DOE–EM/GJTAC2123

Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project Ground Water and Surface Water Monitoring Report July through December 2013

Revision 0

March 2014

U.S. Department of Energy

Office of Environmental Management

Prepared by the Technical Assistance Contractor under contract number DE-EM0002067
for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

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July through December 2013

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Review and Approval

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In concurrence:

Donald R. Metzler — 3-31-14
DOE Moab Federal Project Director — Date

Revision History

Revision No.	Date	Reason/Basis for Revision
0	March 2014	Initial issue.

Contents

Figures

Figures (continued)

Tables

Appendices

Acronyms and Abbreviations

ALS	ALS Environmental, Inc.
°C	degrees Centigrade
CCB	continuing calibration blank
CCV	continuing calibration verification
CF	Configuration
CFR	Code of Federal Regulations
COC	chain of custody
CRI	reporting limit verification
DOE	U.S. Department of Energy
EB	equipment blank
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
ICB	initial calibration blank
ICP	inductively coupled plasma
ICV	initial calibration verification
IDL	instrument detection limit
LCS	laboratory control sample
MDL	method detection limit
µg/L	micrograms per liter
mg/L	milligrams per liter
MS	matrix spike or mass spectroscopy
MSD	matrix spike duplicate
r^2	correlation coefficient
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
SD	serial dilution
SDG	sample data group
UMTRA	Uranium Mill Tailings Remedial Action
USGS	U.S. Geological Survey

1.0 Introduction

1.1 Purpose

The purpose of this semi-annual report is to summarize the results associated with ground water and surface water samples collected from the U.S. Department of Energy (DOE) Moab Uranium Mill Tailings Remedial Action (UMTRA) Project site during the second half of 2013. The results of the data validation process are also presented. Two sampling events were completed during this time frame, the first in September, in which surface water samples were collected from the Colorado River side channel off Configuration (CF) 4, and the other was completed during November/December 2013, with samples collected from a variety of site-wide ground water and surface water locations.

All September surface water locations are shown on Figure 1. These samples were collected to assess the surface water quality along the side channel that developed into a suitable habitat earlier in 2013.

The November/December ground water sample locations are shown on Figure 2, and the associated surface water locations are shown on Figure 3. Surface water sampling was conducted to assess surface water quality adjacent to the site compared to the upstream and downstream water quality. Site-wide ground water sampling was conducted to assess any changes and trends in water quality. The 13 upgradient wells that had not been sampled since November 2011, because historical analytical results indicate typically the ammonia and uranium concentrations in samples from these locations have consistently been below the detection limits, were included in this event.

1.2 Scope

This document presents the Summary of Sampling Events and Data Assessments, including a summary of the anomalous data generated by the validation process, and results for these events. Sampling and analyses were conducted in accordance with the *Moab UMTRA Project Operations and Maintenance Manual* (DOE-EM/GJTAC1973) and the *Moab UMTRA Project Surface Water/Ground Water Sampling and Analysis Plan* (DOE-EM/GJTAC1830), and all data validation follows the criteria according to the *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855). Appendix A includes Water Sampling Field Activities Verification, Water Quality Data, Blanks Report, and the trip report associated with the September surface water sampling event. Appendix B contains Water Sampling field Activities Verification, Minimums and Maximums Report, Water Quality Data, Blanks Report, Water Level Data, and the trip report associated with the November/December site-wide sampling event. All Colorado River flow discussed in this document is measured from the U.S. Geological Survey (USGS) Cisco gaging station number 09180500. River elevation data were collected on site.

The November/December sampling event Minimums and Maximums Report (in Appendix B) was generated (by the Sample Management System and the SEEPro database) to determine if the applicable data are within a normal statistical range. The new data set was compared to the historical data to determine if these data fall outside the historical data range. 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.

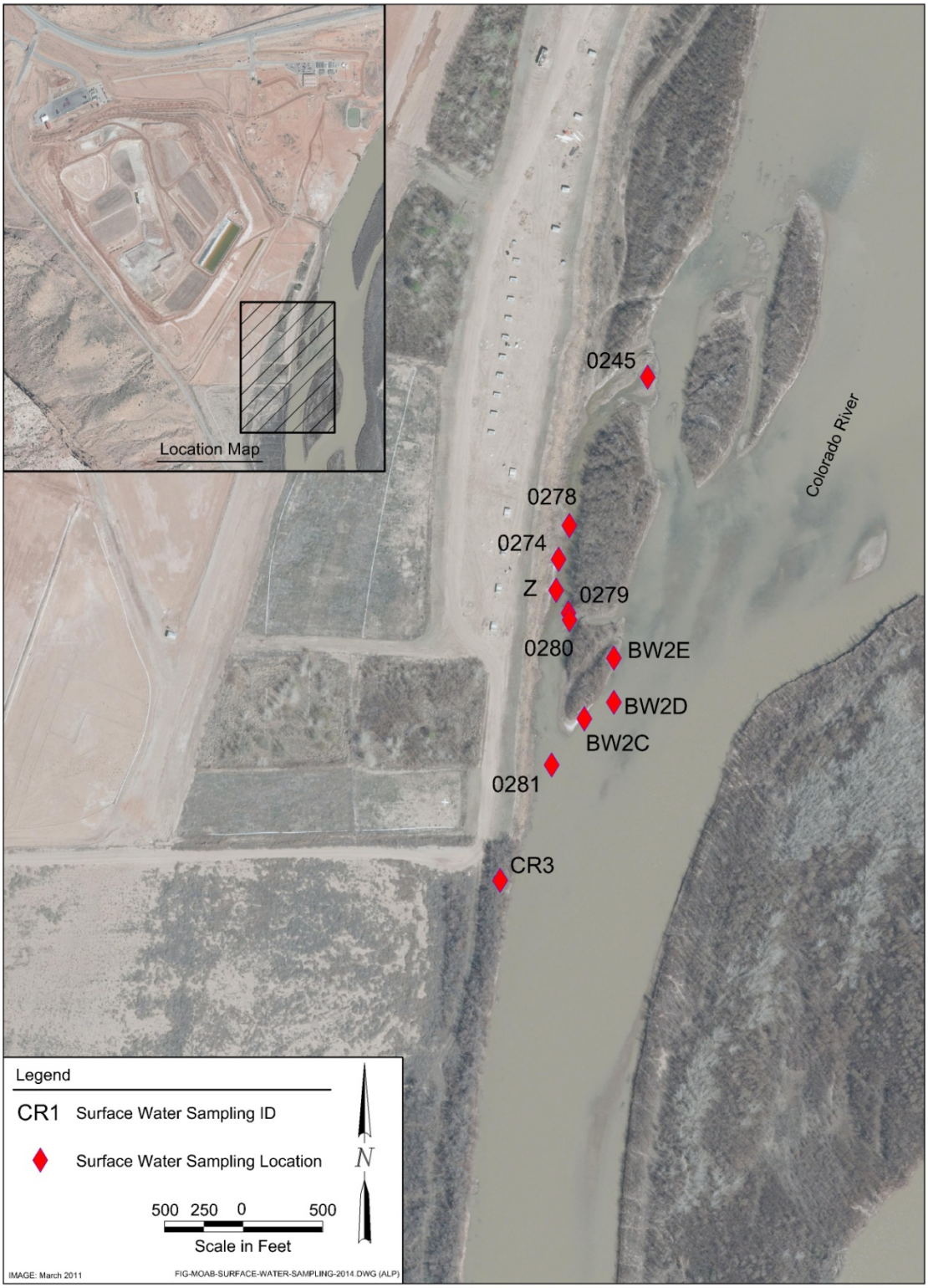


Figure 1. September 2013 Surface Water Sampling Locations

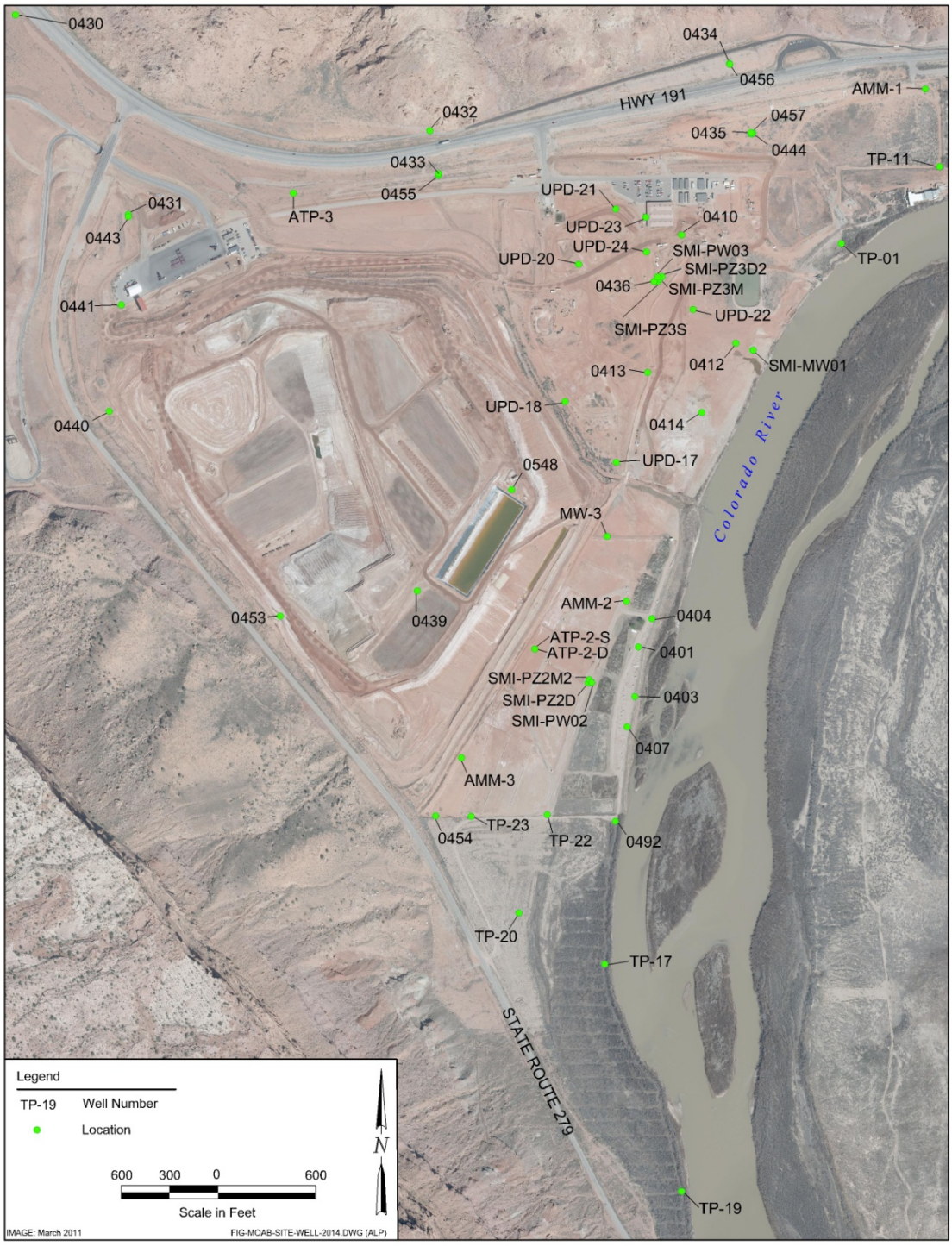


Figure 2. November/December 2013 Site-wide Ground Water Sampling Locations

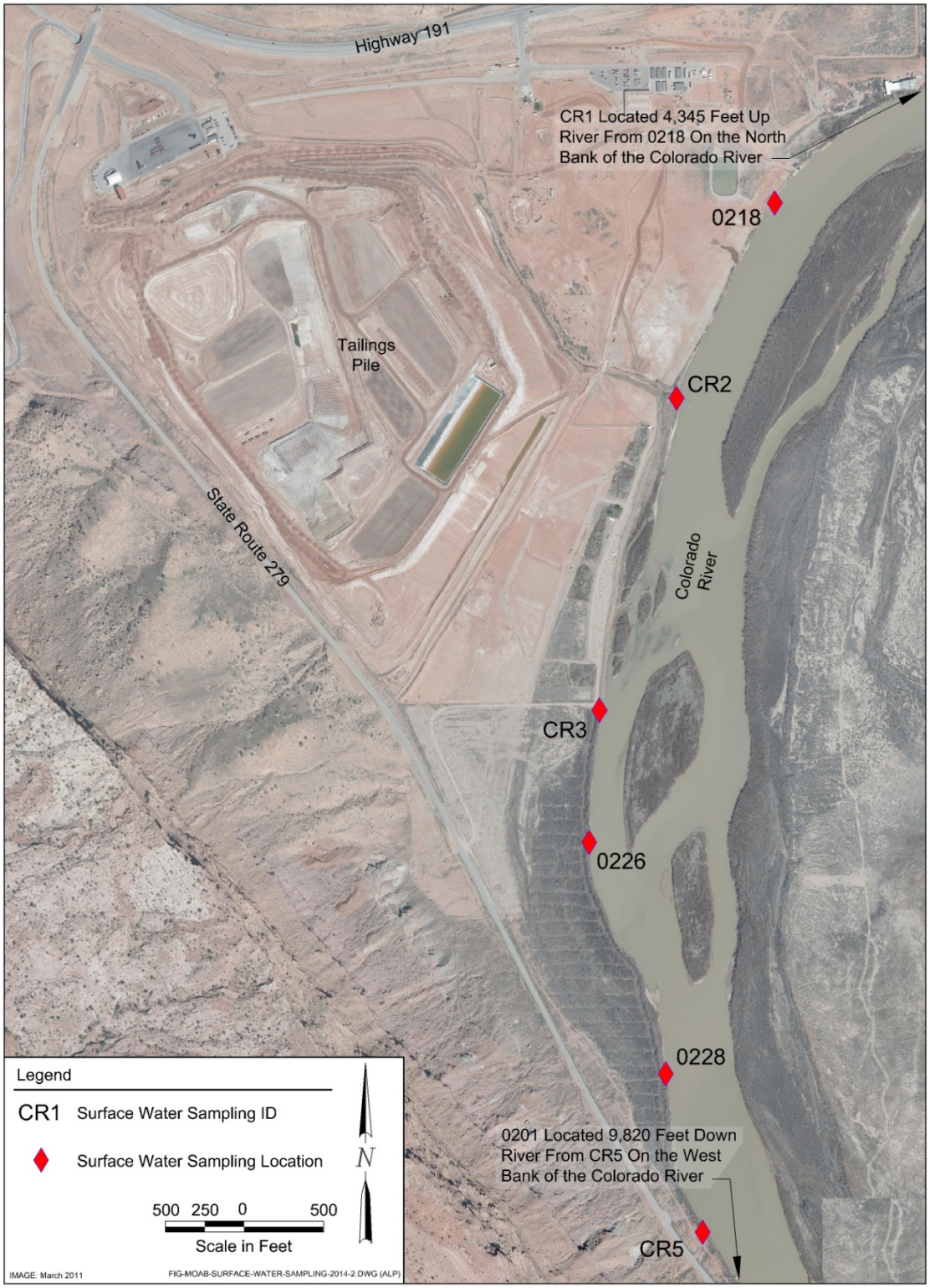


Figure 3. November/December 2013 Site-wide Surface Water Sampling Locations

2.0 Summary of Sampling Events

2.1 September 2013 Surface Water Sampling Event

Eleven surface water samples (Figure 1) were collected in the vicinity of the Colorado River side channel off CF4 on September 30. Starting in late June, the channel developed into a suitable habitat based on the U.S. Fish and Wildlife Service definition. The recently installed surface water diversion system was started on June 25, with the pump intake set downstream of the channel discharging approximately 180 gallons per minute (gpm) into the northern and central areas of the CF4 side channel. The system ran continuously until September 11, at which time the river flows increased, and the side channel no longer met the habitat definition. A total of approximately 18 million gallons had been diverted into the channel by this date. The higher flows continued through September 30, and these samples were collected to confirm field ammonia probe (HACH sension 2 portable pH/ISE probe and meter) sample results from other surface water samples collected during the previous two weeks after the system was shut down.

2.2 November/December 2013 Site Wide Sampling Event

Sixty-two ground water and surface water samples were collected between November 4 and December 10 as part of the site-wide event. This event corresponds to the time frame when the Colorado River flows are generally experiencing base flow conditions.

The 54 ground water samples were collected from a variety of downgradient and cross-gradient locations at various depths. The locations in the vicinity of the northeastern uranium plume were also included. All samples were analyzed for ammonia using a HACH sension 2 portable pH/ISE probe and meter. Approximately one-half of these samples were also submitted to ALS Environmental, Inc. (ALS), laboratory for ammonia analysis. All samples were analyzed by ALS for uranium. All ground water sample locations are shown on Figure 2.

The eight surface water samples were collected upstream, downstream, and adjacent to the site during this event. These surface water locations are presented on Figure 3.

3.0 Data Assessment

3.1 September 2013 Surface Water Sampling Event

3.1.1 Laboratory Performance Assessment

This validation was performed according to *Standard Practice for Validation of Laboratory Data*. The procedure was applied at Level 3, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

Report Identification Number (RIN)	1309067
Laboratory:	ALS, Fort Collins, Colorado
Sample Date Group (SDG) Number:	1310072
Analysis:	Inorganics
Validator:	Elizabeth Moran
Review Date:	February 10, 2014

The samples were prepared and analyzed using accepted procedures as shown in Table 1.

Table 1. September 2013 Surface Water Sampling Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N	EPA 350.1	EPA 350.1

Data Qualifier Summary

None of the data in SDG 1310072 needed to be qualified or flagged.

Sample Shipping/Receiving

ALS received a total of 13 samples for RIN 1309067 in one shipment. SDG 1310072 consisted of 13 ammonia samples, which arrived on October 3, 2013 (UPS tracking number 1Z5W1Y510192403756). The SDG was accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

Preservation and Holding Times

For SDG 1310072, one cooler was received intact with a temperature of 2°C, which complies with all requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. The samples were analyzed within the applicable holding times.

Case Narratives

The case narratives were reviewed, and all results were found to be within quality-control procedures.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration verification (CCV) checks are established to ensure the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. Calibration standards were prepared from independent sources.

Method EPA 350.1, Ammonia as N

Initial calibration for ammonia as was performed using four calibration standards and a blank on October 7, 2013. The calibration curve had a correlation coefficient (r^2) value greater than 0.995 and an intercept less than three times the method detection limit (MDL). Initial calibration verification (ICV) and CCV checks were made at the required frequency. All calibration check results for the SDG were within the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Both initial calibration blanks (ICBs) and continuing calibration blanks (CCBs) are analyzed to assess instrument contamination before and during sample analysis. Detected sample results associated with blanks results greater than the MDL or instrument detection limit (IDL) (depending on method requirements) were "U"-qualified when the detections were less than five times the blank concentration. Non-detects were not qualified.

Equipment Blanks

An equipment blank (EB) is a sample of analyte-free media collected from a rinse of non-dedicated sampling equipment used to sample surface water. EBs are collected to document adequate decontamination of non-dedicated equipment. One EB was collected, and the ammonia concentration was below the detection limit, so no data had to be qualified.

Matrix Spike Analysis

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

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. A duplicate sample was collected from location 0274 (1310072-2), and 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 limit (RL).

Laboratory Control Sample

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

Completeness

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

Electronic Data Deliverable Files
The Electronic Data Deliverable (EDD) files arrived on October 15, 2013. The contents of the files were manually examined to ensure all and only the requested data were delivered in compliance with requirements and that the sample results accurately reflected the data contained in the sample data package.

3.1.2 Minimums and Maximums Report and Anomalous Data Review
All data were within 50 percent of the historical minimum or maximum concentrations (for locations 0245, 0274, 0278, 0279, 0280, 0281, or CR3) or there were fewer than five historical samples for comparison (locations BW2C, BW2D, BW2E, or Z). Based on these results, there were no anomalous data associated with this event.

3.2 November/December 2013 Site-wide Sampling Event

3.2.1 Laboratory Performance Assessment
This validation was performed according to *Standard Practice for Validation of Laboratory Data*. The procedure was applied at Level 3, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

RIN	1311068
Laboratory:	ALS
SDG Numbers:	1311154, 1311472, 1312083, 1312186
Analysis:	Inorganics and Metals
Validator:	Elizabeth Moran
Review Date:	February 10, 2013

The samples were prepared and analyzed using accepted procedures as shown in Table 2.

