DOE–EM/GJTAC1854

Office of Environmental Management – Grand Junction

UMTRA Project

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

November 2009

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
August 2009 Monthly Ground Water Sampling Event

Revision 0

Review and Approval

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TAC Ground Water Manager

11/16/09
Date

Joseph D. Ritchey
TAC Senior Program Manager

11/16/09
Date

Revision History

Revision No.	Date	Reason/Basis for Revision
0	November 2009	Initial issue.

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Acronyms and Abbreviations

CF	Configuration
cfs	cubic feet per second
COC	chain of custody
EB	equipment blank
EDD	electronic data deliverable
EPA	Environmental Protection Agency
ft	feet
gpm	gallons per minute
IA	interim action
IDL	instrument detection limit
LCS	laboratory control sample
MB	method blank
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 surface water and/or ground 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 Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855) (2009).

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 table. 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 August 2009 monthly sampling event completed from August 16 through 24, 2009, in which ground water samples were collected from selected extraction wells, well points, and surface water locations across 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 August 2009 monthly sampling event.

1.1 Summary Criteria

Sampling Period: August 16 through 24, 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 pump rate changes, river flow, or other known causes?**

   Yes. There were three locations with one analytical result each that were considered anomalous based on the Minimums and Maximums Report. Two of the results were anomalously high, and one was low.

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

   Yes. Configuration (CF) 1 wells were restarted at an extraction rate of approximately 25 gallons per minute (gpm) on August 17 after being shut down on May 12 following the *Moab UMTRA Project Well Field Optimization Plan* (DOE-EM/GJTAC1791). CF3 wells were restarted on August 19 at an extraction rate of approximately 60 gpm (after being shut down on July 16 to control the evaporation pond level). Extraction well PW02 was extracting ground water at rate of approximately 27 gpm throughout this sampling event,

and CF4 wells were shut down in accordance with the *Well Field Optimization Plan.* As a result, the total well field extraction rate was approximately 112 gpm after August 19.

3. Was the evaporation pond functioning properly?

Yes. The pond level ranged from 5.5 to 6.4 feet (ft) 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 0607 was damaged during the last peak flow, and 0603 was covered by river debris and could not be sampled. Well point locations 0494, 0590, and 0792 did not recharge sufficiently to provide a sample, and locations 0698 and 0497 were dry. CF4 well points 0793, 0794, and 0795 were inaccessible.

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

No.

1.2 Sampling Event Summary

This VDP presents the validated data associated with the ground water collected during the August 2009 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 three locations with one analytical result each that were considered anomalous based on the Minimums and Maximums Report (see Anomalous Data Review in Section 3.2).

The August 2009 monthly 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 was sampled during this event, and the time versus concentration plots for ammonia, total dissolved solids (TDS), and uranium 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 versus concentration plots, tables for the Baseline Area and each CF displaying the August 2009 ammonia, TDS, and uranium results compared to the March 2009 (the most recent sampling event in which these locations were sampled prior to August 2009) are provided.

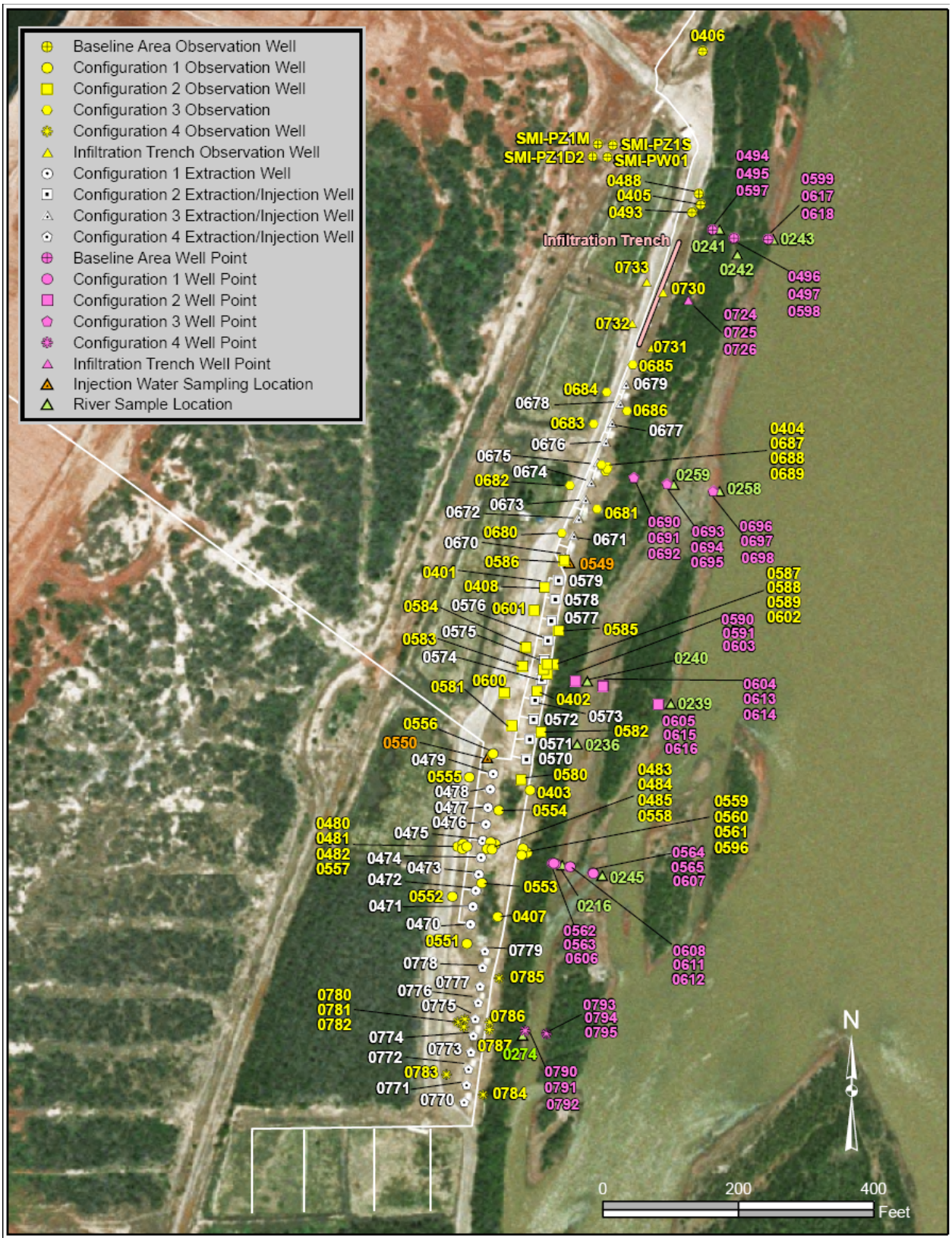


Figure 1. Map of Sample Locations at the Interim Action Well Field and Baseline Area (includes locations not sampled)

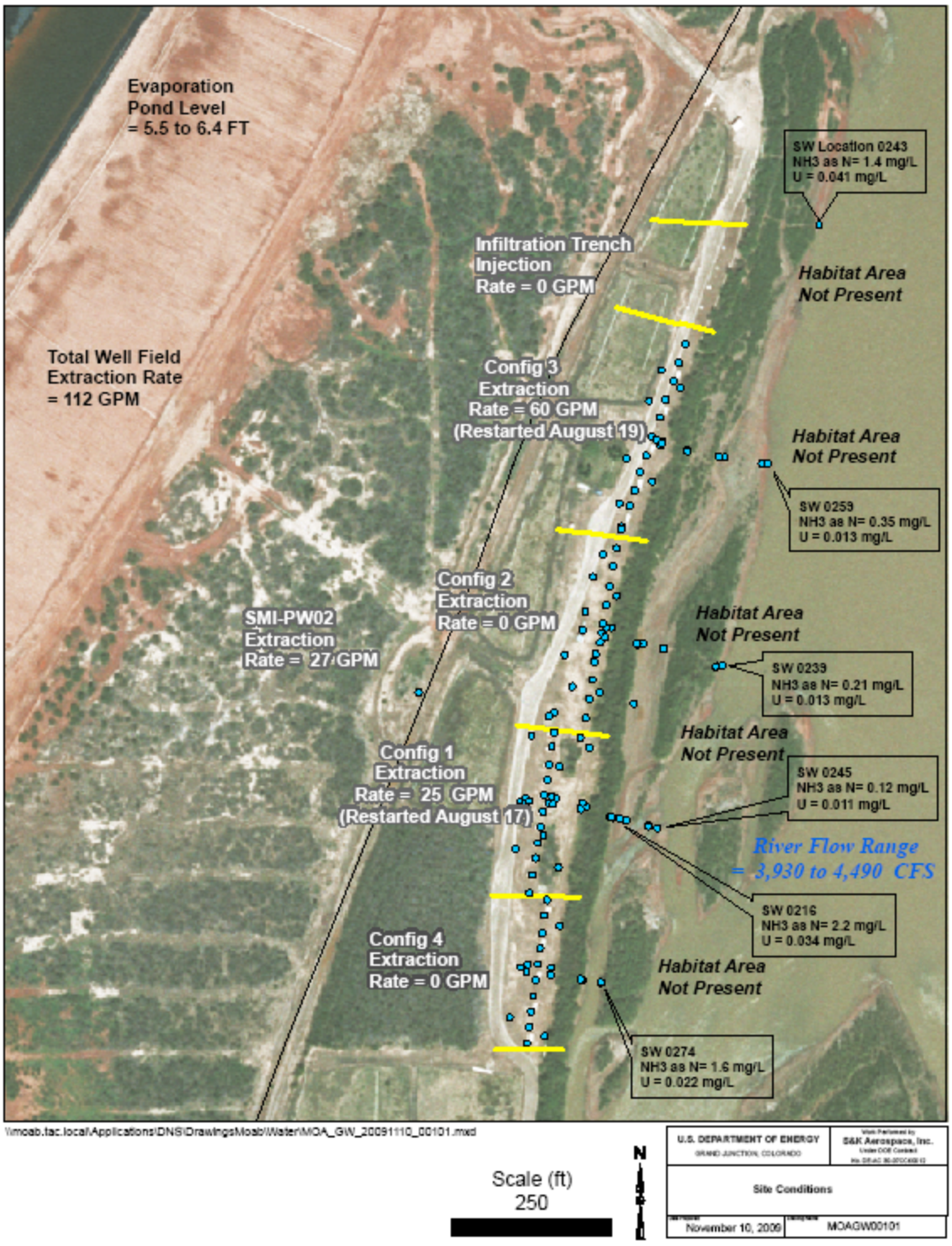


Figure 2. August 2009 Sampling Event Site Conditions

Baseline Area

Comparisons between the Baseline Area August 2009 and March 2009 well point sampling results are provided in Table 1. Ammonia concentrations decreased between these two sampling events in all of the well points. TDS and uranium concentrations decreased in all of the well points except 0495.

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

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)
0494	BLA/Bank WP, Shallow	Ammonia	N/A	N/A
		TDS	N/A	N/A
		Uranium	N/A	N/A
0495	BLA/Bank WP, Middle	Ammonia	0.43	0.1
		TDS	5,900	6,200
		Uranium	2.4	3.1
0597	BLA/Bank WP, Deep	Ammonia	200	110
		TDS	11,000	3,800
		Uranium	1.7	0.97
0496	BLA/Intermediate WP, Shallow	Ammonia	N/A	87
		TDS	N/A	6,900
		Uranium	N/A	1.7
0497	BLA/Intermediate WP, Middle	Ammonia	N/A	N/A
		TDS	N/A	N/A
		Uranium	N/A	N/A
0598	BLA/Intermediate WP, Deep	Ammonia	260	170
		TDS	8,900	6,000
		Uranium	2.2	1.2
0599	BLA/Edge WP, Shallow	Ammonia	250	200
		TDS	10,000	7,400
		Uranium	1.9	1.7
0617	BLA/Edge WP, Middle	Ammonia	160	130
		TDS	9,300	5,900
		Uranium	2	1.9
0618	BLA/Edge WP, Deep	Ammonia	190	140
		TDS	9,500	6,100
		Uranium	1.9	1.6

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 August 2009 and March 2009 analytical results for the CF3 well point sampling. Similar to the Baseline Area locations, the ammonia, TDS, and uranium concentrations generally decreased between these two sampling events. The exception is well point 690 that had an increase in ammonia concentrations in August 2009.

