DOE–EM/GJTAC1870

Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project November 2009 Validation Data Package for Performance Assessment of the Monthly Sampling for the Ground Water Interim Action

January 2010

U.S. Department of Energy

Office of Environmental Management

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

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Moab UMTRA Project
November 2009 Monthly Ground Water Sampling Event

Revision 0

Review and Approval

1/29/10

Kenneth G. Pill
TAC Ground Water Manager

Date

1/29/10

Joseph D. Ritchey
TAC Senior Program Manager

Date

Revision History

Revision No.	Date	Reason/Basis for Revision
0	January 2010	Initial issue.

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Acronyms and Abbreviations

ºC	degrees centigrade
CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
IA	interim action
ICP	inductively coupled plasma
LCS	laboratory control sample
MB	method blank
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
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
UMTRCA	Uranium Mill Tailings Radiation control Act
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 *Environmental Procedures Catalog* (STO 6), "Standard Practice for Validation of Laboratory Data," GT-9(P) (2006).

As part of the scope of this document, the complete results of this data validation process are provided. Section 1 presents the Summary Criteria, the Sampling Event Summary, and the Sampling and Analysis. Section 2 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. The Data Presentation is contained in Section 3, which includes a summary of the anomalous data generated by the validation process. Various appendices contain the Water Sampling Field Activities Verification, Water Quality Data, Water Level Data, and the Minimums and Maximums Report. Attachment 1 contains the trip report. All Colorado River flow discussed in this document is measured from the U.S. Geological Survey (USGS) Cisco gauging station No. 09180500.

This validation data package (VDP) presents the results of the November 2009 monthly sampling event completed from November 2 through 6, 2009, in which ground water samples were collected primarily from a variety of well points and surface water locations adjacent to the well field. 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 November 2009 monthly sampling event.

1.1 Summary Criteria

Sampling Period: November 2 through 6, 2009
The purpose of this sampling was to collect data that can be used to evaluate the performance of the ground water interim action (IA) well field. All sampling locations are shown on Figure 1, and a summary of site conditions is presented in Figure 2.

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

   Yes. There were five results (one result was a duplicate) from four different locations that were considered anomalous based on the Minimums and Maximums Report. Four of the results were anomalously high, and one was low.

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

   Yes. Only half of the Configuration (CF) 4 wells were actively extracting ground water during this sampling event. All other wells were shut down by late September to control the evaporation pond level. As a result, the total well field extraction rate was approximately 29 gallons per minute.

3. Was the evaporation pond functioning properly?

Yes. The pond level was from 8.1 to 8.3 feet during this sampling event.

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

No. Surface water locations 0236, 0240, 0241, 0242, and 0258 were dry. Well point location 0603 was covered by river debris and could not be sampled. Well point location 0698 was dry, and locations 0494 and 0497 did not recharge sufficiently to provide a sample. CF4 well points 0793, 0794, and 0795 were inaccessible.

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

No.

1.2 Sampling Event Summary

This VDP presents the validated data associated with the ground water collected during the November 2009 IA monthly sampling event at the former uranium tailings processing site in Moab, Utah. This VDP includes a discussion of the data validation process in Section 2.0, with a description of how these data are qualified based on field and laboratory verification assessments (Sections 2.1 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 8 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. Based on the results of the Minimums and Maximums Report, there were four locations with a total of five analytical results that were considered anomalous based on the Minimums and Maximums Report (see Anomalous Data Review in Section 3.2).

The November 2009 sampling event focused on collection of samples from the river bed well points as opposed to monitoring wells. As a result, none of the standard performance indicator monitoring wells were sampled during this event, and the time versus concentration plots for ammonia, total dissolved solids [TDS], and uranium which are usually provided in this section are not applicable.

While independent of the data validation process, a brief summary of the most recent concentration trends is provided for Baseline Area, CF3, CF2, CF1, and CF4 (listed from north to south) well points. As opposed to time concentration plots, tables for the Baseline Area and each CF displaying the November 2009 ammonia, TDS, and uranium results compared to the March and August 2009 sampling events are provided.

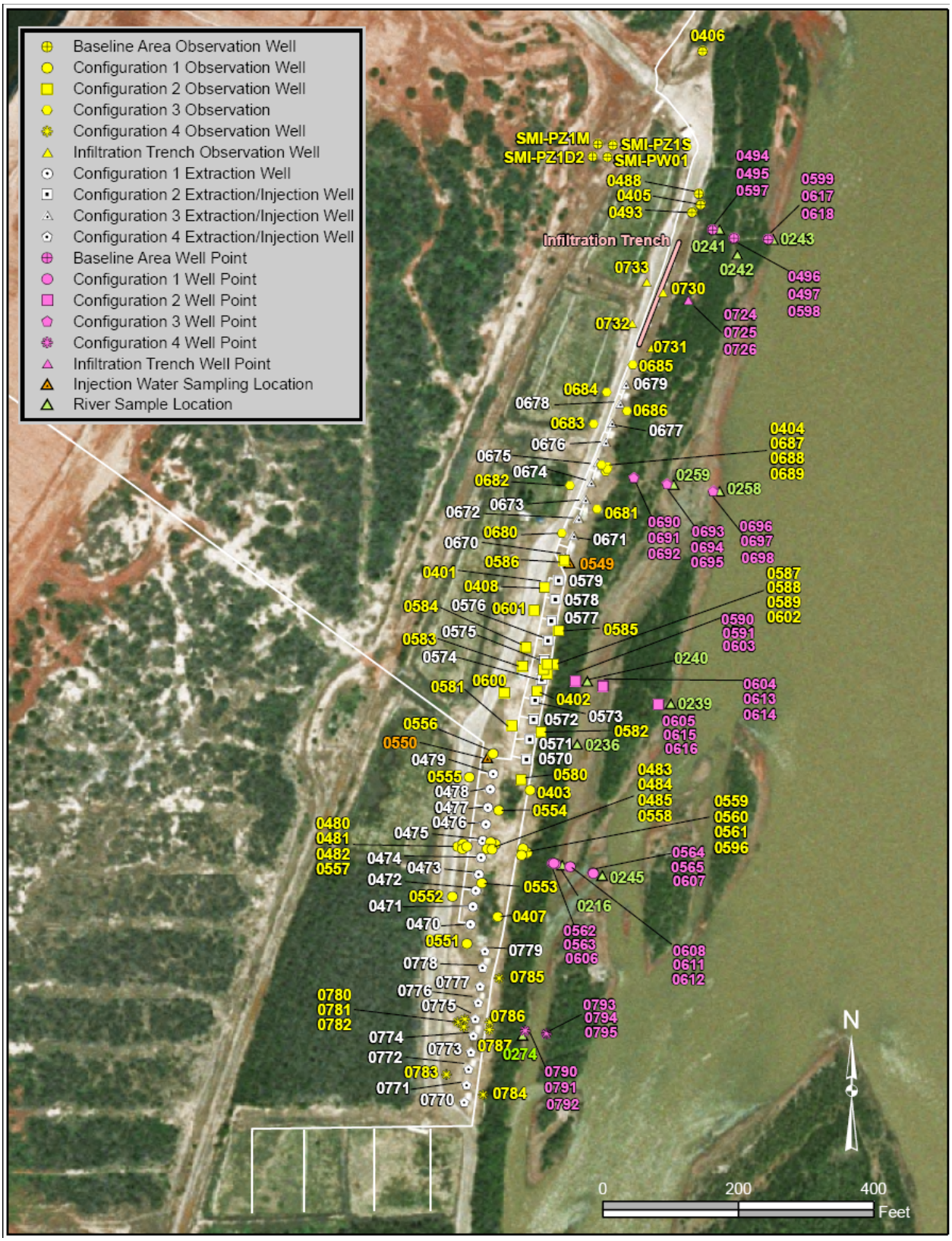


Figure 1. Map of Sample Locations at the IA Well Field and Baseline Area (includes locations not sampled)

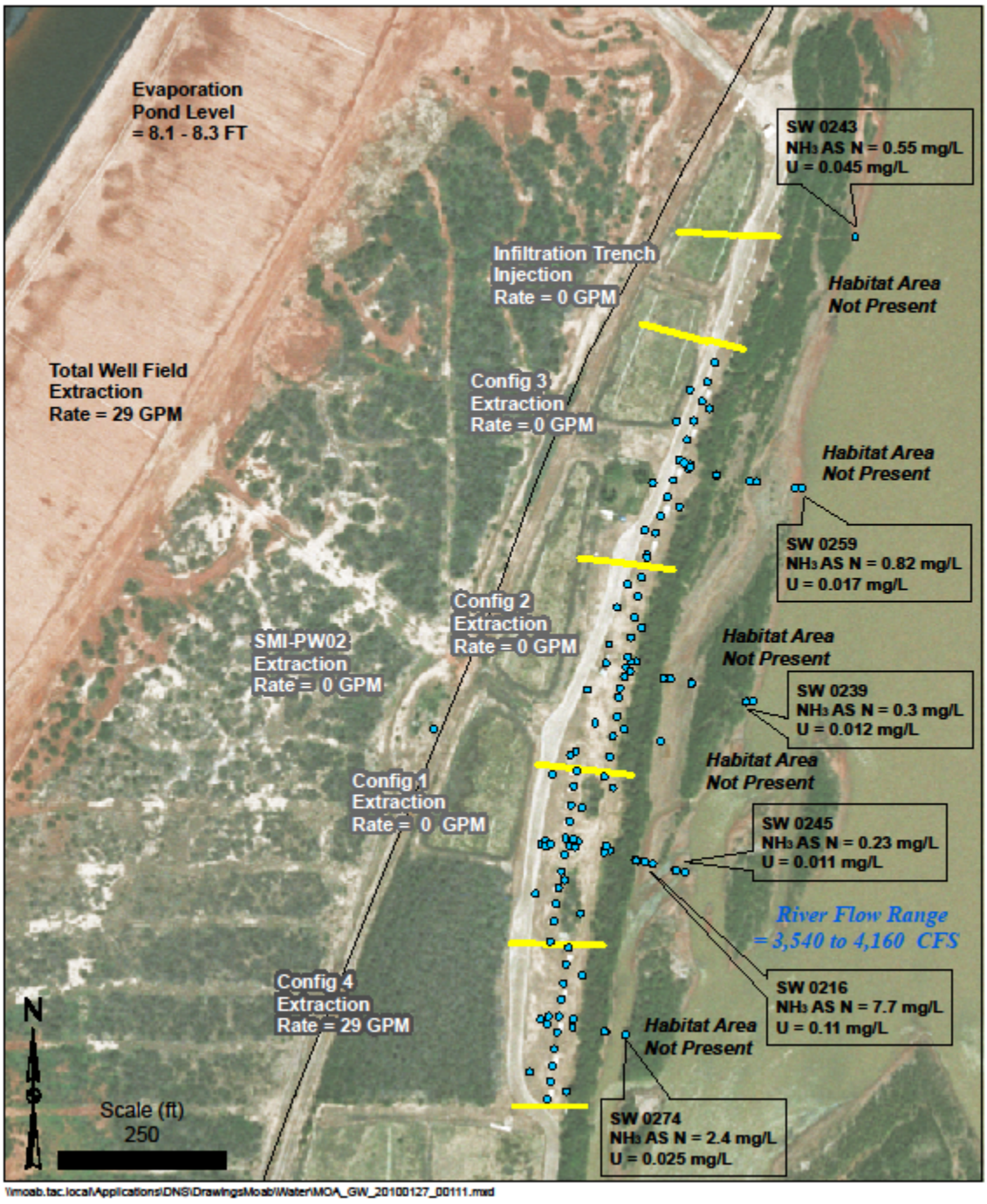


Figure 2. November 2009 Sampling Event Site Conditions

Baseline Area

Comparisons among the Baseline Area August 2009, March 2009, and November 2009 well point sampling results are provided in Table 1. In general, the ammonia, TDS, and uranium concentrations decreased in August and then increased in November.

Table 1. March 2009 and August 2009 Baseline Area Well Point Sampling Results Compared to the November 2009 Results

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L)
0495	BLA/Bank WP, Middle	Ammonia	0.43	0.1	4.2
		TDS	5,900	6,200	5,600
		Uranium	2.4	3.1	1.9
0597	BLA/Bank WP, Deep	Ammonia	200	110	170
		TDS	11,000	3,800	7,700
		Uranium	1.7	0.97	1.2
0496	BLA/Intermediate WP, Shallow	Ammonia	N/A	87	87
		TDS	N/A	6,900	5,900
		Uranium	N/A	1.7	10
0598	BLA/Intermediate WP, Deep	Ammonia	260	170	230
		TDS	8,900	6,000	8,400
		Uranium	2.2	1.2	1.6
0599	BLA/Edge WP, Shallow	Ammonia	250	200	270
		TDS	10,000	7,400	7,700
		Uranium	1.9	1.7	1.2
0617	BLA/Edge WP, Middle	Ammonia	160	130	130
		TDS	9,300	5,900	6,300
		Uranium	2	1.9	1.8
0618	BLA/Edge WP, Deep	Ammonia	190	140	160
		TDS	9,500	6,100	7,200
		Uranium	1.9	1.6	1.5

BLA = Baseline Area; mg/L = milligrams per liter; TDS = Total Dissolved Solids; WP = Well Point
Bank well points are located immediately off the bank from the well field. Intermediate well points are located in the approximate mid-distance from the bank and the river. Edge well points are located on the edge of the river. Shallow well points are sampled from approximately 2 feet below ground surface, middle well points are sampled from approximately 5 feet below ground surface, and deep well points are sampled from approximately 10 feet below ground surface.