Table 2. November/December 2013 Site-wide Sampling Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N	EPA 350.1	EPA 350.1
Uranium	SW-846 3005A	SW-846 6020A

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

Table 3. November/December 2013 Site-wide Sampling Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1311154-1 through 1311154-20	All in SDG 1311154	Uranium	J	MS-1

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

Table 4. November/December 2013 Site-wide Sampling Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-Detects)	Explanation
MS-1	J	U	Results for the affected analytes are regarded as estimated because the concentration of the native sample was much greater than the spike added, so the spike recovery may not be accurate.

Sample Shipping/Receiving

ALS received a total of 69 samples for RIN 1311068 in four shipments as shown in Table 5. All of the SDGs were accompanied by a COC form.

Table 5. November/December 2013 Site-wide Sampling Shipment and Receipt Summary

SDG	Date Arrived	Number of Uranium Samples	Number of Ammonia Samples	Tracking Number
1311154	11/08/2013	20	16	1Z5W1Y510190339786
1311472	11/25/2013	21	19	1Z5W1Y510192808597
1312083	12/06/2013	14	9	1Z5W1Y510195379788
1312186	12/13/2013	14	10	1Z5W1Y510192437416

The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents, including the COC forms and the sample tickets, had no errors or omissions.

Preservation and Holding Times

Each shipment was sent in one cooler, and the arriving temperatures met the acceptable criteria of under 4 °C. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Case Narratives

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

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for CCV checks are established to ensure the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. Calibration standards were prepared from independent sources. In addition, for inductively coupled plasma (ICP) analytes (uranium), reporting limit verifications (CRIs) verify the linearity of the calibration curve near the RL. For ICP-mass spectrometry (MS) analytes (uranium), instrument tuning and performance criteria are checked for mass calibration and resolution verifications. Internal standards for ICP-MS analyte uranium are also analyzed to indicate stability of the instruments.

Method SW-846 6020A, Uranium

The initial calibrations for all SDGs were performed using five calibration standards and one blank, resulting in calibration curves with r^2 values greater than 0.995. The values for the calibration curve intercepts for uranium were positive and less than three times the IDL.

ICV and CCV checks were made at the required frequency. All calibration checks for all SDGs met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRIs were within the acceptance criteria range for all SDGs.

Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries were stable and within acceptable ranges.

Method EPA 350.1, Ammonia as N

Initial calibrations for ammonia as N for all SDGs were performed using six calibration standards and a blank. The calibration curve for each SDG had an r^2 value greater than 0.995 and an intercept less than three times the MDL. ICV and CCV checks were made at the required frequency. All calibration check results for all SDGs were within the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Both ICBs and CCBs are analyzed to assess instrument contamination before and during sample analysis. Detected sample results associated with blanks results greater than the MDL or IDL (depending on method requirements) were "U"-qualified when the detections were less than five times the blank concentration. Non-detects were not qualified.

One of the uranium CCBs in SDG 1311154 was above the IDL (0.003 micrograms per liter [µg/L] compared to 0.0029 µg/L). None of the results were less than three times the highest blank (0.003 µg/L), so no results had to be qualified.

Fourteen ammonia CCBs had results that were greater than the ammonia MDL (SDGs 1311472, 1312083, and 1312186). The only associated ammonia results that were less than five times the highest blank value were the sample locations that had an ammonia concentration of 0.1 milligram per liter (mg/L), which is the detection limit. No data was qualified.

Equipment Blanks

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

The eight surface water samples were collected with the same piece of tubing that was thoroughly cleaned with deionized water and soap between each location. An EB was collected using the rinsate water after sampling. The uranium concentration in the EB was lower than what was analyzed in the surface water samples; therefore, no results had to be qualified.

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

MS recovery could not be evaluated for uranium in SDG 1311154 (1311154-19 MS and matrix spike duplicate [MSD]) because the concentration of the analyte in the native samples was greater than four times the concentration of MS added; therefore, this data were "J"-flagged for reason MS-1.

Laboratory Replicate Analysis
The laboratory replicate results demonstrate acceptable laboratory precision. The RPD values for the reported (MSD) results for all other analytes should be less than 20 for results greater than five times the RL.

Field Duplicate Analysis
Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory replicates, which measure only laboratory performance. Duplicate samples were collected from locations SMI-PZ2M2 (1311154-7), 0431 (1311472-10), 0430 (1311472-11), and SMI-PZ3M (1312083-10). The duplicate results met the EPA-recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than five times the RL.

Laboratory Control Sample
LCSs provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. LCS results were acceptable for ammonia analyses.

LCSs were not reported for uranium. Per national environmental laboratory accreditation requirements provided by the NELAC Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

Metals Serial Dilution
Serial dilution (SD) samples were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. ICP-MS SD data are evaluated when the concentration of the undiluted sample is greater than 100 times the RL. All evaluated SD data were acceptable.

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

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

Electronic Data Deliverable Files
The Electronic Data Deliverable files arrived on November 21 and on December 4, 12, and 20, 2013. The contents of the files were manually examined to ensure all and only the requested data were delivered in compliance with requirements and that the sample results accurately reflected the data contained in the sample data package

3.2.2 Minimums and Maximums Report and Anomalous Data Review
The Minimums and Maximums Report for this sampling event is located in Appendix B. Based on the results, there were no anomalous data associated with this event.

4.0 Results

4.1 September 2013 Surface Water Sampling Event

The surface water sampling event conducted in September 2013 included the collection of samples from locations listed below in Table 6, with all locations shown on Figure 1. The results and comparisons to the applicable EPA criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are shown in Table 6.

Table 6. September 2013 Surface Water Ammonia Concentrations and Comparisons to EPA Acute and Chronic Criteria

Location	Date	Temp (^{o}C)	pH	Ammonia as N (mg/L)	U.S. EPA - Acute Total as N (mg/L)[1]	U.S. EPA - Chronic Total as N (mg/L)[2]
0245	9/30/13	19.53	7.76	<0.1	13	1.0
0274	9/30/13	22.29	7.89	<0.1	11	0.79
0278	9/30/13	23.65	8.19	0.53	5.1	**0.44**
0279	9/30/13	19.14	7.96	0.85	8.8	**0.83**
0280	9/30/13	19.88	8.02	0.86	8.8	**0.78**
0281	9/30/13	22.15	8.02	0.87	8.8	**0.68**
BW2C	9/30/13	20.31	8.11	0.12	7.3	0.67
BW2D	9/30/13	19.10	8.13	<0.1	7.3	0.71
BW2E	9/30/13	19.74	8.16	<0.1	6.0	0.57
CR3	9/30/13	18.38	8.18	0.13	6.0	0.61
Z	9/30/13	19.75	7.84	0.88	13	1.0

Notes:
(1) U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table N.4., Temperature and pH-Dependent Values, Acute Concentration of Total Ammonia as N (mg/L)
(2) U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table 6., Temperature and pH-Dependent Values, Chronic Concentration of Total Ammonia as N (mg/L)

As shown in the table, none of the ammonia concentrations exceeded the acute criteria; however, four of the 11 slightly exceeded the chronic criteria. Of the four chronic exceedences, the sample collected from location 0281 (which represents the largest difference of the four between the measured concentration and the criteria) exceeded the chronic criteria concentration by only 0.19 mg/L.

It should be noted that late September precipitation events increased the river flows to above average starting in early September, and the above-average flows continued through the end of the month. The higher flows resulted in an upstream connection to the main channel, and on September 30, the side channel was not considered a suitable habitat when the samples were collected.

4.2 November/December 2013 Site-wide Sampling Event

All samples collected during this event were analyzed for uranium. Table 7 presents the site-wide locations and associated concentrations that exceeded the 0.044 mg/L uranium ground water standard, which is based on Table 1 in Title 40 Code of Federal Regulations Part 192, Subpart A (40 CFR 192A), "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings and Uranium In Situ Leaching Processing Facilities," assuming uranium-234 and uranium-238 activities are in equilibrium.

4.3 Ground Water Quality Trends

To present the trends observed in the water chemistry for the site-wide locations, the site was divided into six areas. These include the northeastern base of the tailings pile, northeastern uranium plume (which includes the PW03 cluster), the southeastern base of the tailings pile, along the southwestern boundary, along the Colorado River bank, and south of the site. All results are also plotted against the Colorado River flow to determine if the river stage may impact the concentrations. Results based on analysis using the ammonia probe are also displayed.

4.3.1 Northeastern Base of the Tailings Pile

Figures 4 and 5 are time versus ammonia and uranium concentration plots, respectively, for these locations. It was not possible to collect a sample from Well UPD-19 during the November/December 2013 event. The ammonia concentrations in samples collected from UPD-17 and -18 both display a gradual decrease since November 2013 (Figure 4), and uranium concentrations rebounded to comparable November 2012 levels after a slight increase in May 2013 (Figure 5).

Table 7. November/December 2013 Site-wide Locations Exceeding the 0.044 mg/L Uranium Ground Water Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Uranium Concentration (mg/L)
0401	11/26/2013	CF2 Vicinity	18	3.0
0403	11/25/2013	CF1 Vicinity	18	0.91
0404	11/26/2013	CF3 Vicinity	18	1.5
0407	11/25/2013	CF1 Vicinity	17	0.40
0410	12/10/2013	NE Uranium Plume Area	27	0.58
0412	11/7/2013	NE Uranium Plume Area	10.5	2.0
0413	11/6/2013	NE Uranium Plume Area	11.5	3.2
0414	11/7/2013	NE Uranium Plume Area	13	3.7
0439	11/13/2013	NE Uranium Plume Area	118	0.83
0441	12/3/2013	Along SW Site Boundary	118	0.046
0453	11/13/2013	Along SW Site Boundary	80	2.7
0454	11/5/2013	Along S Site Boundary	13	1.9
0492	11/5/2013	Along S Site Boundary	18	0.14
0815	11/4/2013	CF5	22 – 52*	3.3
AMM-2	11/4/2013	Near Base of Tailings Pile	48	1.8
AMM-3	11/5/2013	Near Base of Tailings Pile	48	1.3
MW-3	11/6/2013	CF5 Vicinity	44	3.1
SMI-MW01	11/7/2013	NE Uranium Plume Area	16	4.1
SMI-PZ3D2	12/10/2013	NE Uranium Plume Area	78	1.0
SMI-PW02	11/4/2013	CF5	20 – 60*	3.3
SMI-PW03	12/10/2013	NE Uranium Plume Area	60	0.45
SMI-PZ2D	11/6/2013	CF5 Vicinity	75	0.24
SMI-PZ2M2	11/6/2013	CF5 Vicinity	56	0.50
SMI-PZ3M	12/10/2013	NE Uranium Plume Area	59	0.65
SMI-PZ3S	12/10/2013	NE Uranium Plume Area	25	0.99
TP-01	11/25/2013	NE Uranium Plume Area	22	0.11
TP-22	11/6/2013	NE Uranium Plume Area	17	0.22
TP-23	11/5/2013	NE Uranium Plume Area	25	3.4
UPD-17	12/10/2013	NE Uranium Plume Area	14	1.2
UPD-18	12/10/2013	NE Uranium Plume Area	13	0.87
UPD-20	12/10/2013	NE Uranium Plume Area	17	0.072
UPD-21	12/10/2013	NE Uranium Plume Area	25	6.5
UPD-22	11/7/2013	NE Uranium Plume Area	9	3.7
UPD-23	11/25/2013	NE Uranium Plume Area	26	0.90
UPD-24	12/10/2013	NE Uranium Plume Area	27	14.0

ft bgs = feet below ground surface, S = southern; SW = southwestern; NE = northeastern
*Value represents full screen length; sample collected using submersible pump.

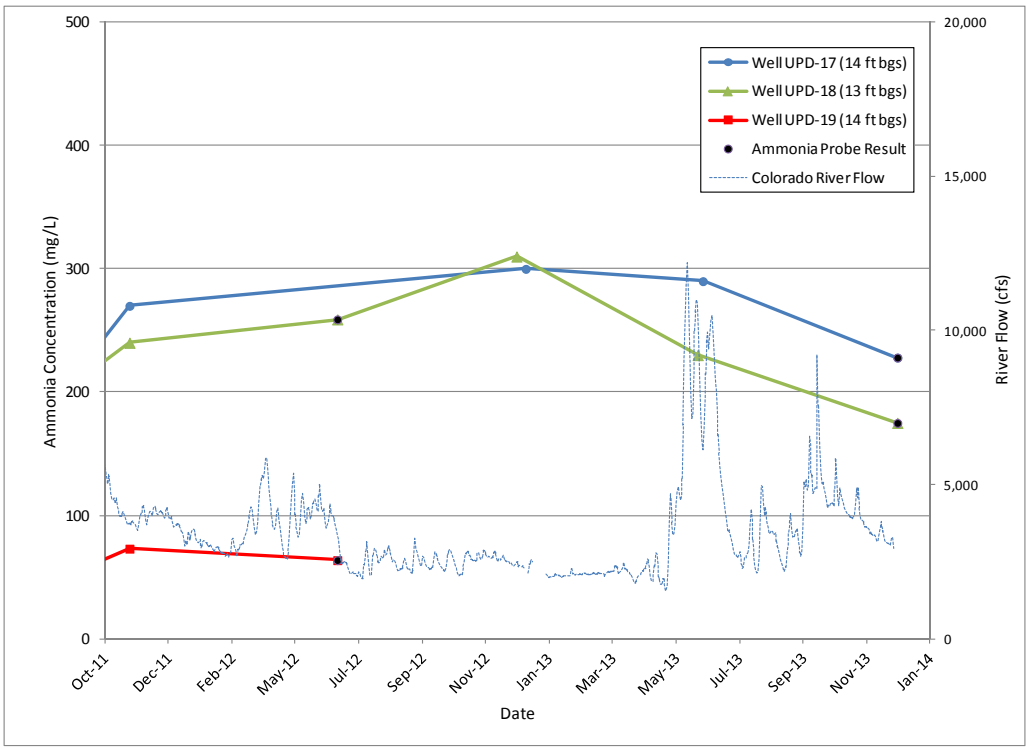


Figure 4. Wells UPD-17, UPD-18, and UPD-19
Time Versus Ammonia Concentration Plot

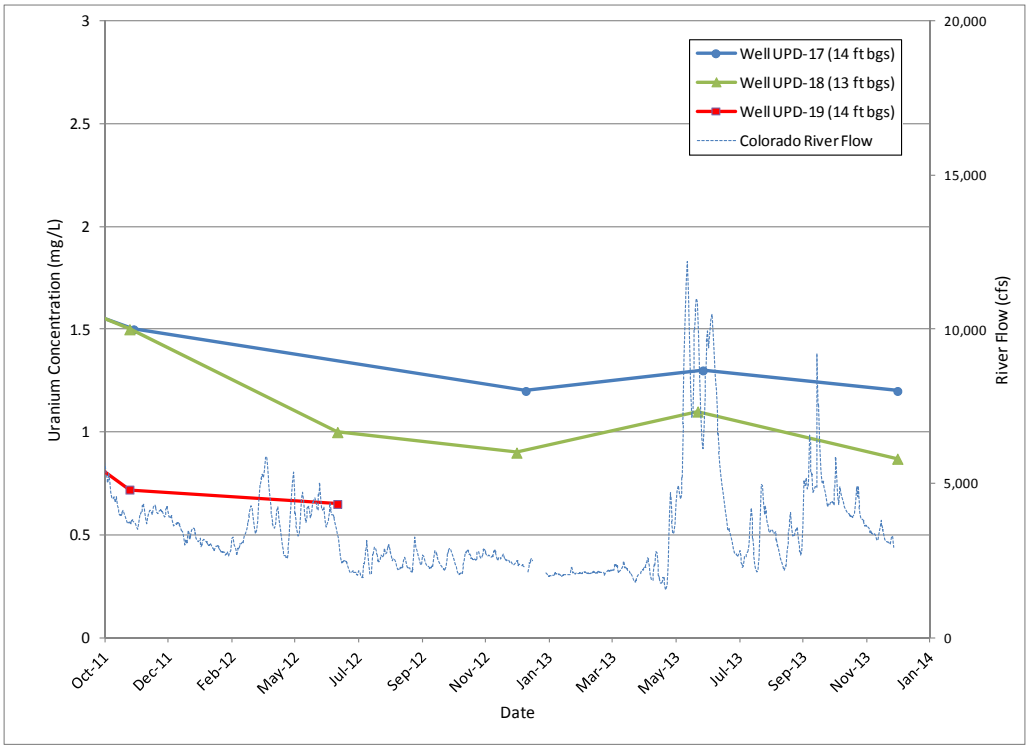


Figure 5. Wells UPD-17, UPD-18, and UPD-19
Time Versus Uranium Concentration Plot

4.3.2 Northeastern Uranium Plume Area

Due to the number of wells associated with the northeastern uranium plume, this area of the site was further divided into three subareas: the center of the plume, the vicinity of the Atlas building, and the northeastern edge of the plume area.

4.3.3 Center of the Northeastern Uranium Plume Area

Figures 6 and 7 are the time versus ammonia and uranium concentration plots, respectively, for the center of the northeastern uranium plume area, which includes locations 0411, 0413, 0414, and UPD-20. As displayed in Figure 6, the ammonia concentrations have remained consistently below 5 mg/L in the samples collected from wells UPD-20 and 0411 and have fluctuated since the November/December 2012 event in the samples collected from 0413 and 0414.

As displayed in Figure 7, the uranium concentrations have not significantly changed in the samples collected from wells 0413, 0414, and UPD-20 since November 2012.

4.3.4 Atlas Building Vicinity

The ammonia and uranium concentrations associated with samples collected from locations in the vicinity of the Atlas building are displayed in Figures 8 and 9, respectively. These wells include 0410, UPD-21, UPD-23, and UPD-24. Wells UPD-23 and UPD-24 were installed in the winter of 2012 to better define the extent of the elevated uranium concentrations detected in the samples collected from well UPD-21. This sampling event represents the third time these new wells were sampled.