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

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)
0690	CF3/Bank WP, Shallow	Ammonia	0.2	10
		TDS	9,800	3,000
		Uranium	2.9	0.71
0691	CF3/Bank WP, Middle	Ammonia	180	110
		TDS	10,000	3,500
		Uranium	2	0.8
0692	CF3/Bank WP, Deep	Ammonia	290	210
		TDS	13,000	4,200
		Uranium	2.3	0.75
0696	CF3/Edge WP, Shallow	Ammonia	230	51
		TDS	6,200	770
		Uranium	1.1	0.22
0697	CF3/Edge WP, Middle	Ammonia	N/A	110
		TDS	N/A	1,600
		Uranium	N/A	0.34
0698	CF3/Edge WP, Deep	Ammonia	N/A	N/A
		TDS	N/A	N/A
		Uranium	N/A	N/A

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 between the CF2 August 2009 and March 2009 well point sampling results are provided in Table 3. Similar to the Baseline Area and CF3 well points, the ammonia, TDS, and uranium concentrations significantly decreased between these two sampling events.

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

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)
0590	CF2/Bank WP, Shallow	Ammonia	110	83
		TDS	8,700	3,600
		Uranium	2	0.4
0591	CF2/Bank WP, Middle	Ammonia	390	63
		TDS	12,000	1,100
		Uranium	1.6	0.33
0603	CF2/Bank WP, Deep	Ammonia	490	N/A
		TDS	16,000	N/A
		Uranium	1.9	N/A
0605	CF2/Edge WP, Shallow	Ammonia	690	96
		TDS	16,000	1,600
		Uranium	1.6	0.52
0615	CF2/Edge WP, Middle	Ammonia	96	45
		TDS	4,000	1,000
		Uranium	0.42	0.17

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

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)
0616	CF2/Edge WP, Deep	Ammonia	320	93
		TDS	6,900	1,300
		Uranium	0.88	0.3

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 August 2009 and March 2009 analytical results for the CF1 well point sampling. In general, the ammonia, TDS, and uranium concentrations also decreased between these two sampling events.

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

Well Point No.	Location, Relative Depth	Analyte	March 2009 Concentration (mg/L)	August 2009 Concentration (mg/L)
0562	CF1/Bank WP, Shallow	Ammonia	74	96
		TDS	4,300	5,400
		Uranium	0.58	1
0563	CF1/Bank WP, Middle	Ammonia	300	77
		TDS	7,600	2,000
		Uranium	0.58	0.34
0606	CF1/Bank WP, Deep	Ammonia	600	240
		TDS	18,000	6,200
		Uranium	1.8	0.84
0611	CF1/Intermediate WP, Shallow	Ammonia	1.5	2.4
		TDS	1,700	1,100
		Uranium	0.048	0.044
0612	CF1/Intermediate WP, Middle	Ammonia	69	24
		TDS	3,800	1,400
		Uranium	0.36	0.11
0608	CF1/Intermediate WP, Deep	Ammonia	560	140
		TDS	15,000	3,300
		Uranium	1.3	0.48
0564	CF1/Edge WP, Shallow	Ammonia	N/A	0.38
		TDS	N/A	730
		Uranium	N/A	0.0039
0565	CF1/Edge WP, Middle	Ammonia	1.8	1.6
		TDS	760	680
		Uranium	0.0098	0.0045
0607	CF1/Edge WP, Deep	Ammonia	340	N/A
		TDS	13,000	N/A
		Uranium	1.4	N/A

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 between the CF4 August 2009 and March 2009 river bank well point sampling results are provided in Table 5. It was not possible to access several CF4 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 these two sampling events.

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

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

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 state of Utah and federal criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) is provided.

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

Location	Date	Temp (^{o}C)	pH	Ammonia Total as N (mg/L)	State/Federal AWQC-Acute Total as N (mg/L)[1]	State/Federal AWQC-Chronic Total as N (mg/L)[2]
0216	8/18/09	23.6	8.22	2.2	3.83	0.973
0239	8/18/09	23.6	8.31	0.21	3.15	0.827
0243	8/17/09	23.6	8.27	1.4	3.15	0.827
0245	8/18/09	23.9	8.4	0.12	2.59	0.7
0259	8/18/09	21.6	8.29	0.35	3.15	0.941
0274	8/19/09	18.6	8.35	1.6	2.59	1.03

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, none of the samples collected from these locations exceeded the acute criteria for ammonia; however, the samples collected from locations 0216, 0243, and 0274 did exceed the state of Utah chronic criteria for ammonia. There were no habitat areas present during this sampling event, and no fish were present while these samples were collected.

Table 7 presents the uranium results from the surface water samples. As shown in this table, none of these samples exceed the Uranium Mill Tailings Radiation Control Act (UMTRCA) Drinking Water Standard of 0.044 milligrams per liter.

Table 7. August 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	8/18/09	0.034	0.044
0239	8/18/09	0.013	
0243	8/17/09	0.041	
0245	8/18/09	0.011	
0259	8/18/09	0.013	
0274	8/19/09	0.022	

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

1.3 Sampling and Analyses

Sampling and analyses were conducted in accordance with the *Moab UMTRA Project Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System* (DOE-EM/GJ1220) (2008). 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 were collected, and all samples were collected using dedicated equipment; therefore, no equipment blanks (EBs) were required. 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 three locations (0243, 0690, and 0696) with one analytical result each that were considered anomalous based on the Minimums and Maximums Report. Surface water location 0243 had anomalously high uranium, well point 0690 had anomalously high ammonia, and well point 0696 had anomalously low manganese. According to the USGS Cisco gauging station, the mean daily Colorado River flow rates varied between 3,930 and 4,490 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):	0908035
Sample Event:	August 2009 IA Well Field Monthly Sampling Event
Site(s):	Moab, Utah
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Sample Data Group (SDG) No.:	0908186 and 0908245
Analysis:	Metals and Inorganics
Validator:	Rachel Cowan
Review Date:	October 19, 2009

This validation was performed according to the *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855) (2009). 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 0908245 samples	0470, 0472, 0474, 0476, 0478, 0547, 0670, 0672, 0674, 0676, 0678, SMI-PW02	All	J	P1
0908186-2 through -9, -19, -20	0239, 0243, 0245, 0259, 0274, 0495, 0496, 0562, 0606, 0608	Ammonia	J	MS1
All 0908245 samples	0470, 0472, 0474, 0476, 0478, 0547, 0670, 0672, 0674, 0676, 0678, SMI-PW02	Manganese	J	MS1, LCS1
All 0908245 samples	0470, 0472, 0474, 0476, 0478, 0547, 0670, 0672, 0674, 0676, 0678, SMI-PW02	Uranium	J	SD1

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

Table 10. Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Nondetects)	Explanation
LCS1	J	UJ	A laboratory control sample was not analyzed.
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.
P1	J	J or R	Samples received outside of the temperature criteria.
SD1	J	NA	Replicate sample frequency criteria were not met.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received a total of 48 samples for RIN 0908035 in two shipments, which arrived on August 20, 2009 (SDG 0908186; UPS tracking numbers 1Z5W1Y510197399735 and 1Z5W1Y510198134545) and August 26, 2009 (SDG 0908186; UPS tracking number 1Z5W1Y510198071756). The sample group 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, except for the following.

In SDG 0908186, the Condition of Sample Upon Receipt Form (filled out by ALS) had been marked that the custody seals on the shipping container were both intact and not present. Since this had not happened before, was not mentioned further anywhere in the ALS report, and all previous SDGs did have intact custody seals on the shipping container, the SDG 0908186 samples were not qualified.

Preservation and Holding Times

SDGs 0908186 and 0908245 were received intact in three coolers with temperatures of 2.4 and 2.8°C (SDG 0908186) and 4.4°C (SDG 0908245). The temperature for the SDG 0908045 cooler exceeded temperature requirements, so all SDG 0908245 results were "J"-flagged for reason P1. All samples were received in the correct container types and had been preserved correctly for the requested analyses, except 0908245-5, which had a pH of 2.5 (preservation requirements for

metals is a pH of less than 2.0). ALS corrected the pH of this sample upon receipt, so it was not flagged. 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 SDG 0908186 did not have the appropriate number of MS samples as per method requirements, so all SDG 0908186 ammonia results were "J"-flagged for MS1.

Method SW-846 6010B, Manganese
The manganese sample selected for MS analysis in SDG 0908245 failed MS method requirements, so the manganese results in SDG 0908245 were flagged for MS1. However, the field duplicate sample passed requirements for manganese results for RS criteria, so no manganese results from SDG 0908245 were "J"-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 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.

All uranium MSs passed requirements, so no uranium results were qualified for LCS failure. However, the manganese MS in SDG 0908245 did not pass, so all manganese results in SDG 0908245 were "J"-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 greater than the method detection limit or instrument detection limit (IDL) (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-mass spectrometry SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the reporting limit (RL). Inductively coupled plasma-atomic emission spectroscopy SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the RL. All evaluated serial dilution data were acceptable with the following exceptions.

According to the case narratives, the uranium SD sample in SDG 0908245 did not pass the requirement, so the uranium results for SDG 0908245 were "J"-flagged for reason 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 0470, 0670, and 0674 (0908245-14, -13, and -12, respectively) in the August 2009 monthly 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 5 times the reporting level, except for the 65 RPD ammonia result from the duplicate from 0470 (0908245-14). However, since the MSD for ammonia for SDG 0908245 passed, no ammonia samples were flagged for this reason.

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. All locations during the August 2009 monthly sampling event were sampled using dedicated equipment; therefore, an EB was not required.

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 August 31, 2009 for both SDGs 0908186 and 0908245. The contents of the EDDs 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 August 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 the ammonia result from the duplicate from 0470 (0908245-14), which had a 65 RPD. Since the MSD for ammonia for this SDG had passed, no results were qualified for this reason.

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), 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 reports are further screened, and the results are not considered anomalous if: (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is less or more than 50 percent of historical minimum or maximum values; or (3) there were fewer than five historical samples for comparison.

3.2 Anomalous Data Review

There were three anomalous data from three different locations associated with this sampling event based on the Minimums and Maximums Report.

Location No.	Analyte	Type of Anomaly	Disposition
0243	Uranium	high	Undetermined; continue monitoring location
0690	Ammonia	high	Still establishing concentration range, 10 or fewer samples collected from location
0696	Manganese	low	Still establishing concentration range, 10 or fewer samples collected from 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	August 2009/RIN 0908035	**Date(s) of Water Sampling**	August 16-24, 2009
Date(s) of Verification	October 21, 2009	**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	
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 48 samples, and three duplicates were collected.

Appendix A. Water Sampling Field Activities Verification (continued)

Sampling Event / RIN	August 2009/RIN 0908035	**Date(s) of Water Sampling**	August 16-24, 2009
Date(s) of Verification	October 21, 2009	**Name of Verifier**	Rachel Cowan

10.	Were EBs taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	All samples were collected on dedicated equipment; therefore, it was not necessary to collect an EB.
11.	Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
12.	Were quality-control samples assigned a fictitious site identification number?	Yes	
	Was the true identity of the samples recorded on the quality-assurance sample log?	Yes	
13.	Were samples collected in the containers specified?	Yes	
14.	Were samples filtered and preserved as specified?	Yes	
15.	Were the number and types of samples collected as specified?	Yes	
16.	Were COC records completed, and was sample custody maintained?	Yes	
17.	Are field data sheets signed and dated by both team members?	Yes	
18.	Was all other pertinent information documented on the field data sheets?	Yes	
19.	Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20.	Were water levels measured at the locations specified in the planning documents?	Yes	

Appendix B.
Minimums and Maximums Report

Appendix B. Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 0908035
Comparison: All Historical Data
Report Date: 10/21/2009

				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	08/17/2009	Ammonia Total as N	1.4			1.07		U	0.1	U	J	28	10
MOA01	0243	08/17/2009	Manganese	0.064			0.0465			0.00026	B		18	1
MOA01	0243	08/17/2009	Total Dissolved Solids	930			850			400			28	0
MOA01	0243	08/17/2009	Uranium	0.041			0.022			0.0033		J	28	1
MOA01	0476	08/24/2009	Manganese	1.7		J	4.2			1.9		J	13	0
MOA01	0478	08/24/2009	Manganese	2.1		J	4.9		F	2.8			12	0
MOA01	0564	08/18/2009	Manganese	0.63			0.59			0.3			5	0
MOA01	0591	08/18/2009	Ammonia Total as N	63			1100		F	90		QF	37	0
MOA01	0591	08/18/2009	Total Dissolved Solids	1100			24000		F	1300		QF	38	0
MOA01	0615	08/18/2009	Manganese	0.61			3.5		J	0.87			7	0
MOA01	0690	08/18/2009	Ammonia Total as N	10			1.5		J	0.1	U	FQ	10	2
MOA01	0690	08/18/2009	Total Dissolved Solids	3000			14000		QF	4900		J	10	0
MOA01	0690	08/18/2009	Uranium	0.71			2.9			0.79			10	0
MOA01	0691	08/18/2009	Total Dissolved Solids	3500			67100		QF	4600		J	25	0
MOA01	0691	08/18/2009	Uranium	0.8			2.36		FQ	0.94			23	0
MOA01	0696	08/18/2009	Manganese	0.25			2.6			1			7	0

Appendix B. Minimums and Maximums Report (continued)

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 0908035
Comparison: All Historical Data
Report Date: 10/21/2009

				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	0697	08/18/2009	Manganese	0.13			2.6			0.146	E	QF	6	0

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

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	Tentatively identified compound is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL 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	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.		