CF3

Table 2 provides a comparison of the March 2009, August 2009, and November 2009 analytical results for the CF3 well point sampling. Similar to the Baseline Area locations, the ammonia, TDS, and uranium concentrations generally increased Between March and November 2009.

Table 2. March 2009 and August 2009 CF3 Well Point Sampling Results Compared to the November 2009 Results

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L)
0690	CF3/Bank WP, Shallow	Ammonia	0.2	10	0.11
		TDS	9,800	3,000	4,100
		Uranium	2.9	0.71	0.64
0691	CF3/Bank WP, Middle	Ammonia	180	110	120
		TDS	10,000	3,500	4,500
		Uranium	2	0.8	0.79
0692	CF3/Bank WP, Deep	Ammonia	290	210	310
		TDS	13,000	4,200	9,200
		Uranium	2.3	0.75	1.7
0696	CF3/Edge WP, Shallow	Ammonia	230	51	69
		TDS	6,200	770	1,400
		Uranium	1.1	0.22	0.21
0697	CF3/Edge WP, Middle	Ammonia	N/A	110	290
		TDS	N/A	1,600	5,400
		Uranium	N/A	0.34	0.73

mg/L = milligrams per liter; TDS = Total Dissolved Solids; WP = Well Point
Bank well points are located immediately off the bank from the well field. Intermediate well points are located in the approximate mid-distance from the bank and the river. Edge well points are located on the edge of the river. Shallow well points are sampled from approximately 2 feet below ground surface, middle well points are sampled from approximately 5 feet below ground surface, and deep well points are sampled from approximately 10 feet below ground surface.

CF2

Comparisons among the CF2 March 2009, August 2009, and November well point sampling results are provided in Table 3. In general, the ammonia, TDS, and uranium concentrations increased in some locations and decreased in other CF2 well points between March and November 2009.

Table 3. March 2009 and August 2009 CF2 Well Point Sampling Results Compared to the November 2009 Results

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L
0590	CF2/Bank WP, Shallow	Ammonia	110	83	24
		TDS	8,700	3,600	3,600
		Uranium	2	0.4	0.55
0591	CF2/Bank WP, Middle	Ammonia	390	63	77
		TDS	12,000	1,100	1,200
		Uranium	1.6	0.33	0.31
0603	CF2/Bank WP, Deep	Ammonia	490	N/A	N/A
		TDS	16,000	N/A	N/A
		Uranium	1.9	N/A	N/A
0605	CF2/Edge WP, Shallow	Ammonia	690	96	210
		TDS	16,000	1,600	3,900
		Uranium	1.6	0.52	0.59

Table 3. March 2009 and August 2009 CF2 Well Point Sampling Results Compared to the November 2009 Results (continued)

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L
0615	CF2/Edge WP, Middle	Ammonia	96	45	7.9
		TDS	4,000	1,000	910
		Uranium	0.42	0.17	0.047
0616	CF2/Edge WP, Deep	Ammonia	320	93	100
		TDS	6,900	1,300	1,600
		Uranium	0.88	0.3	0.32

mg/L = milligrams per liter; TDS = Total Dissolved Solids; WP = Well Point
Bank well points are located immediately off the bank from the well field. Intermediate well points are located in the approximate mid-distance from the bank and the river. Edge well points are located on the edge of the river. Shallow well points are sampled from approximately 2 feet below ground surface, middle well points are sampled from approximately 5 feet below ground surface, and deep well points are sampled from approximately 10 feet below ground surface.

CF1

Table 4 provides a comparison of the March 2009, August 2009, and November 2009 analytical results for the CF1 well point sampling. In general, the ammonia, TDS, and uranium concentrations remained fairly constant at most of the well point locations. Concentration increases were observed at locations 0563 and 0612 between August and November 2009.

Table 4. March 2009 and August 2009 CF1 Well Point Sampling Results Compared to the November 2009 Results

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L)
0562	CF1/Bank WP, Shallow	Ammonia	74	96	83
		TDS	4,300	5,400	4,500
		Uranium	0.58	1	0.79
0563	CF1/Bank WP, Middle	Ammonia	300	77	140
		TDS	7,600	2,000	3,900
		Uranium	0.58	0.34	0.62
0606	CF1/Bank WP, Deep	Ammonia	600	240	220
		TDS	18,000	6,200	5,200
		Uranium	1.8	0.84	0.7
0611	CF1/Intermediate WP, Shallow	Ammonia	1.5	2.4	9.6
		TDS	1,700	1,100	940
		Uranium	0.048	0.044	0.022
0612	CF1/Intermediate WP, Middle	Ammonia	69	24	27
		TDS	3,800	1,400	2,400
		Uranium	0.36	0.11	0.22
0608	CF1/Intermediate WP, Deep	Ammonia	560	140	110
		TDS	15,000	3,300	2,700
		Uranium	1.3	0.48	0.39
0564	CF1/Edge WP, Shallow	Ammonia	N/A	0.38	0.21
		TDS	N/A	730	770
		Uranium	N/A	0.0039	0.0064
0565	CF1/Edge WP, Middle	Ammonia	1.8	1.6	0.87
		TDS	760	680	750
		Uranium	0.0098	0.0045	0.0067

Table 4. March 2009 and August 2009 CF1 Well Point Sampling Results Compared to the November 2009 Results (continued)

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L)
0607	CF1/Edge WP, Deep	Ammonia	340	N/A	81
		TDS	13,000	N/A	2,200
		Uranium	1.4	N/A	0.33

mg/L = milligrams per liter; TDS = Total Dissolved Solids; WP = Well Point
Bank well points are located immediately off the bank from the well field. Intermediate well points are located in the approximate mid-distance from the bank and the river. Edge well points are located on the edge of the river. Shallow well points are sampled from approximately 2 feet below ground surface, middle well points are sampled from approximately 5 feet below ground surface, and deep well points are sampled from approximately 10 feet below ground surface.

CF4

Comparisons among the CF4 March 2009, August 2009, and November 2009 river bank well point sampling results are provided in Table 5. It was not possible to access the other set of well points during this event. Similar to the well points sampled in other areas of the well field, the ammonia, TDS, and uranium concentrations significantly decreased between March and November 2009.

Table 5. March 2009 and August 2009 CF1 Well Point Sampling Results Compared to the November 2009 Results

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)	November 2009 Concentration (mg/L)
0790	CF4/Bank WP, Shallow	Ammonia	720	280	84
		TDS	24,000	12,000	2,200
		Uranium	2.9	1.8	0.35
0791	CF4/Bank WP, Middle	Ammonia	770	420	160
		TDS	26,000	15,000	4,800
		Uranium	2.6	2	0.78
0792	CF4/Bank WP, Deep	Ammonia	310	N/A	260
		TDS	9,100	N/A	8,200
		Uranium	0.19	N/A	0.076

mg/L = milligrams per liter; TDS = Total Dissolved Solids; WP = Well Point
Bank well points are located immediately off the bank from the well field. Intermediate well points are located in the approximate mid-distance from the bank and the river. Edge well points are located on the edge of the river. Shallow well points are sampled from approximately 2 feet below ground surface, middle well points are sampled from approximately 5 feet below ground surface, and deep well points are sampled from approximately 10 feet below ground surface.

Surface Water Sampling Results

Six surface water samples were collected as part of this sampling event, with results provided in Table 6. For comparison purposes, the applicable Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are provided.

Table 6. November 2009 Sampling Event Surface Water Ammonia Concentrations and Comparisons to Utah and Federal Criteria

Location	Date	Temp (°C)	pH	Ammonia Total as N (mg/L)	State/Federal AWQC-Acute Total as N (mg/L)[1]	State/Federal AWQC-Chronic Total as N (mg/L)[2]
0216	11/3/09	11.0	7.96	7.7	**5.62**	**2.43**
0239	11/4/09	9.4	8.39	0.3	2.59	1.29
0243	11/5/09	9.6	8.32	0.55	3.15	1.52
0245	11/3/09	6.6	8.24	0.23	3.83	1.79
0259	11/5/09	11.9	8.36	0.82	2.59	1.29
0274	11/2/09	12.8	8.01	2.4	5.62	2.43

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

As shown in Table 6, the sample collected from location 0216 exceeded both the acute and chronic Utah criteria for ammonia. There were no habitat areas present during this sampling event, and no fish were present while this sample was collected.

Table 7 presents the uranium results from the surface water samples. As shown in this table, the samples collected from locations 0216 and 0243 exceeded the Uranium Mill Tailings Radiation control Act (UMTRCA) Drinking Water Standard of 0.044 milligrams per liter (mg/L).

Table 7. November 2009 Sampling Event Surface Water Uranium Concentrations and Comparisons to the UMTRCA Drinking Water Standard

Location	Date	Uranium (mg/L)	UMTRCA Drinking Water Standard for Uranium (mg/L)[1]
0216	11/3/09	**0.11**	0.044
0239	11/4/09	0.012	
0243	11/5/09	**0.045**	
0245	11/3/09	0.011	
0259	11/5/09	0.017	
0274	11/2/09	0.025	

Note: (1) The maximum concentration limit in the EPA Ground Water Standards (40 CFR 192) for uranium is 30 picocuries per liter, which is equal to 0.044 mg/L assuming U-234 and U-238 are in equilibrium.

Despite the fact that water was present in the side channels during the November sampling event, these surface water bodies did not meet the definition of a habitat area. In addition, no fish were observed during the sampling of the surface water locations containing elevated ammonia and uranium concentrations.

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, April 2008* (DOE-EM/GJ1220). Although not listed here, the normal set of locations were

sampled. Please refer to the attached trip report (Attachment 1) for specific sampled locations and an explanation of why some locations were not sampled.

The data validations indicate that the data meet the quality-control criteria specified for this project. An adequate number of duplicates and equipment blanks (EBs) were collected, and all samples were analyzed within their prescribed holding times. No significant discrepancies were noted regarding chain of custody (COC), case narratives, presence of field and sample identifications, holding times, preservation, and cooler receipts, except as qualified or noted in the Laboratory Performance Assessment (Section 2.2).

There were four locations (0259, 0548, 0611, and 0792) with a total of five analytical results (a duplicate was collected from 0259) that were considered anomalous based on the Minimums and Maximums Report. Surface water location 0259 had anomalously high manganese, well points 0611 and 0792 had anomalously high ammonia and low uranium, respectively, and evaporation pond sample 0548 had anomalously low uranium. According to the USGS Cisco gauging station, the mean daily Colorado River flow rates varied between 3,540 and 4,160 cubic feet per second (cfs) during this sampling period.

2.0 Data Assessment Summaries

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

2.1 Water Sampling Field Activities Verification

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

2.2 Laboratory Performance Assessment

General Information

Report Identification No. (RIN):	0911039
Sample Event:	November 2009 IA Well Field Monthly Sampling Event
Site(s):	Moab, Utah
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Sample Data Group (SDG) No.:	0911038 and 0911093
Analysis:	Metals and Inorganics
Validator:	Rachel Cowan
Review Date:	January 22, 2010

This validation was performed according to the *Environmental Procedures Catalog* (STO 6), "Standard Practice for Validation of Laboratory Data," GT-9(P) (2006). The procedure was applied at Level 1, Data Deliverables Examination. The level 1 validation was performed on 100 percent of the samples, which included a review of the COC, case narratives, field and sample identifications, holding times, preservation, and cooler receipt. 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 8.

Table 8. Analytes and Methods

Analyte	Line Item Code	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	WCH-A-005	EPA 350.1	EPA 350.1
Manganese	G17	SW-846 3005A	SW-846 6010B
Total Dissolved Solids	WIC-A-033	EPA 160.1	EPA 160.1
Selenium	G14	SW-846 3005A	SW-846 6020A
Uranium	G1	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 9. Refer to Table 10 for an explanation of the data qualifiers applied.

Table 9. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
All 0911038 samples	0216, 0245, 0274, 0274, 0562, 0563, 0564, 0565, 0606, 0607, 0612, 0790, 0791, 0792	Ammonia	J	RS1
0911038-6 through -9; 0911093-3 through -9; -28 through -32	0564, 0565, 0606, 0607; 0259, 0495, 0496, 0547, 0548, 0590, 0591	Ammonia	J	MS1
0911093-4, -11, -12 -13, -18, -19, -21, -23, -24	0495, 0598, 0599, 0605, 0617, 0618, 0691, 0696, 0697	Selenium	J	MS1, RS1, SD1

J indicates estimated results; UJ indicates analytical results below detection limit

Table 10. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Nondetects)	Explanation
MS1	J	UJ	Results for the affected analyte(s) are regarded as estimated (J) because the matrix spike sample was (a) from another client, (b) of dissimilar matrix, (c) a field blank or EB, or (d) not analyzed at the proper frequency as stated in the appropriate analytical method.
RS1	J	UJ	Replicate sample frequency criteria were not met.
SD1	J	NA	Serial dilution sample frequency criteria were not met.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received a total of 46 samples for RIN 0911039 in two shipments, which arrived on November 5, 2009 (SDG 0911038; UPS tracking number 1Z5W1Y510195191935) and November 7, 2009 (SDG 0911093; UPS tracking number 1Z5W1Y514497159959). Each of the sample groups was accompanied by a COC form. The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

Preservation and Holding Times
SDGs 0911038 and 0911093 were received intact in three coolers with temperatures of 2.1°C (SDG 0911038) and 0.7°C and 1.7°C (SDG 0911093). All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Case Narratives
The case narratives were reviewed, and all detects were found to be within quality-control procedures except for the following.

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

Method EPA 350.1, Ammonia
The ammonia samples in SDGs 0911038 and 0911093 did not have the appropriate number of MS samples as per method requirements, so ammonia results from samples 0911038-6 through -9, 0911093-3 through -9; and -28 through -32 were "J"-flagged for MS1.