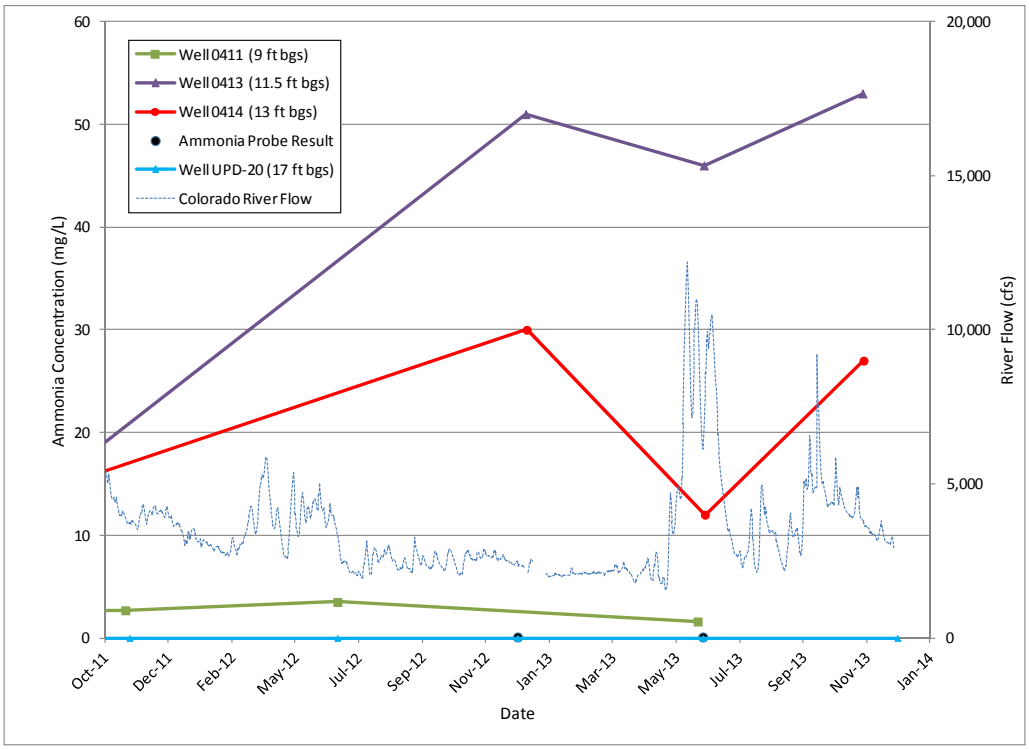


Figure 6. Center of the Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time Versus Ammonia Concentration Plot

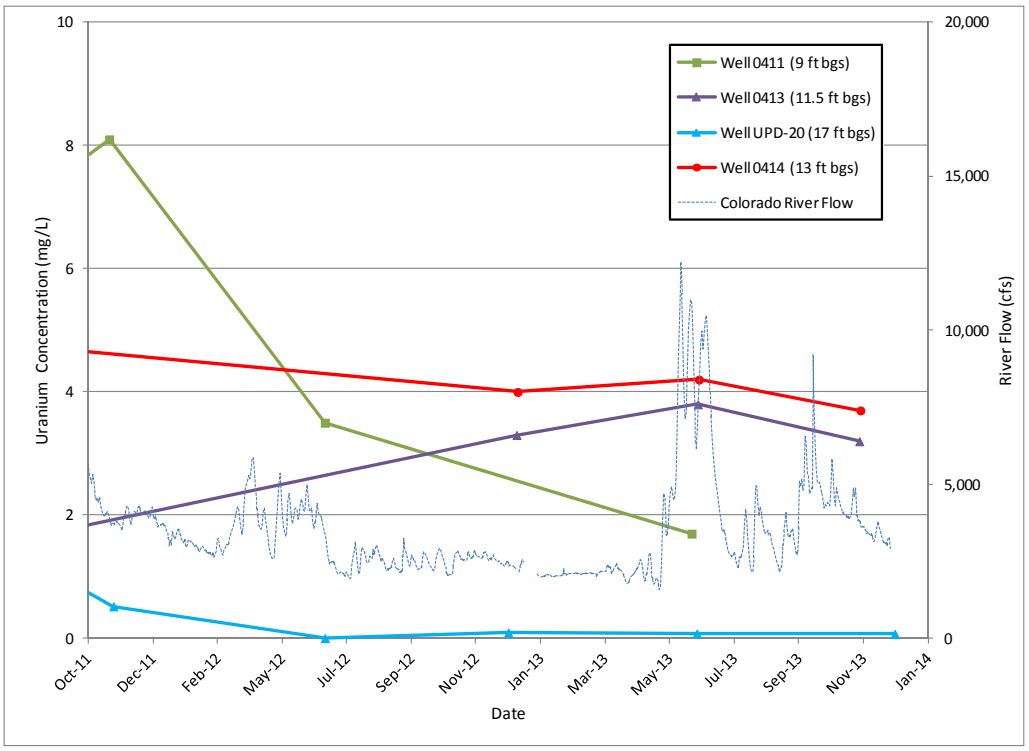


Figure 7. Center of the Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time Versus Uranium Concentration Plot

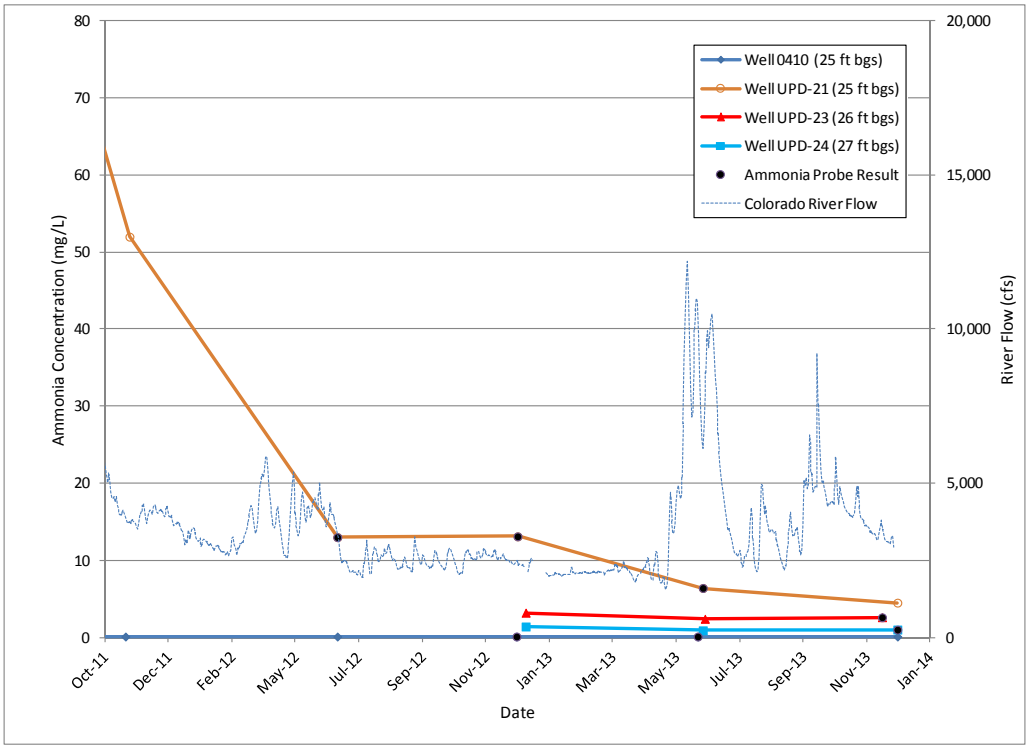


Figure 8. Vicinity of the Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time Versus Ammonia Concentration Plot

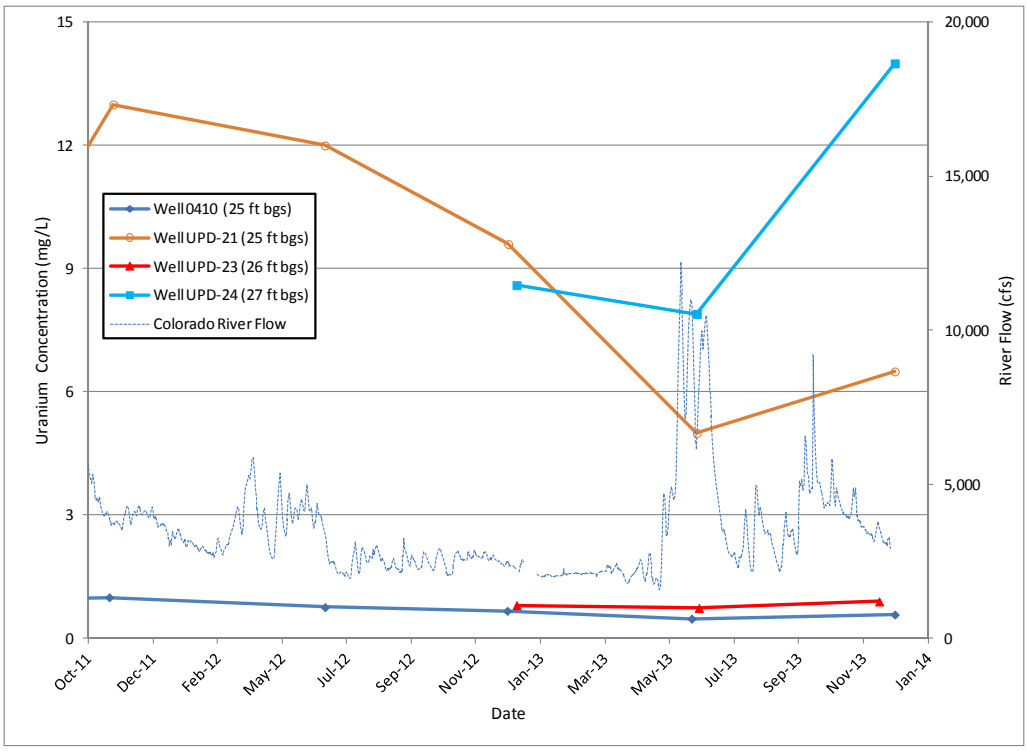


Figure 9. Vicinity of the Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time Versus Uranium Concentration Plot

As shown in Figure 8, the ammonia concentrations in the samples collected from wells 0410, UPD-21, UPD-23, and UPD-24 were all less than 5 mg/L. Figure 9 displays that the uranium concentrations in samples collected from wells 0410 and UPD-23 remain below 1 mg/L, while the sample collected from well UPD-21 has also rebounded slightly since June 2013. The sample collected from well UPD-24 indicates the concentration has almost doubled, from 7.9 to 14 mg/L. At this time, it is difficult to determine the cause of this significant increase, and monitoring of this location will be ongoing to see if this trend continues.

4.3.5 Northeastern Edge of the Uranium Plume Area

Figures 10 and 11 display comparable data for the wells located in the vicinity of the northeastern edge of the plume area (wells 0412, UPD-22, SMI-MW01, and SMI-PZ3S). As Figure 10 exhibits, the ammonia concentrations in the samples collected from each of these locations have not changed significantly since the May/June 2013 event, and are all below 5 mg/L. The concentrations measured in the sample collected from well 0412 remain below the 1.0 mg/L detection limit.

In general, the uranium concentrations (Figure 11) have followed a similar trend, with no significant changes within the past 2 years. The uranium concentrations in the samples collected from each location are all near or below 4 mg/L.

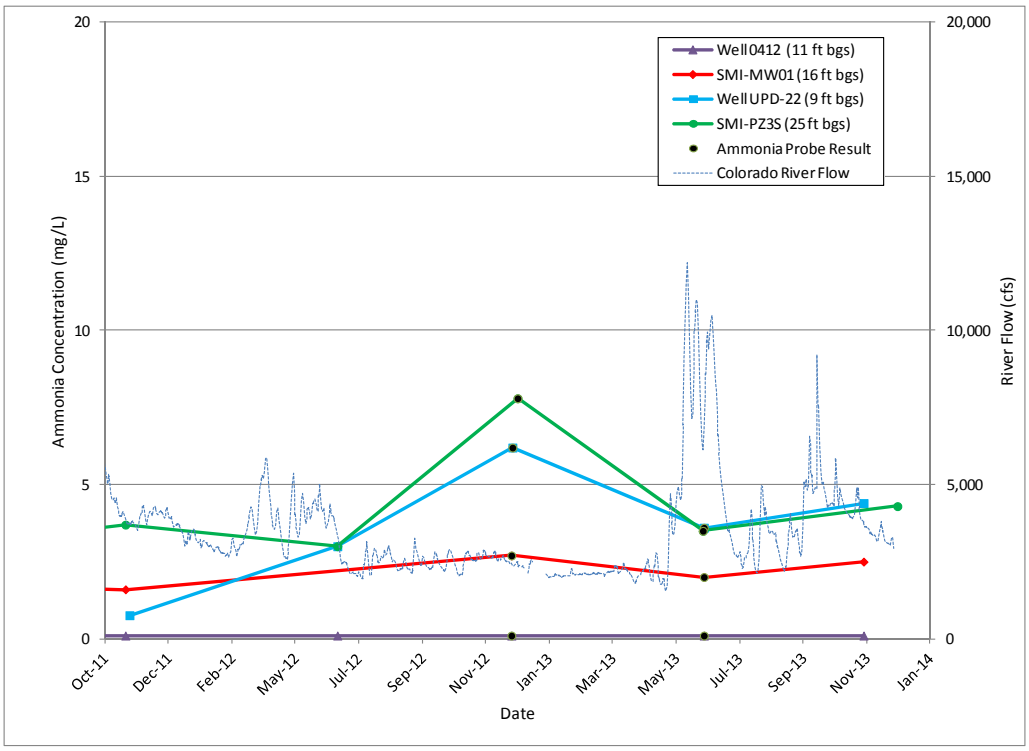


Figure 10. Northeastern Edge of the Uranium Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time Versus Ammonia Concentration Plot

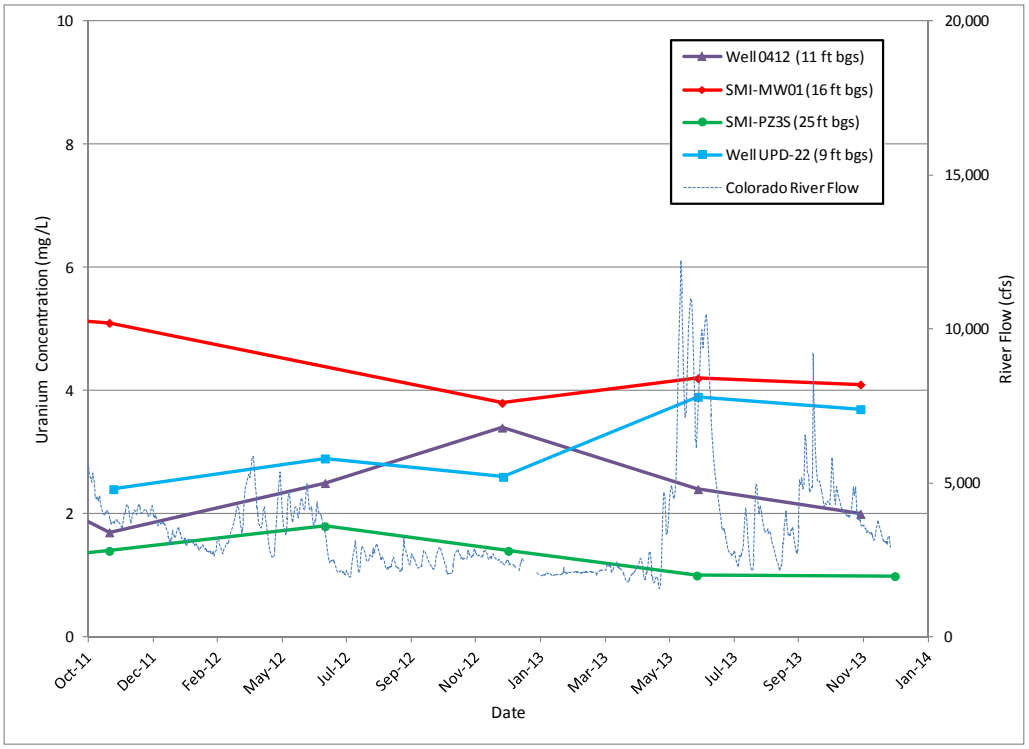


Figure 11. Northeastern Edge of the Uranium Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time Versus Uranium Concentration Plot

4.3.6 Base of the Tailings Pile

The time versus ammonia and uranium concentration plots for the area near the base of the tailings pile are presented in Figures 12 and 13. As Figure 12 exhibits, the ammonia concentrations have generally fluctuated independently of the river flow in the samples collected from wells AMM-3, ATP-2-S, ATP-2-D, and AMM-2 (listed from south to north). The data suggest the ammonia concentrations have not significantly changed in this area of the site since November 2011. Uranium concentrations (Figure 13) have also been consistent since November 2011, with the exception of the uranium concentration measured in the sample collected from well AMM-3, which nearly rebounded to the concentration measured in November/December 2012, decreasing from 2.5 to 1.3 mg/L since May/June 2013.

4.3.7 Southwestern Boundary

Figures 14 and 15 display the time versus concentration plots for the locations along the southwestern boundary (Figure 2), presented in the upgradient to downgradient direction. Ammonia concentrations in the sample collected from well 0453 decreased after gradually increasing since June 2012, dropping from 423 to 310 mg/L, while the concentration measured in the sample from well 0454 did not significantly change within the past year. Uranium concentrations in samples collected from both 0453 and 0454 have not significantly changed since November/December 2012 (Figure 15). The sample collected from well 0440 continued having ammonia concentrations below the detection limit and uranium concentrations below the 0.044 mg/L UMTRA standard.

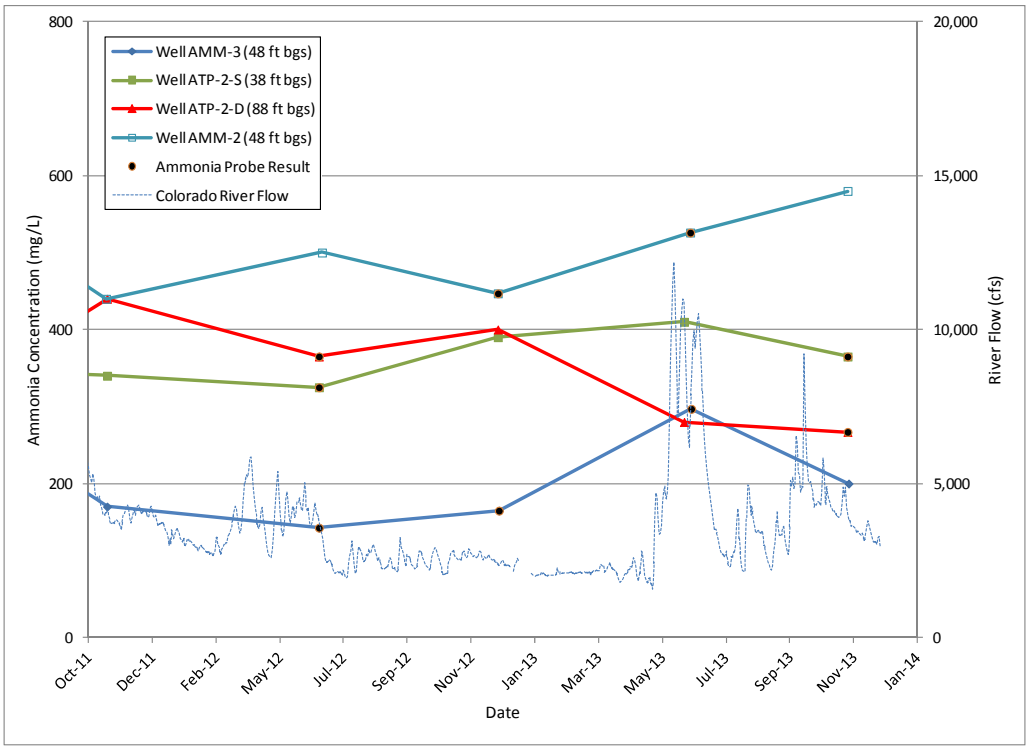


Figure 12. Base of Tailings Pile Observation Wells AMM-3, ATP-2-S, ATP-2-D, and AMM-2 Time Versus Ammonia Concentration Plot

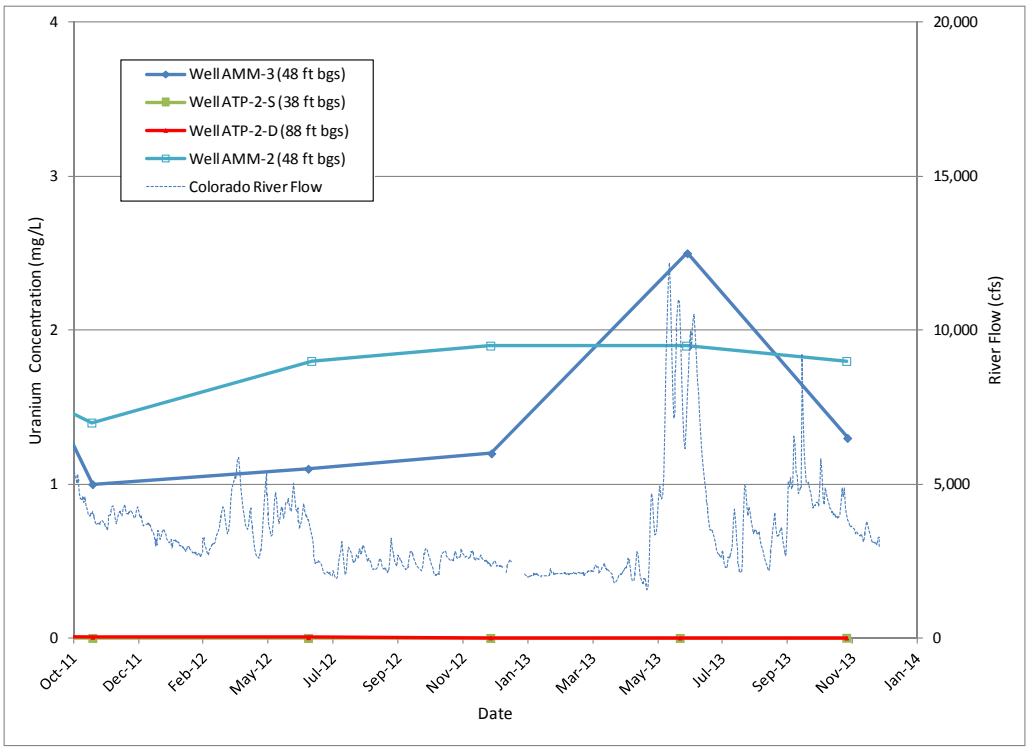


Figure 13. Base of Tailings Pile Observation Wells AMM-3, ATP-2-S, ATP-2-D, and AMM-2 Time Versus Uranium Concentration Plot