Appendix C.
Water Quality Data

Appendix C. Water Quality Data

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	08/18/2009	0001	0.08	-	0.08	2.2			#	0.1	
Ammonia Total as N	mg/L	0239	SL	08/18/2009	0001	0.25	-	0.25	0.21			#	0.1	
Ammonia Total as N	mg/L	0243	SL	08/17/2009	0001	0.17	-	0.17	1.4			#	0.1	
Ammonia Total as N	mg/L	0245	SL	08/18/2009	0001	0.17	-	0.17	0.12			#	0.1	
Ammonia Total as N	mg/L	0259	SL	08/18/2009	0001	0.17	-	0.17	0.35			#	0.1	
Ammonia Total as N	mg/L	0274	SL	08/19/2009	0001	0.25	-	0.25	1.6			#	0.1	
Ammonia Total as N	mg/L	0470	WL	08/24/2009	0001	10.3	-	19.7	720		J	#	20	
Ammonia Total as N	mg/L	0470	WL	08/24/2009	0002	10.3	-	19.7	320		J	#	20	
Ammonia Total as N	mg/L	0472	WL	08/24/2009	0001	10.3	-	19.7	320		J	#	20	
Ammonia Total as N	mg/L	0474	WL	08/24/2009	0001	10.3	-	19.7	930		J	#	20	
Ammonia Total as N	mg/L	0476	WL	08/24/2009	0001	10.3	-	19.7	150		J	#	20	
Ammonia Total as N	mg/L	0478	WL	08/24/2009	0001	9.6	-	23.9	180		J	#	20	
Ammonia Total as N	mg/L	0495	WL	08/17/2009	0001	4.6	-	5.6	0.1	U	J	#	0.1	
Ammonia Total as N	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	87		J	#	10	
Ammonia Total as N	mg/L	0547	TS	08/24/2009	0001	0	-	0	390		J	#	20	
Ammonia Total as N	mg/L	0562	WL	08/18/2009	0001	1.3	-	2.3	96		J	#	10	
Ammonia Total as N	mg/L	0563	WL	08/18/2009	0001	4.6	-	5.6	77			#	10	
Ammonia Total as N	mg/L	0564	WL	08/18/2009	0001	1.2	-	2.2	0.38			#	0.1	
Ammonia Total as N	mg/L	0565	WL	08/18/2009	0001	4	-	5	1.6			#	0.1	
Ammonia Total as N	mg/L	0590	WL	08/18/2009	0001	1	-	2	83			#	10	
Ammonia Total as N	mg/L	0591	WL	08/18/2009	0001	3.9	-	4.9	63			#	10	
Ammonia Total as N	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	110			#	10	
Ammonia Total as N	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	170			#	10	
Ammonia Total as N	mg/L	0599	WL	08/17/2009	0001	9.4	-	10.4	200			#	10	
Ammonia Total as N	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	96			#	10	
Ammonia Total as N	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	240		J	#	10	
Ammonia Total as N	mg/L	0608	WL	08/18/2009	0001	8.9	-	9.9	140			#	10	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0611	WL	08/18/2009	0001	2.2	-	3.2	2.4			#	0.1	
Ammonia Total as N	mg/L	0612	WL	08/18/2009	0001	4.3	-	5.3	24			#	2	
Ammonia Total as N	mg/L	0615	WL	08/18/2009	0001	1.4	-	2.4	45			#	10	
Ammonia Total as N	mg/L	0616	WL	08/18/2009	0001	5.3	-	6.3	93			#	10	
Ammonia Total as N	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	130			#	10	
Ammonia Total as N	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	140			#	10	
Ammonia Total as N	mg/L	0670	WL	08/24/2009	0001	15.9	-	45.9	380		J	#	20	
Ammonia Total as N	mg/L	0670	WL	08/24/2009	0002	15.9	-	45.9	370		J	#	20	
Ammonia Total as N	mg/L	0672	WL	08/24/2009	0001	15	-	45	470		J	#	20	
Ammonia Total as N	mg/L	0674	WL	08/24/2009	0001	15.1	-	45.1	450		J	#	20	
Ammonia Total as N	mg/L	0674	WL	08/24/2009	0002	15.1	-	45.1	440		J	#	20	
Ammonia Total as N	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	320		J	#	20	
Ammonia Total as N	mg/L	0678	WL	08/24/2009	0001	16.3	-	46.3	210		J	#	20	
Ammonia Total as N	mg/L	0690	WL	08/18/2009	0001	3.3	-	4.3	10			#	1	
Ammonia Total as N	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	110			#	10	
Ammonia Total as N	mg/L	0692	WL	08/18/2009	0001	9.7	-	10.1	210			#	10	
Ammonia Total as N	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	51			#	10	
Ammonia Total as N	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	110			#	10	
Ammonia Total as N	mg/L	0790	WL	08/19/2009	0001	2	-	3	280			#	10	
Ammonia Total as N	mg/L	0791	WL	08/19/2009	0001	4.3	-	5.3	420			#	10	
Ammonia Total as N	mg/L	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	620		J	#	20	
Dissolved Oxygen	mg/L	0216	SL	08/18/2009	0001	0.08	-	0.08	6.51			#		
Dissolved Oxygen	mg/L	0239	SL	08/18/2009	0001	0.25	-	0.25	7.85			#		
Dissolved Oxygen	mg/L	0243	SL	08/17/2009	0001	0.17	-	0.17	9.12			#		
Dissolved Oxygen	mg/L	0245	SL	08/18/2009	0001	0.17	-	0.17	6.83			#		
Dissolved Oxygen	mg/L	0259	SL	08/18/2009	0001	0.17	-	0.17	7.68			#		
Dissolved Oxygen	mg/L	0274	SL	08/19/2009	0001	0.25	-	0.25	11.11			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0470	WL	08/24/2009	0001	10.3	-	19.7	2.51			#		
Dissolved Oxygen	mg/L	0472	WL	08/24/2009	0001	10.3	-	19.7	7.81			#		
Dissolved Oxygen	mg/L	0474	WL	08/24/2009	0001	10.3	-	19.7	2.88			#		
Dissolved Oxygen	mg/L	0476	WL	08/24/2009	0001	10.3	-	19.7	5.74			#		
Dissolved Oxygen	mg/L	0478	WL	08/24/2009	0001	9.6	-	23.9	1.4			#		
Dissolved Oxygen	mg/L	0495	WL	08/17/2009	0001	4.6	-	5.6	4.44			#		
Dissolved Oxygen	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	5.68			#		
Dissolved Oxygen	mg/L	0547	TS	08/24/2009	0001	0	-	0	4.43			#		
Dissolved Oxygen	mg/L	0562	WL	08/18/2009	0001	1.3	-	2.3	0.34			#		
Dissolved Oxygen	mg/L	0563	WL	08/18/2009	0001	4.6	-	5.6	1.87			#		
Dissolved Oxygen	mg/L	0564	WL	08/18/2009	0001	1.2	-	2.2	0.43			#		
Dissolved Oxygen	mg/L	0565	WL	08/18/2009	0001	4	-	5	0.2			#		
Dissolved Oxygen	mg/L	0590	WL	08/18/2009	0001	1	-	2	2.27			#		
Dissolved Oxygen	mg/L	0591	WL	08/18/2009	0001	3.9	-	4.9	2.92			#		
Dissolved Oxygen	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	0.33			#		
Dissolved Oxygen	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	0.41			#		
Dissolved Oxygen	mg/L	0599	WL	08/17/2009	0001	9.4	-	10.4	0.97			#		
Dissolved Oxygen	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	1.35			#		
Dissolved Oxygen	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	0.32			#		
Dissolved Oxygen	mg/L	0608	WL	08/18/2009	0001	8.9	-	9.9	0.32			#		
Dissolved Oxygen	mg/L	0611	WL	08/18/2009	0001	2.2	-	3.2	1.7			#		
Dissolved Oxygen	mg/L	0612	WL	08/18/2009	0001	4.3	-	5.3	0.54			#		
Dissolved Oxygen	mg/L	0615	WL	08/18/2009	0001	1.4	-	2.4	4.34			#		
Dissolved Oxygen	mg/L	0616	WL	08/18/2009	0001	5.3	-	6.3	0.08			#		
Dissolved Oxygen	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	2.57			#		
Dissolved Oxygen	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	1.15			#		
Dissolved Oxygen	mg/L	0670	WL	08/24/2009	0001	15.9	-	45.9	0.96			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0672	WL	08/24/2009	0001	15	-	45	2.71			#		
Dissolved Oxygen	mg/L	0674	WL	08/24/2009	0001	15.1	-	45.1	0.42			#		
Dissolved Oxygen	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	0.29			#		
Dissolved Oxygen	mg/L	0678	WL	08/24/2009	0001	16.3	-	46.3	-0.02			#		
Dissolved Oxygen	mg/L	0690	WL	08/18/2009	0001	3.3	-	4.3	3.28			#		
Dissolved Oxygen	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	1.3			#		
Dissolved Oxygen	mg/L	0692	WL	08/18/2009	0001	9.7	-	10.1	0.74			#		
Dissolved Oxygen	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	3.31			#		
Dissolved Oxygen	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	3.16			#		
Dissolved Oxygen	mg/L	0790	WL	08/19/2009	0001	2	-	3	1.04			#		
Dissolved Oxygen	mg/L	0791	WL	08/19/2009	0001	4.3	-	5.3	2.22			#		
Dissolved Oxygen	mg/L	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	0.83			#		
Manganese	mg/L	0216	SL	08/18/2009	0001	0.08	-	0.08	0.088			#	0.0001	
Manganese	mg/L	0239	SL	08/18/2009	0001	0.25	-	0.25	0.013			#	0.0001	
Manganese	mg/L	0243	SL	08/17/2009	0001	0.17	-	0.17	0.064			#	0.0001	
Manganese	mg/L	0245	SL	08/18/2009	0001	0.17	-	0.17	0.013			#	0.0001	
Manganese	mg/L	0259	SL	08/18/2009	0001	0.17	-	0.17	0.012			#	0.0001	
Manganese	mg/L	0274	SL	08/19/2009	0001	0.25	-	0.25	0.055			#	0.0001	
Manganese	mg/L	0470	WL	08/24/2009	0001	10.3	-	19.7	4.3		J	#	0.001	
Manganese	mg/L	0470	WL	08/24/2009	0002	10.3	-	19.7	4.4		J	#	0.001	
Manganese	mg/L	0472	WL	08/24/2009	0001	10.3	-	19.7	2.6		J	#	0.001	
Manganese	mg/L	0474	WL	08/24/2009	0001	10.3	-	19.7	1.7		J	#	0.00052	
Manganese	mg/L	0476	WL	08/24/2009	0001	10.3	-	19.7	1.7		J	#	0.00052	
Manganese	mg/L	0478	WL	08/24/2009	0001	9.6	-	23.9	2.1		J	#	0.001	
Manganese	mg/L	0495	WL	08/17/2009	0001	4.6	-	5.6	0.45			#	0.00021	
Manganese	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	1.8			#	0.00052	
Manganese	mg/L	0547	TS	08/24/2009	0001	0	-	0	4		J	#	0.001	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0562	WL	08/18/2009	0001	1.3	-	2.3	3.2			#	0.00052	
Manganese	mg/L	0563	WL	08/18/2009	0001	4.6	-	5.6	0.63			#	0.00021	
Manganese	mg/L	0564	WL	08/18/2009	0001	1.2	-	2.2	0.63			#	0.0001	
Manganese	mg/L	0565	WL	08/18/2009	0001	4	-	5	0.91			#	0.0001	