In addition, the native ammonia concentration in the SDG 0911038 MS sample was too high. As per requirements, the ammonia results associated with this MS were not flagged for MS1, but since the ammonia field duplicate failed, all ammonia results in 0911038 were "J"-flagged for reason RS1.

Method SW-846 6020A, Selenium
There were no selenium samples from SDG 0911093 selected for testing matrix-specific quality-control samples. Therefore, there were no MSs for selenium, and all SDG 0911093 selenium results were flagged for MS1. Also, since there were no selenium MSDs and no field duplicate selenium samples, all SDG 0911093 selenium results were flagged for RS1.

Laboratory Control Sample
A laboratory control sample (LCS) must be analyzed at the correct frequency (one LCS per 20 samples) to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCSs were prepared and analyzed as appropriate with the following exception.

LCSs were not reported for manganese or uranium. As a standard practice, ALS Laboratory Group does not prepare LCSs for samples that are field-filtered and acidified and then run directly on the instrument without any additional sample preparation. Per national environmental laboratory accreditation requirements, an MS may be used in place of an LCS provided the acceptance samples are "J"-qualified for LCS failure.

The manganese and uranium MS results were acceptable, so no manganese and uranium results were flagged for reason LCS1.

Method and Calibration Blanks
Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Initial calibration blanks and continuing calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. Detected sample results associated with blanks results that were greater than the method detection limit or instrument detection limit (depending on method requirements) were "J"-qualified when the detections were less than five times the associated blank concentration. Nondetects were not qualified. According to the case narratives, all MBs passed requirements, so no results were flagged for this reason.

Metals Serial Dilution
Serial dilution (SD) samples were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Inductively coupled plasma (ICP)-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the reporting limit (RL). ICP-atomic emission spectroscopy SD data are evaluated when the concentration of the undiluted sample is greater than 50 times the RL. All evaluated SD data were acceptable with the following exceptions.

According to the case narratives, the manganese SD in SDG 0911093 failed. However, the concentration in the undiluted SD sample was less than 50 times the RL, so no samples were "J"-flagged for reason SD1.

There was no selenium SD sample in SDG 0911093, so all selenium results in SDG 0911093 were flagged for SD1.

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. Three duplicate samples were collected from locations 0608, 0259, and 0779 (0911038-14, 0911093-31 and -32, respectively) in the November 2009 sampling event. The duplicate results met the U.S. Environmental Protection Agency (EPA)-recommended laboratory duplicate criteria of less than 20 relative percent difference (RPD) for results that are greater than five times the reporting level, except for the ammonia result from 0911038-14, which had a 26 RPD.

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

Six surface water samples were collected using nondedicated equipment. As per procedure, one EB was collected and analyzed.

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 23, 2009 (SDG 0911038) and on November 24, 2009 (SDG 0911093). The contents of the EDD files were manually examined to verify that the sample results accurately reflected the data contained in the SDGs and that all and only the requested data were delivered.

2.3 Field Analyses/Activities

The following information summarizes the field analyses and activities for the November 2009 monthly sampling event.

Field Activities
All monitor wells were purged and sampled using the low-flow sampling method; this method was not used at extraction wells. Three duplicate samples were collected. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. All results met the criteria of ±20 RPD and are considered acceptable, except for ammonia in the duplicate for location 0608, which had an RPD of 26.

2.4 Certification

Results were reported in correct units for all analytes requested. Appropriate contract-required laboratory qualifiers and target analyte lists were used. The RLs were met. All analytical quality-control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the EPA *Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration,* 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 (Section 3.2), tables 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 reports are further screened, and the results are not considered anomalous if: (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is less or more than 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

3.2 Anomalous Data Review

There five anomalous data from four different locations (a duplicate was collected from 0259 that had anomalously high manganese in both samples) associated with this sampling event based on the Minimums and Maximums Report.

Loc. No.	Analyte	Type of Anomaly	Disposition
0259	Manganese	high	Continue monitoring location
0259 (duplicate)	Manganese	high	Continue monitoring location
0548	Manganese	high	Continue monitoring location
0611	Ammonia	high	Continue monitoring location
0792	Uranium	low	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

All samples were collected using dedicated equipment; therefore, an EB was not required for this sampling event.

Appendix A.
Water Sampling Field Activities Verification

Appendix A. Water Sampling Field Activities Verification

Sampling Event / RIN	November 2009/RIN 0911039	**Date(s) of Water Sampling**	November 2-6, 2009
Date(s) of Verification	January 24, 2010	**Name of Verifier**	Rachel Cowan

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

Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	November 2009/RIN 0911039	**Date(s) of Water Sampling**	November 2-6, 2009
Date(s) of Verification	January 24, 2010	**Name of Verifier**	Rachel Cowan

8.	Were the following conditions met when purging a Category II well:		
	Was the flow rate less than 500 milliliters per minute?	Yes	
	Was one pump/tubing volume removed prior to sampling?	Yes	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	There were 46 samples, and three duplicates were collected.
10.	Were EBs taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	There were six surface water samples collected with nondedicated 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?	Yes	
16.	Were COC records completed, and was sample custody maintained?	Yes	
17.	Are field data sheets signed and dated by both team members?	No	One field data sheet (location 0790) was only signed by one team member.
18.	Was all other pertinent information documented on the field data sheets?	Yes	
19.	Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20.	Were water levels measured at the locations specified in the planning documents?	Yes	

Appendix B.
Minimums and Maximums Report

Appendix B. Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS Laboratory Group (Fort Collins, CO)
RIN: 0911039
Comparison: All Historical Data
Report Date: 1/25/2010

				Current			Historical Maximum			Historical Minimum			Count	
					Qualifiers			Qualifiers			Qualifiers			
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect
MOA01	0243	11/05/2009	Manganese	0.08			0.064			0.00026	B		19	1
MOA01	0243	11/05/2009	Uranium	0.045			0.041			0.0033		J	29	1
MOA01	0259	11/05/2009	Manganese	0.069			0.0373			0.0019	B		15	1
MOA01	0259	11/05/2009	Manganese	0.073			0.0373			0.0019	B		15	1
MOA01	0496	11/05/2009	Uranium	10			6.92		FQ	0.00045		QF	18	0
MOA01	0548	11/06/2009	Manganese	11			3.7			2			15	0
MOA01	0564	11/03/2009	Manganese	0.81			0.63			0.3			6	0
MOA01	0590	11/04/2009	Ammonia Total as N	24		J	680		F	36		QF	31	0
MOA01	0605	11/04/2009	Selenium	0.00047	B	J	0.0598		QF	0.00054		J	6	0
MOA01	0611	11/03/2009	Ammonia Total as N	9.6			3.1		F	0.63			14	0
MOA01	0616	11/04/2009	Manganese	0.18			1.2		J	0.19			8	0
MOA01	0690	11/05/2009	Uranium	0.64			2.9			0.71			11	0
MOA01	0691	11/05/2009	Uranium	0.79			2.36		FQ	0.8			24	0
MOA01	0779	11/06/2009	Manganese	4			13		F	4.1			8	0
MOA01	0792	11/02/2009	Uranium	0.076			1.6		QF	0.19			15	0