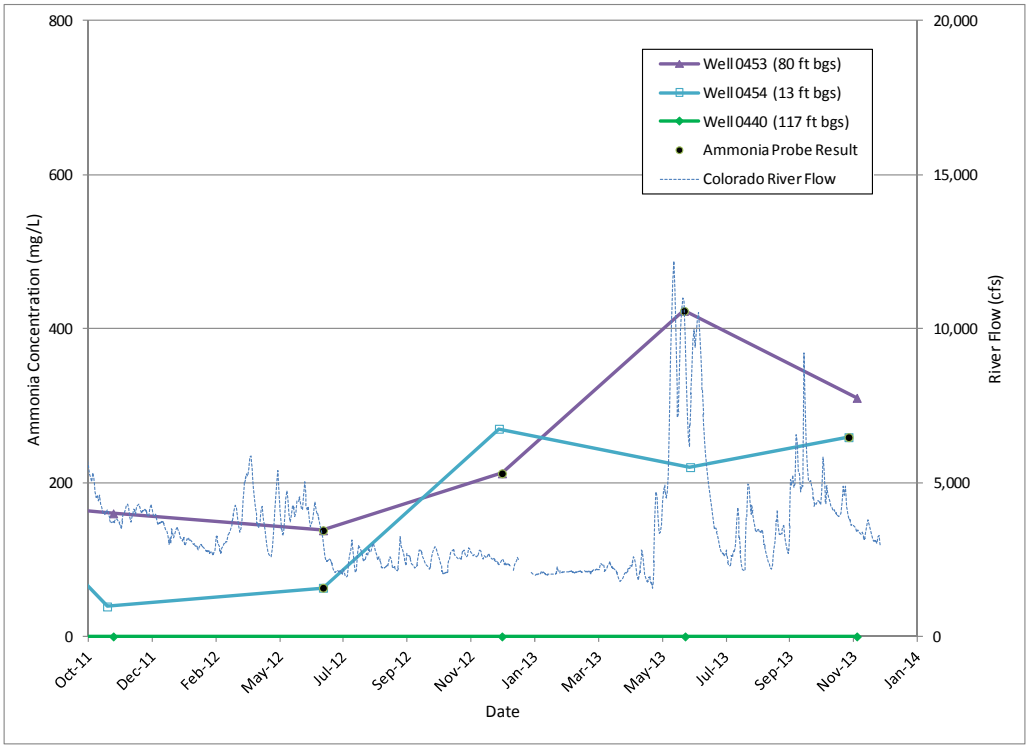


Figure 14. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time Versus Ammonia Concentration Plot

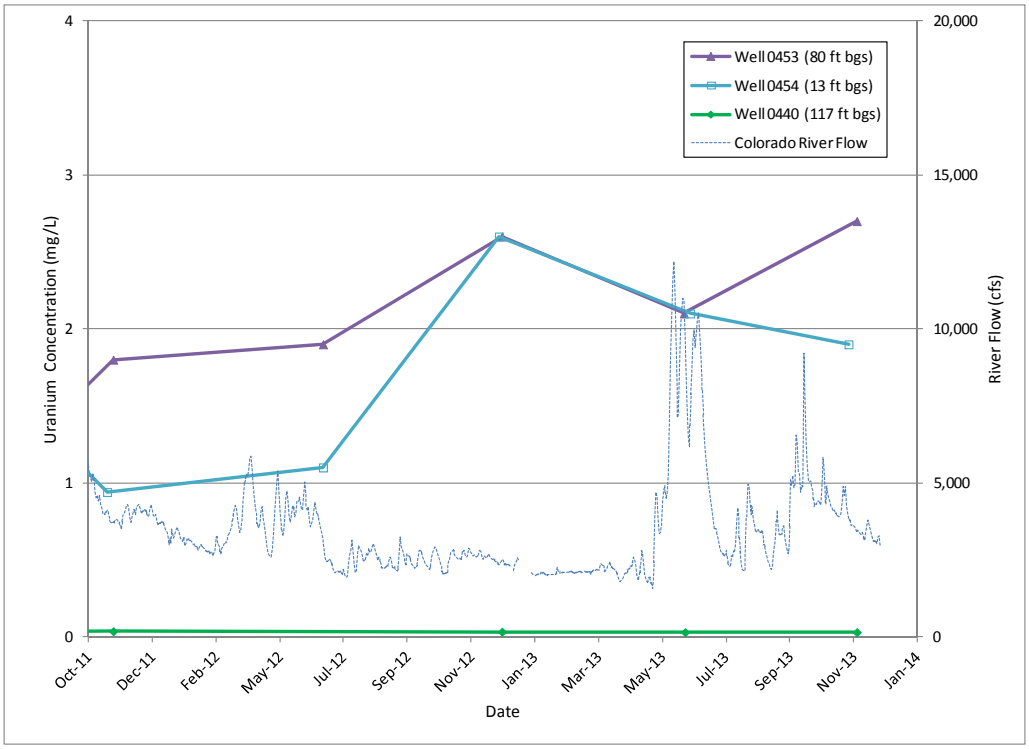


Figure 15. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time Versus Uranium Concentration Plot

4.3.8 Riverbank Area

Figures 16 and 17 are the time versus ammonia and uranium concentration plots, respectively, for the locations sampled along the riverbank, presented from south to north. Ammonia concentrations are low at the southern and northern ends of the site and increase near the middle. As of November/December 2013, ammonia concentrations have not significantly changed in samples collected from wells 0401 and 0404 since November 2011. Uranium concentrations (Figure 17) have not significantly changed since November 2012 in the samples collected from wells 0492, 0404, and TP-01. The plot also displays a gradual increase in the uranium concentration associated with the samples collected from 0401 since May/June 2012, increasing from 1.7 to 3 mg/L during this time frame.

4.3.9 Southern and Off-site Areas

Figures 18 and 19 are the plots for the three locations sampled to the south of the site. Wells TP-17 and TP-19 are located along the riverbank, and TP-20 is located approximately 600 feet off the bank. Ammonia concentrations (Figure 18) in samples collected from TP-17 and TP-20 remain below 4 mg/L after increasing in November/December 2012. The uranium concentrations (Figure 19) have consistently been below the 0.044 mg/L UMTRA standard over the past 2 years.

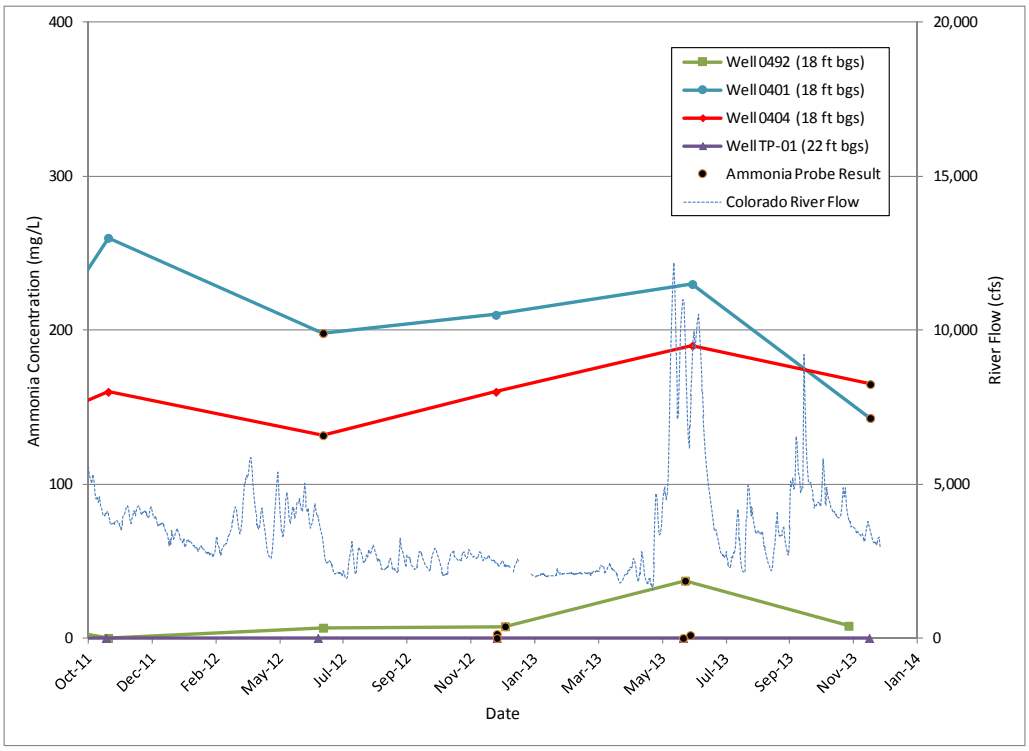


Figure 16. Riverbank Observation Wells 0492, 0401, 0404, and TP-01 Time Versus Ammonia Concentration Plot

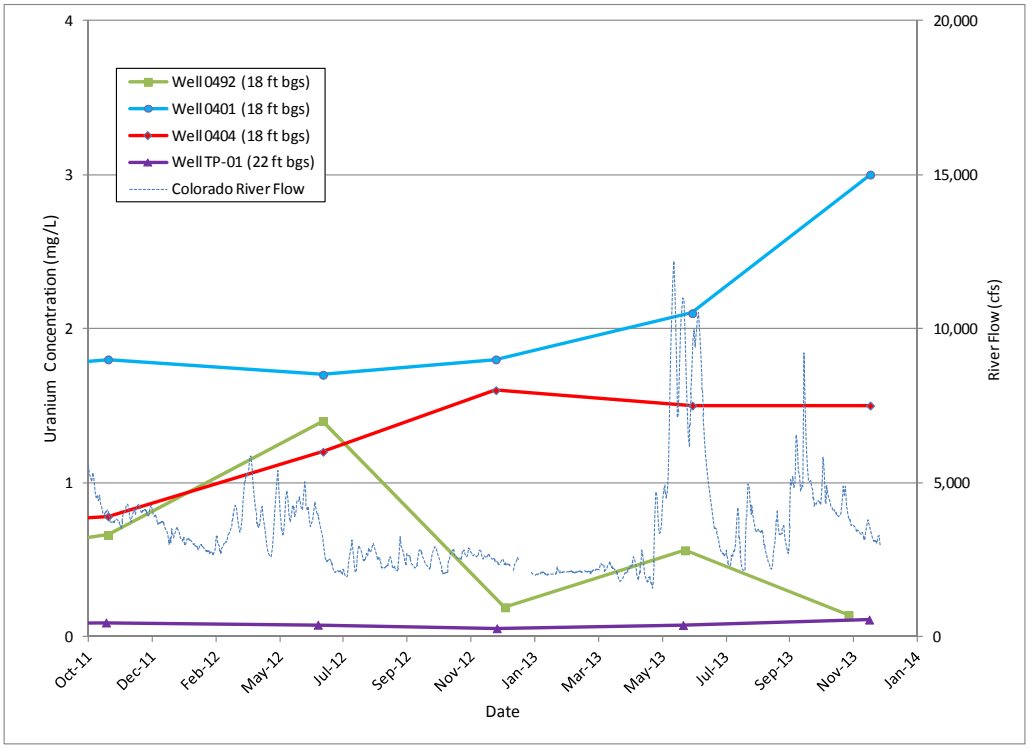


Figure 17. Riverbank Observation Wells 0492, 0401, 0404, and TP-01 Time Versus Uranium Concentration Plot

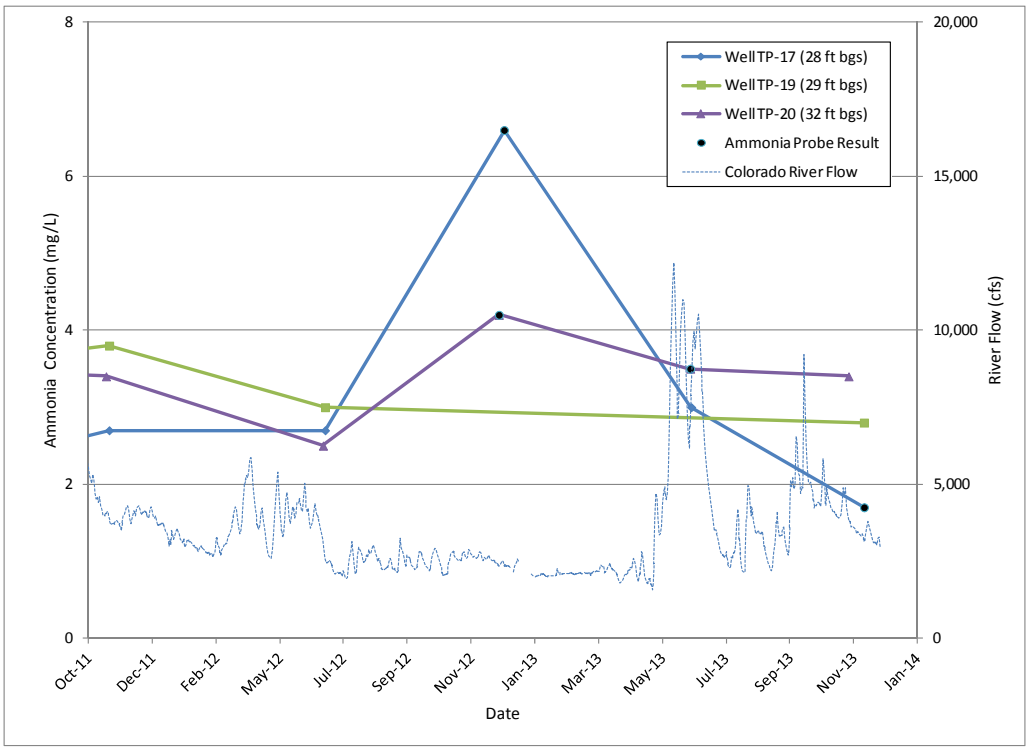


Figure 18. South of Site Observation Wells TP-17, TP-19, and TP-20 Time Versus Ammonia Concentration Plot

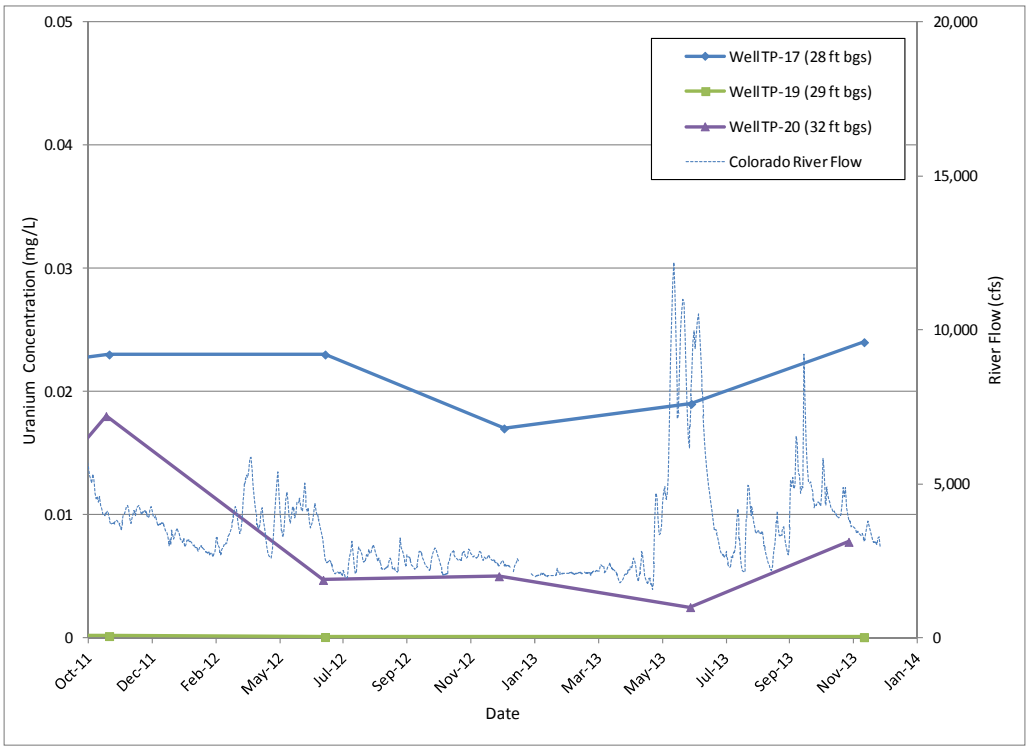


Figure 19. South of Site Observation Wells TP-17, TP-19, and TP-20 Time Versus Uranium Concentration Plot

4.4 Surface Water Sampling

Table 8 presents the ammonia results from the surface water sampling conducted in November/December 2013 from locations 0201, 0218, 0226, 0228, CR1, CR2, CR3, and CR5 (as shown on Figure 2). The ammonia concentrations, all of which were below the 0.1 mg/L detection limit, and comparisons to the applicable EPA criteria for both acute and chronic concentrations (along with the temperature and pH data used to calculate these concentrations) are shown in Table 8.

Table 8. November/December 2013 Surface Water Ammonia Concentrations and Comparisons to EPA Acute and Chronic Criteria

Location	Date	Temp (^oC)	pH	Ammonia as N (mg/L)	U.S. EPA - Acute Total as N (mg/L)[1]	U.S. EPA - Chronic Total as N (mg/L)[2]
0201	11/19/13	5.96	7.19	<0.1	31	4.0
0218	11/19/13	6.47	7.89	<0.1	11	2.1
0226	11/20/13	5.96	8.30	<0.1	4.9	1.1
0228	11/20/13	6.18	8.40	<0.1	4.1	0.95
CR1	11/19/13	5.65	7.10	<0.1	34	4.2
CR2	11/19/13	6.85	7.98	<0.1	8.8	1.8
CR3	11/20/13	6.97	8.32	<0.1	4.9	1.1
CR5	11/19/13	6.06	7.69	<0.1	15	2.6

Notes:
(1) U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table N.4., Temperature and pH-Dependent Values, Acute Concentration of Total Ammonia as N (mg/L)
(2) U.S. EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater State (Effective April 2013), Table 6., Temperature and pH-Dependent Values, Chronic Concentration of Total Ammonia as N (mg/L)

4.5 Ammonia Probe Analysis Results

All site-wide samples collected were analyzed for ammonia using a portable HACH ammonia probe meter. For approximately one-half of the samples, sample splits were collected and submitted to ALS for ammonia analysis to determine how the measured concentrations compared to each other. Table 9 provides the results measured by both ALS and the field method. As the table displays, the results are comparable. Figure 20 is a graphical representation displaying the comparison between the ammonia results generated from the analytical laboratory and the ammonia probe. As shown, the analytical laboratory and the ammonia probe provide comparable results with the trendline having an r^2 value of 0.937, which confirms the ammonia probe does generate reliable results.

4.6 Ground Water Surface

Figure 21 is a ground water surface contour map for the site in November/December 2013. The gradient is similar to that measured during river base flow conditions, with a site average value of 0.0014 feet. All water level data were collected from the alluvial soils screened across the vadose zone and saturated zone interface and exhibit an overall southeast ground water flow direction towards the Colorado River.

Table 9. Site-wide Ammonia Field Analysis Results Compared to Analytical Laboratory Results

Well Number	Date	Ammonia Concentration (mg/L)	
		Analytical Laboratory Results	Field Results
201	11/19/2013	0.1	0.1
218	11/19/2013	0.1	0.1
226	11/20/2013	0.1	0.1
228	11/20/2013	0.1	0.1
410	12/10/2013	0.1	0.1
412	11/7/2013	0.1	0.1
413	11/6/2013	53	50.9
414	11/7/2013	27	31.3
430	12/2/2013	0.1	0.1
431	11/14/2013	0.1	0.1
432	12/3/2013	0.1	0.1
433	12/3/2013	0.1	0.1
434	12/3/2013	0.1	0.1
435	11/21/2013	1.7	1.4
436	12/10/2013	3.3	1.6
439	11/13/2013	6.9	5.7
441	12/3/2013	0.1	0.1
443	11/14/2013	0.1	0.1
444	11/21/2013	1.5	1.5
453	11/13/2013	310	274
455	12/3/2013	0.1	0.1
456	12/3/2013	0.1	0.1
457	11/21/2013	0.1	0.1
492	11/5/2013	8	8.4
815	11/4/2013	270	191
AMM-1	11/21/2013	0.1	0.1
AMM-2	11/4/2013	580	676
AMM-3	11/5/2013	200	228
ATP-3	12/2/2013	0.1	0.1
CR1	11/19/2013	0.1	0.1
CR2	11/19/2013	0.1	0.1
CR3	11/20/2013	0.1	0.1
CR5	11/19/2013	0.1	0.1
MW-3	11/6/2013	490	305
SMI-MW01	11/7/2013	2.5	2.1
SMI-PW02	11/4/2013	440	428
SMI-PW03	12/10/2013	25	18.8
SMI-PZ2D	11/6/2013	340	220
SMI-PZ2M2	11/6/2013	470	366

Table 9. Site-wide Ammonia Field Analysis Results Compared to Analytical Laboratory Results (continued)

Well Number	Date	Ammonia Concentration (mg/L)	
		Analytical Laboratory Results	Field Results
SMI-PZ3M	12/10/2013	34	22.3
SMI-PZ3S	12/10/2013	4.3	2.8
TP-01	11/25/2013	0.1	0.1
TP-11	11/25/2013	0.67	0.6
TP-19	11/20/2013	2.8	2.8
TP-20	11/5/2013	3.4	1.9
TP-23	11/5/2013	190	159
UPD-20	12/10/2013	0.1	0.1
UPD-21	12/10/2013	4.5	3.6
UPD-22	11/7/2013	4.4	4.2

Notes:
Field results measured using HACH sension 2 portable pH/ISE probe and meter.
Analytical laboratory results provided by ALS.