Manganese	mg/L	0590	WL	08/18/2009	0001	1	-	2	3.4			#	0.00021	
Manganese	mg/L	0591	WL	08/18/2009	0001	3.9	-	4.9	0.37			#	0.0001	
Manganese	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	1.5			#	0.00021	
Manganese	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	1.9			#	0.00052	
Manganese	mg/L	0599	WL	08/17/2009	0001	9.4	-	10.4	2.6			#	0.00052	
Manganese	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	0.11			#	0.00021	
Manganese	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	0.94			#	0.00052	
Manganese	mg/L	0608	WL	08/18/2009	0001	8.9	-	9.9	0.31			#	0.00052	
Manganese	mg/L	0611	WL	08/18/2009	0001	2.2	-	3.2	1.9			#	0.0001	
Manganese	mg/L	0612	WL	08/18/2009	0001	4.3	-	5.3	1			#	0.0001	
Manganese	mg/L	0615	WL	08/18/2009	0001	1.4	-	2.4	0.61			#	0.0001	
Manganese	mg/L	0616	WL	08/18/2009	0001	5.3	-	6.3	0.2			#	0.0001	
Manganese	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	2.3			#	0.00052	
Manganese	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	2.4			#	0.00052	
Manganese	mg/L	0670	WL	08/24/2009	0001	15.9	-	45.9	4.3		J	#	0.001	
Manganese	mg/L	0670	WL	08/24/2009	0002	15.9	-	45.9	4.4		J	#	0.001	
Manganese	mg/L	0672	WL	08/24/2009	0001	15	-	45	4.1		J	#	0.001	
Manganese	mg/L	0674	WL	08/24/2009	0001	15.1	-	45.1	4.1		J	#	0.001	
Manganese	mg/L	0674	WL	08/24/2009	0002	15.1	-	45.1	4.4		J	#	0.001	
Manganese	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	4	N	J	#	0.001	
Manganese	mg/L	0678	WL	08/24/2009	0001	16.3	-	46.3	2.8		J	#	0.00052	
Manganese	mg/L	0690	WL	08/18/2009	0001	3.3	-	4.3	2.2			#	0.00021	
Manganese	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	1.3			#	0.00021	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0692	WL	08/18/2009	0001	9.7	-	10.1	1.3			#	0.00052	
Manganese	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	0.25			#	0.0001	
Manganese	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	0.13			#	0.00021	
Manganese	mg/L	0790	WL	08/19/2009	0001	2	-	3	3.6			#	0.001	
Manganese	mg/L	0791	WL	08/19/2009	0001	4.3	-	5.3	4.5			#	0.001	
Manganese	mg/L	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	6.3		J	#	0.0026	
Oxidation Reduction Potential	mV	0216	SL	08/18/2009	0001	0.08	-	0.08	-25			#		
Oxidation Reduction Potential	mV	0239	SL	08/18/2009	0001	0.25	-	0.25	-85			#		
Oxidation Reduction Potential	mV	0243	SL	08/17/2009	0001	0.17	-	0.17	-18			#		
Oxidation Reduction Potential	mV	0245	SL	08/18/2009	0001	0.17	-	0.17	-64			#		
Oxidation Reduction Potential	mV	0259	SL	08/18/2009	0001	0.17	-	0.17	100			#		
Oxidation Reduction Potential	mV	0274	SL	08/19/2009	0001	0.25	-	0.25	-6			#		
Oxidation Reduction Potential	mV	0470	WL	08/24/2009	0001	10.3	-	19.7	118			#		
Oxidation Reduction Potential	mV	0472	WL	08/24/2009	0001	10.3	-	19.7	103			#		
Oxidation Reduction Potential	mV	0474	WL	08/24/2009	0001	10.3	-	19.7	111			#		
Oxidation Reduction Potential	mV	0476	WL	08/24/2009	0001	10.3	-	19.7	118			#		
Oxidation Reduction Potential	mV	0478	WL	08/24/2009	0001	9.6	-	23.9	125			#		
Oxidation Reduction Potential	mV	0495	WL	08/17/2009	0001	4.6	-	5.6	-63			#		
Oxidation Reduction Potential	mV	0496	WL	08/17/2009	0001	2.2	-	3.2	-153			#		
Oxidation Reduction Potential	mV	0547	TS	08/24/2009	0001	0	-	0	133			#		
Oxidation Reduction Potential	mV	0562	WL	08/18/2009	0001	1.3	-	2.3	38			#		
Oxidation Reduction Potential	mV	0563	WL	08/18/2009	0001	4.6	-	5.6	-40			#		
Oxidation Reduction Potential	mV	0564	WL	08/18/2009	0001	1.2	-	2.2	-156			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0565	WL	08/18/2009	0001	4	-	5	-149			#		
Oxidation Reduction Potential	mV	0590	WL	08/18/2009	0001	1	-	2	-71			#		
Oxidation Reduction Potential	mV	0591	WL	08/18/2009	0001	3.9	-	4.9	-97			#		
Oxidation Reduction Potential	mV	0597	WL	08/17/2009	0001	9.3	-	10.3	30			#		
Oxidation Reduction Potential	mV	0598	WL	08/17/2009	0001	9.1	-	10.1	-118			#		
Oxidation Reduction Potential	mV	0599	WL	08/17/2009	0001	9.4	-	10.4	-39			#		
Oxidation Reduction Potential	mV	0605	WL	08/18/2009	0001	9.4	-	10.4	-170			#		
Oxidation Reduction Potential	mV	0606	WL	08/18/2009	0001	9.3	-	10.3	35			#		
Oxidation Reduction Potential	mV	0608	WL	08/18/2009	0001	8.9	-	9.9	-105			#		
Oxidation Reduction Potential	mV	0611	WL	08/18/2009	0001	2.2	-	3.2	-98			#		
Oxidation Reduction Potential	mV	0612	WL	08/18/2009	0001	4.3	-	5.3	-115			#		
Oxidation Reduction Potential	mV	0615	WL	08/18/2009	0001	1.4	-	2.4	-143			#		
Oxidation Reduction Potential	mV	0616	WL	08/18/2009	0001	5.3	-	6.3	-132			#		
Oxidation Reduction Potential	mV	0617	WL	08/17/2009	0001	1.7	-	2.7	-77			#		
Oxidation Reduction Potential	mV	0618	WL	08/17/2009	0001	5.3	-	6.3	-27			#		
Oxidation Reduction Potential	mV	0670	WL	08/24/2009	0001	15.9	-	45.9	141			#		
Oxidation Reduction Potential	mV	0672	WL	08/24/2009	0001	15	-	45	166			#		
Oxidation Reduction Potential	mV	0674	WL	08/24/2009	0001	15.1	-	45.1	140			#		
Oxidation Reduction Potential	mV	0676	WL	08/24/2009	0001	15.9	-	45.9	128			#		
Oxidation Reduction Potential	mV	0678	WL	08/24/2009	0001	16.3	-	46.3	131			#		
Oxidation Reduction Potential	mV	0690	WL	08/18/2009	0001	3.3	-	4.3	-148			#		
Oxidation Reduction Potential	mV	0691	WL	08/18/2009	0001	6.5	-	7.5	-124			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0692	WL	08/18/2009	0001	9.7	-	10.1	123			#		
Oxidation Reduction Potential	mV	0696	WL	08/18/2009	0001	1.3	-	2.3	146			#		
Oxidation Reduction Potential	mV	0697	WL	08/18/2009	0001	4.3	-	5.3	118			#		
Oxidation Reduction Potential	mV	0790	WL	08/19/2009	0001	2	-	3	151			#		
Oxidation Reduction Potential	mV	0791	WL	08/19/2009	0001	4.3	-	5.3	-59			#		
Oxidation Reduction Potential	mV	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	190			#		
pH	s.u.	0216	SL	08/18/2009	0001	0.08	-	0.08	8.22			#		
pH	s.u.	0239	SL	08/18/2009	0001	0.25	-	0.25	8.31			#		
pH	s.u.	0243	SL	08/17/2009	0001	0.17	-	0.17	8.27			#		
pH	s.u.	0245	SL	08/18/2009	0001	0.17	-	0.17	8.4			#		
pH	s.u.	0259	SL	08/18/2009	0001	0.17	-	0.17	8.29			#		
pH	s.u.	0274	SL	08/19/2009	0001	0.25	-	0.25	8.35			#		
pH	s.u.	0470	WL	08/24/2009	0001	10.3	-	19.7	6.82			#		
pH	s.u.	0472	WL	08/24/2009	0001	10.3	-	19.7	6.99			#		
pH	s.u.	0474	WL	08/24/2009	0001	10.3	-	19.7	6.98			#		
pH	s.u.	0476	WL	08/24/2009	0001	10.3	-	19.7	6.9			#		
pH	s.u.	0478	WL	08/24/2009	0001	9.6	-	23.9	6.87			#		
pH	s.u.	0495	WL	08/17/2009	0001	4.6	-	5.6	7.29			#		
pH	s.u.	0496	WL	08/17/2009	0001	2.2	-	3.2	8.06			#		
pH	s.u.	0547	TS	08/24/2009	0001	0	-	0	6.92			#		
pH	s.u.	0562	WL	08/18/2009	0001	1.3	-	2.3	7.09			#		
pH	s.u.	0563	WL	08/18/2009	0001	4.6	-	5.6	7.9			#		
pH	s.u.	0564	WL	08/18/2009	0001	1.2	-	2.2	7.62			#		
pH	s.u.	0565	WL	08/18/2009	0001	4	-	5	7.8			#		
pH	s.u.	0590	WL	08/18/2009	0001	1	-	2	7.44			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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.	0591	WL	08/18/2009	0001	3.9	-	4.9	8.02			#		
pH	s.u.	0597	WL	08/17/2009	0001	9.3	-	10.3	7.07			#		
pH	s.u.	0598	WL	08/17/2009	0001	9.1	-	10.1	7.1			#		
pH	s.u.	0599	WL	08/17/2009	0001	9.4	-	10.4	7.25			#		
pH	s.u.	0605	WL	08/18/2009	0001	9.4	-	10.4	8.42			#		
pH	s.u.	0606	WL	08/18/2009	0001	9.3	-	10.3	7.71			#		
pH	s.u.	0608	WL	08/18/2009	0001	8.9	-	9.9	8.03			#		
pH	s.u.	0611	WL	08/18/2009	0001	2.2	-	3.2	7.51			#		
pH	s.u.	0612	WL	08/18/2009	0001	4.3	-	5.3	7.6			#		
pH	s.u.	0615	WL	08/18/2009	0001	1.4	-	2.4	8.11			#		
pH	s.u.	0616	WL	08/18/2009	0001	5.3	-	6.3	8.26			#		
pH	s.u.	0617	WL	08/17/2009	0001	1.7	-	2.7	7.41			#		
pH	s.u.	0618	WL	08/17/2009	0001	5.3	-	6.3	7.21			#		
pH	s.u.	0670	WL	08/24/2009	0001	15.9	-	45.9	6.78			#		
pH	s.u.	0672	WL	08/24/2009	0001	15	-	45	6.83			#		
pH	s.u.	0674	WL	08/24/2009	0001	15.1	-	45.1	6.78			#		
pH	s.u.	0676	WL	08/24/2009	0001	15.9	-	45.9	6.76			#		
pH	s.u.	0678	WL	08/24/2009	0001	16.3	-	46.3	6.81			#		
pH	s.u.	0690	WL	08/18/2009	0001	3.3	-	4.3	7.65			#		
pH	s.u.	0691	WL	08/18/2009	0001	6.5	-	7.5	7.29			#		
pH	s.u.	0692	WL	08/18/2009	0001	9.7	-	10.1	7.44			#		
pH	s.u.	0696	WL	08/18/2009	0001	1.3	-	2.3	8.31			#		
pH	s.u.	0697	WL	08/18/2009	0001	4.3	-	5.3	8.52			#		
pH	s.u.	0790	WL	08/19/2009	0001	2	-	3	7.12			#		
pH	s.u.	0791	WL	08/19/2009	0001	4.3	-	5.3	7.39			#		
pH	s.u.	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	6.68			#		
Selenium	mg/L	0495	WL	08/17/2009	0001	4.6	-	5.6	0.016			#	0.00016	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

