	101	-	101	0.01		#	2.9E-005	
Uranium	mg/L	0431	WL	10/20/2010	0001	91	-	91	0.01		#	2.9E-005	
Uranium	mg/L	0432	WL	10/20/2010	0001	55	-	55	0.0018		#	2.9E-005	
Uranium	mg/L	0432	WL	10/20/2010	0002	55	-	55	0.0019		#	2.9E-005	
Uranium	mg/L	0433	WL	10/20/2010	0001	99	-	99	0.0018		#	2.9E-005	
Uranium	mg/L	0434	WL	10/20/2010	0001	35	-	35	0.022		#	2.9E-005	
Uranium	mg/L	0435	WL	10/19/2010	0001	173	-	173	0.021		#	2.9E-005	
Uranium	mg/L	0436	WL	11/02/2010	0001	195	-	205	0.0076		#	2.9E-005	
Uranium	mg/L	0440	WL	10/28/2010	0001	117	-	117	0.034		#	1.5E-005	
Uranium	mg/L	0441	WL	10/25/2010	0001	53	-	53	0.033		#	2.9E-005	
Uranium	mg/L	0443	WL	10/20/2010	0001	73	-	73	0.011		#	2.9E-005	
Uranium	mg/L	0444	WL	10/19/2010	0001	116	-	116	0.02		#	2.9E-005	
Uranium	mg/L	0453	WL	10/28/2010	0001	80	-	80	1.8		#	0.00029	
Uranium	mg/L	0454	WL	10/25/2010	0001	13	-	13	2.4		#	0.00029	
Uranium	mg/L	0455	WL	10/25/2010	0001	46	-	46	0.0023		#	2.9E-005	
Uranium	mg/L	0456	WL	10/20/2010	0001	53	-	53	0.024		#	2.9E-005	
Uranium	mg/L	0457	WL	10/19/2010	0001	29	-	29	0.0018		#	2.9E-005	
Uranium	mg/L	0492	WL	10/26/2010	0001	18	-	18	0.51		#	0.00015	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
 REPORT DATE: 1/11/2011

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA						
Uranium	mg/L	AMM-1-19	WL	10/19/2010	0001	19	-	19	0.005		#	2.9E-005		
Uranium	mg/L	AMM-1-53	WL	10/19/2010	0001	53	-	53	0.0049		#	2.9E-005		
Uranium	mg/L	AMM-2	WL	10/26/2010	0001	48	-	48	1.9		#	0.00029		
Uranium	mg/L	AMM-3	WL	10/26/2010	0001	48	-	48	1.6		#	0.00029		
Uranium	mg/L	ATP-2-D	WL	10/26/2010	0001	88	-	88	0.021		#	0.00015		
Uranium	mg/L	ATP-2-S	WL	10/26/2010	0001	38	-	38	0.0019		#	2.9E-005		
Uranium	mg/L	ATP-3	WL	10/20/2010	0001	51	-	51	0.0026		#	2.9E-005		
Uranium	mg/L	CR1	SL	11/01/2010	0001	0	-	0	0.0052		#	2.9E-005		
Uranium	mg/L	CR1	SL	11/01/2010	0002	0	-	0	0.005		#	2.9E-005		
Uranium	mg/L	CR3	SL	10/27/2010	0001	0	-	0	0.0081		#	2.9E-005		
Uranium	mg/L	CR5	SL	11/01/2010	0001	0	-	0	0.0058		#	2.9E-005		
Uranium	mg/L	SMI-MW01	WL	10/27/2010	0001	16	-	16	5.6		#	0.00058		
Uranium	mg/L	SMI-PW03	WL	11/02/2010	0001	60	-	60	1.3		#	0.00029		
Uranium	mg/L	SMI-PZ2D	WL	11/02/2010	0001	75	-	75	0.54		#	0.00015		
Uranium	mg/L	SMI-PZ2M2	WL	11/02/2010	0001	56	-	56	1.4		#	0.00029		
Uranium	mg/L	SMI-PZ3D2	WL	11/02/2010	0001	78	-	78	1.4		#	0.00029		
Uranium	mg/L	SMI-PZ3M	WL	11/02/2010	0001	59	-	59	1.5		#	0.00029		
Uranium	mg/L	SMI-PZ3S	WL	11/02/2010	0001	21.94	-	26.94	1.8		#	0.00015		
Uranium	mg/L	TP-01	WL	10/19/2010	0001	22	-	22	0.079		#	2.9E-005		
Uranium	mg/L	TP-02	WL	10/27/2010	0001	30	-	30	0.87		#	0.00029		
Uranium	mg/L	TP-11	WL	10/19/2010	0001	30	-	30	0.001		#	2.9E-005		
Uranium	mg/L	TP-17	WL	10/27/2010	0001	28	-	28	0.02		#	1.5E-005		
Uranium	mg/L	TP-19	WL	11/01/2010	0001	29	-	29	6.E-005	B	#	2.9E-005		
Uranium	mg/L	TP-20	WL	10/26/2010	0001	32	-	32	0.012		#	2.9E-005		
Uranium	mg/L	TP-22	WL	10/26/2010	0001	17	-	17	0.37		#	2.9E-005		
Uranium	mg/L	TP-23	WL	10/25/2010	0001	25	-	25	3		#	0.00029		