4.7 Contaminant Distribution

Figures 22 and 23 are maps showing shallow ground water ammonia and uranium plumes (respectively) using data collected during the November/December 2013 site-wide event. Contaminant distribution is generally comparable to previous plume maps generated using data collected during the past 2 years. While Figure 22 displays the result associated with well ATP-2-S, this concentration was not taken into consideration for the contour line location. This well is screened over a deeper interval in this shallow zone and is not representative of the uranium concentration in the shallowest ground water. The contour lines were based on the concentration measured in extraction well 0815, located within 50 feet southeast of ATP-2-S.

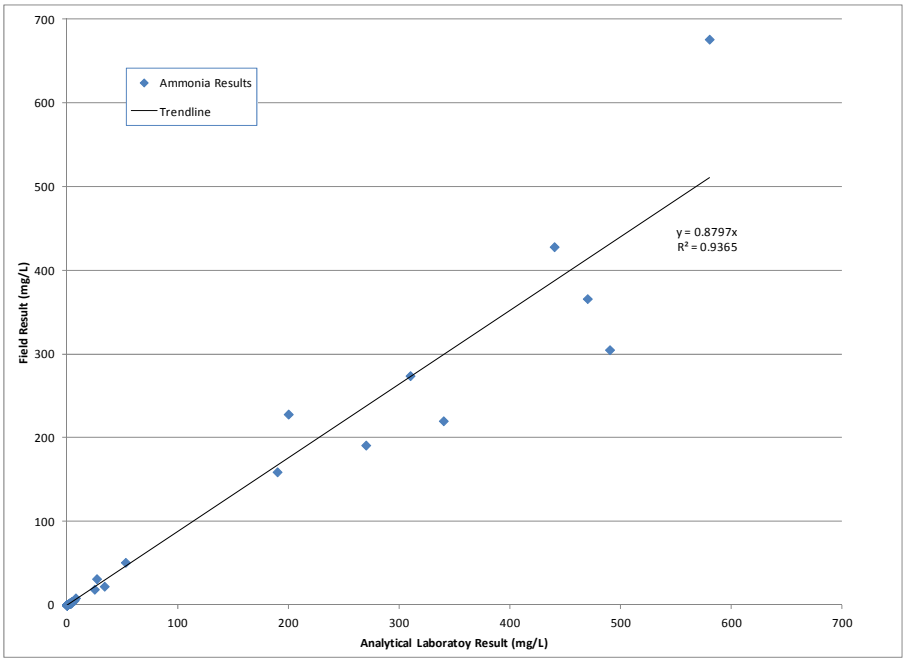


Figure 20. Graphical Comparison of the Ammonia Results Generated from the Analytical Laboratory and Field Analyses

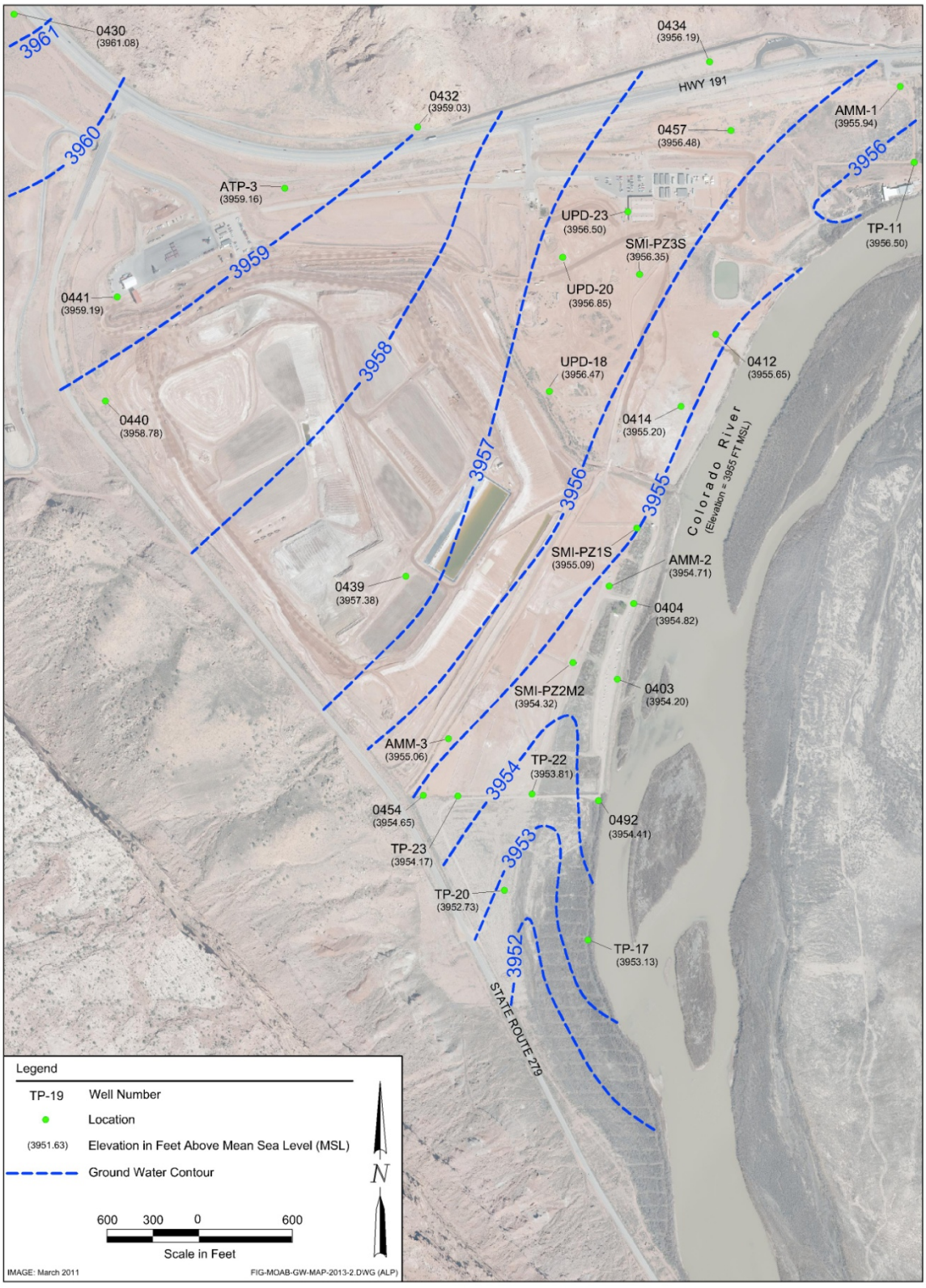


Figure 21. Site-wide Ground Water Surface Contour Map, November/December 2013

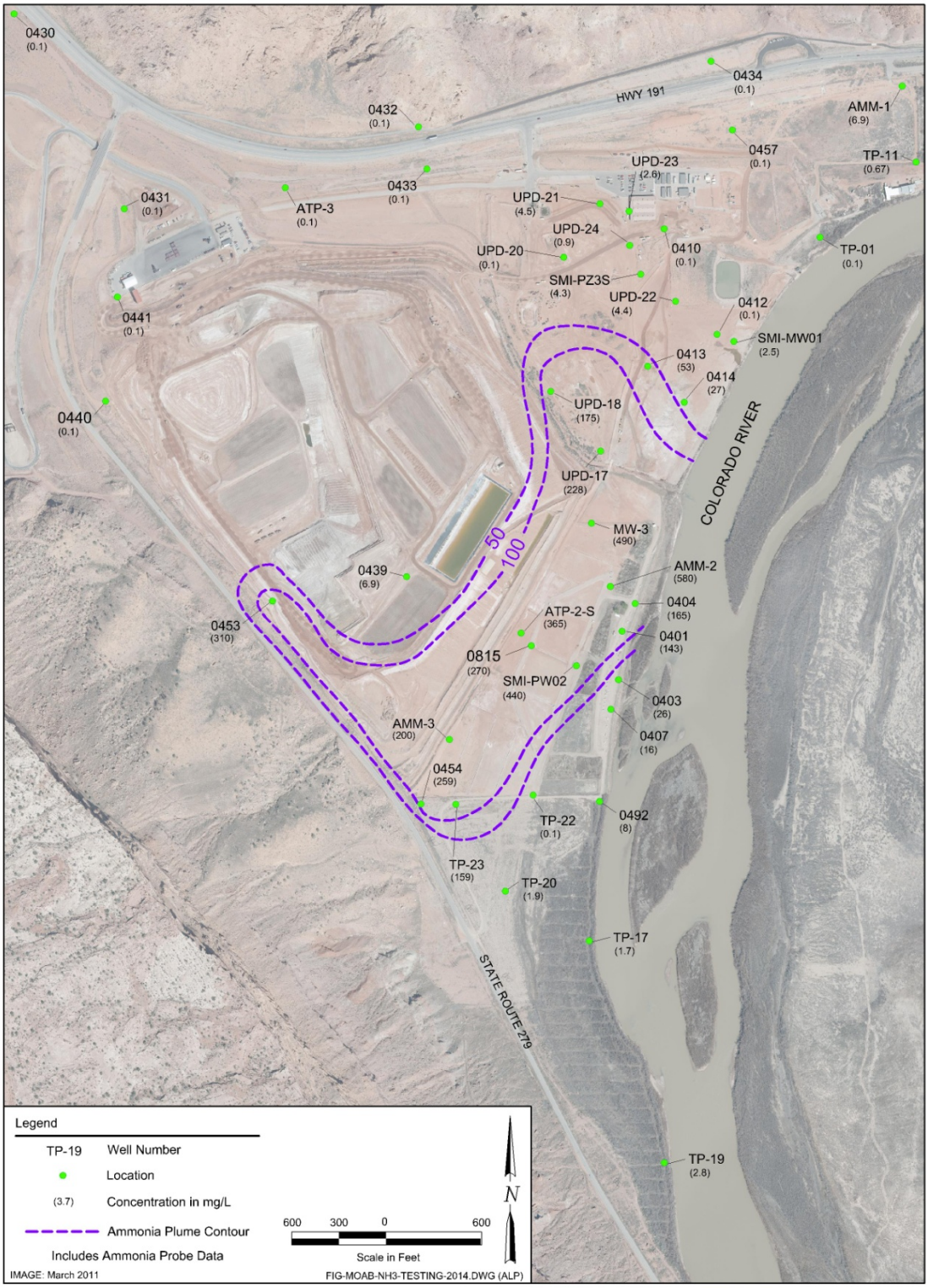


Figure 22. Location of Ammonia Plume in Shallow Ground Water, November/December 2013

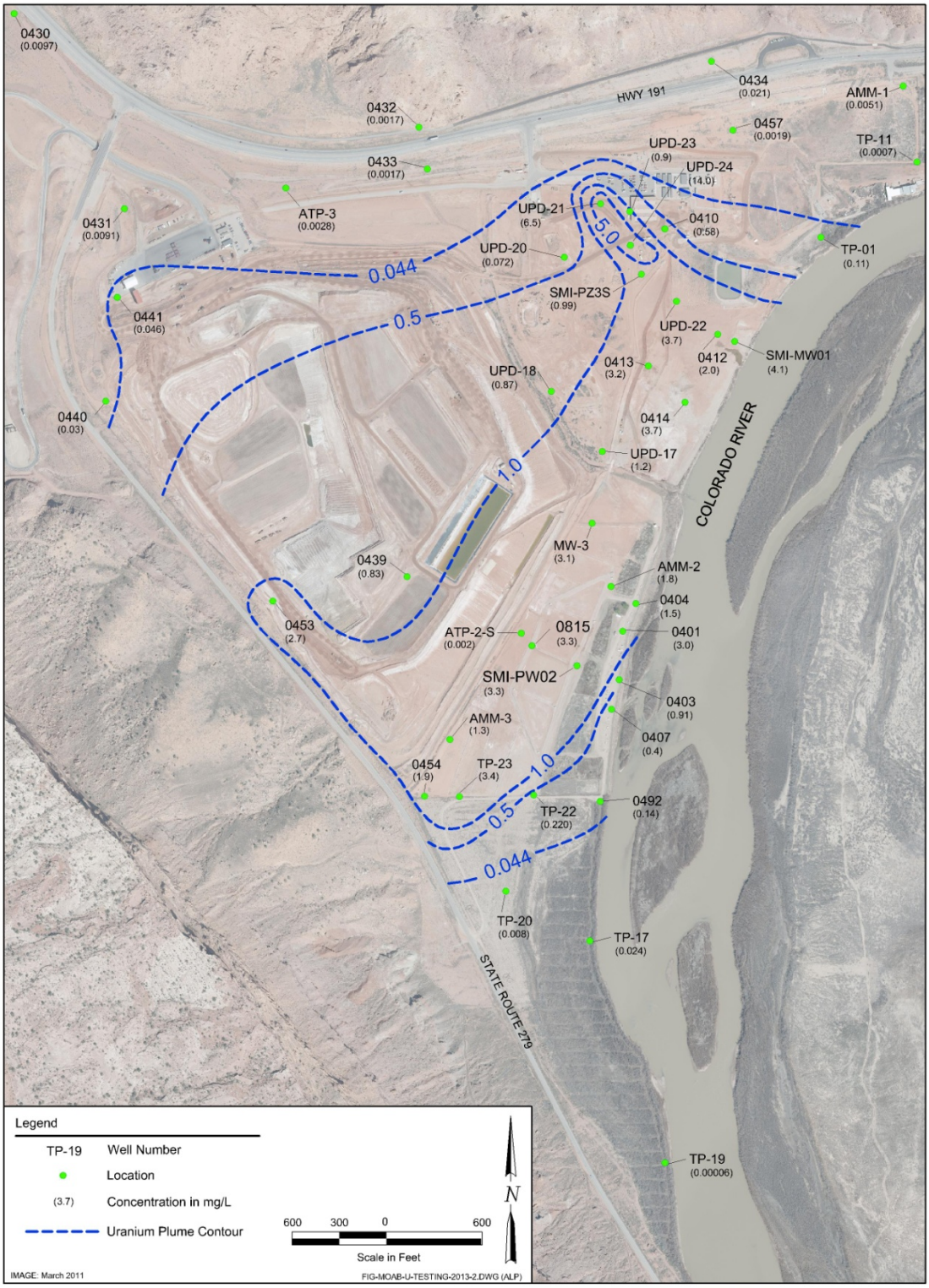


Figure 23. Location of Uranium Plume in Shallow Ground Water, November/December 2013

5.0 Conclusions

5.1 September 2013 Surface Water Sampling Event

The rationale for conducting the September 2013 surface water sampling event was to measure ammonia concentrations of the surface water contained within the Colorado River side channel located off CF4. The side channel became a habitat starting in late June 2013 and, starting in early September, heavy precipitation events increased the river flows to the point that the upstream end of the channel became connected to the main channel, and the conditions no longer met the definition of a suitable habitat. The ammonia concentrations measured did not exceed the acute criteria established by the EPA. Samples collected from four of the locations did, however, exceed the chronic criteria by less than 0.2 mg/L.

5.2 November/December 2013 Site-wide Sampling Event

The rationale for conducting the November/December 2013 site-wide sampling event was to collect data from the site when the Colorado River typically experiences base flows and to assess any changes and trends in the ground water system water chemistry. Surface water sampling was also conducted to assess surface water quality adjacent to the site compared to the upstream and downstream water quality. The following conclusions can be made from the November/December 2013 site-wide sampling event.

- In general, the ammonia and uranium concentrations did not significantly change since the previous site-wide sampling event in May/June 2013. As expected, concentrations associated with locations impacted by the river stage in particular increased as historically observed as typically seen during river base flow conditions.
- All ammonia and uranium concentrations in the site-wide wells were within 50 percent of historical ranges during this sampling event.
- All surface water samples collected during this sampling event had ammonia concentrations that were below the applicable state of EPA criteria for both acute and chronic concentrations.

6.0 References

40 CFR 192A (Code of Federal Regulations), “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings and Uranium In Situ Leaching Processing Facilities.”

DOE (U.S. Department of Energy), *Moab UMTRA Project Operations and Maintenance Manual* (DOE-EM/GJTAC1973), October 2012.

DOE (U.S. Department of Energy), *Moab UMTRA Project Surface Water/Ground Water Sampling and Analysis Plan* (DOE-EM/GJTAC1830), July 2012.

DOE (U.S. Department of Energy), *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855), September 2011.

Appendix A.
September 2013 Surface Water Sampling Event
Water Sampling Field Activities Verification
Water Quality Data
Blanks Report
Trip Report

Appendix A. Water Sampling Field Activities Verification

Sampling Event/RIN	September 2013 Surface Water Sampling Event/1309067	**Date(s) of Water Sampling**	September 30, 2013
Date(s) of Verification	March 6, 2014	**Name of Verifier**	Ken Pill

		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?	No	Additional locations were sampled based on side channel configuration.
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	Field measurements for temperature, pH, turbidity, dissolved oxygen, oxidation reduction potential, and conductivity were collected.
6.	Was the category of the well documented?	NA	All samples collected were surface water.
7.	Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged before sampling?	NA	
	Did the water level stabilize before sampling?	NA	
	Did pH, specific conductance, and turbidity measurements stabilize before sampling?	Yes	
	Was the flow rate less than 500 milliliters per minute?	NA	
	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?	NA	
	Was one pump/tubing volume removed before sampling?	NA	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	One duplicate was collected for 11 samples.
10.	Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	

Appendix A. Water Sampling Field Activities Verification (continued)

11. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA
12. Were quality-control samples assigned a fictitious site identification number?	Yes
Was the true identity of the samples recorded on the quality assurance sample log?	Yes
13. Were samples collected in the containers specified?	Yes
14. Were samples filtered and preserved as specified?	Yes
15. Were the number and types of samples collected as specified?	NA
16. Were COC records completed, and was sample custody maintained?	Yes
17. Are field data sheets signed and dated by both team members?	Yes
18. Was all other pertinent information documented on the field data sheets?	NA
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes
20. Were water levels measured at the locations specified in the planning documents?	NA

Appendix A. Water Quality Data

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0245 SURFACE LOCATION Configuration 1

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.03			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	88			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.21			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1333			#		
Temperature	C	09/30/2013	0001	0	-	0	19.53			#		

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0274 SURFACE LOCATION Configuration 4

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	1.5			#	0.1	
Ammonia Total as N	mg/L	09/30/2013	0002	0	-	0	1.5			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	7.14			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	136			#		
pH	s.u.	09/30/2013	0001	0	-	0	7.76			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1493			#		
Temperature	C	09/30/2013	0001	0	-	0	22.29			#		

Appendix A. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0278 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.53			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.06			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	91			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.19			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1389			#		
Temperature	C	09/30/2013	0001	0	-	0	23.65			#		

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0279 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.85			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.64			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	116			#		
pH	s.u.	09/30/2013	0001	0	-	0	7.96			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1424			#		
Temperature	C	09/30/2013	0001	0	-	0	19.14			#		

Appendix A. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0280 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.86			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.81			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	123			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.02			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1419			#		
Temperature	C	09/30/2013	0001	0	-	0	19.88			#		

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0281 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.87			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	4.87			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	107			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.02			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1406			#		
Temperature	C	09/30/2013	0001	0	-	0	22.15			#		

Appendix A. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: BW2C SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.12			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.19			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	101			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.11			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1338			#		
Temperature	C	09/30/2013	0001	0	-	0	20.31			#		

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: BW2D SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.23			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	100			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.13			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1333			#		
Temperature	C	09/30/2013	0001	0	-	0	19.1			#		

Appendix A. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: BW2E SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.2			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	96			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.16			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1313			#		
Temperature	C	09/30/2013	0001	0	-	0	19.74			#		

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: CR3 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.13			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	4.95			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	92			#		
pH	s.u.	09/30/2013	0001	0	-	0	8.18			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1361			#		
Temperature	C	09/30/2013	0001	0	-	0	18.38			#		

Appendix A. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: Z SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	09/30/2013	0001	0	-	0	0.88			#	0.1	
Dissolved Oxygen	mg/L	09/30/2013	0001	0	-	0	5.65			#		
Oxidation Reduction Potential	mV	09/30/2013	0001	0	-	0	127			#		
pH	s.u.	09/30/2013	0001	0	-	0	7.84			#		
Specific Conductance	umhos /cm	09/30/2013	0001	0	-	0	1429			#		
Temperature	C	09/30/2013	0001	0	-	0	19.75			#		

BLS = below land surface; 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 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Appendix A. Blanks Report

BLANKS REPORT
LAB: ALS
RIN: 1309067
Report Date: 3/5/2014

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Ammonia Total as N	MOA01	0999	09/30/2013	0001	mg/L	.1	U		.1		E

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

SAMPLE TYPES:

E	Equipment Blank.