Parameter	Units	Location ID	Location Type	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	0.0013			#	0.00016	
Selenium	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	0.016			#	0.00016	
Selenium	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	0.0084			#	0.00016	
Selenium	mg/L	0599	WL	08/17/2009	0001	9.4	-	10.4	0.014			#	0.00016	
Selenium	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	0.0095			#	0.00016	
Selenium	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	0.0048			#	0.00016	
Selenium	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	0.0085			#	0.00016	
Selenium	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	0.015			#	0.00016	
Selenium	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	0.017		J	#	0.00016	
Selenium	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	0.0039			#	0.00016	
Selenium	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	0.012			#	0.00016	
Selenium	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	0.014			#	0.00016	
Specific Conductance	µmhos /cm	0216	SL	08/18/2009	0001	0.08	-	0.08	1402			#		
Specific Conductance	µmhos /cm	0239	SL	08/18/2009	0001	0.25	-	0.25	1249			#		
Specific Conductance	µmhos /cm	0243	SL	08/17/2009	0001	0.17	-	0.17	1782			#		
Specific Conductance	µmhos /cm	0245	SL	08/18/2009	0001	0.17	-	0.17	1144			#		
Specific Conductance	µmhos /cm	0259	SL	08/18/2009	0001	0.17	-	0.17	1265			#		
Specific Conductance	µmhos /cm	0274	SL	08/19/2009	0001	0.25	-	0.25	1633			#		
Specific Conductance	µmhos /cm	0470	WL	08/24/2009	0001	10.3	-	19.7	15384			#		
Specific Conductance	µmhos /cm	0472	WL	08/24/2009	0001	10.3	-	19.7	12075			#		
Specific Conductance	µmhos /cm	0474	WL	08/24/2009	0001	10.3	-	19.7	7283			#		
Specific Conductance	µmhos /cm	0476	WL	08/24/2009	0001	10.3	-	19.7	8401			#		
Specific Conductance	µmhos /cm	0478	WL	08/24/2009	0001	9.6	-	23.9	11884			#		
Specific Conductance	µmhos /cm	0495	WL	08/17/2009	0001	4.6	-	5.6	8446			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0496	WL	08/17/2009	0001	2.2	-	3.2	8428			#		
Specific Conductance	µmhos /cm	0547	TS	08/24/2009	0001	0	-	0	32487			#		
Specific Conductance	µmhos /cm	0562	WL	08/18/2009	0001	1.3	-	2.3	6577			#		
Specific Conductance	µmhos /cm	0563	WL	08/18/2009	0001	4.6	-	5.6	3361			#		
Specific Conductance	µmhos /cm	0564	WL	08/18/2009	0001	1.2	-	2.2	1116			#		
Specific Conductance	µmhos /cm	0565	WL	08/18/2009	0001	4	-	5	1047			#		
Specific Conductance	µmhos /cm	0590	WL	08/18/2009	0001	1	-	2	3849			#		
Specific Conductance	µmhos /cm	0591	WL	08/18/2009	0001	3.9	-	4.9	2172			#		
Specific Conductance	µmhos /cm	0597	WL	08/17/2009	0001	9.3	-	10.3	6233			#		
Specific Conductance	µmhos /cm	0598	WL	08/17/2009	0001	9.1	-	10.1	8818			#		
Specific Conductance	µmhos /cm	0599	WL	08/17/2009	0001	9.4	-	10.4	10256			#		
Specific Conductance	µmhos /cm	0605	WL	08/18/2009	0001	9.4	-	10.4	2962			#		
Specific Conductance	µmhos /cm	0606	WL	08/18/2009	0001	9.3	-	10.3	9808			#		
Specific Conductance	µmhos /cm	0608	WL	08/18/2009	0001	8.9	-	9.9	5541			#		
Specific Conductance	µmhos /cm	0611	WL	08/18/2009	0001	2.2	-	3.2	1595			#		
Specific Conductance	µmhos /cm	0612	WL	08/18/2009	0001	4.3	-	5.3	2204			#		
Specific Conductance	µmhos /cm	0615	WL	08/18/2009	0001	1.4	-	2.4	1971			#		
Specific Conductance	µmhos /cm	0616	WL	08/18/2009	0001	5.3	-	6.3	2623			#		
Specific Conductance	µmhos /cm	0617	WL	08/17/2009	0001	1.7	-	2.7	8478			#		
Specific Conductance	µmhos /cm	0618	WL	08/17/2009	0001	5.3	-	6.3	8970			#		
Specific Conductance	µmhos /cm	0670	WL	08/24/2009	0001	15.9	-	45.9	19433			#		
Specific Conductance	µmhos /cm	0672	WL	08/24/2009	0001	15	-	45	31994			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0674	WL	08/24/2009	0001	15.1	-	45.1	29997			#		
Specific Conductance	µmhos /cm	0676	WL	08/24/2009	0001	15.9	-	45.9	17529			#		
Specific Conductance	µmhos /cm	0678	WL	08/24/2009	0001	16.3	-	46.3	11917			#		
Specific Conductance	µmhos /cm	0690	WL	08/18/2009	0001	3.3	-	4.3	2338			#		
Specific Conductance	µmhos /cm	0691	WL	08/18/2009	0001	6.5	-	7.5	4982			#		
Specific Conductance	µmhos /cm	0692	WL	08/18/2009	0001	9.7	-	10.1	6795			#		
Specific Conductance	µmhos /cm	0696	WL	08/18/2009	0001	1.3	-	2.3	1931			#		
Specific Conductance	µmhos /cm	0697	WL	08/18/2009	0001	4.3	-	5.3	3180			#		
Specific Conductance	µmhos /cm	0790	WL	08/19/2009	0001	2	-	3	17730			#		
Specific Conductance	µmhos /cm	0791	WL	08/19/2009	0001	4.3	-	5.3	20762			#		
Specific Conductance	µmhos /cm	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	61984			#		
Temperature	C	0216	SL	08/18/2009	0001	0.08	-	0.08	23.64			#		
Temperature	C	0239	SL	08/18/2009	0001	0.25	-	0.25	23.61			#		
Temperature	C	0243	SL	08/17/2009	0001	0.17	-	0.17	23.6			#		
Temperature	C	0245	SL	08/18/2009	0001	0.17	-	0.17	23.9			#		
Temperature	C	0259	SL	08/18/2009	0001	0.17	-	0.17	21.62			#		
Temperature	C	0274	SL	08/19/2009	0001	0.25	-	0.25	18.62			#		
Temperature	C	0470	WL	08/24/2009	0001	10.3	-	19.7	16.93			#		
Temperature	C	0472	WL	08/24/2009	0001	10.3	-	19.7	15.89			#		
Temperature	C	0474	WL	08/24/2009	0001	10.3	-	19.7	15.97			#		
Temperature	C	0476	WL	08/24/2009	0001	10.3	-	19.7	16.8			#		
Temperature	C	0478	WL	08/24/2009	0001	9.6	-	23.9	15.77			#		
Temperature	C	0495	WL	08/17/2009	0001	4.6	-	5.6	22.94			#		
Temperature	C	0496	WL	08/17/2009	0001	2.2	-	3.2	25.77			#		
Temperature	C	0547	TS	08/24/2009	0001	0	-	0	19.27			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0562	WL	08/18/2009	0001	1.3	-	2.3	17.1			#		
Temperature	C	0563	WL	08/18/2009	0001	4.6	-	5.6	16.51			#		
Temperature	C	0564	WL	08/18/2009	0001	1.2	-	2.2	20.75			#		
Temperature	C	0565	WL	08/18/2009	0001	4	-	5	19.82			#		
Temperature	C	0590	WL	08/18/2009	0001	1	-	2	26.04			#		
Temperature	C	0591	WL	08/18/2009	0001	3.9	-	4.9	19			#		
Temperature	C	0597	WL	08/17/2009	0001	9.3	-	10.3	16.38			#		
Temperature	C	0598	WL	08/17/2009	0001	9.1	-	10.1	15.79			#		
Temperature	C	0599	WL	08/17/2009	0001	9.4	-	10.4	17.16			#		
Temperature	C	0605	WL	08/18/2009	0001	9.4	-	10.4	14.82			#		
Temperature	C	0606	WL	08/18/2009	0001	9.3	-	10.3	13.99			#		
Temperature	C	0608	WL	08/18/2009	0001	8.9	-	9.9	14.89			#		
Temperature	C	0611	WL	08/18/2009	0001	2.2	-	3.2	18.44			#		
Temperature	C	0612	WL	08/18/2009	0001	4.3	-	5.3	17.08			#		
Temperature	C	0615	WL	08/18/2009	0001	1.4	-	2.4	18.18			#		
Temperature	C	0616	WL	08/18/2009	0001	5.3	-	6.3	15.93			#		
Temperature	C	0617	WL	08/17/2009	0001	1.7	-	2.7	20.41			#		
Temperature	C	0618	WL	08/17/2009	0001	5.3	-	6.3	17.5			#		
Temperature	C	0670	WL	08/24/2009	0001	15.9	-	45.9	15.3			#		
Temperature	C	0672	WL	08/24/2009	0001	15	-	45	15.7			#		
Temperature	C	0674	WL	08/24/2009	0001	15.1	-	45.1	15.08			#		
Temperature	C	0676	WL	08/24/2009	0001	15.9	-	45.9	14.74			#		
Temperature	C	0678	WL	08/24/2009	0001	16.3	-	46.3	15.21			#		
Temperature	C	0690	WL	08/18/2009	0001	3.3	-	4.3	22.12			#		
Temperature	C	0691	WL	08/18/2009	0001	6.5	-	7.5	19.18			#		
Temperature	C	0692	WL	08/18/2009	0001	9.7	-	10.1	17.98			#		
Temperature	C	0696	WL	08/18/2009	0001	1.3	-	2.3	19.92			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0697	WL	08/18/2009	0001	4.3	-	5.3	19.07			#		
Temperature	C	0790	WL	08/19/2009	0001	2	-	3	15.05			#		
Temperature	C	0791	WL	08/19/2009	0001	4.3	-	5.3	14.63			#		
Temperature	C	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	15.69			#		
Total Dissolved Solids	mg/L	0216	SL	08/18/2009	0001	0.08	-	0.08	920			#	20	
Total Dissolved Solids	mg/L	0239	SL	08/18/2009	0001	0.25	-	0.25	760			#	20	
Total Dissolved Solids	mg/L	0243	SL	08/17/2009	0001	0.17	-	0.17	930			#	20	
Total Dissolved Solids	mg/L	0245	SL	08/18/2009	0001	0.17	-	0.17	760			#	20	
Total Dissolved Solids	mg/L	0259	SL	08/18/2009	0001	0.17	-	0.17	770			#	20	
Total Dissolved Solids	mg/L	0274	SL	08/19/2009	0001	0.25	-	0.25	830			#	20	
Total Dissolved Solids	mg/L	0470	WL	08/24/2009	0001	10.3	-	19.7	10000		J	#	400	
Total Dissolved Solids	mg/L	0470	WL	08/24/2009	0002	10.3	-	19.7	9900		J	#	200	
Total Dissolved Solids	mg/L	0472	WL	08/24/2009	0001	10.3	-	19.7	7200		J	#	200	
Total Dissolved Solids	mg/L	0474	WL	08/24/2009	0001	10.3	-	19.7	4100		J	#	200	
Total Dissolved Solids	mg/L	0476	WL	08/24/2009	0001	10.3	-	19.7	5100		J	#	200	
Total Dissolved Solids	mg/L	0478	WL	08/24/2009	0001	9.6	-	23.9	7600		J	#	200	
Total Dissolved Solids	mg/L	0495	WL	08/17/2009	0001	4.6	-	5.6	6200			#	80	
Total Dissolved Solids	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	6900			#	200	
Total Dissolved Solids	mg/L	0547	TS	08/24/2009	0001	0	-	0	18000		J	#	400	
Total Dissolved Solids	mg/L	0562	WL	08/18/2009	0001	1.3	-	2.3	5400			#	80	
Total Dissolved Solids	mg/L	0563	WL	08/18/2009	0001	4.6	-	5.6	2000			#	80	
Total Dissolved Solids	mg/L	0564	WL	08/18/2009	0001	1.2	-	2.2	730			#	20	
Total Dissolved Solids	mg/L	0565	WL	08/18/2009	0001	4	-	5	680			#	20	
Total Dissolved Solids	mg/L	0590	WL	08/18/2009	0001	1	-	2	3600			#	80	
Total Dissolved Solids	mg/L	0591	WL	08/18/2009	0001	3.9	-	4.9	1100			#	40	
Total Dissolved Solids	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	3800			#	80	
Total Dissolved Solids	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	6000			#	200	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0599	WL	08/17/2009	0001	9.4	-	10.4	7400			#	200	
Total Dissolved Solids	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	1600			#	80	
Total Dissolved Solids	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	6200			#	200	
Total Dissolved Solids	mg/L	0608	WL	08/18/2009	0001	8.9	-	9.9	3300			#	80	
Total Dissolved Solids	mg/L	0611	WL	08/18/2009	0001	2.2	-	3.2	1100			#	40	
Total Dissolved Solids	mg/L	0612	WL	08/18/2009	0001	4.3	-	5.3	1400			#	40	
Total Dissolved Solids	mg/L	0615	WL	08/18/2009	0001	1.4	-	2.4	1000			#	40	
Total Dissolved Solids	mg/L	0616	WL	08/18/2009	0001	5.3	-	6.3	1300			#	40	
Total Dissolved Solids	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	5900			#	80	
Total Dissolved Solids	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	6100			#	80	
Total Dissolved Solids	mg/L	0670	WL	08/24/2009	0001	15.9	-	45.9	13000		J	#	200	
Total Dissolved Solids	mg/L	0670	WL	08/24/2009	0002	15.9	-	45.9	13000		J	#	200	
Total Dissolved Solids	mg/L	0672	WL	08/24/2009	0001	15	-	45	19000		J	#	400	
Total Dissolved Solids	mg/L	0674	WL	08/24/2009	0001	15.1	-	45.1	19000		J	#	400	
Total Dissolved Solids	mg/L	0674	WL	08/24/2009	0002	15.1	-	45.1	20000		J	#	400	
Total Dissolved Solids	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	12000		J	#	200	
Total Dissolved Solids	mg/L	0678	WL	08/24/2009	0001	16.3	-	46.3	8200		J	#	200	
Total Dissolved Solids	mg/L	0690	WL	08/18/2009	0001	3.3	-	4.3	3000			#	80	
Total Dissolved Solids	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	3500			#	80	
Total Dissolved Solids	mg/L	0692	WL	08/18/2009	0001	9.7	-	10.1	4200			#	80	
Total Dissolved Solids	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	770			#	40	
Total Dissolved Solids	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	1600			#	40	
Total Dissolved Solids	mg/L	0790	WL	08/19/2009	0001	2	-	3	12000			#	200	
Total Dissolved Solids	mg/L	0791	WL	08/19/2009	0001	4.3	-	5.3	15000			#	400	
Total Dissolved Solids	mg/L	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	39000		J	#	1000	
Turbidity	NTU	0216	SL	08/18/2009	0001	0.08	-	0.08	56.8			#		
Turbidity	NTU	0239	SL	08/18/2009	0001	0.25	-	0.25	122			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	08/17/2009	0001	0.17	-	0.17	60.7			#		
Turbidity	NTU	0245	SL	08/18/2009	0001	0.17	-	0.17	368			#		
Turbidity	NTU	0259	SL	08/18/2009	0001	0.17	-	0.17	1.37			#		
Turbidity	NTU	0274	SL	08/19/2009	0001	0.25	-	0.25	4.39			#		
Turbidity	NTU	0470	WL	08/24/2009	0001	10.3	-	19.7	7.55			#		
Turbidity	NTU	0472	WL	08/24/2009	0001	10.3	-	19.7	5.72			#		
Turbidity	NTU	0474	WL	08/24/2009	0001	10.3	-	19.7	5.67			#		
Turbidity	NTU	0476	WL	08/24/2009	0001	10.3	-	19.7	5.52			#		
Turbidity	NTU	0478	WL	08/24/2009	0001	9.6	-	23.9	6.22			#		
Turbidity	NTU	0495	WL	08/17/2009	0001	4.6	-	5.6	74.1			#		
Turbidity	NTU	0496	WL	08/17/2009	0001	2.2	-	3.2	201			#		
Turbidity	NTU	0547	TS	08/24/2009	0001	0	-	0	1.81			#		
Turbidity	NTU	0562	WL	08/18/2009	0001	1.3	-	2.3	59.5			#		
Turbidity	NTU	0563	WL	08/18/2009	0001	4.6	-	5.6	400			#		
Turbidity	NTU	0564	WL	08/18/2009	0001	1.2	-	2.2	6.82			#		
Turbidity	NTU	0565	WL	08/18/2009	0001	4	-	5	24.5			#		
Turbidity	NTU	0590	WL	08/18/2009	0001	1	-	2	102			#		
Turbidity	NTU	0591	WL	08/18/2009	0001	3.9	-	4.9	30.5			#		
Turbidity	NTU	0597	WL	08/17/2009	0001	9.3	-	10.3	8.74			#		
Turbidity	NTU	0598	WL	08/17/2009	0001	9.1	-	10.1	151			#		
Turbidity	NTU	0599	WL	08/17/2009	0001	9.4	-	10.4	130			#		
Turbidity	NTU	0605	WL	08/18/2009	0001	9.4	-	10.4	13.9			#		
Turbidity	NTU	0608	WL	08/18/2009	0001	8.9	-	9.9	79.6			#		
Turbidity	NTU	0611	WL	08/18/2009	0001	2.2	-	3.2	66.6			#		
Turbidity	NTU	0612	WL	08/18/2009	0001	4.3	-	5.3	57.6			#		
Turbidity	NTU	0615	WL	08/18/2009	0001	1.4	-	2.4	270			#		
Turbidity	NTU	0616	WL	08/18/2009	0001	5.3	-	6.3	16.5			#		