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.
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Appendix D.
Water Level Data

Appendix D. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 1/19/2011

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		3969.6	10/26/2010		15.69	3953.91	
0403	O	3968.95	10/26/2010		15.6	3953.35	
0404	O	3968.3	10/27/2010		14.05	3954.25	
0407	O	3969.09	10/26/2010		15.89	3953.2	
0410	O	3979.11	11/02/2010		25.17	3953.94	
0411	O	3964.88	11/02/2010		8.75	3956.13	
0412	O	3965.76	10/27/2010		10.67	3955.09	
0413	O	3965.33	11/01/2010		9.88	3955.45	
0414	O	3963.2	10/27/2010		8.47	3954.73	
0430	U	4022.1	10/25/2010		59.92	3962.18	
0431	O	4007.04	10/20/2010		47.26	3959.78	
0432	U	4001.47	10/20/2010		41.74	3959.73	
0433	O	3989.99	10/20/2010		31.45	3958.54	
0434	U	3990.21	10/20/2010		33.9	3956.31	
0435	O	3971.67	10/19/2010		14.54	3957.13	
0436	O	3970.8	11/02/2010		10.6	3960.2	
0440	O	4070.71	10/28/2010		111.52	3959.19	
0441		4008.77	10/25/2010		48.84	3959.93	
0443	O	4006.72	10/20/2010		46.49	3960.23	
0444	O	3970.99	10/19/2010		14.89	3956.1	
0453			10/28/2010		73.8		
0454		3966.47	10/25/2010		12.13	3954.34	
0455	O	3990.2	10/25/2010		31.91	3958.29	
0456	U	3990.46	10/20/2010		34.4	3956.06	
0457	O	3971.3	10/19/2010		15.33	3955.97	
0492		3967.64	10/26/2010		14.89	3952.75	
AMM-1-19			10/19/2010		16.55		

Appendix D. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 1/19/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
AMM-1-53			10/19/2010		16.55		
AMM-2	O	3967.74	10/26/2010		9.74	3958	
AMM-3	O	3967.69	10/26/2010		8.42	3959.27	
ATP-2-D	O	3967.05	10/26/2010		10.1	3956.95	
ATP-2-S	O	3967.04	10/26/2010		7.78	3959.26	
ATP-3	O	3998.29	10/20/2010		39.55	3958.74	
SMI-MW01	O	3968.32	10/27/2010		11.5	3956.82	
SMI-PW03	O	3975.04	11/02/2010		19.15	3955.89	
SMI-PZ2D	O	3967.38	11/02/2010		15.45	3951.93	
SMI-PZ2M2	O	3967.18	11/02/2010		14.4	3952.78	
SMI-PZ3D2	O	3975.13	11/02/2010		19.57	3955.56	
SMI-PZ3M	O	3975.23	11/02/2010		19.42	3955.81	
SMI-PZ3S	O	3975.03	11/02/2010		19.13	3955.9	
TP-01	O	3969.39	10/19/2010		13	3956.39	
TP-02	O	3975.55	10/27/2010		20.71	3954.84	
TP-11	O	3967.51	10/19/2010		11.99	3955.52	
TP-17	D	3963.69	10/27/2010		11.39	3952.3	
TP-19	D	3962.17	11/01/2010		10.54	3951.63	
TP-20	D	3967.55	10/26/2010		1	3966.55	
TP-22		3966.48	10/26/2010		17.56	3948.92	
TP-23		3962.54	10/25/2010		8.85	3953.69	

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

**Appendix E.
Blanks Report**

Appendix E. Blanks Report

BLANKS REPORT
LAB: ALS
RIN: 1010053
Report Date: 1/24/2011

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab Data	Detection Limit	Uncertainty	Sample Type
Ammonia Total as N	MOA01	0999	10/26/2010	0001	mg/L	0.1	U	0.1		E
Total Dissolved Solids	MOA01	0999	10/26/2010	0001	mg/L	20	U	20		E
Uranium	MOA01	0999	10/26/2010	0001	mg/L	4.E-005	B	2.9E-005		E

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 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.

SAMPLE TYPES:

- E Equipment Blank.