Appendix A. September 2013 Surface Water Sampling Trip Report

DATE: January 16, 2014
TO: K. Pill
FROM: James Ritchey
SUBJECT: September 2013 Surface Water Sampling Trip Report

Site: Moab
Date of Sampling Event: September 30, 2013
Team Members: Elizabeth Moran, James Ritchey
RIN Number Assigned: All samples were assigned to RIN 1309067.
Sample Shipment: All samples were shipped in one cooler overnight UPS to ALS Laboratory from Moab, Utah on October 2, 2013 (Tracking Number 1Z5W1Y51092403756).

September 2013 Surface Water Sampling

Number of Locations Sampled: Eleven surface water samples (0245, 0274, 0278, 0279, 0280, 0281, BW2C, BW2D, BW2E, CR3, and Z), one duplicate, and one EB were collected during the September 2013 sampling event.

Locations Not Sampled: None.

Field Variance: None.

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

False ID	True ID	Sample Type	Associated matrix
2000	0274	Duplicate	Surface Water
2001	NA	Equipment Blank	De-ionized Water

Appendix A. September 2013 Surface Water Sampling Trip Report (continued)

Location-specific Information: Each surface water sample was collected using a peristaltic pump and tubing. The tubing was cleaned with soap and de-ionized water between samples. The table below provides additional information:

Sample ID	Location	Date	Comments
SEP 010	0245	09/30/2013	Turbidity is over range.
SEP 001	0274	09/30/2013	Turbidity is over range. Duplicate
SEP 009	0278	09/30/2013	Turbidity is over range.
SEP 004	0279	09/30/2013	Turbidity is over range.
SEP 002	0280	09/30/2013	Turbidity is over range.
SEP 005	0281	09/30/2013	Turbidity is over range.
SEP 006	BW2C	09/30/2013	Turbidity is over range.
SEP 007	BW2D	09/30/2013	Turbidity is over range.
SEP 008	BW2E	09/30/2013	Turbidity is over range.
SEP 011	CR3	09/30/2013	Turbidity is over range.
SEP 013	Z	09/30/2013	Turbidity is over range.

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

Date	Daily Mean Flow (cfs)
09/30/2013	4,850

cfs = cubic feet per second

Equipment Issues: None.

Corrective Action Required/Taken: None.

Appendix B.
November/December 2013 Site-wide Sampling Event
Water Sampling Field Activities Verification
Minimums and Maximums Report
Water Quality Data
Blanks Report
Water Level Data
Trip Report

Appendix B. Water Sampling Field Activities Verification

Sampling Event/RIN	November/December 2013 Site-wide Sampling Event/1311068	**Date(s) of Water Sampling**	November 4 through December 10, 2013
Date(s) of Verification	March 6, 2013	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
21. Is the Sampling Analysis Plan the primary document directing field procedures?	Yes	
List other documents, standard operating procedures, instructions.	NA	
22. Were the sampling locations specified in the planning documents sampled?	No	The following wells were not sampled: UPD-19 (well damaged) and 0411 (dry).
23. Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
24. Was an operational check of the field equipment conducted twice daily?	Yes	
Did the operational checks meet criteria?	Yes	
25. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, dissolved oxygen, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, dissolved oxygen, oxidation reduction potential, and conductivity were collected.
26. Was the category of the well documented?	Yes	
27. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged before sampling?	Yes	
Did the water level stabilize before sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize before 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	
28. 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 before sampling?	Yes	
29. Were duplicates taken at a frequency of one per 20 samples?	Yes	Four duplicates were collected for 62 samples.
30. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One EB was collected for the eight surface water samples.

Appendix B. Water Sampling Field Activities Verification (continued)

31. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA
32. 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
33. Were samples collected in the containers specified?	Yes
34. Were samples filtered and preserved as specified?	Yes
35. Were the number and types of samples collected as specified?	NA
36. Were COC records completed, and was sample custody maintained?	Yes
37. Are field data sheets signed and dated by both team members?	Yes
38. Was all other pertinent information documented on the field data sheets?	NA
39. Was the presence or absence of ice in the cooler documented at every sample location?	Yes
40. Were water levels measured at the locations specified in the planning documents?	NA

Appendix B. Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1311068
Comparison: All Historical Data
Report Date: 3/5/2014

				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	0413	11/06/2013	Ammonia Total as N	53			51			7			13	0
MOA01	0432	12/03/2013	Uranium	0.0017			0.002		F	0.0018		F	9	0
MOA01	0433	12/03/2013	Uranium	0.0017			0.0021		F	0.0018			10	0
MOA01	0435	11/21/2013	Ammonia Total as N	1.7			3.02		F	1.9		J	9	0
MOA01	0436	12/10/2013	Ammonia Total as N	3.3			950			3.4		J	12	0
MOA01	0453	11/13/2013	Uranium	2.7			2.6			0.7			9	0
MOA01	0455	12/03/2013	Uranium	0.0021			0.0053			0.0022			8	0
MOA01	ATP-2-D	11/04/2013	Uranium	0.0028			8.64			0.0029			61	0
MOA01	SMI-MW01	11/07/2013	Ammonia Total as N	2.5			2.3			0.43			11	0
MOA01	SMI-PW02	11/04/2013	Ammonia Total as N	440			4400			470		F	39	0
MOA01	SMI-PW03	12/10/2013	Ammonia Total as N	25			150		J	28		J	17	0
MOA01	SMI-PW03	12/10/2013	Uranium	0.45			2.69			0.6		J	17	0
MOA01	SMI-PZ2D	11/06/2013	Ammonia Total as N	340			4220			400			12	0
MOA01	SMI-PZ2D	11/06/2013	Uranium	0.24			3.03			0.34			12	0
MOA01	SMI-PZ2M2	11/06/2013	Uranium	0.5			2.2			0.68			7	0
MOA01	SMI-PZ2M2	11/06/2013	Uranium	0.52			2.2			0.68			7	0
MOA01	SMI-PZ3D2	12/10/2013	Uranium	1			7			1.1			19	0
MOA01	SMI-PZ3M	12/10/2013	Ammonia Total as N	34			84			38			12	0

Appendix B. Minimums and Maximums Report (continued)

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1311068
Comparison: All Historical Data
Report Date: 3/5/2014

				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	SMI-PZ3M	12/10/2013	Ammonia Total as N	35			84			38			12	0
MOA01	SMI-PZ3S	12/10/2013	Uranium	0.99			3.24		F	1			16	0
MOA01	TP-11	11/25/2013	Uranium	0.00073			0.002			0.00079	B	F	8	0
MOA01	TP-19	11/20/2013	Ammonia Total as N	2.8			10.2			3			28	0
MOA01	UPD-18	12/10/2013	Uranium	0.87			1.4			0.9			5	0
MOA01	UPD-20	12/10/2013	Uranium	0.072			0.97			0.08			5	0

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

Appendix B. Water Quality Data

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0201 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/19/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/19/2013	0001	0 - 0	13.68			#		
Oxidation Reduction Potential	mV	11/19/2013	0001	0 - 0	60			#		
pH	s.u.	11/19/2013	0001	0 - 0	7.19			#		
Specific Conductance	umhos /cm	11/19/2013	0001	0 - 0	1410			#		
Temperature	C	11/19/2013	0001	0 - 0	5.96			#		
Turbidity	NTU	11/19/2013	0001	0 - 0	11.4			#		
Uranium	mg/L	11/19/2013	0001	0 - 0	0.0048			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0218 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/19/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/19/2013	0001	0 - 0	13.99			#		
Oxidation Reduction Potential	mV	11/19/2013	0001	0 - 0	31.2			#		
pH	s.u.	11/19/2013	0001	0 - 0	7.89			#		
Specific Conductance	umhos /cm	11/19/2013	0001	0 - 0	1435			#		
Temperature	C	11/19/2013	0001	0 - 0	6.47			#		
Turbidity	NTU	11/19/2013	0001	0 - 0	113			#		
Uranium	mg/L	11/19/2013	0001	0 - 0	0.0053			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0226 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/20/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/20/2013	0001	0 - 0	8.51			#		
Oxidation Reduction Potential	mV	11/20/2013	0001	0 - 0	-60			#		
pH	s.u.	11/20/2013	0001	0 - 0	8.3			#		
Specific Conductance	umhos /cm	11/20/2013	0001	0 - 0	1812			#		
Temperature	C	11/20/2013	0001	0 - 0	5.96			#		
Turbidity	NTU	11/20/2013	0001	0 - 0	25			#		
Uranium	mg/L	11/20/2013	0001	0 - 0	0.0053			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0228 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/20/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/20/2013	0001	0 - 0	9.89			#		
Oxidation Reduction Potential	mV	11/20/2013	0001	0 - 0	-207			#		
pH	s.u.	11/20/2013	0001	0 - 0	8.4			#		
Specific Conductance	umhos /cm	11/20/2013	0001	0 - 0	1790			#		
Temperature	C	11/20/2013	0001	0 - 0	6.18			#		
Turbidity	NTU	11/20/2013	0001	0 - 0	12.3			#		
Uranium	mg/L	11/20/2013	0001	0 - 0	0.0052			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0401 WELL Configuration 2

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/26/2013	0001	18	-	2.59			#		
Oxidation Reduction Potential	mV	11/26/2013	0001	18	-	39			#		
pH	s.u.	11/26/2013	0001	18	-	6.76			#		
Specific Conductance	umhos /cm	11/26/2013	0001	18	-	15165			#		
Temperature	C	11/26/2013	0001	18	-	17.92			#		
Turbidity	NTU	11/26/2013	0001	18	-	1.85			#		
Uranium	mg/L	11/26/2013	0001	18	-	3			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0403 WELL Configuration 1

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/25/2013	0001	18	-	6.64			#		
Oxidation Reduction Potential	mV	11/25/2013	0001	18	-	8			#		
pH	s.u.	11/25/2013	0001	18	-	6.83			#		
Specific Conductance	umhos /cm	11/25/2013	0001	18	-	5551			#		
Temperature	C	11/25/2013	0001	18	-	16.73			#		
Turbidity	NTU	11/25/2013	0001	18	-	2.27			#		
Uranium	mg/L	11/25/2013	0001	18	-	0.91			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0404 WELL Configuration 3

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/26/2013	0001	18	-	2.67			#		
Oxidation Reduction Potential	mV	11/26/2013	0001	18	-	19			#		
pH	s.u.	11/26/2013	0001	18	-	6.83			#		
Specific Conductance	umhos /cm	11/26/2013	0001	18	-	13027			#		
Temperature	C	11/26/2013	0001	18	-	17.21			#		
Turbidity	NTU	11/26/2013	0001	18	-	2.26			#		
Uranium	mg/L	11/26/2013	0001	18	-	1.5			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0407 WELL Configuration 1

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/25/2013	0001	17	-	5.3			#		
Oxidation Reduction Potential	mV	11/25/2013	0001	17	-	-4			#		
pH	s.u.	11/25/2013	0001	17	-	6.99			#		
Specific Conductance	umhos /cm	11/25/2013	0001	17	-	4200			#		
Temperature	C	11/25/2013	0001	17	-	17.45			#		
Turbidity	NTU	11/25/2013	0001	17	-	1.83			#		
Uranium	mg/L	11/25/2013	0001	17	-	0.4			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0410 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	25	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/10/2013	0001	25	-	5.59			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	25	-	186.4			#		
pH	s.u.	12/10/2013	0001	25	-	7.07			#		
Specific Conductance	umhos /cm	12/10/2013	0001	25	-	3196			#		
Temperature	C	12/10/2013	0001	25	-	13.22			#		
Turbidity	NTU	12/10/2013	0001	25	-	26.3			#		
Uranium	mg/L	12/10/2013	0001	25	-	0.58			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0412 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/07/2013	0001	9.5	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/07/2013	0001	9.5	-	2.54			#		
Oxidation Reduction Potential	mV	11/07/2013	0001	9.5	-	108			#		
pH	s.u.	11/07/2013	0001	9.5	-	6.77			#		
Specific Conductance	umhos /cm	11/07/2013	0001	9.5	-	2372			#		
Temperature	C	11/07/2013	0001	9.5	-	18.02			#		
Turbidity	NTU	11/07/2013	0001	9.5	-	51.5			#		
Uranium	mg/L	11/07/2013	0001	9.5	-	2		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0413 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/06/2013	0001	10.5	-	53			#	2	
Dissolved Oxygen	mg/L	11/06/2013	0001	10.5	-	1.96			#		
Oxidation Reduction Potential	mV	11/06/2013	0001	10.5	-	49.1			#		
pH	s.u.	11/06/2013	0001	10.5	-	7.48			#		
Specific Conductance	umhos /cm	11/06/2013	0001	10.5	-	5598			#		
Temperature	C	11/06/2013	0001	10.5	-	18.37			#		
Turbidity	NTU	11/06/2013	0001	10.5	-	2.76			#		
Uranium	mg/L	11/06/2013	0001	10.5	-	3.2		J	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0414 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/07/2013	0001	7.5	-	27			#	2	
Dissolved Oxygen	mg/L	11/07/2013	0001	7.5	-	0.35			#		
Oxidation Reduction Potential	mV	11/07/2013	0001	7.5	-	-71			#		
pH	s.u.	11/07/2013	0001	7.5	-	7			#		
Specific Conductance	umhos /cm	11/07/2013	0001	7.5	-	10028			#		
Temperature	C	11/07/2013	0001	7.5	-	17.13			#		
Turbidity	NTU	11/07/2013	0001	7.5	-	1.05			#		
Uranium	mg/L	11/07/2013	0001	7.5	-	3.7		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0430 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/02/2013	0001	101	-	0.1	U		#	0.1	
Ammonia Total as N	mg/L	12/02/2013	0002	101	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/02/2013	0001	101	-	0.89			#		
Oxidation Reduction Potential	mV	12/02/2013	0001	101	-	-9			#		
pH	s.u.	12/02/2013	0001	101	-	7.28			#		
Specific Conductance	umhos /cm	12/02/2013	0001	101	-	6643			#		
Temperature	C	12/02/2013	0001	101	-	17.75			#		
Turbidity	NTU	12/02/2013	0001	101	-	1.85			#		
Uranium	mg/L	12/02/2013	0001	101	-	0.0097			#	0.000029	
Uranium	mg/L	12/02/2013	0002	101	-	0.0096			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0431 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/14/2013	0001	91	-	0.1	U		#	0.1	
Ammonia Total as N	mg/L	11/14/2013	0002	91	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/14/2013	0001	91	-	2.08			#		
Oxidation Reduction Potential	mV	11/14/2013	0001	91	-	-44.1			#		
pH	s.u.	11/14/2013	0001	91	-	6.71			#		
Specific Conductance	umhos /cm	11/14/2013	0001	91	-	35167			#		
Temperature	C	11/14/2013	0001	91	-	18.77			#		
Turbidity	NTU	11/14/2013	0001	91	-	1.06			#		
Uranium	mg/L	11/14/2013	0001	91	-	0.0091			#	0.000029	
Uranium	mg/L	11/14/2013	0002	91	-	0.0093			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0432 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	55	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	55	-	2.57			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	55	-	27			#		
pH	s.u.	12/03/2013	0001	55	-	7.15			#		
Specific Conductance	umhos /cm	12/03/2013	0001	55	-	5545			#		
Temperature	C	12/03/2013	0001	55	-	18.54			#		
Turbidity	NTU	12/03/2013	0001	55	-	1.3			#		
Uranium	mg/L	12/03/2013	0001	55	-	0.0017			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0433 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	99	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	99	-	2.14			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	99	-	-33.7			#		
pH	s.u.	12/03/2013	0001	99	-	7.4			#		
Specific Conductance	umhos /cm	12/03/2013	0001	99	-	4738			#		
Temperature	C	12/03/2013	0001	99	-	18.1			#		
Turbidity	NTU	12/03/2013	0001	99	-	2.96			#		
Uranium	mg/L	12/03/2013	0001	99	-	0.0017			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0434 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	35	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	35	-	0.18			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	35	-	-82			#		
pH	s.u.	12/03/2013	0001	35	-	6.96			#		
Specific Conductance	umhos /cm	12/03/2013	0001	35	-	45948			#		
Temperature	C	12/03/2013	0001	35	-	18.33			#		
Turbidity	NTU	12/03/2013	0001	35	-	6.83			#		
Uranium	mg/L	12/03/2013	0001	35	-	0.021			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0435 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/21/2013	0001	173	-	1.7			#	0.1	
Dissolved Oxygen	mg/L	11/21/2013	0001	173	-	0.64			#		
Oxidation Reduction Potential	mV	11/21/2013	0001	173	-	-197			#		
pH	s.u.	11/21/2013	0001	173	-	6.78			#		
Specific Conductance	umhos /cm	11/21/2013	0001	173	-	115758			#		
Temperature	C	11/21/2013	0001	173	-	16.39			#		
Turbidity	NTU	11/21/2013	0001	173	-	9.5			#		
Uranium	mg/L	11/21/2013	0001	173	-	0.023			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0436 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	197	-	3.3			#	0.1	
Dissolved Oxygen	mg/L	12/10/2013	0001	197	-	0.16			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	197	-	-2050			#		
pH	s.u.	12/10/2013	0001	197	-	7.04			#		
Specific Conductance	umhos /cm	12/10/2013	0001	197	-	128061			#		
Temperature	C	12/10/2013	0001	197	-	16.45			#		
Turbidity	NTU	12/10/2013	0001	197	-	7.64			#		
Uranium	mg/L	12/10/2013	0001	197	-	0.008			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0439 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/13/2013	0001	118	-	6.9			#	0.5	
Dissolved Oxygen	mg/L	11/13/2013	0001	118	-	5.31			#		
Oxidation Reduction Potential	mV	11/13/2013	0001	118	-	39.9			#		
pH	s.u.	11/13/2013	0001	118	-	6.52			#		
Specific Conductance	umhos /cm	11/13/2013	0001	118	-	32062			#		
Temperature	C	11/13/2013	0001	118	-	15.95			#		
Turbidity	NTU	11/13/2013	0001	118	-	1.63			#		
Uranium	mg/L	11/13/2013	0001	118	-	0.83			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0440 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/13/2013	0001	117	-	0.28			#		
Oxidation Reduction Potential	mV	11/13/2013	0001	117	-	45.6			#		
pH	s.u.	11/13/2013	0001	117	-	6.92			#		
Specific Conductance	umhos /cm	11/13/2013	0001	117	-	24715			#		
Temperature	C	11/13/2013	0001	117	-	17.78			#		
Turbidity	NTU	11/13/2013	0001	117	-	50.8			#		
Uranium	mg/L	11/13/2013	0001	117	-	0.03			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0441 WELL Queue/Support Area

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	53	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	53	-	1.59			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	53	-	-47.9			#		
pH	s.u.	12/03/2013	0001	53	-	7.08			#		
Specific Conductance	umhos /cm	12/03/2013	0001	53	-	10181			#		
Temperature	C	12/03/2013	0001	53	-	16.95			#		
Turbidity	NTU	12/03/2013	0001	53	-	5.83			#		
Uranium	mg/L	12/03/2013	0001	53	-	0.046			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0443 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/14/2013	0001	73	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/14/2013	0001	73	-	1.86			#		
Oxidation Reduction Potential	mV	11/14/2013	0001	73	-	6.8			#		
pH	s.u.	11/14/2013	0001	73	-	7.08			#		
Specific Conductance	umhos /cm	11/14/2013	0001	73	-	6324			#		
Temperature	C	11/14/2013	0001	73	-	18.64			#		
Turbidity	NTU	11/14/2013	0001	73	-	2.92			#		
Uranium	mg/L	11/14/2013	0001	73	-	0.01			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0444 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/21/2013	0001	116	-	1.5			#	0.1	
Dissolved Oxygen	mg/L	11/21/2013	0001	116	-	0.41			#		
Oxidation Reduction Potential	mV	11/21/2013	0001	116	-	-143			#		
pH	s.u.	11/21/2013	0001	116	-	6.56			#		
Specific Conductance	umhos /cm	11/21/2013	0001	116	-	116224			#		
Temperature	C	11/21/2013	0001	116	-	16.45			#		
Turbidity	NTU	11/21/2013	0001	116	-	4.86			#		
Uranium	mg/L	11/21/2013	0001	116	-	0.015			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0453 WELL Contaminated Area