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0617	WL	08/17/2009	0001	1.7	-	2.7	120			#		
Turbidity	NTU	0618	WL	08/17/2009	0001	5.3	-	6.3	125			#		
Turbidity	NTU	0670	WL	08/24/2009	0001	15.9	-	45.9	7.47			#		
Turbidity	NTU	0672	WL	08/24/2009	0001	15	-	45	6.57			#		
Turbidity	NTU	0674	WL	08/24/2009	0001	15.1	-	45.1	7.55			#		
Turbidity	NTU	0676	WL	08/24/2009	0001	15.9	-	45.9	7.55			#		
Turbidity	NTU	0678	WL	08/24/2009	0001	16.3	-	46.3	18.6			#		
Turbidity	NTU	0690	WL	08/18/2009	0001	3.3	-	4.3	134			#		
Turbidity	NTU	0691	WL	08/18/2009	0001	6.5	-	7.5	479			#		
Turbidity	NTU	0692	WL	08/18/2009	0001	9.7	-	10.1	212			#		
Turbidity	NTU	0696	WL	08/18/2009	0001	1.3	-	2.3	288			#		
Turbidity	NTU	0697	WL	08/18/2009	0001	4.3	-	5.3	470			#		
Turbidity	NTU	0790	WL	08/19/2009	0001	2	-	3	8.23			#		
Turbidity	NTU	0791	WL	08/19/2009	0001	4.3	-	5.3	92.2			#		
Turbidity	NTU	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	2.07			#		
Uranium	mg/L	0216	SL	08/18/2009	0001	0.08	-	0.08	0.034			#	1.7E-006	
Uranium	mg/L	0239	SL	08/18/2009	0001	0.25	-	0.25	0.013			#	1.7E-006	
Uranium	mg/L	0243	SL	08/17/2009	0001	0.17	-	0.17	0.041			#	1.7E-006	
Uranium	mg/L	0245	SL	08/18/2009	0001	0.17	-	0.17	0.011			#	1.7E-006	
Uranium	mg/L	0259	SL	08/18/2009	0001	0.17	-	0.17	0.013			#	1.7E-006	
Uranium	mg/L	0274	SL	08/19/2009	0001	0.25	-	0.25	0.022			#	1.7E-006	
Uranium	mg/L	0470	WL	08/24/2009	0001	10.3	-	19.7	1.8		J	#	8.7E-005	
Uranium	mg/L	0470	WL	08/24/2009	0002	10.3	-	19.7	1.9		J	#	8.7E-005	
Uranium	mg/L	0472	WL	08/24/2009	0001	10.3	-	19.7	1.3		J	#	8.7E-005	
Uranium	mg/L	0474	WL	08/24/2009	0001	10.3	-	19.7	0.85		J	#	8.7E-005	
Uranium	mg/L	0476	WL	08/24/2009	0001	10.3	-	19.7	1.1		J	#	8.7E-005	
Uranium	mg/L	0478	WL	08/24/2009	0001	9.6	-	23.9	1.5		J	#	8.7E-005	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0495	WL	08/17/2009	0001	4.6	-	5.6	3.1			#	0.00017	
Uranium	mg/L	0496	WL	08/17/2009	0001	2.2	-	3.2	1.7			#	3.5E-005	
Uranium	mg/L	0547	TS	08/24/2009	0001	0	-	0	1.9		J	#	8.7E-005	
Uranium	mg/L	0562	WL	08/18/2009	0001	1.3	-	2.3	1			#	3.5E-005	
Uranium	mg/L	0563	WL	08/18/2009	0001	4.6	-	5.6	0.34			#	1.7E-005	
Uranium	mg/L	0564	WL	08/18/2009	0001	1.2	-	2.2	0.0039			#	1.7E-006	
Uranium	mg/L	0565	WL	08/18/2009	0001	4	-	5	0.0045			#	1.7E-006	
Uranium	mg/L	0590	WL	08/18/2009	0001	1	-	2	0.4			#	8.7E-006	
Uranium	mg/L	0591	WL	08/18/2009	0001	3.9	-	4.9	0.33			#	3.5E-005	
Uranium	mg/L	0597	WL	08/17/2009	0001	9.3	-	10.3	0.97			#	3.5E-005	
Uranium	mg/L	0598	WL	08/17/2009	0001	9.1	-	10.1	1.2			#	3.5E-005	
Uranium	mg/L	0599	WL	08/17/2009	0001	9.4	-	10.4	1.7			#	8.7E-005	
Uranium	mg/L	0605	WL	08/18/2009	0001	9.4	-	10.4	0.52			#	3.5E-005	
Uranium	mg/L	0606	WL	08/18/2009	0001	9.3	-	10.3	0.84			#	3.5E-005	
Uranium	mg/L	0608	WL	08/18/2009	0001	8.9	-	9.9	0.48			#	8.7E-006	
Uranium	mg/L	0611	WL	08/18/2009	0001	2.2	-	3.2	0.044			#	1.7E-006	
Uranium	mg/L	0612	WL	08/18/2009	0001	4.3	-	5.3	0.11			#	8.7E-006	
Uranium	mg/L	0615	WL	08/18/2009	0001	1.4	-	2.4	0.17			#	8.7E-006	
Uranium	mg/L	0616	WL	08/18/2009	0001	5.3	-	6.3	0.3			#	1.7E-005	
Uranium	mg/L	0617	WL	08/17/2009	0001	1.7	-	2.7	1.9			#	8.7E-005	
Uranium	mg/L	0618	WL	08/17/2009	0001	5.3	-	6.3	1.6			#	8.7E-005	
Uranium	mg/L	0670	WL	08/24/2009	0001	15.9	-	45.9	2.1		J	#	8.7E-005	
Uranium	mg/L	0670	WL	08/24/2009	0002	15.9	-	45.9	2.3		J	#	8.7E-005	
Uranium	mg/L	0672	WL	08/24/2009	0001	15	-	45	1.7		J	#	8.7E-005	
Uranium	mg/L	0674	WL	08/24/2009	0001	15.1	-	45.1	2		J	#	8.7E-005	
Uranium	mg/L	0674	WL	08/24/2009	0002	15.1	-	45.1	2		J	#	8.7E-005	
Uranium	mg/L	0676	WL	08/24/2009	0001	15.9	-	45.9	1.9	E	J	#	8.7E-005	