Attachment 1.
October 2010 Site-wide Sampling Event

Attachment 1. October 2010 Site-wide Sampling Event



Date: November 10, 2010
To: Ken Pill
From: James Ritchey
Subject: October 2010 Site-wide Sampling Event

Site: Moab, Utah

Date of Sampling Event: October 19 - November 2, 2010

Team Members: T. Meadows, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 1010053.

Sample Shipment: The coolers were shipped overnight UPS to ALS Laboratory Group from Moab, Utah, on October 21, October 28, and November 4, 2010 (tracking numbers 0197080453, 0195764067, 0195402073, and 0194988176).

Number of Locations Sampled: The purpose of the site-wide sampling event was to monitor any changes in the water chemistry across the site. The standard routine sampling event locations were also added to this sampling event to monitor the site during base-flow conditions of the Colorado River. A total of 47 monitoring wells were sampled during this event (with one location [AMM-1] sampled from two different depths), along with seven surface water locations. Including three duplicates and one equipment blank, a total of 59 samples were collected during the October 2010 sampling event.

Locations Not Sampled/Reason: Wells 0437, 0438, and 0439 could not be sampled due to the excavation operations. The dedicated bladder pump was pulled from well 0437 last year to accommodate excavation activities. Well 0438 was cut down and buried (with pump reinstalled) to accommodate load-out operations. Well 0439 was in a tailings drying bed and inaccessible.

Field Variance: While sampling, wells 0453 and TP-20 could not provide a definitive static water level. The water level of well 0453 was below the top of the bladder pump that prevented reaching the water. The water level of well TP-20 was not measured due to condensation along the well casing and problems with the water level meter.

Attachment 1. October 2010 Site-wide Sampling Event (continued)

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

False ID	True ID	Sample Type	Associated matrix
2000	0432	Duplicate from 55 ft bgs	Ground Water
2001	0401	Duplicate from 18 ft bgs	Ground Water
2002	N/A	Equipment blank from tubing decon	D.I. Water
2003	CR1	Duplicate from surface	Surface Water

ID = identification

Location-specific Information: All of the monitor wells were sampled using a peristaltic pump and dedicated tubing unless otherwise noted. The table below provides additional information.

Location	Date	Sample Depth (ft bgs)	Comments
0201	11/01/2010	NA	Collected at surface 1 ft from bank
0218	10/27/2010	NA	Collected at surface 1 ft from bank
0226	10/27/2010	NA	Collected at surface 1 ft from bank
0228	11/01/2010	NA	Collected at surface 1 ft from bank
0401	10/26/2010	18	
0403	10/26/2010	18	
0404	10/27/2010	18	Could not monitor water level due to casing diameter
0407	10/26/2010	17	
0410	11/02/2010	27	Dewatered <0.5 L when purged on 11/01/2010
0411	11/02/2010	9	Dewatered at 0.1 L on 11/01/2010
0412	10/27/2010	11	Sampled 2 ft from bottom
0413	11/01/2010	10.5	Sampled for selenium.
0414	10/27/2010	9	Sampled 1 ft from bottom
0430	10/25/2010	101	Sampled with dedicated bladder pump
0431	10/20/2010	91	Sampled with dedicated bladder pump
0432	10/20/2010	55	Sampled with dedicated bladder pump
0433	10/20/2010	99	Sampled with dedicated bladder pump
0434	10/20/2010	35	Sampled with dedicated bladder pump
0435	10/19/2010	173	Sulfur odor.
0436	10/19/2010	~192	Sulfur odor, pump was pulled ~5 ft from casing and could not be lowered. Sample collected ~5 ft above usual sample depth.
0440	10/28/2010	117	Sampled with dedicated bladder pump, turbidimeter not working, visually appears low.
0441	10/25/2010	53	Sampled with dedicated bladder pump
0443	10/20/2010	73	Sampled with dedicated bladder pump
0444	10/19/2010	116	Sulfur odor.
0453	10/28/2010	80	WL inconsistent and at top of pump
0454	10/25/2010	13	
0455	10/25/2010	46	Sampled with inertia pump.
0456	10/20/2010	53	Very turbid.
0457	10/19/2010	29	
0492	10/26/2010	18	Could not monitor water level due to size of well casing
AMM-1-19	10/19/2010	19	
AMM-1-53	10/19/2010	53	
AMM-2	10/26/2010	48	Casing cut prior to sample event, sample collected from original intake depth
AMM-3	10/26/2010	48	Sample collected from original sample depth prior to casing modification
ATP-2-D	10/26/2010	88	Dark, black water; water collected from original sample depth following casing modification.
ATP-2-S	10/26/2010	38	

Attachment 1. October 2010 Site-wide Sampling Event (continued)