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

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 MB.
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: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0216	SL	11/03/2009	0001	0.08	-	0.08	7.7		J	#	0.5	
Ammonia Total as N	mg/L	0239	SL	11/04/2009	0001	0.5	-	0.5	0.3			#	0.1	
Ammonia Total as N	mg/L	0243	SL	11/05/2009	0001	0.25	-	0.25	0.55			#	0.1	
Ammonia Total as N	mg/L	0245	SL	11/03/2009	0001	0.08	-	0.08	0.23		J	#	0.1	
Ammonia Total as N	mg/L	0259	SL	11/05/2009	0001	0.17	-	0.17	0.82		J	#	0.1	
Ammonia Total as N	mg/L	0259	SL	11/05/2009	0002	0.17	-	0.17	0.79		J	#	0.1	
Ammonia Total as N	mg/L	0274	SL	11/02/2009	0001	0.25	-	0.25	2.4		J	#	0.1	
Ammonia Total as N	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	4.2		J	#	0.1	
Ammonia Total as N	mg/L	0496	WL	11/05/2009	0001	2.2	-	3.2	87		J	#	5	
Ammonia Total as N	mg/L	0547	TS	11/06/2009	0001	0	-	0	430		J	#	10	
Ammonia Total as N	mg/L	0548	TS	11/06/2009	0001	0	-	0	890		J	#	20	
Ammonia Total as N	mg/L	0562	WL	11/03/2009	0001	1.3	-	2.3	83		J	#	10	
Ammonia Total as N	mg/L	0563	WL	11/03/2009	0001	4.6	-	5.6	140		J	#	5	
Ammonia Total as N	mg/L	0564	WL	11/03/2009	0001	1.2	-	2.2	0.21		J	#	0.1	
Ammonia Total as N	mg/L	0565	WL	11/03/2009	0001	4	-	5	0.87		J	#	0.1	
Ammonia Total as N	mg/L	0590	WL	11/04/2009	0001	1	-	2	24		J	#	5	
Ammonia Total as N	mg/L	0591	WL	11/04/2009	0001	3.9	-	4.9	77		J	#	5	
Ammonia Total as N	mg/L	0597	WL	11/05/2009	0001	9.3	-	10.3	170			#	10	
Ammonia Total as N	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	230			#	10	
Ammonia Total as N	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	270			#	10	
Ammonia Total as N	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	210			#	10	
Ammonia Total as N	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	220		J	#	5	
Ammonia Total as N	mg/L	0607	WL	11/03/2009	0001	9.6	-	10.6	81		J	#	2	
Ammonia Total as N	mg/L	0608	WL	11/03/2009	0001	8.9	-	9.9	110			#	10	
Ammonia Total as N	mg/L	0608	WL	11/03/2009	0002	8.9	-	9.9	130		J	#	5	
Ammonia Total as N	mg/L	0611	WL	11/03/2009	0001	2.2	-	3.2	9.6			#	0.5	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	0612	WL	11/03/2009	0001	4.3	-	5.3	27		J	#	1	
Ammonia Total as N	mg/L	0615	WL	11/04/2009	0001	1.4	-	2.4	7.9			#	0.5	
Ammonia Total as N	mg/L	0616	WL	11/04/2009	0001	5.3	-	6.3	100			#	10	
Ammonia Total as N	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	130			#	10	
Ammonia Total as N	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	160			#	10	
Ammonia Total as N	mg/L	0690	WL	11/05/2009	0001	3.3	-	4.3	0.11			#	0.1	
Ammonia Total as N	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	120			#	10	
Ammonia Total as N	mg/L	0692	WL	11/05/2009	0001	9.7	-	10.1	310			#	10	
Ammonia Total as N	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	69			#	10	
Ammonia Total as N	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	290			#	10	
Ammonia Total as N	mg/L	0770	WL	11/06/2009	0001	14.9	-	34.8	290			#	10	
Ammonia Total as N	mg/L	0772	WL	11/06/2009	0001	15.15	-	35.05	360			#	10	
Ammonia Total as N	mg/L	0776	WL	11/06/2009	0001	15.15	-	35.05	490			#	20	
Ammonia Total as N	mg/L	0778	WL	11/06/2009	0001	15.1	-	35	500		J	#	10	
Ammonia Total as N	mg/L	0779	WL	11/06/2009	0001	15.66	-	35.56	650		J	#	20	
Ammonia Total as N	mg/L	0779	WL	11/06/2009	0002	15.66	-	35.56	640		J	#	20	
Ammonia Total as N	mg/L	0790	WL	11/02/2009	0001	2	-	3	84		J	#	2	
Ammonia Total as N	mg/L	0791	WL	11/02/2009	0001	4.3	-	5.3	160		J	#	5	
Ammonia Total as N	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	260		J	#	10	
Dissolved Oxygen	mg/L	0216	SL	11/03/2009	0001	0.08	-	0.08	10.5			#		
Dissolved Oxygen	mg/L	0239	SL	11/04/2009	0001	0.5	-	0.5	70.6			#		
Dissolved Oxygen	mg/L	0243	SL	11/05/2009	0001	0.25	-	0.25	8.99			#		
Dissolved Oxygen	mg/L	0245	SL	11/03/2009	0001	0.08	-	0.08	11.68			#		
Dissolved Oxygen	mg/L	0259	SL	11/05/2009	0001	0.17	-	0.17	13.77			#		
Dissolved Oxygen	mg/L	0274	SL	11/02/2009	0001	0.25	-	0.25	11.52			#		
Dissolved Oxygen	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	3.12			v		
Dissolved Oxygen	mg/L	0496	WL	11/05/2009	0001	2.2	-	3.2	4.9			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	0547	TS	11/06/2009	0001	0	-	0	3.24			#		
Dissolved Oxygen	mg/L	0548	TS	11/06/2009	0001	0	-	0	4.01			#		
Dissolved Oxygen	mg/L	0562	WL	11/03/2009	0001	1.3	-	2.3	3.03			#		
Dissolved Oxygen	mg/L	0563	WL	11/03/2009	0001	4.6	-	5.6	7.87			#		
Dissolved Oxygen	mg/L	0564	WL	11/03/2009	0001	1.2	-	2.2	1.18			#		
Dissolved Oxygen	mg/L	0565	WL	11/03/2009	0001	4	-	5	0.27			#		
Dissolved Oxygen	mg/L	0590	WL	11/04/2009	0001	1	-	2	6.16			#		
Dissolved Oxygen	mg/L	0591	WL	11/04/2009	0001	3.9	-	4.9	3.24			#		
Dissolved Oxygen	mg/L	0597	WL	11/05/2009	0001	9.3	-	10.3	0.41			#		
Dissolved Oxygen	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	0.43			#		
Dissolved Oxygen	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	2.18			#		
Dissolved Oxygen	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	10.3			#		
Dissolved Oxygen	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	0.34			#		
Dissolved Oxygen	mg/L	0607	WL	11/03/2009	0001	9.6	-	10.6	6.5			#		
Dissolved Oxygen	mg/L	0608	WL	11/03/2009	0001	8.9	-	9.9	0.42			#		
Dissolved Oxygen	mg/L	0611	WL	11/03/2009	0001	2.2	-	3.2	7.91			#		
Dissolved Oxygen	mg/L	0612	WL	11/03/2009	0001	4.3	-	5.3	0.6			#		
Dissolved Oxygen	mg/L	0615	WL	11/04/2009	0001	1.4	-	2.4	4.85			#		
Dissolved Oxygen	mg/L	0616	WL	11/04/2009	0001	5.3	-	6.3	0.33			#		
Dissolved Oxygen	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	1.58			#		
Dissolved Oxygen	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	0.05			#		
Dissolved Oxygen	mg/L	0690	WL	11/05/2009	0001	3.3	-	4.3	5.09			#		
Dissolved Oxygen	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	6.1			#		
Dissolved Oxygen	mg/L	0692	WL	11/05/2009	0001	9.7	-	10.1	2.9			#		
Dissolved Oxygen	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	5.33			#		
Dissolved Oxygen	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	6.32			#		
Dissolved Oxygen	mg/L	0770	WL	11/06/2009	0001	14.9	-	34.8	1.66			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	0772	WL	11/06/2009	0001	15.15	-	35.05	0.95			#		
Dissolved Oxygen	mg/L	0776	WL	11/06/2009	0001	15.15	-	35.05	1.18			#		
Dissolved Oxygen	mg/L	0778	WL	11/06/2009	0001	15.1	-	35	1.69			#		
Dissolved Oxygen	mg/L	0779	WL	11/06/2009	0001	15.66	-	35.56	2.78			#		
Dissolved Oxygen	mg/L	0790	WL	11/02/2009	0001	2	-	3	1.07			#		
Dissolved Oxygen	mg/L	0791	WL	11/02/2009	0001	4.3	-	5.3	1.17			#		
Dissolved Oxygen	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	3.31			#		
Manganese	mg/L	0216	SL	11/03/2009	0001	0.08	-	0.08	0.29			#	0.0002	
Manganese	mg/L	0239	SL	11/04/2009	0001	0.5	-	0.5	0.011	E		#	0.0002	
Manganese	mg/L	0243	SL	11/05/2009	0001	0.25	-	0.25	0.08			#	0.0002	
Manganese	mg/L	0245	SL	11/03/2009	0001	0.08	-	0.08	0.015			#	0.0002	
Manganese	mg/L	0259	SL	11/05/2009	0001	0.17	-	0.17	0.069			#	0.0002	
Manganese	mg/L	0259	SL	11/05/2009	0002	0.17	-	0.17	0.073			#	0.0002	
Manganese	mg/L	0274	SL	11/02/2009	0001	0.25	-	0.25	0.046			#	0.0002	
Manganese	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	0.89			#	0.001	
Manganese	mg/L	0496	WL	11/05/2009	0001	2.2	-	3.2	1			#	0.001	
Manganese	mg/L	0547	TS	11/06/2009	0001	0	-	0	4.1			#	0.002	
Manganese	mg/L	0548	TS	11/06/2009	0001	0	-	0	11			#	0.005	
Manganese	mg/L	0562	WL	11/03/2009	0001	1.3	-	2.3	2.9			#	0.0002	
Manganese	mg/L	0563	WL	11/03/2009	0001	4.6	-	5.6	0.76			#	0.001	
Manganese	mg/L	0564	WL	11/03/2009	0001	1.2	-	2.2	0.81			#	0.0002	
Manganese	mg/L	0565	WL	11/03/2009	0001	4	-	5	0.88			#	0.0002	
Manganese	mg/L	0590	WL	11/04/2009	0001	1	-	2	2.6			#	0.0004	
Manganese	mg/L	0591	WL	11/04/2009	0001	3.9	-	4.9	0.37			#	0.0002	
Manganese	mg/L	0597	WL	11/05/2009	0001	9.3	-	10.3	4.2			#	0.001	
Manganese	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	2.7			#	0.001	
Manganese	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	3.3			#	0.001	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	0.34			#	0.001	
Manganese	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	0.59			#	0.001	
Manganese	mg/L	0607	WL	11/03/2009	0001	9.6	-	10.6	0.097			#	0.0004	
Manganese	mg/L	0608	WL	11/03/2009	0001	8.9	-	9.9	0.19			#	0.001	
Manganese	mg/L	0608	WL	11/03/2009	0002	8.9	-	9.9	0.2			#	0.001	
Manganese	mg/L	0611	WL	11/03/2009	0001	2.2	-	3.2	1.3			#	0.0002	
Manganese	mg/L	0612	WL	11/03/2009	0001	4.3	-	5.3	1.1			#	0.0004	
Manganese	mg/L	0615	WL	11/04/2009	0001	1.4	-	2.4	0.86			#	0.0002	
Manganese	mg/L	0616	WL	11/04/2009	0001	5.3	-	6.3	0.18			#	0.0004	
Manganese	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	3.4			#	0.001	
Manganese	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	3.7			#	0.001	
Manganese	mg/L	0690	WL	11/05/2009	0001	3.3	-	4.3	1.7			#	0.0004	
Manganese	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	2.1			#	0.001	
Manganese	mg/L	0692	WL	11/05/2009	0001	9.7	-	10.1	3.6			#	0.001	
Manganese	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	0.44			#	0.0002	
Manganese	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	0.61			0	0.001	
Manganese	mg/L	0770	WL	11/06/2009	0001	14.9	-	34.8	3.5			#	0.005	
Manganese	mg/L	0772	WL	11/06/2009	0001	15.15	-	35.05	4.3			#	0.002	
Manganese	mg/L	0776	WL	11/06/2009	0001	15.15	-	35.05	4.6			#	0.005	
Manganese	mg/L	0778	WL	11/06/2009	0001	15.1	-	35	3.5			#	0.002	
Manganese	mg/L	0779	WL	11/06/2009	0001	15.66	-	35.56	4.1			#	0.01	
Manganese	mg/L	0779	WL	11/06/2009	0002	15.66	-	35.56	4			#	0.005	
Manganese	mg/L	0790	WL	11/02/2009	0001	2	-	3	0.22			#	0.0004	
Manganese	mg/L	0791	WL	11/02/2009	0001	4.3	-	5.3	1.2			#	0.001	
Manganese	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	1			#	0.002	
Oxidation Reduction Potential	mV	0216	SL	11/03/2009	0001	0.08	-	0.08	-51.7			#		
Oxidation Reduction Potential	mV	0239	SL	11/04/2009	0001	0.5	-	0.5	-65.8			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0243	SL	11/05/2009	0001	0.25	-	0.25	-54			#		
Oxidation Reduction Potential	mV	0245	SL	11/03/2009	0001	0.08	-	0.08	166.3			#		
Oxidation Reduction Potential	mV	0259	SL	11/05/2009	0001	0.17	-	0.17	-31.1			#		
Oxidation Reduction Potential	mV	0274	SL	11/02/2009	0001	0.25	-	0.25	72			#		
Oxidation Reduction Potential	mV	0495	WL	11/05/2009	0001	4.6	-	5.6	-46			#		
Oxidation Reduction Potential	mV	0496	WL	11/05/2009	0001	2.2	-	3.2	-39			#		
Oxidation Reduction Potential	mV	0547	TS	11/06/2009	0001	0	-	0	168.9			#		
Oxidation Reduction Potential	mV	0548	TS	11/06/2009	0001	0	-	0	163			#		
Oxidation Reduction Potential	mV	0562	WL	11/03/2009	0001	1.3	-	2.3	-12.3			#		
Oxidation Reduction Potential	mV	0563	WL	11/03/2009	0001	4.6	-	5.6	-45.5			#		
Oxidation Reduction Potential	mV	0564	WL	11/03/2009	0001	1.2	-	2.2	-155.6			#		
Oxidation Reduction Potential	mV	0565	WL	11/03/2009	0001	4	-	5	-1874			#		
Oxidation Reduction Potential	mV	0590	WL	11/04/2009	0001	1	-	2	-158			#		
Oxidation Reduction Potential	mV	0591	WL	11/04/2009	0001	3.9	-	4.9	112.2			#		
Oxidation Reduction Potential	mV	0597	WL	11/05/2009	0001	9.3	-	10.3	-24			#		
Oxidation Reduction Potential	mV	0598	WL	11/05/2009	0001	9.1	-	10.1	-28			#		
Oxidation Reduction Potential	mV	0599	WL	11/05/2009	0001	9.4	-	10.4	-6.9			#		
Oxidation Reduction Potential	mV	0605	WL	11/04/2009	0001	9.4	-	10.4	208.6			#		
Oxidation Reduction Potential	mV	0606	WL	11/03/2009	0001	9.3	-	10.3	-62.5			#		
Oxidation Reduction Potential	mV	0607	WL	11/03/2009	0001	9.6	-	10.6	-254.7			#		
Oxidation Reduction Potential	mV	0608	WL	11/03/2009	0001	8.9	-	9.9	-98			#		
Oxidation Reduction Potential	mV	0611	WL	11/03/2009	0001	2.2	-	3.2	-85.5			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	0612	WL	11/03/2009	0001	4.3	-	5.3	-116.7			#		
Oxidation Reduction Potential	mV	0615	WL	11/04/2009	0001	1.4	-	2.4	-148.9			#		
Oxidation Reduction Potential	mV	0616	WL	11/04/2009	0001	5.3	-	6.3	-193.1			#		
Oxidation Reduction Potential	mV	0617	WL	11/05/2009	0001	1.7	-	2.7	-8.5			#		
Oxidation Reduction Potential	mV	0618	WL	11/05/2009	0001	5.3	-	6.3	8			#		
Oxidation Reduction Potential	mV	0690	WL	11/05/2009	0001	3.3	-	4.3	-119.9			#		
Oxidation Reduction Potential	mV	0691	WL	11/05/2009	0001	6.5	-	7.5	3			#		
Oxidation Reduction Potential	mV	0692	WL	11/05/2009	0001	9.7	-	10.1	-63.4			#		
Oxidation Reduction Potential	mV	0696	WL	11/05/2009	0001	1.3	-	2.3	-49.6			#		
Oxidation Reduction Potential	mV	0697	WL	11/05/2009	0001	4.3	-	5.3	-41.4			#		
Oxidation Reduction Potential	mV	0770	WL	11/06/2009	0001	14.9	-	34.8	126.4			#		
Oxidation Reduction Potential	mV	0772	WL	11/06/2009	0001	15.15	-	35.05	14.8			#		
Oxidation Reduction Potential	mV	0776	WL	11/06/2009	0001	15.15	-	35.05	8			#		
Oxidation Reduction Potential	mV	0778	WL	11/06/2009	0001	15.1	-	35	-4			#		
Oxidation Reduction Potential	mV	0779	WL	11/06/2009	0001	15.66	-	35.56	8.2			#		
Oxidation Reduction Potential	mV	0790	WL	11/02/2009	0001	2	-	3	-94			#		
Oxidation Reduction Potential	mV	0791	WL	11/02/2009	0001	4.3	-	5.3	-94			#		
Oxidation Reduction Potential	mV	0792	WL	11/02/2009	0001	9.3	-	10.3	-142			#		
pH	s.u.	0216	SL	11/03/2009	0001	0.08	-	0.08	7.96			#		
pH	s.u.	0239	SL	11/04/2009	0001	0.5	-	0.5	8.39			#		
pH	s.u.	0243	SL	11/05/2009	0001	0.25	-	0.25	8.32			#		
pH	s.u.	0245	SL	11/03/2009	0001	0.08	-	0.08	8.24			#		
pH	s.u.	0259	SL	11/05/2009	0001	0.17	-	0.17	8.36			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	0274	SL	11/02/2009	0001	0.25	-	0.25	8.01			#		
pH	s.u.	0495	WL	11/05/2009	0001	4.6	-	5.6	7.34			#		
pH	s.u.	0496	WL	11/05/2009	0001	2.2	-	3.2	8.45			#		
pH	s.u.	0547	TS	11/06/2009	0001	0	-	0	6.97			#		
pH	s.u.	0548	TS	11/06/2009	0001	0	-	0	7.36			#		
pH	s.u.	0562	WL	11/03/2009	0001	1.3	-	2.3	7.04			#		
pH	s.u.	0563	WL	11/03/2009	0001	4.6	-	5.6	7.93			#		
pH	s.u.	0564	WL	11/03/2009	0001	1.2	-	2.2	7.56			#		
pH	s.u.	0565	WL	11/03/2009	0001	4	-	5	7.67			#		
pH	s.u.	0590	WL	11/04/2009	0001	1	-	2	8.24			#		
pH	s.u.	0591	WL	11/04/2009	0001	3.9	-	4.9	7.67			#		
pH	s.u.	0597	WL	11/05/2009	0001	9.3	-	10.3	6.89			#		
pH	s.u.	0598	WL	11/05/2009	0001	9.1	-	10.1	7.06			#		
pH	s.u.	0599	WL	11/05/2009	0001	9.4	-	10.4	6.98			#		
pH	s.u.	0605	WL	11/04/2009	0001	9.4	-	10.4	7.94			#		
pH	s.u.	0606	WL	11/03/2009	0001	9.3	-	10.3	7.75			#		
pH	s.u.	0607	WL	11/03/2009	0001	9.6	-	10.6	9.75			#		
pH	s.u.	0608	WL	11/03/2009	0001	8.9	-	9.9	8.05			#		
pH	s.u.	0611	WL	11/03/2009	0001	2.2	-	3.2	7.53			#		
pH	s.u.	0612	WL	11/03/2009	0001	4.3	-	5.3	7.56			#		
pH	s.u.	0615	WL	11/04/2009	0001	1.4	-	2.4	7.81			#		
pH	s.u.	0616	WL	11/04/2009	0001	5.3	-	6.3	8.17			#		
pH	s.u.	0617	WL	11/05/2009	0001	1.7	-	2.7	7.1			#		
pH	s.u.	0618	WL	11/05/2009	0001	5.3	-	6.3	6.9			#		
pH	s.u.	0690	WL	11/05/2009	0001	3.3	-	4.3	7.12			#		
pH	s.u.	0691	WL	11/05/2009	0001	6.5	-	7.5	7.11			#		
pH	s.u.	0692	WL	11/05/2009	0001	9.7	-	10.1	7.55			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	0696	WL	11/05/2009	0001	1.3	-	2.3	7.67			#		
pH	s.u.	0697	WL	11/05/2009	0001	4.3	-	5.3	7.78			#		
pH	s.u.	0770	WL	11/06/2009	0001	14.9	-	34.8	6.82			#		
pH	s.u.	0772	WL	11/06/2009	0001	15.15	-	35.05	6.78			#		
pH	s.u.	0776	WL	11/06/2009	0001	15.15	-	35.05	6.81			#		
pH	s.u.	0778	WL	11/06/2009	0001	15.1	-	35	6.92			#		
pH	s.u.	0779	WL	11/06/2009	0001	15.66	-	35.56	6.99			#		
pH	s.u.	0790	WL	11/02/2009	0001	2	-	3	8.21			#		
pH	s.u.	0791	WL	11/02/2009	0001	4.3	-	5.3	7.77			#		
pH	s.u.	0792	WL	11/02/2009	0001	9.3	-	10.3	8.17			#		
Selenium	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	0.012		J	#	0.00013	
Selenium	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	0.0089		J	#	0.00013	
Selenium	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	0.013		J	#	0.00013	
Selenium	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	0.00047	B	J	#	0.00013	