Appendix C. Water Quality Data (continued)

General Water Quality Data by Parameter (USEE205) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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	0678	WL	08/24/2009	0001	16.3	-	46.3	1.5		J	#	8.7E-005	
Uranium	mg/L	0690	WL	08/18/2009	0001	3.3	-	4.3	0.71			#	3.5E-005	
Uranium	mg/L	0691	WL	08/18/2009	0001	6.5	-	7.5	0.8			#	3.5E-005	
Uranium	mg/L	0692	WL	08/18/2009	0001	9.7	-	10.1	0.75			#	3.5E-005	
Uranium	mg/L	0696	WL	08/18/2009	0001	1.3	-	2.3	0.22			#	3.5E-005	
Uranium	mg/L	0697	WL	08/18/2009	0001	4.3	-	5.3	0.34			#	3.5E-005	
Uranium	mg/L	0790	WL	08/19/2009	0001	2	-	3	1.8			#	8.7E-005	
Uranium	mg/L	0791	WL	08/19/2009	0001	4.3	-	5.3	2			#	8.7E-005	
Uranium	mg/L	SMI-PW02	WL	08/24/2009	0001	20.04	-	60.04	2.8		J	#	8.7E-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: 10/21/2009

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
0470		3964.12	08/24/2009		13.81	3950.31	
0472		3964.4	08/24/2009		15.38	3949.02	
0474		3964.99	08/24/2009		13.99	3951	
0476		3965.24	08/24/2009		16.06	3949.18	
0495		3959.89	08/17/2009		5.4	3954.49	
0496		3956.98	08/17/2009		2.86	3954.12	
0562		3955.37	08/18/2009		2.74	3952.63	
0563		3958.04	08/18/2009		5.34	3952.7	
0564		3956.03	08/18/2009		3.19	3952.84	
0565		3955.47	08/18/2009		2.71	3952.76	
0590		3956.19	08/18/2009		2.38	3953.81	
0591		3955.2	08/18/2009		1.22	3953.98	
0597		3959.11	08/17/2009		4.46	3954.65	
0598		3957.01	08/17/2009		2.57	3954.44	
0599		3956.52	08/17/2009		2.42	3954.1	
0605		3956.92	08/18/2009		3.43	3953.49	
0606		3955.69	08/18/2009		2.87	3952.82	
0608		3955.71	08/18/2009		3.09	3952.62	
0611		3957.48	08/18/2009		4.71	3952.77	
0612		3955.27	08/18/2009		2.48	3952.79	
0615		3956.78	08/18/2009		3.37	3953.41	
0616		3955.97	08/18/2009		2.51	3953.46	
0617		3955.85	08/17/2009		2.12	3953.73	
0618		3955.16	08/17/2009		1.12	3954.04	
0670		3969.54	08/24/2009		17	3952.54	
0672		3969.57	08/24/2009		18.87	3950.7	
0674		3969.49	08/24/2009		18.68	3950.81	

Appendix D. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 10/21/2009

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
0676		3969.69	08/24/2009		17.32	3952.37	
0678		3969.65	08/24/2009		16.98	3952.67	
0690		3963.83	08/18/2009		5.3	3958.53	
0691		3962.7	08/18/2009		4.61	3958.09	
0692		3962.29	08/18/2009		4.86	3957.43	
0696		3956.42	08/18/2009		2.89	3953.53	
0697		3955.71	08/18/2009		1.85	3953.86	
0790		3955.2	08/19/2009		5.99	3949.21	
0791		3954.76	08/19/2009		2.95	3951.81	

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

Attachment 1.
IA Well Field Monthly Sampling Trip Report

Attachment 1.
IA Well Field Monthly Sampling Trip Report

Moab TAC Team

DATE: August 27, 2009

TO: K. Pill

FROM: J. Ritchey

SUBJECT: August 2009 IA Well Field Monthly Sampling Trip Report

Site: Moab, Utah

Date of Sampling Event: August 16-24, 2009

Team Members: James Ritchey, Elizabeth Glowiak

RIN Number Assigned: All samples were assigned to RIN 0908035.

Sample Shipment: All samples were shipped in a cooler overnight UPS to ALS Laboratory Group from Moab, Utah, on August 19 and 25, 2009 (Tracking Nos. 97399735, 98134545, and 98071756).

August 2009 CF1 Sampling

Number of Locations Sampled: Six extraction wells (0470, 0472, 0474, 0476, 0478, and SMI-PW02), eight well points (0562, 0563, 0564, 0565, 0606, 0608, 0611, and 0612), two surface samples (0216 and 0245), and one evaporation pond (0547) location were sampled. Including one duplicate, a total of 18 samples were collected during the August 2009 monthly sampling event.

Locations Not Sampled: Surface well point location 0607 seemed to be damaged during the last peak flow. This location was not sampled due to unknown sample depth and inconclusive parameters. Also, evaporation pond location 0548 was not collected as the sprinkler system was not in operation.

Field Variance: None

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2002	0470	Duplicate from 18 ft bgs	Ground Water	AUG 046

ft bgs = feet below ground surface; ID = identification

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

Location Specific Information – CF 1 Extraction Wells: Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0470	08/24/2009	10:49	13.81	18
0472	08/24/2009	10:42	15.38	18
0474	08/24/2009	10:35	13.99	18
0476	08/24/2009	10:27	16.06	18
0478	08/24/2009	10:21	16.29	23
SMI-PW02	08/24/2009	11:00	N/A*	55

ft bgs = feet below ground surface; ft btoc = feet below top of casing
*Water-level access port was blocked by equipment

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	08/18/2009	15:38	2.74	2.41	Dry
0563	08/18/2009	15:50	5.34	3.98	Dry
0564	08/18/2009	14:24	3.19	2.39	Dry
0565	08/18/2009	14:16	2.71	2.00	Dry
0606	08/18/2009	15:43	2.87	1.57	Dry
0607	08/18/2009	14:09	3.05	2.63	Dry
0608	08/18/2009	15:10	3.03	0	Dry
0611	08/18/2009	15:03	4.71	2.31	Dry
0612	08/18/2009	14:56	2.48	0	Dry

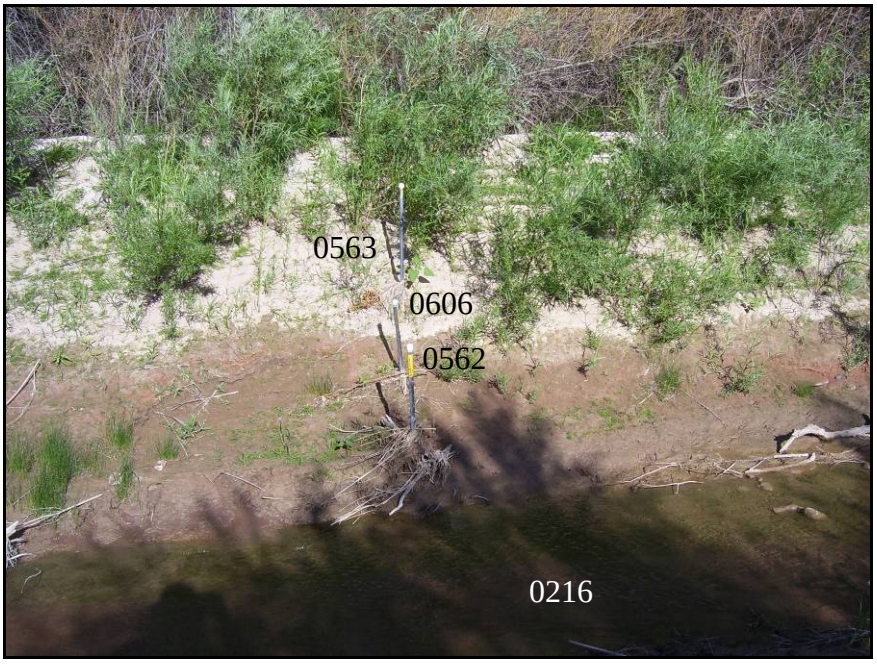
ft btoc = feet below top of casing; WP = well point

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

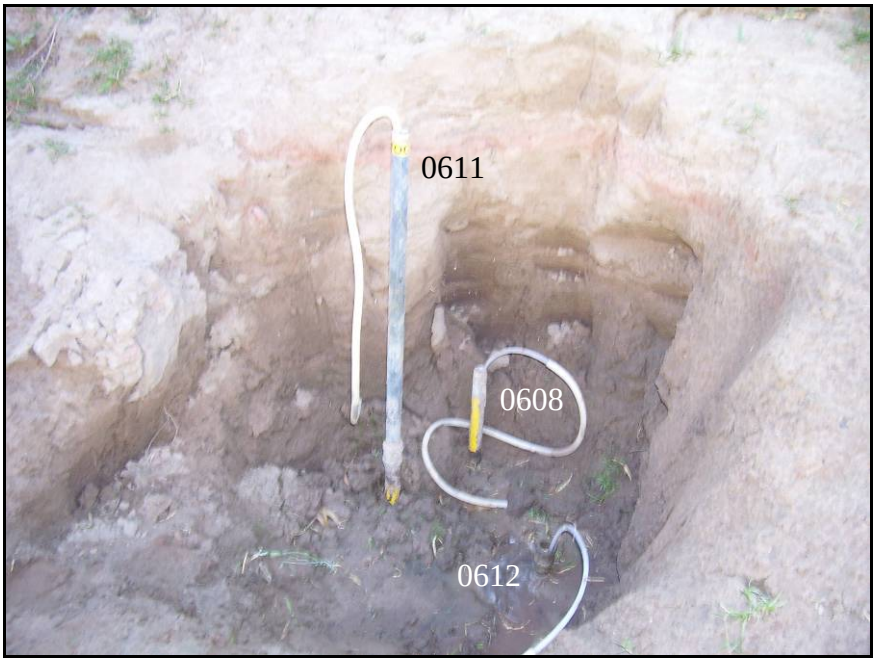
SW No.	Date	Time	Depth (inches below surface)	Characteristics
0216	08/18/2009	15:26	1	8 inches off bank, slow flow, slightly open upriver
0245	08/18/2009	14:40	2	1 ft off bank, moderate flow, secondary channel

SW = surface water

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

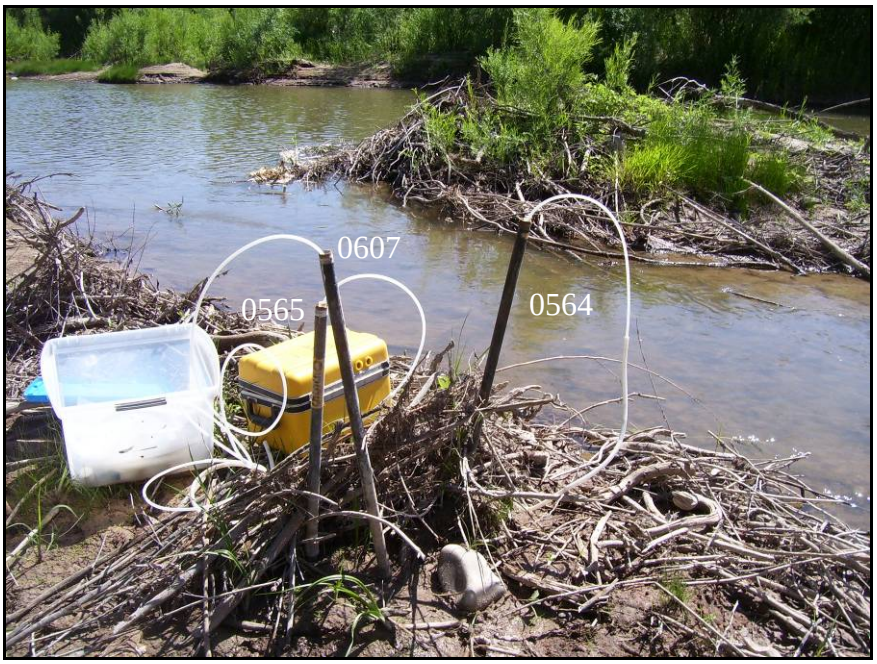


River Bank Well Points 0562, 0563, and 0606
and Surface Water Location 0216



Intermediate Well Points 0608, 0611, and 0612

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



River Edge Well Points 0564, 0565, and 0607

Surface Water Location 0245

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

August 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 August 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 and was not uncovered to preserve the present condition of the adjacent habitat.