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/13/2013	0001	80	-	310			#	10	
Dissolved Oxygen	mg/L	11/13/2013	0001	80	-	1.17			#		
Oxidation Reduction Potential	mV	11/13/2013	0001	80	-	34			#		
pH	s.u.	11/13/2013	0001	80	-	6.77			#		
Specific Conductance	umhos /cm	11/13/2013	0001	80	-	57595			#		
Temperature	C	11/13/2013	0001	80	-	16.9			#		
Turbidity	NTU	11/13/2013	0001	80	-	3.3			#		
Uranium	mg/L	11/13/2013	0001	80	-	2.7			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0454 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/05/2013	0001	13	-	0.61			#		
Oxidation Reduction Potential	mV	11/05/2013	0001	13	-	38			#		
pH	s.u.	11/05/2013	0001	13	-	6.77			#		
Specific Conductance	umhos /cm	11/05/2013	0001	13	-	54567			#		
Temperature	C	11/05/2013	0001	13	-	19.16			#		
Turbidity	NTU	11/05/2013	0001	13	-	4.07			#		
Uranium	mg/L	11/05/2013	0001	13	-	1.9		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0455 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	46	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	46	-	0.94			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	46	-	-53.9			#		
pH	s.u.	12/03/2013	0001	46	-	7.45			#		
Specific Conductance	umhos /cm	12/03/2013	0001	46	-	2984			#		
Temperature	C	12/03/2013	0001	46	-	17.75			#		
Uranium	mg/L	12/03/2013	0001	46	-	0.0021			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0456 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/03/2013	0001	53	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/03/2013	0001	53	-	3.22			#		
Oxidation Reduction Potential	mV	12/03/2013	0001	53	-	-50			#		
pH	s.u.	12/03/2013	0001	53	-	7.47			#		
Specific Conductance	umhos /cm	12/03/2013	0001	53	-	8247			#		
Temperature	C	12/03/2013	0001	53	-	17.67			#		
Uranium	mg/L	12/03/2013	0001	53	-	0.027			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0457 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/21/2013	0001	29	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/21/2013	0001	29	-	0.89			#		
Oxidation Reduction Potential	mV	11/21/2013	0001	29	-	-132			#		
pH	s.u.	11/21/2013	0001	29	-	7.74			#		
Specific Conductance	umhos /cm	11/21/2013	0001	29	-	5482			#		
Temperature	C	11/21/2013	0001	29	-	16.92			#		
Turbidity	NTU	11/21/2013	0001	29	-	3.17			#		
Uranium	mg/L	11/21/2013	0001	29	-	0.0019			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0492 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/05/2013	0001	18	-	8			#	0.2	
Dissolved Oxygen	mg/L	11/05/2013	0001	18	-	5.17			#		
Oxidation Reduction Potential	mV	11/05/2013	0001	18	-	5.7			#		
pH	s.u.	11/05/2013	0001	18	-	6.85			#		
Specific Conductance	umhos /cm	11/05/2013	0001	18	-	2776			#		
Temperature	C	11/05/2013	0001	18	-	17.74			#		
Turbidity	NTU	11/05/2013	0001	18	-	3.79			#		
Uranium	mg/L	11/05/2013	0001	18	-	0.14		J	#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: 0815 WELL Configuration 5

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/04/2013	0001	21.7	-	51.7	270			#	10	
Dissolved Oxygen	mg/L	11/04/2013	0001	21.7	-	51.7	0.86			#		
Oxidation Reduction Potential	mV	11/04/2013	0001	21.7	-	51.7	200			#		
pH	s.u.	11/04/2013	0001	21.7	-	51.7	6.56			#		
Specific Conductance	umhos /cm	11/04/2013	0001	21.7	-	51.7	25302			#		
Temperature	C	11/04/2013	0001	21.7	-	51.7	17.4			#		
Turbidity	NTU	11/04/2013	0001	21.7	-	51.7	2.09			#		
Uranium	mg/L	11/04/2013	0001	21.7	-	51.7	3.3		J	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: AMM-1 WELL NE corner of DOE property.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/21/2013	0001	19	-		0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/21/2013	0001	19	-		1.22			#		
Oxidation Reduction Potential	mV	11/21/2013	0001	19	-		39			#		
pH	s.u.	11/21/2013	0001	19	-		6.7			#		
Specific Conductance	umhos /cm	11/21/2013	0001	19	-		12204			#		
Temperature	C	11/21/2013	0001	19	-		17.6			#		
Turbidity	NTU	11/21/2013	0001	19	-		5.89			#		
Uranium	mg/L	11/21/2013	0001	19	-		0.0051			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: AMM-2 WELL East of pile along road.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/04/2013	0001	48	-	580			#	20	
Dissolved Oxygen	mg/L	11/04/2013	0001	48	-	0.97			#		
Oxidation Reduction Potential	mV	11/04/2013	0001	48	-	108			#		
pH	s.u.	11/04/2013	0001	48	-	6.58			#		
Specific Conductance	umhos /cm	11/04/2013	0001	48	-	18037			#		
Temperature	C	11/04/2013	0001	48	-	16.34			#		
Turbidity	NTU	11/04/2013	0001	48	-	20.1			#		
Uranium	mg/L	11/04/2013	0001	48	-	1.8		J	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: AMM-3 WELL Near SE corner of pile.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/05/2013	0001	48	-	200			#	10	
Dissolved Oxygen	mg/L	11/05/2013	0001	48	-	0.51			#		
Oxidation Reduction Potential	mV	11/05/2013	0001	48	-	-117			#		
pH	s.u.	11/05/2013	0001	48	-	6.8			#		
Specific Conductance	umhos /cm	11/05/2013	0001	48	-	18230			#		
Temperature	C	11/05/2013	0001	48	-	20.08			#		
Turbidity	NTU	11/05/2013	0001	48	-	5.46			#		
Uranium	mg/L	11/05/2013	0001	48	-	1.3		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: ATP-2-D WELL Piezometer; see boring ATP-2

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/04/2013	0001	88	-	0.43			#		
Oxidation Reduction Potential	mV	11/04/2013	0001	88	-	-266			#		
pH	s.u.	11/04/2013	0001	88	-	8.1			#		
Specific Conductance	umhos /cm	11/04/2013	0001	88	-	118294			#		
Temperature	C	11/04/2013	0001	88	-	17.35			#		
Turbidity	NTU	11/04/2013	0001	88	-	9.31			#		
Uranium	mg/L	11/04/2013	0001	88	-	0.0028		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: ATP-2-S WELL Piezometer; see boring ATP-2

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/04/2013	0001	25	-	2.87			#		
Oxidation Reduction Potential	mV	11/04/2013	0001	25	-	-113			#		
pH	s.u.	11/04/2013	0001	25	-	9			#		
Specific Conductance	umhos /cm	11/04/2013	0001	25	-	16166			#		
Temperature	C	11/04/2013	0001	25	-	17.25			#		
Turbidity	NTU	11/04/2013	0001	25	-	9.38			#		
Uranium	mg/L	11/04/2013	0001	25	-	0.0022		J	#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: ATP-3 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/02/2013	0001	51	-		0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/02/2013	0001	51	-		1.52			#		
Oxidation Reduction Potential	mV	12/02/2013	0001	51	-		8			#		
pH	s.u.	12/02/2013	0001	51	-		7.4			#		
Specific Conductance	umhos /cm	12/02/2013	0001	51	-		2617			#		
Temperature	C	12/02/2013	0001	51	-		18.53			#		
Turbidity	NTU	12/02/2013	0001	51	-		6.49			#		
Uranium	mg/L	12/02/2013	0001	51	-		0.0028			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: CR1 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/19/2013	0001	0	-	0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/19/2013	0001	0	-	0	13.9			#		
Oxidation Reduction Potential	mV	11/19/2013	0001	0	-	0	56			#		
pH	s.u.	11/19/2013	0001	0	-	0	7.1			#		
Specific Conductance	umhos /cm	11/19/2013	0001	0	-	0	1556			#		
Temperature	C	11/19/2013	0001	0	-	0	5.65			#		
Turbidity	NTU	11/19/2013	0001	0	-	0	8.91			#		
Uranium	mg/L	11/19/2013	0001	0	-	0	0.0048			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: CR2 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/19/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/19/2013	0001	0 - 0	15.3			#		
Oxidation Reduction Potential	mV	11/19/2013	0001	0 - 0	37			#		
pH	s.u.	11/19/2013	0001	0 - 0	7.98			#		
Specific Conductance	umhos /cm	11/19/2013	0001	0 - 0	1428			#		
Temperature	C	11/19/2013	0001	0 - 0	6.85			#		
Turbidity	NTU	11/19/2013	0001	0 - 0	22.5			#		
Uranium	mg/L	11/19/2013	0001	0 - 0	0.0075			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: CR3 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/20/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/20/2013	0001	0 - 0	14.41			#		
Oxidation Reduction Potential	mV	11/20/2013	0001	0 - 0	-39			#		
pH	s.u.	11/20/2013	0001	0 - 0	8.32			#		
Specific Conductance	umhos /cm	11/20/2013	0001	0 - 0	1472			#		
Temperature	C	11/20/2013	0001	0 - 0	6.97			#		
Turbidity	NTU	11/20/2013	0001	0 - 0	552			#		
Uranium	mg/L	11/20/2013	0001	0 - 0	0.0057			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: CR5 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/19/2013	0001	0 - 0	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/19/2013	0001	0 - 0	13.49			#		
Oxidation Reduction Potential	mV	11/19/2013	0001	0 - 0	50			#		
pH	s.u.	11/19/2013	0001	0 - 0	7.68			#		
Specific Conductance	umhos /cm	11/19/2013	0001	0 - 0	1398			#		
Temperature	C	11/19/2013	0001	0 - 0	6.06			#		
Turbidity	NTU	11/19/2013	0001	0 - 0	11.7			#		
Uranium	mg/L	11/19/2013	0001	0 - 0	0.005			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: MW-3 WELL See borehole 8

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/06/2013	0001	44 -	490			#	20	
Dissolved Oxygen	mg/L	11/06/2013	0001	44 -	2.65			#		
Oxidation Reduction Potential	mV	11/06/2013	0001	44 -	55.5			#		
pH	s.u.	11/06/2013	0001	44 -	6.69			#		
Specific Conductance	umhos /cm	11/06/2013	0001	44 -	29420			#		
Temperature	C	11/06/2013	0001	44 -	17.69			#		
Turbidity	NTU	11/06/2013	0001	44 -	5.77			#		
Uranium	mg/L	11/06/2013	0001	44 -	3.1		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-MW01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/07/2013	0001	16	-	2.5			#	0.1	
Dissolved Oxygen	mg/L	11/07/2013	0001	16	-	0.35			#		
Oxidation Reduction Potential	mV	11/07/2013	0001	16	-	42			#		
pH	s.u.	11/07/2013	0001	16	-	6.98			#		
Specific Conductance	umhos /cm	11/07/2013	0001	16	-	5607			#		
Temperature	C	11/07/2013	0001	16	-	18.23			#		
Turbidity	NTU	11/07/2013	0001	16	-	24			#		
Uranium	mg/L	11/07/2013	0001	16	-	4.1		J	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PW02 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/04/2013	0001	20.04	60.04	440			#	20	
Dissolved Oxygen	mg/L	11/04/2013	0001	20.04	60.04	2.02			#		
Oxidation Reduction Potential	mV	11/04/2013	0001	20.04	60.04	139			#		
pH	s.u.	11/04/2013	0001	20.04	60.04	6.9			#		
Specific Conductance	umhos /cm	11/04/2013	0001	20.04	60.04	29848			#		
Temperature	C	11/04/2013	0001	20.04	60.04	16.08			#		
Turbidity	NTU	11/04/2013	0001	20.04	60.04	0.83			#		
Uranium	mg/L	11/04/2013	0001	20.04	60.04	3.3		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PW03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	60	-	25			#	2	
Dissolved Oxygen	mg/L	12/10/2013	0001	60	-	0.66			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	60	-	-39.6			#		
pH	s.u.	12/10/2013	0001	60	-	7.46			#		
Specific Conductance	umhos /cm	12/10/2013	0001	60	-	9643			#		
Temperature	C	12/10/2013	0001	60	-	14.34			#		
Turbidity	NTU	12/10/2013	0001	60	-	244			#		
Uranium	mg/L	12/10/2013	0001	60	-	0.45			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PZ2D WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/06/2013	0001	75	-	340			#	50	
Dissolved Oxygen	mg/L	11/06/2013	0001	75	-	0.32			#		
Oxidation Reduction Potential	mV	11/06/2013	0001	75	-	82.8			#		
pH	s.u.	11/06/2013	0001	75	-	6.69			#		
Specific Conductance	umhos /cm	11/06/2013	0001	75	-	127309			#		
Temperature	C	11/06/2013	0001	75	-	16.51			#		
Turbidity	NTU	11/06/2013	0001	75	-	4.14			#		
Uranium	mg/L	11/06/2013	0001	75	-	0.24		J	#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PZ2M2 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/06/2013	0001	56	-	470		J	#	20	
Ammonia Total as N	mg/L	11/06/2013	0002	56	-	450		J	#	20	
Dissolved Oxygen	mg/L	11/06/2013	0001	56	-	0.51			#		
Oxidation Reduction Potential	mV	11/06/2013	0001	56	-	17.6			#		
pH	s.u.	11/06/2013	0001	56	-	6.6			#		
Specific Conductance	umhos /cm	11/06/2013	0001	56	-	119674			#		
Temperature	C	11/06/2013	0001	56	-	16.75			#		
Turbidity	NTU	11/06/2013	0001	56	-	5.59			#		
Uranium	mg/L	11/06/2013	0001	56	-	0.52			#	0.000029	
Uranium	mg/L	11/06/2013	0002	56	-	0.5			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PZ3D2 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	12/10/2013	0001	78	-	0.67			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	78	-	-5.4			#		
pH	s.u.	12/10/2013	0001	78	-	7			#		
Specific Conductance	umhos /cm	12/10/2013	0001	78	-	20460			#		
Temperature	C	12/10/2013	0001	78	-	15.49			#		
Turbidity	NTU	12/10/2013	0001	78	-	2.61			#		
Uranium	mg/L	12/10/2013	0001	78	-	1			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PZ3M WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	59	-	34			#	2	
Ammonia Total as N	mg/L	12/10/2013	0002	59	-	35			#	2	
Dissolved Oxygen	mg/L	12/10/2013	0001	59	-	0.26			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	59	-	-52.1			#		
pH	s.u.	12/10/2013	0001	59	-	7.4			#		
Specific Conductance	umhos /cm	12/10/2013	0001	59	-	9026			#		
Temperature	C	12/10/2013	0001	59	-	17.4			#		
Turbidity	NTU	12/10/2013	0001	59	-	7.62			#		
Uranium	mg/L	12/10/2013	0001	59	-	0.65			#	0.00029	
Uranium	mg/L	12/10/2013	0002	59	-	0.64			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: SMI-PZ3S WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	25	-	4.3			#	0.1	
Dissolved Oxygen	mg/L	12/10/2013	0001	25	-	0.3			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	25	-	-37.3			#		
pH	s.u.	12/10/2013	0001	25	-	7.99			#		
Specific Conductance	umhos /cm	12/10/2013	0001	25	-	4661			#		
Temperature	C	12/10/2013	0001	25	-	17.94			#		
Turbidity	NTU	12/10/2013	0001	25	-	3.18			#		
Uranium	mg/L	12/10/2013	0001	25	-	0.99			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-01 WELL Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/25/2013	0001	22	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	11/25/2013	0001	22	-	3.45			#		
Oxidation Reduction Potential	mV	11/25/2013	0001	22	-	-86			#		
pH	s.u.	11/25/2013	0001	22	-	7.61			#		
Specific Conductance	umhos /cm	11/25/2013	0001	22	-	6660			#		
Temperature	C	11/25/2013	0001	22	-	15.51			#		
Turbidity	NTU	11/25/2013	0001	22	-	6.11			#		
Uranium	mg/L	11/25/2013	0001	22	-	0.11			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-11 WELL Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98);PWC_Moab.mdb chemistry data in both HLA Surface_Water and HLA Groundwater tables

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/25/2013	0001	30	-	0.67			#	0.1	
Dissolved Oxygen	mg/L	11/25/2013	0001	30	-	2.09			#		
Oxidation Reduction Potential	mV	11/25/2013	0001	30	-	-70			#		
pH	s.u.	11/25/2013	0001	30	-	7.33			#		
Specific Conductance	umhos /cm	11/25/2013	0001	30	-	18645			#		
Temperature	C	11/25/2013	0001	30	-	16.16			#		
Turbidity	NTU	11/25/2013	0001	30	-	31.7			#		
Uranium	mg/L	11/25/2013	0001	30	-	0.00073			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-17 WELL Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/20/2013	0001	28	-	0.27			#		
Oxidation Reduction Potential	mV	11/20/2013	0001	28	-	-128			#		
pH	s.u.	11/20/2013	0001	28	-	6.63			#		
Specific Conductance	umhos /cm	11/20/2013	0001	28	-	100316			#		
Temperature	C	11/20/2013	0001	28	-	14.11			#		
Turbidity	NTU	11/20/2013	0001	28	-	51.3			#		
Uranium	mg/L	11/20/2013	0001	28	-	0.024			#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-19 WELL Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98);PWC_Moab.mdb chemistry data in both HLA Surface_Water and HLA Groundwater tables

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/20/2013	0001	29	-	2.8			#	0.1	
Dissolved Oxygen	mg/L	11/20/2013	0001	29	-	-0.3			#		
Oxidation Reduction Potential	mV	11/20/2013	0001	29	-	-315			#		
pH	s.u.	11/20/2013	0001	29	-	6.53			#		
Specific Conductance	umhos /cm	11/20/2013	0001	29	-	129474			#		
Temperature	C	11/20/2013	0001	29	-	14.63			#		
Turbidity	NTU	11/20/2013	0001	29	-	7.77			#		
Uranium	mg/L	11/20/2013	0001	29	-	0.00006	B		#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-20 WELL Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/05/2013	0001	32	-	3.4			#	0.1	
Dissolved Oxygen	mg/L	11/05/2013	0001	32	-	0.35			#		
Oxidation Reduction Potential	mV	11/05/2013	0001	32	-	-218			#		
pH	s.u.	11/05/2013	0001	32	-	7.02			#		
Specific Conductance	umhos /cm	11/05/2013	0001	32	-	126792			#		
Temperature	C	11/05/2013	0001	32	-	17.43			#		
Turbidity	NTU	11/05/2013	0001	32	-	3.94			#		
Uranium	mg/L	11/05/2013	0001	32	-	0.0078		J	#	0.000029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-22 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/06/2013	0001	17	-	3.77			#		
Oxidation Reduction Potential	mV	11/06/2013	0001	17	-	90.6			#		
pH	s.u.	11/06/2013	0001	17	-	6.75			#		
Specific Conductance	umhos /cm	11/06/2013	0001	17	-	27065			#		
Temperature	C	11/06/2013	0001	17	-	16.73			#		
Turbidity	NTU	11/06/2013	0001	17	-	34.5			#		
Uranium	mg/L	11/06/2013	0001	17	-	0.22		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: TP-23 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/05/2013	0001	25	-	190			#	5	
Dissolved Oxygen	mg/L	11/05/2013	0001	25	-	2.24			#		
Oxidation Reduction Potential	mV	11/05/2013	0001	25	-	-0.5			#		
pH	s.u.	11/05/2013	0001	25	-	6.72			#		
Specific Conductance	umhos /cm	11/05/2013	0001	25	-	50885			#		
Temperature	C	11/05/2013	0001	25	-	19.74			#		
Turbidity	NTU	11/05/2013	0001	25	-	91.6			#		
Uranium	mg/L	11/05/2013	0001	25	-	3.4		J	#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-17 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	12/10/2013	0001	14.5	-	0.23			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	14.5	-	83.7			#		
pH	s.u.	12/10/2013	0001	14.5	-	6.79			#		
Specific Conductance	umhos /cm	12/10/2013	0001	14.5	-	10864			#		
Temperature	C	12/10/2013	0001	14.5	-	16.71			#		
Turbidity	NTU	12/10/2013	0001	14.5	-	8.51			#		
Uranium	mg/L	12/10/2013	0001	14.5	-	1.2			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-18 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	12/10/2013	0001	13	-	2.69			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	13	-	48.4			#		
pH	s.u.	12/10/2013	0001	13	-	6.92			#		
Specific Conductance	umhos /cm	12/10/2013	0001	13	-	8704			#		
Temperature	C	12/10/2013	0001	13	-	16.99			#		
Uranium	mg/L	12/10/2013	0001	13	-	0.87			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-20 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	17	-	0.1	U		#	0.1	
Dissolved Oxygen	mg/L	12/10/2013	0001	17	-	0.42			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	17	-	-48.4			#		
pH	s.u.	12/10/2013	0001	17	-	7.47			#		
Specific Conductance	umhos /cm	12/10/2013	0001	17	-	3198			#		
Temperature	C	12/10/2013	0001	17	-	15.4			#		
Turbidity	NTU	12/10/2013	0001	17	-	45.7			#		
Uranium	mg/L	12/10/2013	0001	17	-	0.072			#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-21 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	12/10/2013	0001	25	-	4.5			#	0.1	
Dissolved Oxygen	mg/L	12/10/2013	0001	25	-	0.26			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	25	-	-17.9			#		
pH	s.u.	12/10/2013	0001	25	-	7.34			#		
Specific Conductance	umhos /cm	12/10/2013	0001	25	-	3285			#		
Temperature	C	12/10/2013	0001	25	-	17.01			#		
Turbidity	NTU	12/10/2013	0001	25	-	4.25			#		
Uranium	mg/L	12/10/2013	0001	25	-	6.5			#	0.0015	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-22 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Ammonia Total as N	mg/L	11/07/2013	0001	9	-	4.4			#	0.2	
Dissolved Oxygen	mg/L	11/07/2013	0001	9	-	2.26			#		
Oxidation Reduction Potential	mV	11/07/2013	0001	9	-	-13			#		
pH	s.u.	11/07/2013	0001	9	-	7.44			#		
Specific Conductance	umhos /cm	11/07/2013	0001	9	-	5504			#		
Temperature	C	11/07/2013	0001	9	-	18.71			#		
Turbidity	NTU	11/07/2013	0001	9	-	5.18			#		
Uranium	mg/L	11/07/2013	0001	9	-	3.7		J	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-23 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	11/25/2013	0001	26	-	5.4			#		
Oxidation Reduction Potential	mV	11/25/2013	0001	26	-	176			#		
pH	s.u.	11/25/2013	0001	26	-	7.09			#		
Specific Conductance	umhos /cm	11/25/2013	0001	26	-	4087			#		
Temperature	C	11/25/2013	0001	26	-	16.74			#		
Uranium	mg/L	11/25/2013	0001	26	-	0.9			#	0.00029	