Selenium	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	0.0057			#	0.00013	
Selenium	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	0.0082		J	#	0.00013	
Selenium	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	0.013		J	#	0.00013	
Selenium	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	0.0056		J	#	0.00013	
Selenium	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	0.0034		J	#	0.00013	
Selenium	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	0.007		J	#	0.00013	
Selenium	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	0.00018	B		#	0.00013	
Specific Conductance	µmhos /cm	0216	SL	11/03/2009	0001	0.08	-	0.08	1915			#		
Specific Conductance	µmhos /cm	0239	SL	11/04/2009	0001	0.5	-	0.5	1388			#		
Specific Conductance	µmhos /cm	0243	SL	11/05/2009	0001	0.25	-	0.25	1771			#		
Specific Conductance	µmhos /cm	0245	SL	11/03/2009	0001	0.08	-	0.08	1340			#		
Specific Conductance	µmhos /cm	0259	SL	11/05/2009	0001	0.17	-	0.17	1765			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	µmhos /cm	0274	SL	11/02/2009	0001	0.25	-	0.25	1773			#		
Specific Conductance	µmhos /cm	0495	WL	11/05/2009	0001	4.6	-	5.6	6411			#		
Specific Conductance	µmhos /cm	0496	WL	11/05/2009	0001	2.2	-	3.2	8666			#		
Specific Conductance	µmhos /cm	0547	TS	11/06/2009	0001	0	-	0	32525			#		
Specific Conductance	µmhos /cm	0548	TS	11/06/2009	0001	0	-	0	42814			#		
Specific Conductance	µmhos /cm	0562	WL	11/03/2009	0001	1.3	-	2.3	6047			#		
Specific Conductance	µmhos /cm	0563	WL	11/03/2009	0001	4.6	-	5.6	6499			#		
Specific Conductance	µmhos /cm	0564	WL	11/03/2009	0001	1.2	-	2.2	1261			#		
Specific Conductance	µmhos /cm	0565	WL	11/03/2009	0001	4	-	5	1269			#		
Specific Conductance	µmhos /cm	0590	WL	11/04/2009	0001	1	-	2	3970			#		
Specific Conductance	µmhos /cm	0591	WL	11/04/2009	0001	3.9	-	4.9	2337			#		
Specific Conductance	µmhos /cm	0597	WL	11/05/2009	0001	9.3	-	10.3	9839			#		
Specific Conductance	µmhos /cm	0598	WL	11/05/2009	0001	9.1	-	10.1	11474			#		
Specific Conductance	µmhos /cm	0599	WL	11/05/2009	0001	9.4	-	10.4	10292			#		
Specific Conductance	µmhos /cm	0605	WL	11/04/2009	0001	9.4	-	10.4	7166			#		
Specific Conductance	µmhos /cm	0606	WL	11/03/2009	0001	9.3	-	10.3	8736			#		
Specific Conductance	µmhos /cm	0607	WL	11/03/2009	0001	9.6	-	10.6	2416			#		
Specific Conductance	µmhos /cm	0608	WL	11/03/2009	0001	8.9	-	9.9	5246			#		
Specific Conductance	µmhos /cm	0611	WL	11/03/2009	0001	2.2	-	3.2	1465			#		
Specific Conductance	µmhos /cm	0612	WL	11/03/2009	0001	4.3	-	5.3	3624			#		
Specific Conductance	µmhos /cm	0615	WL	11/04/2009	0001	1.4	-	2.4	1520			#		
Specific Conductance	µmhos /cm	0616	WL	11/04/2009	0001	5.3	-	6.3	3383			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	µmhos /cm	0617	WL	11/05/2009	0001	1.7	-	2.7	9591			#		
Specific Conductance	µmhos /cm	0618	WL	11/05/2009	0001	5.3	-	6.3	9493			#		
Specific Conductance	µmhos /cm	0690	WL	11/05/2009	0001	3.3	-	4.3	4020			#		
Specific Conductance	µmhos /cm	0691	WL	11/05/2009	0001	6.5	-	7.5	6212			#		
Specific Conductance	µmhos /cm	0692	WL	11/05/2009	0001	9.7	-	10.1	10812			#		
Specific Conductance	µmhos /cm	0696	WL	11/05/2009	0001	1.3	-	2.3	2703			#		
Specific Conductance	µmhos /cm	0697	WL	11/05/2009	0001	4.3	-	5.3	8611			#		
Specific Conductance	µmhos /cm	0770	WL	11/06/2009	0001	14.9	-	34.8	33356			#		
Specific Conductance	µmhos /cm	0772	WL	11/06/2009	0001	15.15	-	35.05	30259			#		
Specific Conductance	µmhos /cm	0776	WL	11/06/2009	0001	15.15	-	35.05	34137			#		
Specific Conductance	µmhos /cm	0778	WL	11/06/2009	0001	15.1	-	35	26648			#		
Specific Conductance	µmhos /cm	0779	WL	11/06/2009	0001	15.66	-	35.56	40218			#		
Specific Conductance	µmhos /cm	0790	WL	11/02/2009	0001	2	-	3	4459			#		
Specific Conductance	µmhos /cm	0791	WL	11/02/2009	0001	4.3	-	5.3	8915			#		
Specific Conductance	µmhos /cm	0792	WL	11/02/2009	0001	9.3	-	10.3	14172			#		
Temperature	C	0216	SL	11/03/2009	0001	0.08	-	0.08	10.99			#		
Temperature	C	0239	SL	11/04/2009	0001	0.5	-	0.5	9.38			#		
Temperature	C	0243	SL	11/05/2009	0001	0.25	-	0.25	9.63			#		
Temperature	C	0245	SL	11/03/2009	0001	0.08	-	0.08	6.55			#		
Temperature	C	0259	SL	11/05/2009	0001	0.17	-	0.17	11.85			#		
Temperature	C	0274	SL	11/02/2009	0001	0.25	-	0.25	12.83			#		
Temperature	C	0495	WL	11/05/2009	0001	4.6	-	5.6	16.56			#		
Temperature	C	0496	WL	11/05/2009	0001	2.2	-	3.2	17.16			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	0547	TS	11/06/2009	0001	0	-	0	18.15			#		
Temperature	C	0548	TS	11/06/2009	0001	0	-	0	16.3			#		
Temperature	C	0562	WL	11/03/2009	0001	1.3	-	2.3	10.24			#		
Temperature	C	0563	WL	11/03/2009	0001	4.6	-	5.6	11.98			#		
Temperature	C	0564	WL	11/03/2009	0001	1.2	-	2.2	9.4			#		
Temperature	C	0565	WL	11/03/2009	0001	4	-	5	11.4			#		
Temperature	C	0590	WL	11/04/2009	0001	1	-	2	14.9			#		
Temperature	C	0591	WL	11/04/2009	0001	3.9	-	4.9	13.69			#		
Temperature	C	0597	WL	11/05/2009	0001	9.3	-	10.3	15.44			#		
Temperature	C	0598	WL	11/05/2009	0001	9.1	-	10.1	16			#		
Temperature	C	0599	WL	11/05/2009	0001	9.4	-	10.4	14.8			#		
Temperature	C	0605	WL	11/04/2009	0001	9.4	-	10.4	14.05			#		
Temperature	C	0606	WL	11/03/2009	0001	9.3	-	10.3	12.91			#		
Temperature	C	0607	WL	11/03/2009	0001	9.6	-	10.6	10.91			#		
Temperature	C	0608	WL	11/03/2009	0001	8.9	-	9.9	14.26			#		
Temperature	C	0611	WL	11/03/2009	0001	2.2	-	3.2	13.97			#		
Temperature	C	0612	WL	11/03/2009	0001	4.3	-	5.3	14.44			#		
Temperature	C	0615	WL	11/04/2009	0001	1.4	-	2.4	13.96			#		
Temperature	C	0616	WL	11/04/2009	0001	5.3	-	6.3	13.55			#		
Temperature	C	0617	WL	11/05/2009	0001	1.7	-	2.7	13.92			#		
Temperature	C	0618	WL	11/05/2009	0001	5.3	-	6.3	13.72			#		
Temperature	C	0690	WL	11/05/2009	0001	3.3	-	4.3	13.24			#		
Temperature	C	0691	WL	11/05/2009	0001	6.5	-	7.5	14.19			#		
Temperature	C	0692	WL	11/05/2009	0001	9.7	-	10.1	14.09			#		
Temperature	C	0696	WL	11/05/2009	0001	1.3	-	2.3	10.06			#		
Temperature	C	0697	WL	11/05/2009	0001	4.3	-	5.3	12.04			#		
Temperature	C	0770	WL	11/06/2009	0001	14.9	-	34.8	15.37			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Temperature	C	0772	WL	11/06/2009	0001	15.15	-	35.05	16.63			#		
Temperature	C	0776	WL	11/06/2009	0001	15.15	-	35.05	15.29			#		
Temperature	C	0778	WL	11/06/2009	0001	15.1	-	35	16.4			#		
Temperature	C	0779	WL	11/06/2009	0001	15.66	-	35.56	18.02			#		
Temperature	C	0790	WL	11/02/2009	0001	2	-	3	13.64			#		
Temperature	C	0791	WL	11/02/2009	0001	4.3	-	5.3	14.06			#		
Temperature	C	0792	WL	11/02/2009	0001	9.3	-	10.3	14.45			#		
Total Dissolved Solids	mg/L	0216	SL	11/03/2009	0001	0.08	-	0.08	1200			#	40	
Total Dissolved Solids	mg/L	0239	SL	11/04/2009	0001	0.5	-	0.5	840			#	20	
Total Dissolved Solids	mg/L	0243	SL	11/05/2009	0001	0.25	-	0.25	910			#	40	
Total Dissolved Solids	mg/L	0245	SL	11/03/2009	0001	0.08	-	0.08	780			#	20	
Total Dissolved Solids	mg/L	0259	SL	11/05/2009	0001	0.17	-	0.17	900			#	40	
Total Dissolved Solids	mg/L	0259	SL	11/05/2009	0002	0.17	-	0.17	910			#	20	
Total Dissolved Solids	mg/L	0274	SL	11/02/2009	0001	0.25	-	0.25	850			#	20	
Total Dissolved Solids	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	5600			#	80	
Total Dissolved Solids	mg/L	0496	WL	11/05/2009	0001	2.2	-	3.2	5900			#	200	
Total Dissolved Solids	mg/L	0547	TS	11/06/2009	0001	0	-	0	22000			#	400	
Total Dissolved Solids	mg/L	0548	TS	11/06/2009	0001	0	-	0	28000			#	1000	
Total Dissolved Solids	mg/L	0562	WL	11/03/2009	0001	1.3	-	2.3	4500			#	80	
Total Dissolved Solids	mg/L	0563	WL	11/03/2009	0001	4.6	-	5.6	3900			#	80	
Total Dissolved Solids	mg/L	0564	WL	11/03/2009	0001	1.2	-	2.2	770			#	20	
Total Dissolved Solids	mg/L	0565	WL	11/03/2009	0001	4	-	5	750			#	20	
Total Dissolved Solids	mg/L	0590	WL	11/04/2009	0001	1	-	2	3600			#	80	
Total Dissolved Solids	mg/L	0591	WL	11/04/2009	0001	3.9	-	4.9	1200			#	40	
Total Dissolved Solids	mg/L	0597	WL	11/05/2009	0001	9.3	-	10.3	7700			#	200	
Total Dissolved Solids	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	8400			#	200	
Total Dissolved Solids	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	7800			#	200	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Total Dissolved Solids	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	3900			#	80	
Total Dissolved Solids	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	5200			#	200	
Total Dissolved Solids	mg/L	0607	WL	11/03/2009	0001	9.6	-	10.6	2200			#	80	
Total Dissolved Solids	mg/L	0608	WL	11/03/2009	0001	8.9	-	9.9	2700			#	80	
Total Dissolved Solids	mg/L	0608	WL	11/03/2009	0002	8.9	-	9.9	2700			#	80	
Total Dissolved Solids	mg/L	0611	WL	11/03/2009	0001	2.2	-	3.2	940			#	40	
Total Dissolved Solids	mg/L	0612	WL	11/03/2009	0001	4.3	-	5.3	2400			#	80	
Total Dissolved Solids	mg/L	0615	WL	11/04/2009	0001	1.4	-	2.4	910			#	40	
Total Dissolved Solids	mg/L	0616	WL	11/04/2009	0001	5.3	-	6.3	1600			#	80	
Total Dissolved Solids	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	6300			#	200	
Total Dissolved Solids	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	7200			#	200	
Total Dissolved Solids	mg/L	0690	WL	11/05/2009	0001	3.3	-	4.3	4100			#	80	
Total Dissolved Solids	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	4500			#	80	
Total Dissolved Solids	mg/L	0692	WL	11/05/2009	0001	9.7	-	10.1	9200			#	200	
Total Dissolved Solids	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	1400			#	40	
Total Dissolved Solids	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	5400			#	200	
Total Dissolved Solids	mg/L	0770	WL	11/06/2009	0001	14.9	-	34.8	23000			#	400	
Total Dissolved Solids	mg/L	0772	WL	11/06/2009	0001	15.15	-	35.05	21000			#	400	
Total Dissolved Solids	mg/L	0776	WL	11/06/2009	0001	15.15	-	35.05	23000			#	400	
Total Dissolved Solids	mg/L	0778	WL	11/06/2009	0001	15.1	-	35	16000			#	400	
Total Dissolved Solids	mg/L	0779	WL	11/06/2009	0001	15.66	-	35.56	24000			#	2000	
Total Dissolved Solids	mg/L	0779	WL	11/06/2009	0002	15.66	-	35.56	26000			#	1000	
Total Dissolved Solids	mg/L	0790	WL	11/02/2009	0001	2	-	3	2200			#	80	
Total Dissolved Solids	mg/L	0791	WL	11/02/2009	0001	4.3	-	5.3	4800			#	200	
Total Dissolved Solids	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	8200			#	200	
Turbidity	NTU	0216	SL	11/03/2009	0001	0.08	-	0.08	31.8			#		
Turbidity	NTU	0239	SL	11/04/2009	0001	0.5	-	0.5	52.9			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	0243	SL	11/05/2009	0001	0.25	-	0.25	462			#		
Turbidity	NTU	0245	SL	11/03/2009	0001	0.08	-	0.08	14.7			#		
Turbidity	NTU	0274	SL	11/02/2009	0001	0.25	-	0.25	127			#		
Turbidity	NTU	0495	WL	11/05/2009	0001	4.6	-	5.6	232			#		
Turbidity	NTU	0496	WL	11/05/2009	0001	2.2	-	3.2	22			#		
Turbidity	NTU	0547	TS	11/06/2009	0001	0	-	0	1.38			#		
Turbidity	NTU	0548	TS	11/06/2009	0001	0	-	0	155			#		
Turbidity	NTU	0562	WL	11/03/2009	0001	1.3	-	2.3	2.35			#		
Turbidity	NTU	0563	WL	11/03/2009	0001	4.6	-	5.6	44.1			#		
Turbidity	NTU	0564	WL	11/03/2009	0001	1.2	-	2.2	1.55			#		
Turbidity	NTU	0565	WL	11/03/2009	0001	4	-	5	3.2			#		
Turbidity	NTU	0590	WL	11/04/2009	0001	1	-	2	76.6			#		
Turbidity	NTU	0591	WL	11/04/2009	0001	3.9	-	4.9	5.45			#		
Turbidity	NTU	0597	WL	11/05/2009	0001	9.3	-	10.3	7.04			#		
Turbidity	NTU	0598	WL	11/05/2009	0001	9.1	-	10.1	6.99			#		
Turbidity	NTU	0599	WL	11/05/2009	0001	9.4	-	10.4	4.8			#		
Turbidity	NTU	0605	WL	11/04/2009	0001	9.4	-	10.4	3.03			#		
Turbidity	NTU	0606	WL	11/03/2009	0001	9.3	-	10.3	16.5			#		
Turbidity	NTU	0607	WL	11/03/2009	0001	9.6	-	10.6	160			#		
Turbidity	NTU	0608	WL	11/03/2009	0001	8.9	-	9.9	9.78			#		
Turbidity	NTU	0611	WL	11/03/2009	0001	2.2	-	3.2	172			#		
Turbidity	NTU	0612	WL	11/03/2009	0001	4.3	-	5.3	7.31			#		
Turbidity	NTU	0615	WL	11/04/2009	0001	1.4	-	2.4	12.1			#		
Turbidity	NTU	0616	WL	11/04/2009	0001	5.3	-	6.3	4.04			#		
Turbidity	NTU	0617	WL	11/05/2009	0001	1.7	-	2.7	21.3			#		
Turbidity	NTU	0618	WL	11/05/2009	0001	5.3	-	6.3	4.04			#		
Turbidity	NTU	0690	WL	11/05/2009	0001	3.3	-	4.3	82.2			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	0691	WL	11/05/2009	0001	6.5	-	7.5	14.8			#		
Turbidity	NTU	0692	WL	11/05/2009	0001	9.7	-	10.1	44.7			#		
Turbidity	NTU	0696	WL	11/05/2009	0001	1.3	-	2.3	1.88			#		
Turbidity	NTU	0697	WL	11/05/2009	0001	4.3	-	5.3	20.1			#		
Turbidity	NTU	0770	WL	11/06/2009	0001	14.9	-	34.8	8.89			#		
Turbidity	NTU	0772	WL	11/06/2009	0001	15.15	-	35.05	3.84			#		
Turbidity	NTU	0776	WL	11/06/2009	0001	15.15	-	35.05	4.33			#		
Turbidity	NTU	0778	WL	11/06/2009	0001	15.1	-	35	2.9			#		
Turbidity	NTU	0779	WL	11/06/2009	0001	15.66	-	35.56	2.95			#		
Turbidity	NTU	0790	WL	11/02/2009	0001	2	-	3	6.02			#		
Turbidity	NTU	0791	WL	11/02/2009	0001	4.3	-	5.3	66.4			#		
Turbidity	NTU	0792	WL	11/02/2009	0001	9.3	-	10.3	382			#		
Uranium	mg/L	0216	SL	11/03/2009	0001	0.08	-	0.08	0.11			#	1.2E-005	
Uranium	mg/L	0239	SL	11/04/2009	0001	0.5	-	0.5	0.012			#	2.4E-006	
Uranium	mg/L	0243	SL	11/05/2009	0001	0.25	-	0.25	0.045			#	2.4E-006	
Uranium	mg/L	0245	SL	11/03/2009	0001	0.08	-	0.08	0.011			#	2.4E-006	
Uranium	mg/L	0259	SL	11/05/2009	0001	0.17	-	0.17	0.017			#	2.4E-006	
Uranium	mg/L	0259	SL	11/05/2009	0002	0.17	-	0.17	0.016			#	2.4E-006	
Uranium	mg/L	0274	SL	11/02/2009	0001	0.25	-	0.25	0.025			#	1.2E-005	
Uranium	mg/L	0495	WL	11/05/2009	0001	4.6	-	5.6	1.9			#	0.00012	
Uranium	mg/L	0496	WL	11/05/2009	0001	2.2	-	3.2	10			#	0.00049	
Uranium	mg/L	0547	TS	11/06/2009	0001	0	-	0	1.8			#	0.00012	
Uranium	mg/L	0548	TS	11/06/2009	0001	0	-	0	2			#	0.00012	
Uranium	mg/L	0562	WL	11/03/2009	0001	1.3	-	2.3	0.79			#	4.9E-005	
Uranium	mg/L	0563	WL	11/03/2009	0001	4.6	-	5.6	0.62			#	4.9E-005	
Uranium	mg/L	0564	WL	11/03/2009	0001	1.2	-	2.2	0.0046			#	2.4E-006	
Uranium	mg/L	0565	WL	11/03/2009	0001	4	-	5	0.0067			#	2.4E-006	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Uranium	mg/L	0590	WL	11/04/2009	0001	1	-	2	0.55			#	0.00012	
Uranium	mg/L	0591	WL	11/04/2009	0001	3.9	-	4.9	0.31			#	0.00012	
Uranium	mg/L	0597	WL	11/05/2009	0001	9.3	-	10.3	1.2			#	0.00012	
Uranium	mg/L	0598	WL	11/05/2009	0001	9.1	-	10.1	1.6			#	0.00012	
Uranium	mg/L	0599	WL	11/05/2009	0001	9.4	-	10.4	1.8			#	0.00012	
Uranium	mg/L	0605	WL	11/04/2009	0001	9.4	-	10.4	0.59			#	0.00012	
Uranium	mg/L	0606	WL	11/03/2009	0001	9.3	-	10.3	0.7			#	0.00012	
Uranium	mg/L	0607	WL	11/03/2009	0001	9.6	-	10.6	0.33			#	4.9E-005	
Uranium	mg/L	0608	WL	11/03/2009	0001	8.9	-	9.9	0.39			#	4.9E-005	
Uranium	mg/L	0608	WL	11/03/2009	0002	8.9	-	9.9	0.39			#	2.4E-005	
Uranium	mg/L	0611	WL	11/03/2009	0001	2.2	-	3.2	0.022			#	2.4E-006	
Uranium	mg/L	0612	WL	11/03/2009	0001	4.3	-	5.3	0.22			#	2.4E-005	
Uranium	mg/L	0615	WL	11/04/2009	0001	1.4	-	2.4	0.047			#	1.2E-005	
Uranium	mg/L	0616	WL	11/04/2009	0001	5.3	-	6.3	0.32			#	4.9E-005	
Uranium	mg/L	0617	WL	11/05/2009	0001	1.7	-	2.7	1.8			#	0.00012	
Uranium	mg/L	0618	WL	11/05/2009	0001	5.3	-	6.3	1.5			#	0.00012	
Uranium	mg/L	0690	WL	11/05/2009	0001	3.3	-	4.3	0.64			#	4.9E-005	
Uranium	mg/L	0691	WL	11/05/2009	0001	6.5	-	7.5	0.79			#	0.00012	
Uranium	mg/L	0692	WL	11/05/2009	0001	9.7	-	10.1	1.7			#	0.00012	
Uranium	mg/L	0696	WL	11/05/2009	0001	1.3	-	2.3	0.21			#	4.9E-005	
Uranium	mg/L	0697	WL	11/05/2009	0001	4.3	-	5.3	0.73			#	0.00012	
Uranium	mg/L	0770	WL	11/06/2009	0001	14.9	-	34.8	1.4			#	0.00012	
Uranium	mg/L	0772	WL	11/06/2009	0001	15.15	-	35.05	2.5			#	0.00012	
Uranium	mg/L	0776	WL	11/06/2009	0001	15.15	-	35.05	2.2			#	0.00012	
Uranium	mg/L	0778	WL	11/06/2009	0001	15.1	-	35	1.7			#	0.00012	
Uranium	mg/L	0779	WL	11/06/2009	0001	15.66	-	35.56	1.8			#	0.00012	
Uranium	mg/L	0779	WL	11/06/2009	0002	15.66	-	35.56	1.7			#	0.00012	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Uranium	mg/L	0790	WL	11/02/2009	0001	2	-	3	0.35			#	2.4E-005	
Uranium	mg/L	0791	WL	11/02/2009	0001	4.3	-	5.3	0.78			#	4.9E-005	
Uranium	mg/L	0792	WL	11/02/2009	0001	9.3	-	10.3	0.076			#	1.2E-005	