Field Variance: Well point 0590 did not supply ample recharge, and a limited volume of sample was submitted to the lab. Also, the YSI monitor stopped working while sampling 0590. A few minutes passed before the meter was in operating again. This resulted in an inaccurate temperature reading.

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	08/18/2009	10:36	2.38	0.90	Dry
0591	08/18/2009	11:12	1.22	0.3	Dry
0605	08/18/2009	11:43	3.43	1.10	Dry
0615	08/18/2009	11:39	3.37	1.15	Dry
0616	08/18/2009	11:33	2.51	0.49	Dry

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

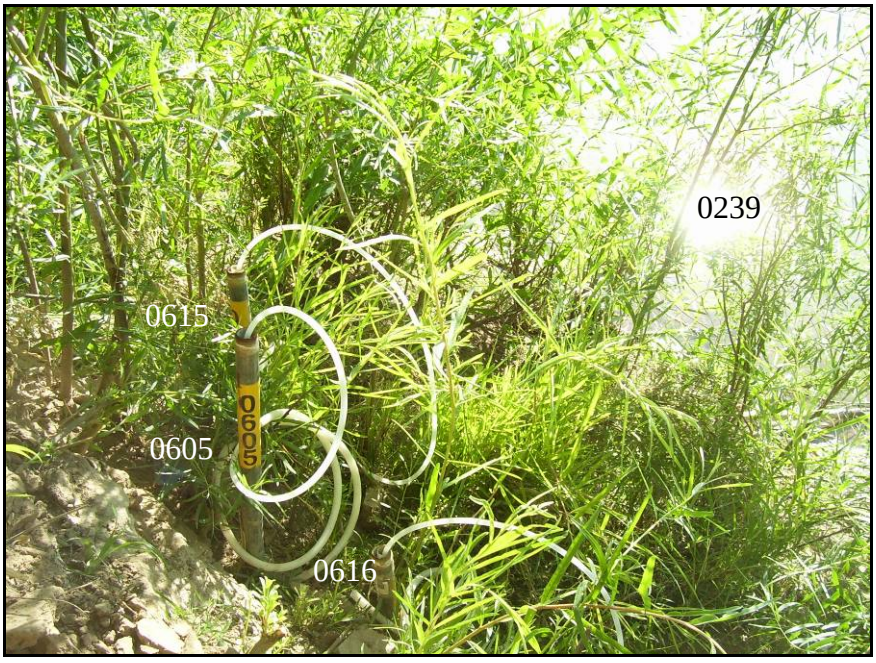
Location-Specific Information – Surface Water Sampling: The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0239	08/18/2009	11:52	3	1 ft off bank, moderate flow

SW = surface water

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

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



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

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

August 2009 CF3 Sampling

Number of Locations Sampled: Five remediation wells (0670, 0672, 0674, 0676, and 0678), five well points (0690, 0691, 0692, 0696, and 0697), and one surface water location (0259) were sampled. Including two duplicates, a total of 13 locations were sampled during the August 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 not sampled.

Field Variance: None.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2000	0674	Duplicate from 35 ft bgs	Ground Water	AUG 037
2001	0670	Duplicate from 35 ft bgs	Ground Water	AUG 040

ft bgs = feet below ground surface; ID = identification

Location Specific Information – CF 3 Remediation Wells: Extraction wells were sampled using dedicated submersible pumps.

Well No.	Date	Time	Water Level (ft btoc)	Pump Intake (ft bgs)
0670	08/24/2009	10:06	17.00	35
0672	08/24/2009	10:00	18.87	35
0674	08/24/2009	09:25	18.68	35
0676	08/24/2009	09:20	17.32	35
0678	08/24/2009	09:09	16.98	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)
0690	08/18/2009	09:46	5.30	1.50	Dry
0691	08/18/2009	09:51	4.61	0.49	Dry
0692	08/18/2009	09:54	4.86	0.2	Dry
0696	08/18/2009	09:15	2.89	2.27	Dry
0697	08/18/2009	09:18	1.85	1.58	Dry
0698	08/18/2009	09:12	Dry	0.67	Dry

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

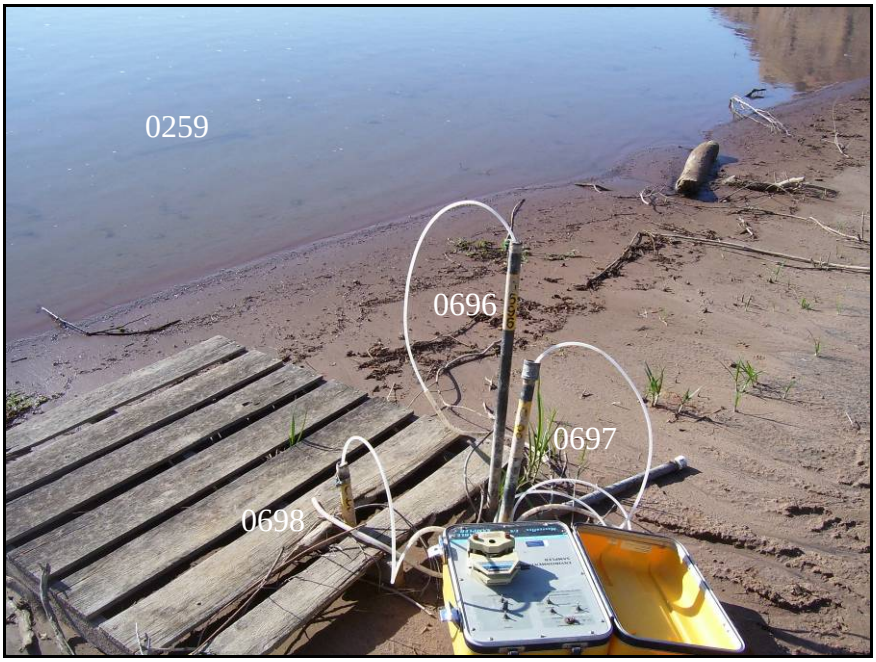
Attachment 1.
IA Well Field Monthly Sampling Trip Report (continued)

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

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0259	08/18/2009	09:31	2	1.5 ft off bank, moderate flow, main river channel

SW = surface water

River Bank Well Points 0690, 0691, and 0692



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

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

August 2009 CF4 Sampling

Number of Locations Sampled: Two well points (0790 and 0791), and one surface water location (0274) were sampled. A total of three samples were collected during the August 2009 monthly sampling event.

Locations Not Sampled: Well point 0792 did not produce enough recharge to collect samples. Well points 0793, 0794, and 0795 were inaccessible due to high river flow. Also, the remediation wells (0771, 0773, 0775, 0777, and 0779) were not sampled as the wells were not running during this sampling event.

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)
0790	08/19/2009	08:16	5.99	2.22	Dry
0791	08/19/2009	08:26	2.95	2.20	Dry
0792	08/19/2009	08:32	2.98	2.61	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	08/19/2009	08:45	3	1 ft off bank, slow flow, backwater channel flowing through

SW = surface water

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

August 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 August 2009 monthly sampling event.

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

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)
0494	08/17/2009	13:44	3.88	0.5	Dry
0495	08/17/2009	13:53	5.40	1.43	Dry
0496	08/17/2009	14:51	2.86	0	Dry
0497	08/17/2009	14:44	Dry	1.31	Dry
0597	08/17/2009	13:57	4.46	0.78	Dry
0598	08/17/2009	14:53	2.57	0	Dry
0599	08/17/2009	15:51	2.42	2.71	Dry
0617	08/17/2009	15:57	2.12	2.30	Dry
0618	08/17/2009	16:02	1.12	1.64	Dry

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

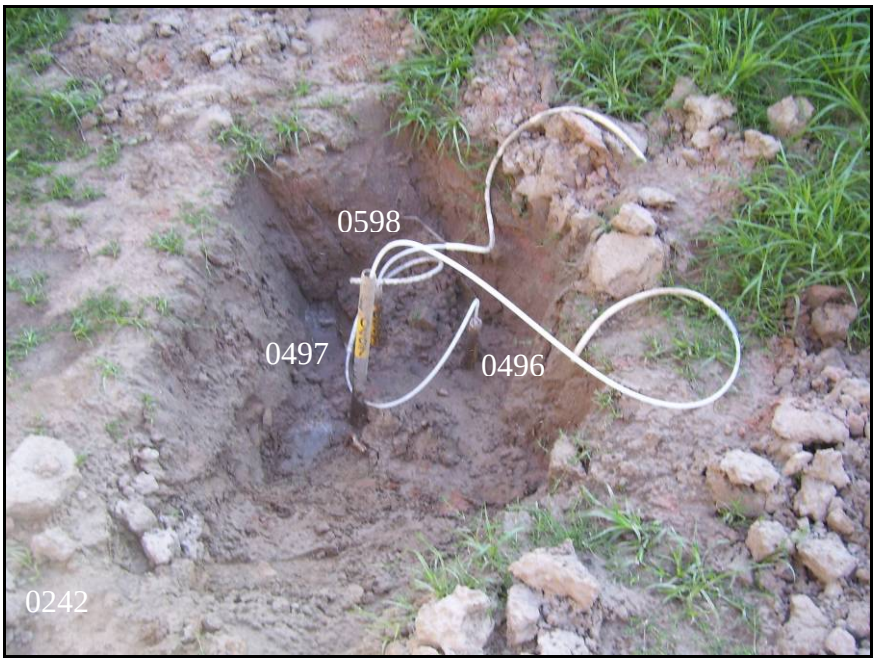
Location-Specific Information – Surface Water Sampling: The table below represents the surface water locations sampled.

SW No.	Date	Time	Depth (inches below surface)	Characteristics
0243	08/17/2009	16:10	2	1 ft off bank, moderate flow, low turbidity

SW = surface water

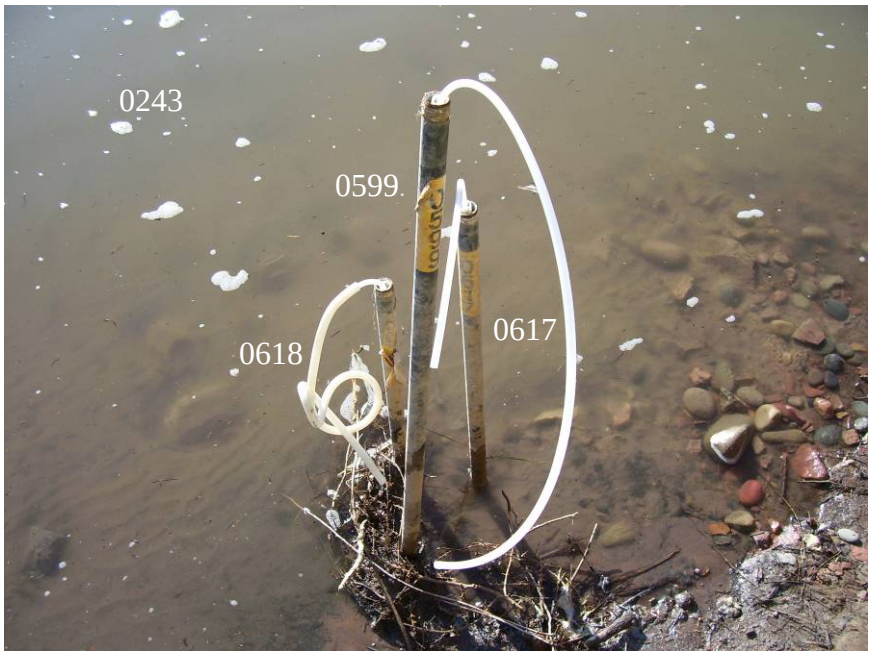
Attachment 1.
IA Well Field Monthly Sampling Trip Report (continued)

River Bank Well Points 0494, 0495, and 0597 and
Dry Surface Water Location 0241



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

Attachment 1.
IA 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: According to the USGS Cisco gauging station (Station No. 09180500), the mean daily Colorado River flows during this sampling event are provided below:

Date	Daily Mean Flow (cfs)
08/17/2009	4,490
08/18/2009	4,390
08/19/2009	4,030
08/20/2009	No Data
08/21/2009	4,020
08/22/2009	3,930
08/23/2009	4,010
08/24/2009	4,140

Equipment Issues: None.

Corrective Action Required/Taken: Clean out mud and develop CF3 river edge well points.