Location	Date	Sample Depth (ft bgs)	Comments
ATP-3	10/20/2010	51	Sampled with dedicated bladder pump.
CR1	11/01/2010	NA	Collected 1 ft from bank 2 inches below surface
CR3	10/27/2010	NA	Collected at surface
CR5	11/01/2010	NA	Collected at surface 1 ft from bank
SMI-MW01	10/27/2010	16	
SMI-PW03	11/02/2010	60	
SMI-PZ2D	11/02/2010	75	
SMI-PZ2M2	11/02/2010	56	
SMI-PZ3D2	11/02/2010	78	
SMI-PZ3M	11/02/2010	59	
SMI-PZ3S	10/19/2010	25	Sampled for selenium
TP-01	10/19/2010	22	Sulfur odor
TP-02	10/27/2010	30	
TP-11	10/19/2010	30	Casing is broken to approximately 6 inches above ground surface
TP-17	10/27/2010	28	Black smelly water
TP-19	11/01/2010	29	Sulfur odor, dark color
TP-20	10/26/2010	32	Due to condensation in well casing, water level could not be determined; sulfur odor
TP-22	10/26/2010	17	Sampled 1 ft from total depth, dewatered at 1.5 L
TP-23	10/25/2010	25	Sampled 1 ft from total depth

L = liter



Surface Water Location CR-1

Attachment 1. October 2010 Site-wide Sampling Event (continued)



Surface water location 0201



Surface water location CR-5

Attachment 1. October 2010 Site-wide Sampling Event (continued)



Surface water location 0218



Surface water location 0228

Attachment 1. October 2010 Site-wide Sampling Event (continued)



Surface water location CR-3

Water Level Measurements: Water level data are provided in the table below. These data represent depth to water (ft below top of casing) measurements.

Well No.	Date	Time	Depth to Water (ft btoc)
0401	10/26/2010	15:32	15.69
0403	10/26/2010	15:01	15.60
0404	10/27/2010	09:13	14.05
0407	10/26/2010	14:40	15.89
0410	11/02/2010	10:13	25.17
0411	11/02/2010	16:03	8.75
0412	10/27/2010	10:30	10.67
0413	11/01/2010	15:31	9.88
0414	10/27/2010	10:49	8.42
0430	10/25/2010	10:56	59.92
0431	10/20/2010	11:53	47.26
0432	10/20/2010	10:08	41.74
0433	10/20/2010	14:46	31.45
0434	10/20/2010	09:12	33.90
0435	10/19/2010	11:56	14.54
0436	10/19/2010	14:27	10.60
0440	10/28/2010	09:42	111.52
0441	10/25/2010	10:16	48.84
0443	10/20/2010	11:35	46.49
0444	10/19/2010	11:30	14.89
0453	10/28/2010	10:14	–
0454	10/25/2010	11:56	12.13
0455	10/25/2010	15:54	31.91
0456	10/20/2010	8:50	34.40
0457	10/19/2010	12:19	15.33
0492	10/26/2010	09:17	14.89
AMM-1-19	10/19/2010	09:25	16.55

Attachment 1. October 2010 Site-wide Sampling Event (continued)

Well No.	Date	Time	Depth to Water (ft btoc)
AMM-1-53	10/19/2010	09:40	16.55
AMM-2	10/26/2010	08:50	9.74
AMM-3	10/26/2010	14:01	8.42
ATP-2-D	10/26/2010	10:45	10.10
ATP-2-S	10/26/2010	11:12	7.78
ATP-3	10/20/2010	15:49	39.55
SMI-MW01	10/27/2010	10:10	11.50
SMI-PW03	11/02/2010	10:33	19.15
SMI-PZ2D	11/02/2010	08:28	15.45
SMI-PZ2M2	11/02/2010	08:44	14.40
SMI-PZ3D2	11/02/2010	10:59	19.557
SMI-PZ3M	11/02/2010	11:15	19.42
SMI-PZ3S	10/19/2010	14:11	19.13
TP-01	10/19/2010	10:54	13.00
TP-02	10/27/2010	09:50	20.71
TP-11	10/19/2010	10:22	11.99
TP-17	10/27/2010	14:54	11.39
TP-19	11/01/2010	11:12	10.54
TP-20	10/26/2010	9:48	–
TP-22	10/26/2010	08:32	17.56
TP-23	10/25/2010	14:12	8.85

ft btoc = feet below top of casing

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

Site Issues: The mean daily Colorado River flows during this sampling event, according to the USGS Cisco gauging station (number 09180500), are provided below.

Date	Daily Mean Flow (cfs)
10/19/2010	3,920
10/20/2010	3,950
10/21/2010	3,870
10/22/2010	4,090
10/23/2010	4,760
10/24/2010	5,100
10/25/2010	5,120
10/26/2010	5,670
10/27/2010	5,350
10/28/2010	4,990
10/29/2010	4,750
10/30/2010	4,490
10/31/2010	4,360
11/1/2010	4,400
11/2/2010	4,380

Corrective Action Required/Taken: None.