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

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 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	Postdigestion 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.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines

Appendix D.
Water Level Data

Appendix D. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0495		3959.89	11/05/2009		5.79	3954.1	
0496		3956.98	11/05/2009		3.18	3953.8	
0562		3955.37	11/03/2009		2.88	3952.49	
0563		3958.04	11/03/2009		5.62	3952.42	
0564		3956.03	11/03/2009		3.38	3952.65	
0565		3955.47	11/03/2009		2.87	3952.6	
0590		3956.19	11/04/2009		2.86	3953.33	
0591		3955.2	11/04/2009		1.84	3953.36	
0597		3959.11	11/05/2009		5	3954.11	
0598		3957.01	11/05/2009		3.11	3953.9	
0599		3956.52	11/05/2009		2.82	3953.7	
0605		3956.92	11/04/2009		3.79	3953.13	
0606		3955.69	11/03/2009		3.11	3952.58	
0607		3955.62	11/03/2009		3.34	3952.28	
0608		3955.71	11/03/2009		3.1	3952.61	
0611		3957.48	11/03/2009		4.97	3952.51	
0612		3955.27	11/03/2009		2.61	3952.66	
0615		3956.78	11/04/2009		3.65	3953.13	
0616		3955.97	11/04/2009		2.81	3953.16	
0617		3955.85	11/05/2009		2.42	3953.43	
0618		3955.16	11/05/2009		1.5	3953.66	
0690		3963.83	11/05/2009		6	3957.83	
0691		3962.7	11/05/2009		4.95	3957.75	
0692		3962.29	11/05/2009		5.08	3957.21	
0696		3956.42	11/05/2009		3.17	3953.25	
0697		3955.71	11/05/2009		2.29	3953.42	
0770		3968.86	11/06/2009		17.7	3951.16	

Appendix D. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 1/25/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0772		3969.21	11/06/2009		18.11	3951.1	
0776		3968.97	11/06/2009		17.65	3951.32	
0778		3968.93	11/06/2009		17.73	3951.2	
0779		3968.43	11/06/2009		16.52	3951.91	
0790		3955.2	11/02/2009		6.37	3948.83	
0791		3954.76	11/02/2009		5.9	3948.86	
0792		3954.84	11/02/2009		7.98	3946.86	

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

Attachment 1.
Interim Action Well Field Monthly Sampling Trip Report

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

Moab TAC Team

DATE: November 23, 2009

TO: K. Pill

FROM: J. Ritchey

SUBJECT: November 2009 IA Well Field Monthly Sampling Trip Report

Site: Moab, Utah

Date of Sampling Event: November 2 - 6, 2009

Team Members: Elizabeth Glowiak, Tyler Meadows, James Ritchey

RIN Number Assigned: All samples were assigned to RIN 0911039.