Appendix B. Water Quality Data (continued)

General Water Quality Data by Location (USEE105) FOR SITE MOA01, Moab Site
REPORT DATE: 3/5/2014
Location: UPD-24 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	12/10/2013	0001	27	-	0.22			#		
Oxidation Reduction Potential	mV	12/10/2013	0001	27	-	-1.1			#		
pH	s.u.	12/10/2013	0001	27	-	7.43			#		
Specific Conductance	umhos /cm	12/10/2013	0001	27	-	4754			#		
Temperature	C	12/10/2013	0001	27	-	17.31			#		
Turbidity	NTU	12/10/2013	0001	27	-	6.14			#		
Uranium	mg/L	12/10/2013	0001	27	-	14			#	0.0015	

BLS = below land surface; 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 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:
- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

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

QA QUALIFIER:
- # Validated according to quality assurance guidelines.

Appendix B. Blanks Report

BLANKS REPORT
LAB: ALS
RIN: 1311068
Report Date: 3/5/2014

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Ammonia Total as N	MOA01	0999	11/21/2013	0001	mg/L	.1	U		.1		E
Uranium	MOA01	0999	11/21/2013	0001	mg/L	.00008	B		.000029		E

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

SAMPLE TYPES:

E	Equipment Blank.

Appendix B. Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site

REPORT DATE: 9/10/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
0401		3969.6	11/26/2013	14.17	3955.43	
0403	O	3968.95	11/25/2013	16.21	3952.74	
0404	O	3968.3	11/26/2013	14.74	3953.56	
0407	O	3969.09	11/25/2013	16.4	3952.69	
0410	O	3979.11	12/10/2013	25.88	3953.23	
0412	O	3962.48	11/7/2013	7.91	3954.57	
0413	O	3965.33	11/6/2013	8.45	3956.88	
0414	O	3959.20	11/7/2013	4.84	3954.36	
0430	U	4022.1	12/2/2013	61.2	3960.9	
0431	O	4007.04	11/14/2013	48.32	3958.72	
0432	U	4001.47	12/3/2013	42.9	3958.57	
0433	O	3989.99	12/3/2013	32.35	3957.64	
0434	U	3990.21	12/3/2013	34.2	3956.01	
0435	O	3971.67	11/21/2013	15.11	3956.56	
0436	O	3970.8	12/10/2013	11.2	3959.6	
0439		4055.27	11/13/2013	98.97	3956.3	
0440	O	4070.71	11/13/2013	112.24	3958.47	
0441		4008.77	12/3/2013	49.89	3958.88	
0443	O	4006.72	11/14/2013	47.55	3959.17	
0444	O	3970.99	11/21/2013	15.54	3955.45	
0454		3966.47	11/5/2013	12.79	3953.68	
0455	O	3990.2	12/3/2013	32.7	3957.5	
0456	U	3990.46	12/3/2013	35.09	3955.37	
0457	O	3971.3	11/21/2013	16.72	3954.58	
0492		3967.64	11/5/2013	15.5	3952.14	
AMM-1		3972.02	11/21/2013	17.17	3954.85	
AMM-2	O	3964.09	11/4/2013	10.35	3953.74	
AMM-3	O	3962.90	11/5/2013	9.01	3953.89	

Appendix B. Water Level Data (continued)

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Site
REPORT DATE: 9/10/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
ATP-2-D	O	3967.05	11/4/2013	7.42	3959.63	
ATP-2-S	O	3967.04	11/4/2013	13.76	3953.28	
ATP-3	O	3998.29	12/2/2013	39.68	3958.61	
MW-3		3965.98	11/6/2013	12.05	3953.93	
SMI-MW01	O	3968.45	11/7/2013	6	3962.45	
SMI-PW03	O	3969.13	12/10/2013	19.82	3949.31	
SMI-PZ2D	O	3967.38	11/6/2013	16.32	3951.06	
SMI-PZ2M2	O	3967.18	11/6/2013	14.83	3952.35	
SMI-PZ3D2	O	3975.13	12/10/2013	20.14	3954.99	
SMI-PZ3M	O	3975.23	12/10/2013	20	3955.23	
SMI-PZ3S	O	3975.03	12/10/2013	19.8	3955.23	
TP-11	O	3966.61	11/25/2013	12.32	3954.29	
TP-17	D	3963.69	11/20/2013	12.09	3951.6	
TP-19	D	3962.17	11/20/2013	11.41	3950.76	
TP-20	D	3967.55	11/5/2013	15.91	3951.64	
TP-22		3966.48	11/5/2013	13.91	3952.57	
TP-23		3962.54	11/5/2013	9.52	3953.02	
UPD-17		3970.71	12/10/2013	13.73	3956.98	
UPD-18		3968.74	12/10/2013	13.38	3955.36	
UPD-20		3978.73	12/10/2013	22.85	3955.88	
UPD-21		3981.45	12/10/2013	25.82	3955.63	
UPD-22		3966.2	11/7/2013	11.08	3955.12	
UPD-23		3982.38	11/25/2013	26.97	3955.41	
UPD-24		3977.1	12/10/2013	21.78	3955.32	

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

Appendix B. November/December 2013 Site-wide Sampling Event Trip Report

Date: January 21, 2014
To: Ken Pill
From: James Ritchey
Subject: November/December 2013 Site-wide Sampling Event

Site: Moab
Date of Sampling Event: November 4 – December 10, 2013
Team Members: E. Moran, K. Pill, and James Ritchey
RIN Number Assigned: All samples were assigned to RIN 1311068.
Sample Shipment: The coolers were shipped overnight UPS to Paragon Analytics, Inc., from Moab, Utah, on November 07 and 21 and on December 05 and 12 of 2013 (tracking numbers 1Z5W1Y510190339786, 1Z5W1Y510192808597, 1Z5W1Y510195379788, and 1Z5W1Y510192437416).

Number of Locations Sampled: The purpose of the site-wide sampling event is to update contaminant plume maps. A total of 62 locations (eight surface samples and 54 monitoring wells) were sampled during this event. Including four duplicates and one EB, a total of 67 samples were collected during the November 2013 ground water sampling event.

Locations Not Sampled/Reason: Well 0411 was dry and not sampled, and UPD-19 was damaged and could not be sampled.

Field Variance: None.

Quality-control Sample Cross Reference: False identifications assigned to the quality-control samples are shown below.

False ID	True ID	Sample Type	Associated matrix
2000	SMI-PZ2M2	Duplicate from 56 ft bgs	Ground Water
2001	0431	Duplicate from 91 ft bgs	Ground Water
2002	NA	Equipment Blank	De-ionized Water
2003	0430	Duplicate from 101 ft bgs	Ground Water
2004	SMI-PZ3M	Duplicate from 59 ft bgs	Ground Water

ft bgs = feet below ground surface

Appendix B. November/December 2013 Site-wide Sampling Event Trip Report (continued)

Location-specific Information: All of the observation wells were sampled using a peristaltic pump and dedicated tubing unless otherwise noted. The surface water samples were collected with dedicated surface water tubing that was decontaminated with Alconox® and de-ionized water between locations. The table below provides additional information:

Location	Date	Sample Depth (ft bgs)	Ammonia Probe Results (mg/L)	Ammonia Lab Analysis	Comments
0201	11/19/2013	–	<1	Yes	Unknown depth, moderate flow.
0218	11/19/2013	–	<1	Yes	Approximately 6 inches deep, rocky substrate, moderate flow.
0226	11/20/2013	–	<1	Yes	Approximately 3 inches deep, muddy substrate.
0228	11/20/2013	–	<1	Yes	Approximately 3 inches deep, slow flow, muddy substrate.
0401	11/26/2013	18	143.2	No	
0403	11/25/2013	18	25.5	No	
0404	11/26/2013	18	164.8	No	
0407	11/25/2013	17	16.14	No	
0410	12/10/2013	25	<1	Yes	Dewatered at 0.3 L.
0412	11/07/2013	9.5	<1	Yes	Tubing had to be lowered to the bottom. Well dewatered, but recharges.
0413	11/06/2013	10.5	50.9	Yes	
0414	11/07/2013	7.5	31.3	Yes	Sulfur odor.
0430	12/02/2013	101	<1	Yes	Sampled with dedicated bladder pump. Duplicate
0431	11/14/2013	91	<1	Yes	Sampled with dedicated bladder pump.
0432	12/03/2013	55	<1	Yes	Sampled with dedicated bladder pump.
0433	12/03/2013	99	<1	Yes	Sampled with dedicated bladder pump.
0434	12/03/2013	35	<1	Yes	Sampled with dedicated bladder pump.
0435	11/21/2013	173	1.36	Yes	
0436	12/10/2013	197	1.6	Yes	Sulfur odor.
0439	11/13/2013	118	5.69	Yes	Sampled with dedicated bladder pump.
0440	11/13/2013	117	<1	No	Sampled with dedicated bladder pump.
0441	12/03/2013	53	<1	Yes	Sampled with dedicated bladder pump. Water level dropped below pump.
0443	11//14/2013	73	<1	Yes	
0444	11/21/2013	116	1.53	Yes	
0453	11/13/2013	80	274	Yes	Sampled with dedicated bladder pump.
0454	11/05/2013	13	259	No	
0455	12/03/2013	46	<1	Yes	Sampled with dedicated inertia pump
0456	12/03/2013	53	<1	Yes	Sampled with dedicated inertia pump
0457	11/21/2013	29	<1	Yes	

Location	Date	Sample Depth (ft bgs)	Ammonia Probe Results (mg/L)	Ammonia Lab Analysis	Comments
0492	11/05/2013	18	8.38	Yes	
AMM-1	11/21/2013	19	<1	Yes	
AMM-2	11/04/2013	48	676	Yes	
AMM-3	11/05/2013	48	228	Yes	
ATP-2-D	11/04/2013	88	267	No	
ATP-2-S	11/04/2013	25	365	No	
ATP-3	12/02/2013	51	<1	Yes	Sampled with dedicated bladder pump.
CR1	11/19/2013	–	<1	Yes	Approximately 2 feet. deep.
CR2	11/19/2103	–	<1	Yes	Approximately 3 inches deep, rocky substrate.
CR3	11/20/2013	–	<1	Yes	Silty substrate, low flow velocity, approximately 3 inches deep.
CR5	11/19/2013	–	<1	Yes	Unknown depth, moderate flow.
MW-3	11/06/2013	44	305	Yes	
SMI-MW01	11/07/2013	16	2.05	Yes	Slight odor.
SMI-PW03	12/10/2013	60	18.84	Yes	
SMI-PZ2D	11/06/2013	75	220	Yes	
SMI-PZ2M2	11/06/2013	56	366	Yes	
SMI-PZ3D2	12/10/2013	78	266	No	
SMI-PZ3M	12/10/2013	59	22.3	Yes	Duplicate.
SMI-PZ3S	12/10/2013	25	2.81	Yes	
TP-01	11/25/2013	22	<1	Yes	
TP-11	11/25/2013	30	<1	Yes	
TP-17	11/20/2013	28	1.69	No	
TP-19	11/20/2013	29	2.82	Yes	Top of casing needs repair.
TP-20	11/05/2013	32	1.87	Yes	Sulfur odor
TP-22	11/05/2013	17	159	Yes	
TP-23	11/05/2013	25	<1	No	
UPD-17	12/10/2013	14.5	228	No	
UPD-18	12/10/2013	13	175.0	No	Dropped tubing. Dewatered at 0.5 L. Turbid water.
UPD-20	12/10/2013	17	<1	Yes	
UPD-21	12/10/2013	25	3.59	Yes	
UPD-22	11/07/2013	9	4.22	Yes	
UPD-23	11/25/2013	26	2.56	No	Dewatered at 0.3 L
UPD-24	12/10/2013	27	<1	No	

ft bgs = feet below ground surface

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

Appendix B. November/December 2013 Site-wide Sampling Event Trip Report (continued)

Well No.	Date	Depth to Water (ft btoc)
0401	11/26/2013	14.17
0403	11/25/2013	16.21
0404	11/26/2013	14.74
0407	11/25/2013	16.40
0410	12/10/2013	25.88
0412	11/07/2013	7.91
0413	11/06/2013	8.45
0414	11/07/2013	4.84
0430	12/02/2013	61.20
0431	11/14/2013	48.32
0432	12/03/2013	42.90
0433	12/03/2013	32.35
0434	12/03/2013	34.20
0435	11/21/2013	15.11
0436	12/10/2013	11.20
0439	11/13/2013	98.97
0440	11/13/2013	112.24
0441	12/03/2013	49.89
0443	11/14/2013	47.55
0444	11/21/2013	15.54
0453	11/13/2013	>73.9*
0454	11/05/2013	12.79
0455	12/03/2013	32.70
0456	12/03/2013	35.09
0457	11/21/2013	16.72
0492	11/05/2013	15.50
AMM-1	11/21/2013	17.17
AMM-2	11/04/2013	10.35
AMM-3	11/05/2013	9.01
ATP-2-D	11/04/2013	7.42
ATP-2-S	11/04/2013	13.76
ATP-3	12/02/2013	39.68
MW-3	11/06/2013	12.05
SMI-MW01	11/07/2013	6.00
SMI-PW03	12/10/2013	19.82
SMI-PZ2D	11/06/2013	16.32
SMI-PZ2M2	11/06/2013	14.83
SMI-PZ3D2	12/10/2013	20.14
SMI-PZ3M	12/10/2013	20.00
SMI-PZ3S	12/10/2013	19.80
TP-01	11/25/2013	NA**
TP-11	11/25/2013	12.32
TP-17	11/20/2013	12.09
TP-19	11/20/2013	11.41
TP-20	11/05/2013	15.91
TP-22	11/05/2013	13.91
TP-23	11/05/2013	9.52
UPD-17	12/10/2013	13.73
UPD-18	12/10/2013	13.38
UPD-20	12/10/2013	22.85
UPD-21	12/10/2013	25.82
UPD-22	11/07/2013	11.08
UPD-23	11/25/2013	26.97
UPD-24	12/10/2013	21.78

btoc = feet below top of casing
*Water level below the top of pump.
**Casing is blocked.

Surface Water Location 0201

Surface Water Location 0218

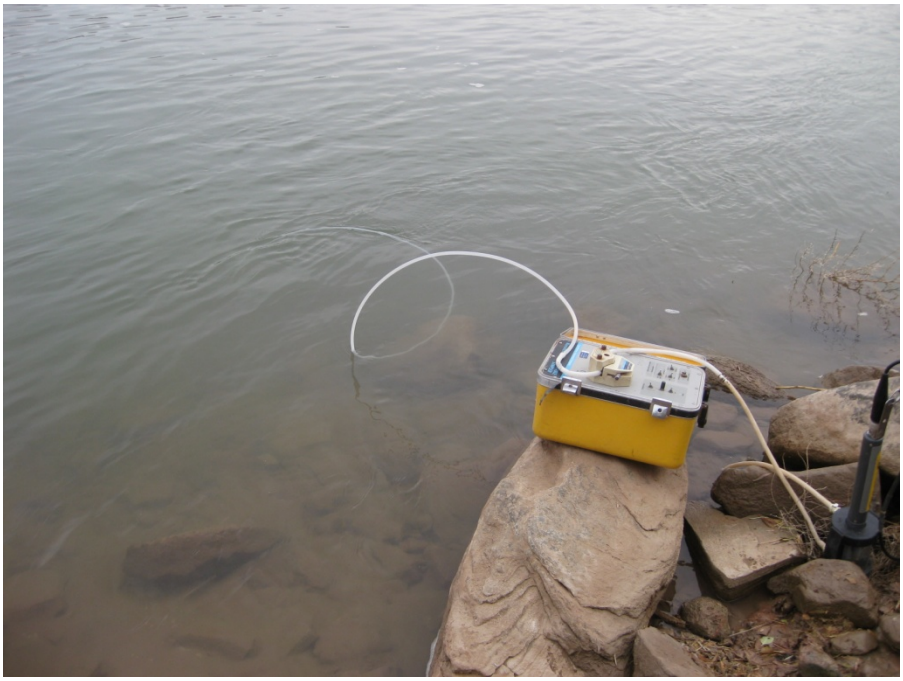
Surface Water Location 0226

Surface Water Location 0228

Surface Water Location CR1

Surface Water Location CR2

Surface Water Location CR3



Surface Water Location CR5

Appendix B. November/December 2013 Site-wide Sampling Event Trip Report (continued)

November 2013 Configuration 5 Sampling

Number of Locations Sampled: Two extraction wells (0815 and SMI-PW02) were sampled during the November/December 2013 sampling event.

Locations Not Sampled: None.

Field Variance: None.

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

Well No.	Date	Time	Ticket Number	Flow Rate (gpm)	Depth to Water (ft btoc)	Ammonia Probe Results (mg/L)	Pump Intake Depth (ft bgs)
0815	11/04/2013	15:05	NOV 004	25	11.86	191	45
SMI-PW02	11/04/2013	15:10	NOV 005	27	17.25	428	55

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

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

Site Issues: The mean daily Colorado River flow during this sampling event, according to the USGS Cisco Gaging Station (Station No. 09180500), is provided below:

Date	Daily Mean Flow (cfs)
11/04/2013	3,990
11/05/2013	3,820
11/06/2013	3,820
11/07/2013	3,780
11/08/2013	3,610
11/09/2013	3,630
11/10/2013	3,620
11/11/2013	3,580
11/12/2013	3,530
11/13/2013	3,390
11/14/2013	3,460
11/15/2013	3,400

Date	Daily Mean Flow (cfs)
11/16/2013	3,360
11/17/2013	3,330
11/18/2013	3,380
11/19/2013	3,280
11/20/2013	3,150
11/21/2013	3,180
11/22/2013	3,390
11/23/2013	3,600
11/24/2013	3,790
11/25/2013	3,630
11/26/2013	3,510
11/27/2013	3,350
11/28/2013	3,200
11/29/2013	3,110
11/30/2013	3,110
12/01/2013	3,100
12/02/2013	3,080
12/03/2013	3,030
12/04/2013	3,240
12/05/2013	3,290
12/06/2013	2,920
12/07/2013	Ice
12/08/2013	Ice
12/09/2013	Ice
12/10/2013	Ice

cfs = cubic feet per second

ICE = No flow measured due to ice build-up at station measurement point

Corrective Action Required/Taken: None.