Sample Shipment: All samples were shipped in coolers overnight UPS to ALS Laboratory Group from Moab, Utah. One cooler was shipped on November 4, 2009, and two coolers were shipped on November 6, 2009 (Tracking Nos. 0195191935, 4499814746, and 4497159959).

November 2009 CF1 Sampling

Number of Locations Sampled: Nine well points (0562, 0563, 0564, 0565, 0606, 0607, 0608, 0611, and 0612), two surface samples (0216 and 0245), and two evaporation pond (0547 and 0548) locations were sampled. Including one duplicate and an EB, a total of 15 samples were collected during the November 2009 monthly sampling event.

Locations Not Sampled: Extraction wells were not in operation during the sampling event and were not sampled.

Field Variance: Location 0548 was sampled from the northwest corner of the evaporation pond by dropping a bucket into the pond instead of sampling from the outlet because the valve was sealed shut and could not be opened.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2000	0608	Duplicate	Ground Water	NOV 013
2003	NA	Equipment Blank	Deionized Water	NOV 046

ID = identification

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

Location-Specific Information – Well Point Sampling: The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

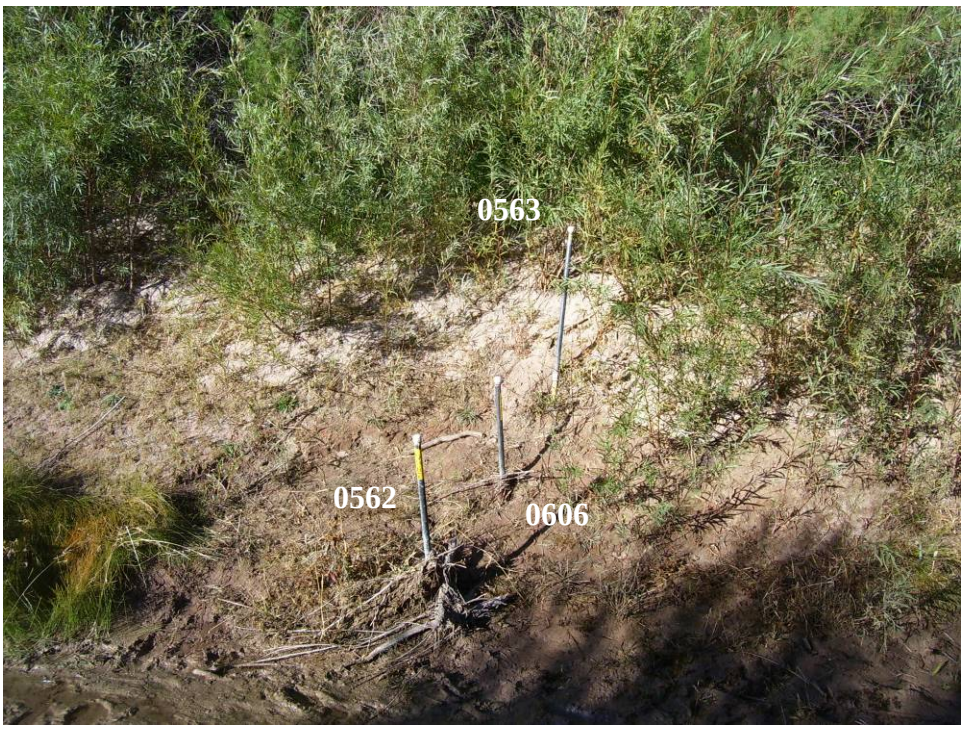
WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0562	11/03/2009	15:49	2.88	2.20	Dry
0563	11/03/2009	16:21	5.62	2.65	Dry
0564	11/03/2009	09:33	3.38	2.24	Dry
0565	11/03/2009	09:09	2.87	2.90	Dry
0606	11/03/2009	16:06	3.11	1.45	Dry
0607	11/03/2009	08:52	3.34	2.48	Dry
0608	11/03/2009	15:29	3.10	0	Dry
0611	11/03/2009	11:00	4.97	2.15	Dry
0612	11/03/2009	11:18	2.61	0	Dry

ft btoc = feet below top of casing; WP = well point

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

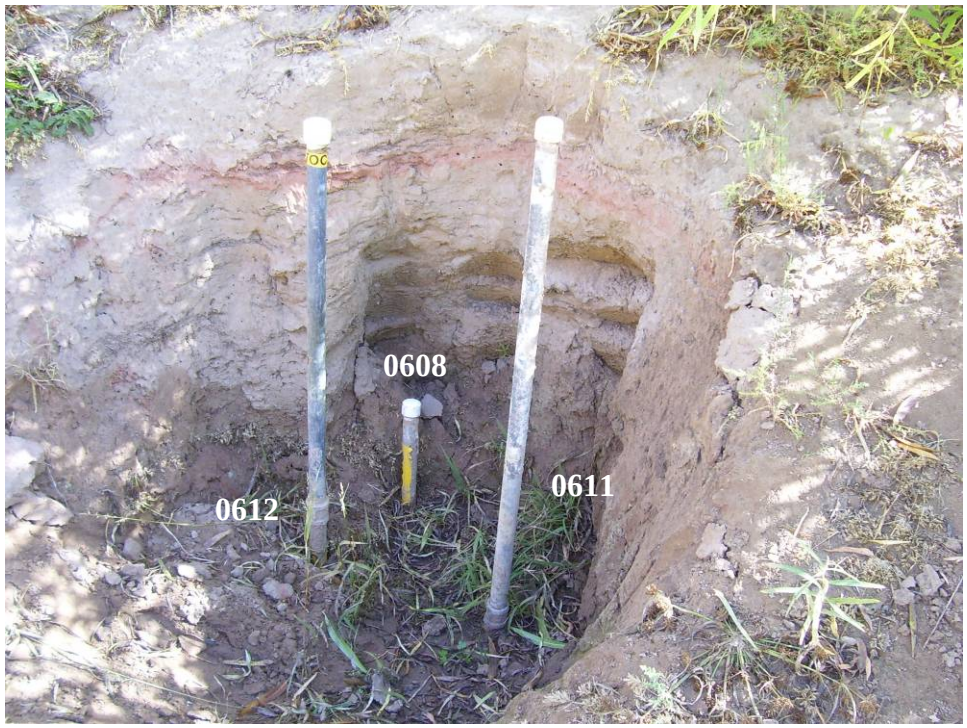
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0216	11/03/2009	10:36	1	1 foot off bank, slow flow, slightly open up river
0245	11/03/2009	08:35	1	1 foot off bank, low flow, secondary channel

SW = surface well

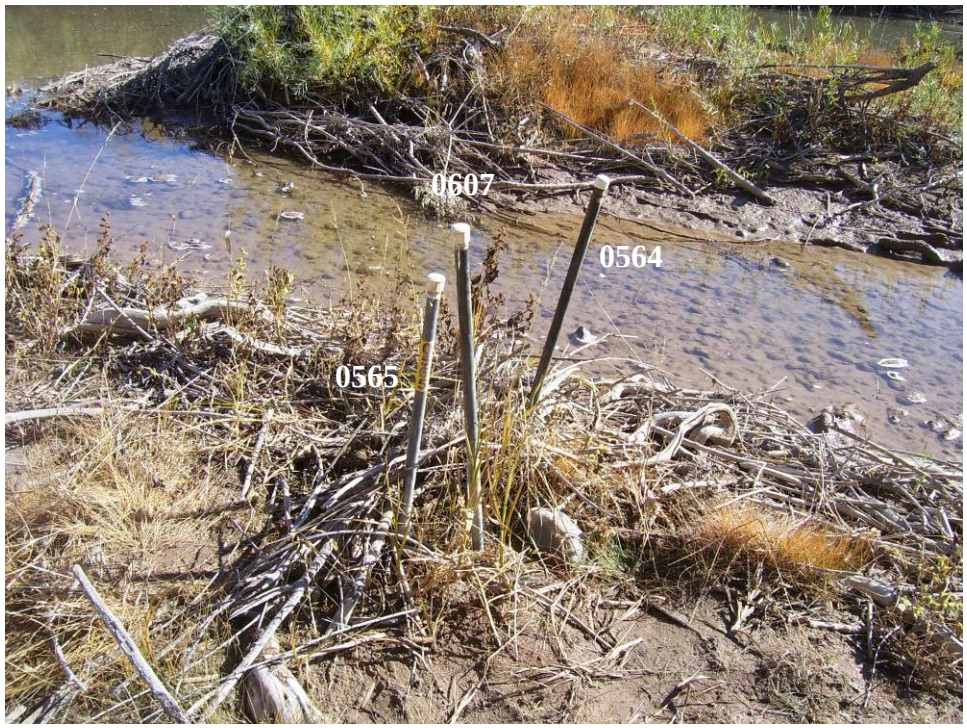


River Bank Well Points 0562, 0563, and 0606

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



Intermediate Well Points 0608, 0611, and 0612



River Edge Well Points 0564, 0565, and 0607

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

Surface Water Location 0245

November 2009 CF2 Sampling

Number of Locations Sampled: Five well points (0590, 0591, 0605, 0615, and 0616), and one surface water location (0239) were sampled. A total of six locations were sampled during the November 2009 monthly sampling event.

Locations Not Sampled: Surface water locations 0236 and 0240 were dry and not sampled. Well point 0603 was not sampled as it was covered by river debris.

Field Variance: None.

Location-Specific Information – Well Point Sampling: The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0590	11/04/2009	11:09	2.85	0.85	Dry
0591	11/04/2009	11:22	1.84	0.55	Dry
0605	11/04/2009	14:35	3.79	1.05	Dry
0615	11/04/2009	14:22	3.65	1.05	Dry
0616	11/04/2009	14:51	2.81	0.38	Dry

ft btoc = feet below top of casing; WP = well point

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

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

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0239	11/04/2009	15:29	6	2 feet off bank, moderate flow

SW = surface well

River Bank Well Points 0590 and 0591 and Dry Surface Water Location 0240

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

River Edge Well Points 0605, 0615, and 0616 and Surface Water Location 0239

Surface Water Location 0243

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

November 2009 CF3 Sampling

Number of Locations Sampled: Five well points (0690, 0691, 0692, 0696, and 0697), and one surface water location (0259) were sampled. Including one duplicate, a total of seven samples were collected during the November 2009 monthly sampling event.

Locations Not Sampled: One of the river edge well points (0698) was dry, and a sample could not be collected. Surface water location 0258 was also dry and was not sampled.

Field Variance: None.

Quality-Control Sample Cross Reference: The following table shows the false identifications assigned to the quality-control samples.

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2001	0259	Duplicate from 2 inches	Surface Water	NOV 030

ID = identification

Location-Specific Information – Well Point Sampling: The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0690	11/05/2009	08:23	6.00	1.45	Dry
0691	11/05/2009	08:29	4.95	0.6	Dry
0692	11/05/2009	08:51	5.08	0.25	Dry
0696	11/05/2009	09:17	3.17	2.10	Dry
0697	11/05/2009	09:38	2.29	1.58	Dry
0698	11/05/2009	09:59	Dry	0.5	Dry

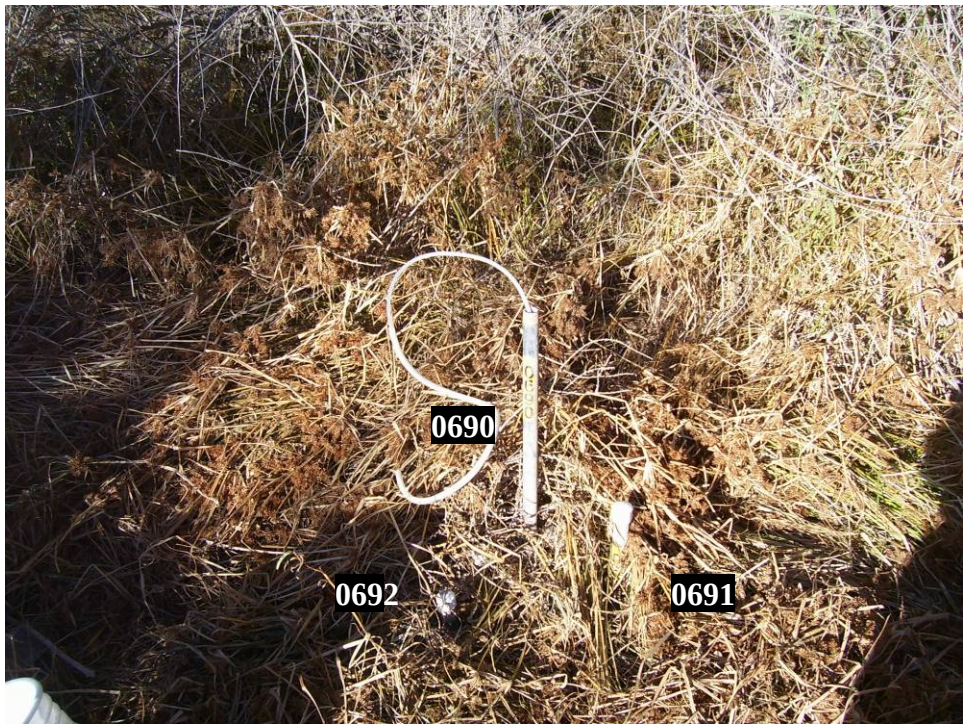
ft btoc = feet below top of casing; WP = well point

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

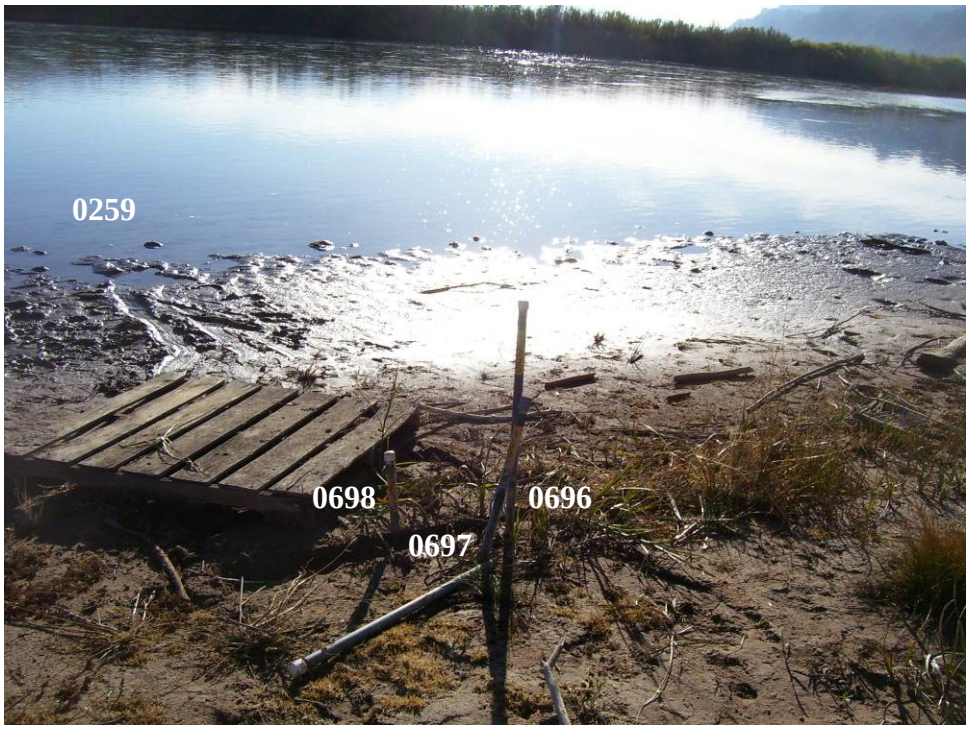
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0259	11/05/2009	10:14	2	1.5 feet off bank, moderate flow, main river channel

SW = surface well

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



River Bank Well Points 0690, 0691, and 0692



River Edge Well Points 0696, 0697, and 0698 and Surface Water Location 0259

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

November 2009 CF4 Sampling

Number of Locations Sampled: Five remediation wells, (0770, 0772, 0776, 0778, and 0779), three well points (0790, 0791, and 0792), and one surface water location (0274) were sampled. Including one duplicate, a total of 10 samples were collected during the November 2009 monthly sampling event.

Locations Not Sampled: Well points 0793, 0794, and 0795 were inaccessible due to high river flow.

Field Variance: None.

Quality-Control Sample Cross Reference: the following table shows the false identifications assigned to the quality-control samples:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2002	0779	Duplicate from 35 feet	Ground Water	NOV 043

ID = identification

Location-Specific Information – CF4 Remediation Wells: Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0770	11/06/2009	08:45	17.70	35
0772	11/06/2009	08:57	18.11	35
0776	11/06/2009	09:10	17.65	35
0778	11/06/2009	09:19	17.73	35
0779	11/06/2009	09:25	16.52	35

ft bgs = feet below ground surface; ft btoc = feet below top of casing

Location-Specific Information – Well Point Sampling: The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0790	11/02/2009	14:17	6.37	2.13	Dry
0791	11/02/2009	14:03	5.90	2.00	Dry
0792	11/02/2009	13:52	7.98	2.65	Dry

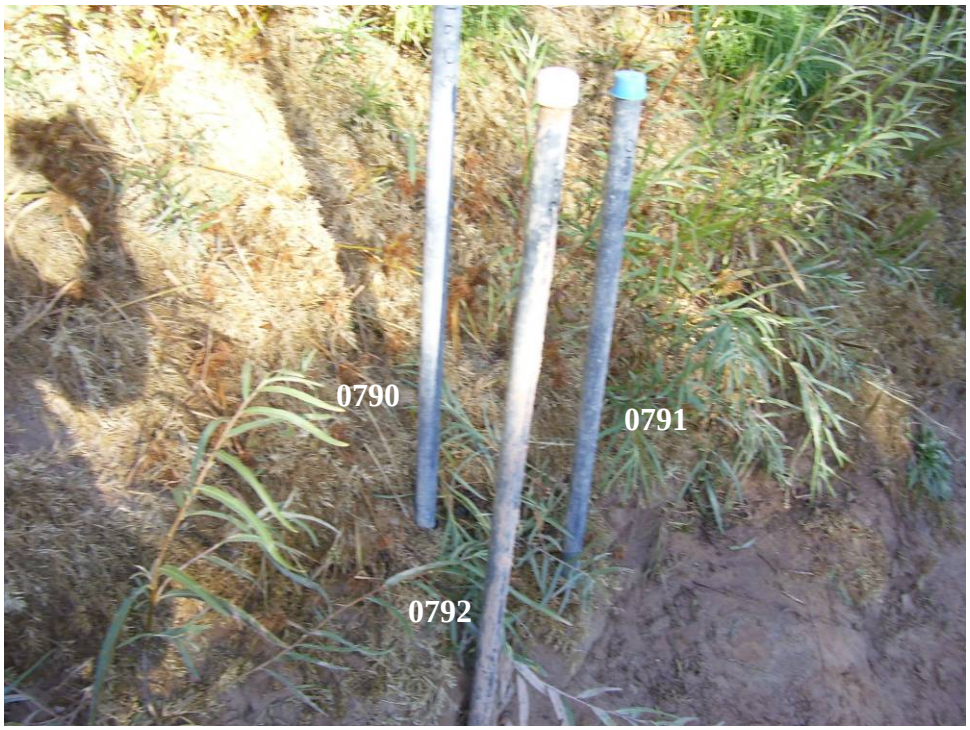
ft btoc = feet below top of casing; WP = well point

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

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0274	11/02/2009	13:40	3	1 foot off bank, slow flow, backwater channel flowing through

SW = surface well

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



River Bank Well Points 0790, 0791, and 0792

Surface Water Location 0274 (1 foot off bank)

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

November 2009 Baseline Sampling

Number of Locations Sampled: Seven well points (0495, 0496, 0597, 0598, 0599, 0617, and 0618) and one surface water location (0243) were sampled. A total of eight samples were collected during the November 2009 monthly sampling event.

Locations Not Sampled: Surface water locations 0241 and 0242 were dry and could not be sampled. Also, well points 0494 and 0497 did not recharge and were not sampled.

Field Variance: Well 0496 recharged at a low rate and a limited volume sample was sent for analysis.

Location-Specific Information – Well Point Sampling: The table below presents the water level, stick up height, and depth to the river surface prior to the initial purge.

WP No.	Date	Time	Depth to Water (ft btoc)	Stick Up Height (ft)	Depth to River Surface (ft btoc)
0494	11/05/2009	14:30	Dry	0.40	Dry
0495	11/05/2009	14:35	5.79	1.30	Dry
0496	11/05/2009	14:10	3.18	0	Dry
0497	11/05/2009	14:08	Dry	1.08	Dry
0597	11/05/2009	14:36	5.00	0.70	Dry
0598	11/05/2009	14:15	3.11	0	Dry
0599	11/05/2009	11:25	2.82	2.78	Dry
0617	11/05/2009	11:42	2.42	2.20	Dry
0618	11/05/2009	11:58	1.50	1.60	Dry

ft btoc = feet below top of casing; WP = well point

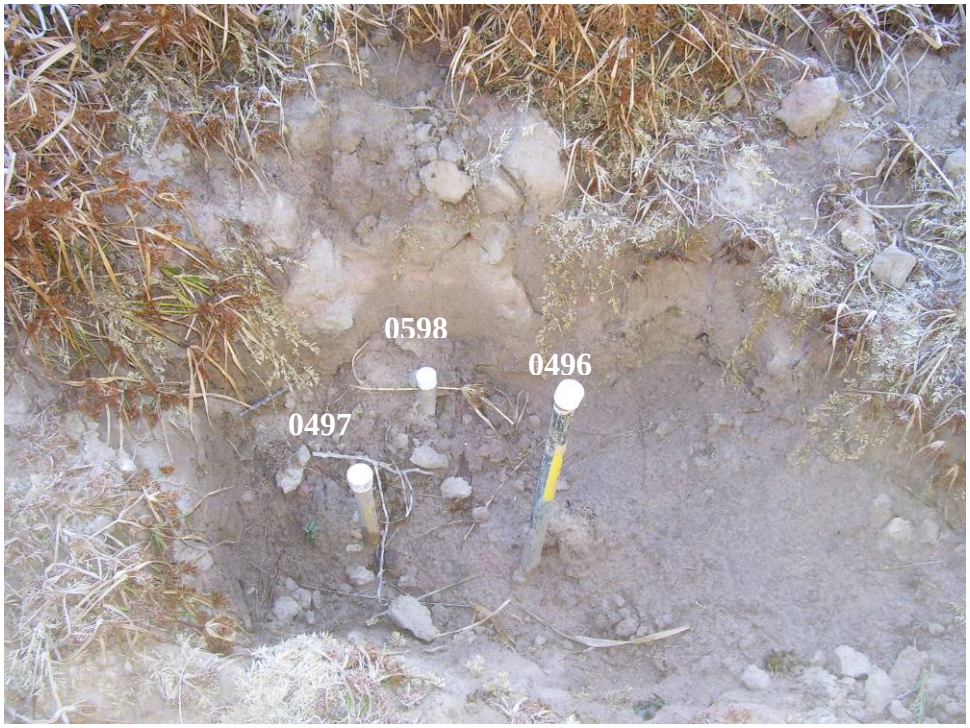
Location-Specific Information – Surface Water Sampling: The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0243	11/05/2009	15:00	3	1 foot off bank, moderate flow, low turbidity

SW = surface well

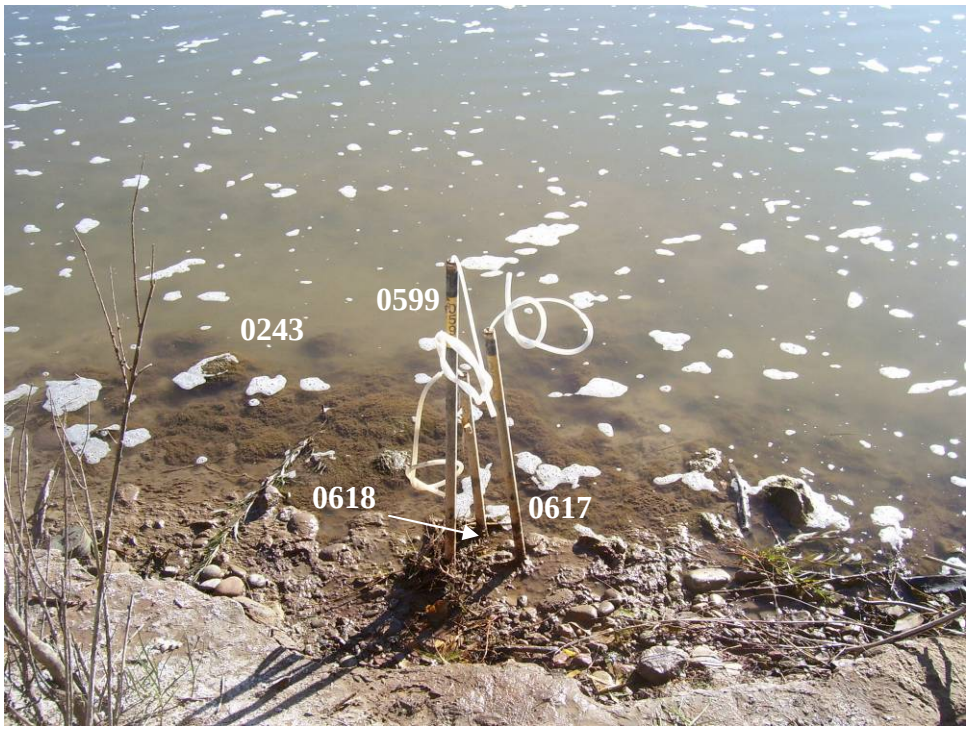
Attachment 1.
Interim Action Well Field Monthly Sampling Trip Report (continued)

River Bank Well Points 0494, 0495, and 0597



Intermediate Well Points 0496, 0597, and 0598 and Dry Surface Water Location 0242

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



River Edge Well Points 0599, 0617, and 0618 and Surface Water Location 0243

Well Inspection Summary: A well inspection was not conducted.

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

Date	Daily Mean Flow (cfs)
11/02/2009	3,950
11/03/2009	4,080
11/04/2009	4,160
11/05/2009	3,800
11/06/2009	3,540

Equipment Issues: None.

Corrective Action Required/Taken: None.